

Chapter One

INTRODUCTION

1.1 Introduction

... owning property makes us more sensitive to the particular and varied demands of a specific place, it gives us a stake in the neighbourhood, makes us part of its history and beauty. And "Buildings ... are political and cultural entities which touch directly the fabric of everyone's life... when we talk about architecture, we talk about our vision of the country itself."(Sulivan,1985 in Sorensen and Auster,1991:19).

*A man's house is his castle.
Sir Edward Coke, (1552 - 1634)*

This chapter sets out to present the key focus and aims of this research. It also justifies why this research was carried out. Sources of information are stated and the style and methodology used explained. The last section of this chapter, which is on the structure of the thesis, offers a brief outline of all the chapters.

1.2 The key focus

Housing is an important basic need in any human civilization. It is undoubtedly an indispensable accompaniment to human life and activity. A house provides shelter from the natural elements, it is essentially a family place, a home. The connotations of home run deeply in the human psyche. It represents shelter from not only physical elements, but also those of social, spiritual and psychological nature. The house is also a claim to a particular position in society. It provides to its main occupant the title of 'head of household'. Its 'facade and front fence' reflect the image of the occupants, and give a 'social status' to them. A house cannot be considered separately from the land it stands on, and the location of the house determines access to services. The location also determines the class and the status of its occupants (Nikkyo,1982:54).

The housing industry, which is closely related to the construction industry, is a major component of advanced economies. Indeed, housing has always been a complex issue in all countries, more so in the developing countries, requiring careful thought on the part of planners and policy makers. In this context, the key focus of this thesis is threefold. First, it examines the housing preferences of a sample of Singaporeans living in private owner-occupied housing in districts 5 and 21 in the first half of the 1990s. Secondly, the thesis seeks to illuminate the social and economic phenomenon of rising expectations, of which the aspiration for better housing is an essential component. Thirdly, the study documents the approaches by government and non government agencies in meeting the rising aspirations of the people to own private housing.

1.3 The purpose and aims of this research

The main objective of this research is to study the housing preferences of a sample of owner-occupiers in the private housing sector in Singapore. Towards this research objective, descriptive models of housing preferences are developed. These models include a conceptual model of housing preferences and three related sub-models. The models serve as catalysts for empirical measurement of housing preferences. Based on these models, null hypotheses are formulated and tested with data obtained from the household survey. In all, five key research questions have been put forward to promote the research activities, and these are presented below. The first three key questions (questions 1 to 3) are designed to illuminate logically the main objectives, while two other auxiliary questions (questions 4 and 5) are intended to highlight the side issues affecting owner-occupiers' choice of housing.

The five key questions are as follows :

QUESTION 1

What attributes of housing might Singaporeans consider in making their residential choice and how can those attributes be grouped?

The following groups of attributes are considered in this study:

- i. Environmental
- ii. Locational
- iii. Social
- iv. Design and Structural

The underlying influences on these groupings of attributes are classified as :

- i. Socio-economic and political factors
- ii. Personal situational factors

These attributes and factors are further elaborated in Chapter Four.

QUESTION 2

(2a) Which, in overall terms, are the most important attributes in housing preferences perceived by the sample of owner-occupiers?

(2b) To what extent does the importance of those attributes vary according to age, gender, occupation and other selected socio-demographic characteristics?

Some of these attributes include location, accessibility, and environmental factors, as well as financial and social attributes. In general, residential densities prescribed in the Master Plan (1991) are categorised into low and high density. Under this Plan, areas of low residential density have approximately 185 persons per hectare, while high residential density refers to areas with 371 persons per hectare or more. Given the scarcity of land in Singapore it is increasingly difficult for owner-occupiers to own homes in low density private housing estates. Nevertheless, with higher density developments, certain environmental problems such as noise, less privacy and crimes are inevitable. The answers to questions 2a and 2b are found in Chapter Six and further elaborated in Chapter Seven.

QUESTION 3

Which housing type yields optimal (maximum) overall satisfaction for owner-occupiers: landed property or condominium?

In Singapore, the private residential property market can be divided broadly into two categories: landed housing and condominium housing. Landed housing comprises terrace, semi-detached, and detached houses. Condominium housing includes flats, condominium units and townhouses in low, medium and high density developments. For the condominium type of housing, the management of estates is vested in management corporations. This aspect of the Singapore property market is explained in Chapter Three.

The remaining two auxiliary questions (questions 4 and 5) highlight two side issues affecting owner-occupiers' choice of housing, i.e. the acceptance of 99-year leasehold tenure for housing and the willingness of owner-occupiers of private housing to downgrade to public housing.

QUESTION 4

To what extent has 99-year leasehold housing gained acceptance among owner-occupiers?

Chong(1990) observed that given a choice between a freehold and a 99-year leasehold property, the answer is obvious. Indeed, the overwhelming preference is for the former, everything being equal. In other words, the choice must be fair - the two properties would have to be in the same location, having the same facilities, design and size, and be offered at the same price. However, this thesis demonstrates that in most cases, the owner-occupiers are never given such a fair choice. They usually would have to weigh in their purchasing decision such factors as price, location, design, facilities and a number of other attributes as highlighted in Chapter Four. Furthermore, with a limited availability of freehold land, this thesis postulates that owner-occupiers will become less resistant to buying leasehold properties. It is to this end that this study will measure in empirical terms the willingness of owner-occupiers to buy properties on leasehold titles in selected western residential districts.

QUESTION 5

To what extent are owner-occupiers of private housing prepared to consider moving to public housing?

In Singapore, public housing, especially those older Housing and Development Board (HDB) flats, is being physically upgraded by the government to a standard nearer to that of private housing. In fact, upgrading works in most HDB estates have received very positive feedback from the leasees. This raises the interesting possibility that the quality of some public sector housing is reaching a comparable standard to that of private housing. In the light of this development, this thesis attempts to highlight private owner-occupiers' perception of public housing. In doing so, it will also examine whether upgrading of HDB estates has an influence on the decision of owner-occupiers of private housing in moving over to upgraded HDB housing. If so, to what extent are they willing to forego the privilege and status of private ownership in order to enjoy the benefits of improved public housing? Chapters Six and Seven offer an insight into this aspect.

1.4 Justifications for this Research

This research has been carried out because of the importance of housing matters to Singapore's economy and society. Housing has always been an issue that is debated in the local parliament and has played a vital role in maintaining social cohesion of the nation. However, there have been remarkably few previous significant local studies on the subject, as most literature on housing deals with mature industrialised countries. Nevertheless, this thesis anticipated that perhaps the situation in Singapore would have some similarities, as well as differences, to studies of housing preferences in these industrialised countries. This theme is developed in more detail the literature review in Chapter Two.

Indeed, as is explained in Chapter Three, a rising population and a declining household sized in recent years presupposes a large increase in the number of housing units demanded by the population. Yet, as pointed out earlier, existing Singaporean literature on housing and housing related topics is restricted in quantity as compared to that found in the more developed Western countries. Within the

limited local literature on housing, none has focused specifically on the area of rising aspirations and housing preferences. This thesis therefore attempts to fill the gap by presenting its findings on housing preferences and satisfaction in the local private housing sector. The next section briefly explains the style and methodology used in this thesis.

1.5 The Style and Methodology used in this Thesis

Analysis of housing preferences sits at the interface of several areas of academic enquiry. As shown in Figure 1-1, these areas may include :

- i) urban planning
- ii) urban economics
- iii) urban sociology
- iv) human geography
- v) environmental studies
- vi) real estate studies
- vii) architecture and building



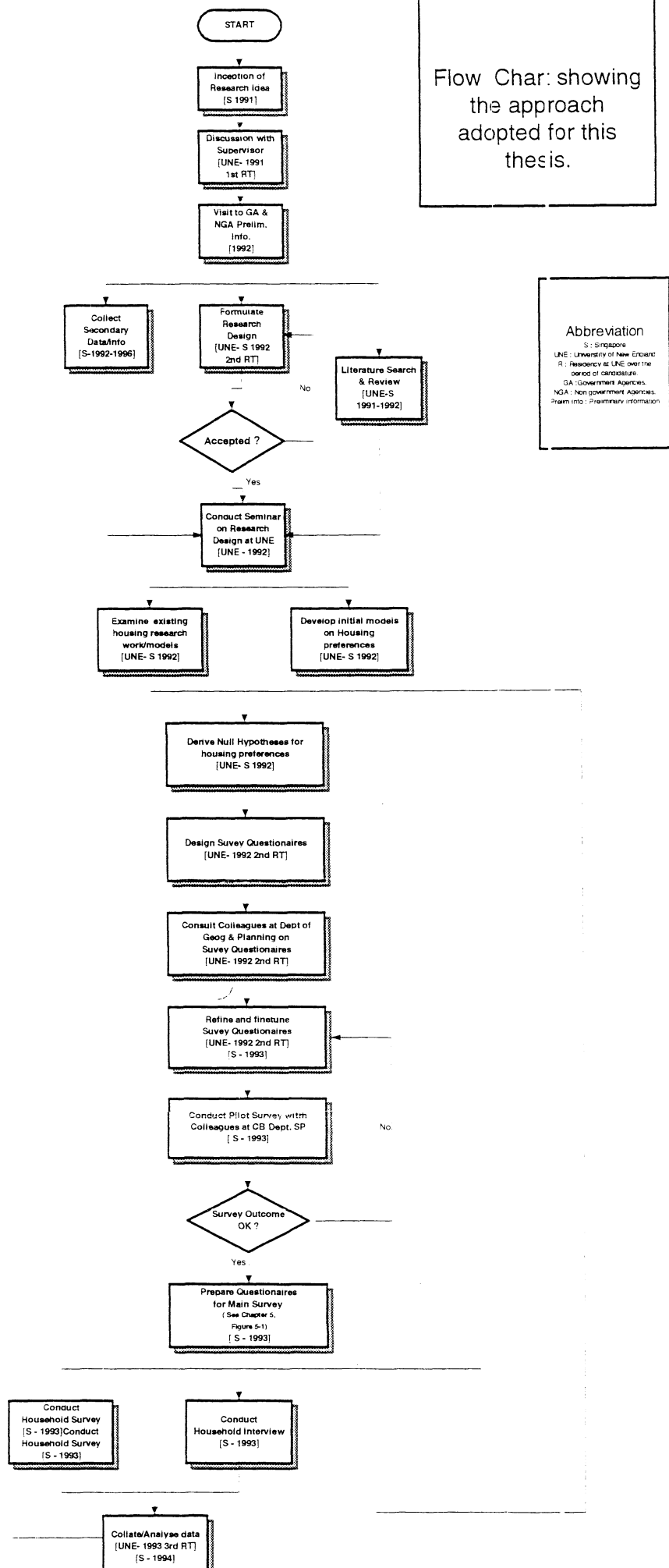
Multidisciplinary Aspects of Housing Research
(Source : The Author:1995)

Figure 1-1

Thus, the author has taken into consideration the multi-disciplinary nature of housing preferences studies when writing this thesis and has adopted a positivist and empirical style in its presentation. In line with this style, a holistic and humanistic approach is intentionally adopted. This is a deliberate attempt by the author to explain issues pertaining to housing preferences among middle class owner-occupiers in Singapore.

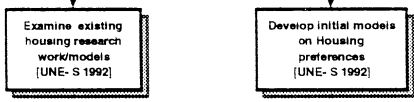
This research is an empirical study that brings together surveys and secondary data on housing preferences. The data obtained is analysed statistically in the light of existing literature on housing. In addition, from the information collected, conceptual models and sub-models on housing preferences are systematically developed. The development of models is via an inductive process, taking into consideration the theoretical ideals about housing preferences among a segment of Singapore's population. This information and related ideas are compared with observations made in various countries. Figure 1-2 shows the approach adopted in this thesis.

Flow Char: showing the approach adopted for this thesis.



Abbreviation
 S : Singapore
 UNE : University of New England
 R : Residency at UNE over the period of candidature.
 GA : Government Agencies.
 NGA : Non government Agencies.
 Prelim Info : Preliminary information

Classify data [UNE - 1992]



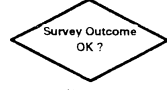
Derive Null Hypotheses for housing preferences [UNE- S 1992]

Design Survey Questionnaires [UNE- 1992 2nd RT]

Consult Colleagues at Dept of Geog & Planning on Survey Questionnaires [UNE- 1992 2nd RT]

Refine and finetune Survey Questionnaires [UNE- 1992 2nd RT] [S - 1993]

Conduct Pilot Survey with Colleagues at CB Dept. SP [S - 1993]



Prepare Questionnaires for Main Survey [See Chapter 5, Figure 5-1] [S - 1993]

Conduct Household Survey [S - 1993] Conduct Household Survey [S - 1993]

Conduct Household Interview [S - 1993]

Collate/Analyse data [UNE- 1993 3rd RT] [S - 1994]

Presentation of data [S - 1994]

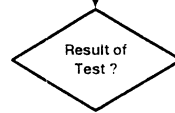
Conduct Seminar on research progress [UNE - 1995 4th RT]

Re-examine Housing Models [S - 1993]

Review Literature on housing preferences/choice [S 1993-96]

Test Null Hypotheses [S - 1995/96]

Draft chapters [S - 1995-96]



Tabulate Attributes which have no correlation. [S- 1995/96]

Deduce correlation of attributes affecting housing preferences. [S- 1995/96]

Document Macro/Micro level Approaches Models [S - 1995/96]

Redraft Chapters [S - 1995 96]

Present Research Findings [S1996.17]

This thesis makes use of information obtained from a number of vital sources. The bulk of primary data comes from the household survey of owner-occupiers on housing preferences conducted by the author over a six month period in 1994. This was supplemented by personal interviews with owner-occupiers. Secondary data was obtained from official sources such as the Urban Renewal Authority's (URA), Housing and Development Board's (HDB) and the Land Office's publications, financial institutions and real estate firms.

Planning-related information such as that in the Master Plan, and Development Guide Plans (DGPs) were obtained from the Ministry of National Development. Such information was further supplemented by other sources, including government agency reports, media reports, interest group publications and submissions, as well as journals and magazines. In addition to the above, information on real estate transactions and news was obtained from the Internet. However, such information is only used when the providers are government agencies and such other reliable sources as reputable real estate agencies or universities

1.6 The Structure of the Thesis

This thesis consists of eight chapters in all. A brief outlines of the chapters follows:

Chapter One, the *introductory chapter*, outlines in specific terms the objectives and justification of this research and proceeds to give a brief description of each of the other chapters. **Chapter Two**, *Literature Review*, documents and discusses previous works on housing studies in general and housing preferences in particular. Both work carried out locally and elsewhere will be reviewed. *The Emergence of Private Housing in Singapore* is examined in **Chapter Three**. The chapter begins with a brief outline of private housing in Singapore and how it evolved into the state it is today, taking into consideration policy matters as well as the socio-economic factors affecting the housing market. The chapter explains the rising aspirations of an increasing affluent population to own private housing and documents the diversity of housing in Singapore as well as a section on the issue of titles to real estate.

Chapter Four, *Development of Models and Derivation of Hypotheses on Housing Preferences*, presents an overview of *residential environments* which include physical, locational, social, environmental and financial attributes affecting owner-occupiers' housing preferences. This section therefore, acts as the catalyst for the development of housing preference models. Timmermans, *et al.*(1990) put it thus:

The study of preferences and choice patterns is perhaps the most important contribution of behavioural geography to problems of an applied nature, because theories and models of preferences and choice are widely used to forecast the likely impacts of policy decisions on spatial behaviours, and to assess the feasibility of envisaged projects (Timmermans, *et al.*, 1990).

That said, these models serve as the basis for the formulation of null hypotheses which are tested using data from the social survey on Housing Preferences described in **Chapter Five**. This chapter, *The Household Survey and Data Collection*, covers collection procedures for the *primary data* in the form of a survey and describes the *design of the questionnaire* as well as the sources of *secondary data*. The problems encountered are systematically highlighted in tabulation form. This is followed by **Chapter Six**, *Housing Preferences and Satisfaction: Analysis and Results*. In this chapter, statistical analysis is performed on the data, and charts and tables are used to highlight the major findings on housing preferences.

Chapter Seven, *Housing Preferences and Satisfaction: Managing Expectations*, discusses the major implications of the findings presented in Chapter Six. This chapter also attempts to discuss the approaches taken by government and non government agencies in meeting the rising aspirations of the people to own private housing. More importantly the chapter relates the findings presented earlier to these approaches. **Chapter Eight**, the *concluding chapter*, presents a summary of the research work and highlights its inadequacies before putting forth recommendations for future research on Housing. **Appendices** are included at the end of the thesis for cross reference purposes.

Chapter Two

LITERATURE REVIEW

2.1 Introduction

Property is the fruit of labour; property is desirable; it is a positive good in the world. That some should be rich shows that others may become rich and hence, is just encouragement to industry and enterprise.

Lincoln, Abraham(1809 - 1865)

This chapter reviews the work of other researchers in an attempt to generate ideas for this thesis and to enable comparison to be made. In a nutshell, it highlights the work of past researchers on housing studies, particularly on the subject of housing preferences. Indeed, this chapter outlines key debates and controversies in housing studies carried out by past researchers. Topics reviewed include housing needs, preferences and choices, as well as on investigation of housing aspirations and satisfaction. Although most of these studies were carried out in industrialised countries, nevertheless, some were carried out locally. Furthermore, as a prelude to Chapter Four, a section of this chapter reviews some of the housing models that were developed prior to 1990 and those that were evolved in the 1990s.

2.2 Housing Studies : Needs, Preferences and Choices

Many studies have been devoted to the study of housing needs, preferences and choices, although most were carried out in the industrialised countries. It is appropriate at this stage to indicate clearly the meaning of “preferences” and “choices”. For MacLennan (1977) the term “preferences” relates to the concept of underlying tastes which exist independently of constraints. Thus, preferences reside within the mind. As such, they must be distinguished from choices. “Choices” or “selections” are the outcome of the interaction of tastes and constraints. Choices are equivalent to preferences revealed with respect to a given set of constraints. This definition of choices is further elaborated by Lindberg *et al.* (1988) who argued that choices are subject to various constraints to a greater extent than preferences. According to these researchers, a price which cannot be afforded is probably the most

common constraint, as is a location that requires several hours a day travelling to and from work. They further stated that although almost everyone would prefer to live in a modern owner-occupied house in a fashionable area rather than in a small rented apartment in a slum, budget constraints may force one to choose the latter alternative instead of the former. Still on the subject of housing choices, Kelly's (1955) personal construct theory provided a further explanation of the ways in which owner-occupiers go about making housing choices. The approach adopted by Kelly was derived from clinical psychology and assumed that humans try to understand the workings of the world around them. Kelly theorised that individuals sampled their environment perceptually and then tested the accuracy of their perceptions by trying out the environment through their action.

Indeed, previous studies of housing tend to demonstrate that housing preferences may be predicted from beliefs held by the respondents concerning the effects of various housing attributes on the attainment of a small number of life values (see Hempel and Tucker, 1979; Smith and Clarke, 1982; Maclennan, 1977; Timmermas, 1984a, 1984b; Lindberg *et al.*, 1988; Widmar, 1994). As such, if an understanding of the significance of people's housing preferences is to be achieved, more in-depth research of a qualitative or discursive nature such as that of MaLaverly and Yip (1991) is needed. In their work, MaLaverly and Yip contributed to the debate about the meaning which should be given to people's expressed preferences for different housing tenures. Not unexpectedly, their findings indicated a large majority of respondents preferring to own their dwellings in Littlewood, United Kingdom. Their findings also suggested that people seem inclined to express a preference for the tenure type in which they are currently living. They went on to suggest that respondents may face difficulty in comparing a tenure with which they are familiar, with one with which they are unfamiliar.

In the context in which the study was undertaken, the tenures in question refer to that of renting versus owning the dwelling. However, in the local context which this study is addressing, it is tenures of freehold housing as against those of leasehold housing which the respondents are concerned with. Rental housing in this instance is

not a key issue, as most Singaporeans own their homes or are purchasing them and making mortgage payments.

It has also been shown in several housing studies (for example, Lindberg *et al.*, 1988 and Francescato *et al.*, 1974), that housing preferences of owner-occupiers are influenced by their aspirations and life values. Past work on this aspect are reviewed below.

2.3 Rising Aspirations and Satisfaction

The issues of housing aspirations and satisfaction are attracting a growing interest from researchers in different arenas (Lindberg *et al.*, 1988). In a broader perspective, these issues are related to that of people's aspirations for better quality of life as demonstrated by Francescato *et al.* (1974), Campbell *et al.* (1976); Weidemann and Anderson (1985), and more recently by Robinson (1993) and Cooper *et al.* (1994). A majority of past researchers have stressed how different housing alternatives are typically conceived of as "bundles" of attributes such as cost, size, and location. Apart from these housing attributes, characteristics of the owner-occupiers themselves, such as life cycle, occupation, sex and age have been found to influence housing preferences (Lewis, 1984; Lindberg *et al.*, 1988 and Doyle, 1990).

According to Lewis (1984), as one ages, one passes through different stages of life, and each of these stages is a part of one's life cycle. He stressed that in each stage, one has new aspirations and faces new challenges. One also develops new needs and values. He went on to maintain that these changes have a great effect on one's housing. Furthermore, he stressed that as owner-occupiers move from one stage of their life to another, their housing needs change. He concluded that individual and family life cycles have a great effect on housing. He based his conclusion on the argument that differently composed households affect housing demand in general through their different lifestyles and needs. Accordingly, the owner-occupiers' preferences for certain housing types and locations are dependent upon their social

needs to cater for the very old, very young or for themselves as working adults. Indeed, he reiterated that underlying demand for owner-occupied housing is thus very much a function of age structure. If Lewis's arguments stand, then the changes in the distribution of age categories will be a significant component of long-term changes in housing demand. This has in fact been confirmed by Maher (1994) and Evelyn (1984). Maher (1994), for example, revealed in his study on housing demand in the Australian housing market of the 1980s that the greatest demand for housing comes from those aged in the category from 25 to 34 years, while older age groups fuel the market through upgrading. A number of researchers believe that existing owner-occupiers may move to another type of housing which better serves their current needs. Other researchers such as Lewis (1984); Clark and Osaka (1983); Moore (1972) and Simmons (1968) have all shown in their studies that families with children require greater amounts of dwelling space than childless couples or people living alone. However, Troy (1996) argued that space requirements do not necessarily decline with age, in fact they may even increase. This, according to Troy, is because older age households may require space for visiting friends and relatives or for their hobbies. Moreover, older people can often afford more space.

That said, the housing targets of individuals change throughout their life-cycle, prompted by new household circumstances, and many studies therefore focus on demographic explanations (Nutts *et al.*, 1976; Seek, 1983). Seek (1983) identified the different behaviour of expanding and contracting households, the former tending to increase the size of their dwellings through extension while the latter increase quality by improvement. The emergence of "housing stress" at certain points during the household life-cycle, particularly associated with increasing family size, may therefore be a key trigger for extension activity or changing housing preferences, as demonstrated by Gosling, Keigh and Stabler (1993).

Short (1982) supported this proposition by arguing that one of the most important reasons for residential relocation is related to people's changing requirements for household space. He stressed that such requirements may be regarded as a function of life-cycle stage as reported in the work of Clark and Osaka (1983); Moore (1972) and

Simmons (1968). Family background and lifestyle therefore play a vital role in determining housing preferences and must be examined in the light of availability of choices. Making choices in turn depends very much on market conditions and public policies. Indeed, Clapham and Kintrea (1984) had shown that choosing a house involves a complex process of information-gathering throughout which the full range of possibilities is never apparent. They believed that for each household there is always a reason or indication of the point at which search should stop and a decision be made. Therefore, according to them, the outcomes are highly dependent on first, the initial aspirations of the household; second, the method of information gathering and the nature of the information, and third, the household's ability to undertake an extended search.

Besides "aspirations", the concept of households' "satisfaction" with aspects of their residential environment has become the pre-eminent indicator employed by housing developers, analysts, and policy makers in at least three distinct ways. First, it has been used as an ad hoc evaluative measure for judging the success of housing developments constructed by the private sector. Second, it has been used as an indicator of incipient residential mobility and, hence, altered housing demands and neighbourhood change. Third, it has been used to assess residents' perceptions of inadequacies in their current housing environment so as to direct forthcoming private or public efforts to improve the status quo (Galster, 1987:540). Given these numerous applications, it is not surprising that Francescator *et al.* (1979) predicted that the criterion of residential satisfaction will be consistently employed in future research.

Indeed, two contrasting conceptual treatments of housing satisfaction have emerged as potential underpinnings for Galster's research on housing aspirations: the "purposive" approach and "actual-aspiration gap" approach. In the view of the former, people are seen as having certain goals and associated activities directed at the achievement of such goals. The extent to which a given residential environment is perceived as facilitating these goal-directed actions is seen as a statement of their environmental satisfaction. It follows that research must investigate goals, associated activities, and environmental factors.

From the perspective of the actual-aspirational gap approach, people perceive salient attributes of their physical environment and evaluate them based on certain standards of comparison, especially the standard defined by what people believe they may reasonably aspire to. The size of the gap between perceived actual environment and the aspired-to environment provides the measure of satisfaction. The research implications of this approach are that objective features of the environment and personal characteristics that presumably influence perceptions and evaluations must be identified. Galster's work follows the tradition established by the actual-aspirational gap approach and is intended as a critique of previous empirical work, which he claimed had been misspecified because it had employed aggregated linear statistical models to estimate the relationship between features of the residential environment and the associated levels of satisfaction. Of course, Galster's consideration of "satisfaction-residential context function" suggests that empirical specifications should be disaggregated (or stratified) by household type and allow for nonlinear relationships between residential contexts and their associated levels of satisfaction.

Indeed, from the perspective of the actual-aspirational gap approach, the construct of satisfaction rests on the conceptual foundation as developed primarily by Francescato *et al.*(1974,1979), Campbell *et al.*(1976) and Weidemann and Anderson(1985). Campbell *et al.*(1976), for example argue that individuals may be seen as cognitively constructing a "reference" condition for each particular salient feature of their residential situation. Furthermore the quantity or quality of the given feature implied by the reference point will depend on the individual's self-assessed needs and aspirations. They argued that if the current situation is perceived to be in proximate congruence with the reference situation, an affective state of satisfaction should be manifested. On the other hand, they argued that if the current situation falls short of the reference situation by more than a "threshold deficiency," two alternatives are possible. According to them, one may attempt to reconcile the incongruence by "adaptation", redefining needs, lowering aspirations, or altering the evaluation of the current residential situation, thereby producing a modicum of satisfaction.

The other alternative, according to Campbell *et al.*(1976), is that one cannot somehow readily adapt to the current residential context, in which case “dissatisfaction” should be manifested. Such individuals, over time, would likely attempt to reduce their dissatisfaction by altering conditions in their present dwelling or by moving to another, more congruent residential situation. Of course, Campbell *et al.*(1976) believed that either attempt may be more or less feasible for different household types in different contexts. They explained that the ability to alter features of the current dwelling may, for instance, be severely constrained by the low income or physical limitations of the homeowner or by the capabilities of the structure itself.

Galster (1987) stated that numerous economic, social, and informational constraints are operative upon the mobility decision. He stressed that the satisfaction-residential context function is household-type-specific and may be deduced from consideration of how people establish aspirations and perceived needs, and how they respond to gaps between such aspirations or needs and reality. Galster went on to hypothesise that housing aspirations are undoubtedly influenced by a person’s prior residential experiences, perceived status, sense of personal efficacy, and potential for upward mobility. Other researchers like Michelson (1976); Morrow (1988) and more recently, Ford (1990), concentrated on the question of housing needs. They stressed that needs, though difficult to distinguish from aspirations, are more a function of family size and demographical composition and life-cycle stage.

It seems, therefore, that most of the studies of housing investigated housing preferences in relation to current life styles of respondents, and relate such preferences to needs and aspirations. In this thesis, housing preferences are discussed in which households have some degree of discretion regarding the house which they would like to own. Situations where constraints and preferences interact to determine actual housing preferences are also considered. These will be discussed in Chapter Four. The following section highlights past work on specific attributes concerning housing preferences and satisfaction. These are attributes such as locational, environmental and social factors.

2.4 Housing Studies : Specific Attributes

As early as the 1970s, Lowry (1970), investigated the distance concepts of urban residents by analysing certain kinds of human behaviour related to the spatial characteristics of the physical environment. These spatial characteristics include the location and arrangement of various urban facilities, which are defined to consist of ten types or classes:

- (i) shopping centres
- (ii) bus stops
- (iii) libraries
- (iv) terminals for buses, trains, or aircraft
- (v) schools
- (vi) parking lots and garages
- (vii) parks
- (viii) expressway interchanges
- (ix) post offices
- (x) hospitals

In his study, Lowry (1970) assumed that variation among people in their use of facilities does not bias their judgments of one facility class in relation to any other facility class, and that urban dwellers visualize or think about distances in abstract settings. In other words, from a behavioural aspect, distances are concepts each of which has many components. He concluded that perception of distance is a subjective phenomenon which corresponds to a physical distance, though it may be distorted by any number of factors. The present study has in fact identified a number of these factors.

Other theories, such as the neoclassical theory of household location, depict utility maximizing consumers' consumption and residential location choices in a monocentric urban area (Turnbull, 1990; Alonso, 1964 and Brown, 1985). Such theory provides a rich set of testable hypotheses and comparative-static predictions. In all the work cited so far, accessibility is one of the most commonly considered locational characteristics of housing. Home buyers will distinguish between houses according to the ease with which they may travel from them to work, school or shopping centre (Charles, 1977).

Though closely influenced by distance, accessibility is also affected by the quality of roads, public transport services and density of traffic. Furthermore the level of accessibility is determined by both the time spent on travel and its costs. As the time and cost of travelling rises, other aspects of houses being identical, consumers' evaluations will fall and thus prices will be lower. If most of the places to which a household requires access are within the centre of an urban area, we can expect that prices of similar houses will fall with increasing distance from the city centre, though the fall will be less along the main transport routes. It should be noted that though location does influence the accessibility of owner-occupiers, it must be stressed that location is not the only factor in determining the relative accessibility as perceived by the owner-occupiers. Accessibility is thus a prime ingredient in a newer way of thinking. As Cooper and Rodman (1994:54) put it :

Judgements of degrees of accessibility appear to depend not only on the physical characteristics of the environment but also on the relations of the latter to people's physical, social, and psychological needs. However, it is essential to see that such judgements by individuals also reflect ongoing political, cultural, and social processes and the relations of particular individuals to them.

A number of research studies have been produced in this field. For instance, Brun *et al.* (1994) investigated the correlation of lifestyles and locational choices trade offs and compromises in a case study of middle-class couples living in the Ile-de-France region. Takeuchi (1980) examined the housing location decisions and preferences of minority and non-minority households in Montgomery County, Maryland, and went on to imply that racial aspects of housing and neighbourhood were found to be of much lesser importance in housing location decisions than other aspects of housing, most notably cost factors, the upkeep and maintenance of the rental complex, and a convenient location. It has also been shown by other researchers such as Phang (1992), Clark *et al.* (1983) and Robinson (1979) that price relativities will vary between cities according to their population characteristics such as average age of first time home-buyers and their income levels.

Charles (1977), on the other hand, suggested that the environmental attributes which are desired by buyers may vary according to social class and income of the buyers. Of course, there are also environmental attributes specific to individual houses which will

cause price differences, even within a fairly homogeneous district. In Singapore, studies had been done on noise pollution, and some of these studies concentrated on specific areas of noise such as traffic, construction site and services noise (Tan,1988). Moreover, Lim (1986) reported that there was a correlation between the type of flats and the average sound pressure level. He showed that the smaller the flats, the higher the noise level. Tarasoff (1993) reported that airports are a well-known source of negative externality noise; and housing markets are commonly thought to be affected by airport noise. In his study, a hedonic model was applied to airport noise and the housing market, together. It was found that the housing market of the West Island of Montreal did account implicitly for the noise annoyance from Dorval Airport, hence noise was considered as a pecuniary externality. Moreover, each additional unit of noise annoyance was found to cause an average depreciation in housing price of 0.76 per cent.

Other aspects of the effect of noise, on the behaviour of people in various environments have been of long-standing interest to researchers. A study on noise in housing estates conducted by this author has shown that road traffic and children's playgrounds are the two main sources of disturbance in housing estates (Tan,1988). Much earlier, Matter (1977) conducted a statistical study of traffic noise in private housing estates in Singapore and concluded that traffic noise was indeed a noticeable environmental problem in these estates. More recently, Chew (1994) reported that traffic noise tends to increase as one goes up a building, and then maintains a more or less constant level.

A number of other interesting studies have been carried out on environmental sounds. Peder,*et al.* (1994) studied the effect of construction noise and vibration in urban areas stressing on the importance of noise control measures, while Ballas and Howard (1987) concluded that environmental sounds become integrated on the basis of cognitive processes similar to those used in perceived speech. Anderson, *et al.* (1983) stressed that minor unpleasantness of noise in an environment was probably the most common experience of noise pollution for city residents. Weldemann *et al.* (1982) showed that noise may be an issue in affecting owner-occupiers' housing

satisfaction and perception of safety. This, they argued, is because residents may perceive noise as being related to crime activities, particularly those involving fighting and other abusive behaviours. Despite this, noise is often ignored by housing developers and designers as a pollutant, even though it can make the environment unpleasant and even harmful (Lewis,1984).

Besides noise, the quality of air within and surrounding the house is also of concern to owner-occupiers. Research into this aspect, especially in the housing situation, however, is rare (Hall,1995; Smith and Huang,1995; Sekhar,*et al.*,1995). Anderson *et al.*(1971) attempted to do this by comparing the values of residential property and the extent of air pollution. No mention was made, however, with regard to the preference levels of the residents. Because the air we breathe has such a direct influence on us, air quality and good ventilation are often the central issue when evaluating the healthiness of an interior or an environment (Rousseau *et al.*,1988). The technical and legal issues of indoor air quality for the local context have been examined by some academics at the National University of Singapore (Sekhar *et al.*,1995). These researchers maintained that indoor air pollution is increasingly being treated as one of the top four environmental concerns by the United States Environmental Protection Agency and the scientific community regards it as a more serious environmental threat than outdoor air pollution.

One other environmental attribute featured in the housing preferences of owner-occupiers is that of the availability of lighting. Ne'eman, Craddock and Hopkinson (1976) conducted a social survey on sunlight requirements in buildings. Using factor analysis and semantic differential techniques, the three researchers confirmed that the wish of residents in the locations under study to have access to as much sunlight as possible had been an important consideration in the siting and orientation of the blocks. Besides, the work of Bitter and van Ierland on the appreciation of sunlight in the home, concluded that in dwellings sunlight was not needed just for its capacity to provide warmth, but more for its properties of light and 'atmosphere'. In other words, there seemed to be a preference for sunshine entering the home rather than a congenial view (Bitter and Ierland,1965). Studies have also

been conducted on lighting related subjects such as the effects of setting on window preferences (Butler and Biner,1989) and lighting level preferences (Butler and Biner,1987; Biner,*et al.*,1989).

Besides studies on environmental attributes, research on security aspects of housing have also been carried out. Klein *et al.*(1989), doubtful that criminal justice authorities can successfully achieve their delegated responsibility of protecting life and property, reported that many United States citizens and businesses employed alternative measures to secure safety from criminal victimization. This led to the growth of private security and private policing in private housing estates. Rohe and Burby (1988) attempted to identify the factors associated with fear of crime among public housing residents and to determine if they are the same factors that influence this fear among the general US population. They employed three models of fear of crime: vulnerability, social control, and victimization in their studies of crime in public housing. Multiple regression analysis indicated that variables associated with each model contribute to an explanation of fear of crime, although the social control model had the greatest predictive power. Key explanatory variables include social and physical incivilities, personal victimization, race, and the adequacy of security measures; policy implications are discussed. Huth (1981) revealed that not only are residents of public housing the most vulnerable segment of the United States population in terms of criminal victimization, but that even in projects where the actual incidence of crime is not high, a great fear of crime prevails, especially among elderly tenants.

After reviewing previous studies on environmental and social aspects of housing, the following section highlights some of the work on housing policies.

2.5 Housing Policies

Housing policies are, first and foremost, political statements, so the policies will suit socio economic conditions such as level of economic development, pattern of urbanisation and existence of free enterprise. Housing policies also consist of defining housing need, identifying target groups, formulation, and land policy, and defining the role of both the private and public sector (Laquian,1983:119).

That said, Hempel and Tucker (1979), in their work on citizens' preferences for housing as community social indicators, stressed that governmental policies on housing have a great impact on housing affordability as well as on the housing preferences of the people. They argued that although the residential environment is essentially local in character, changes in its forms and content are significantly influenced by government policies on housing. They reiterated that the impact of government decisions on residential quality range from the initial land-use plans and zoning regulations which give shape to the community, through specifications of building codes and standards, to the transportation and urban renewal programmes which influence the life-styles of its residents. Other researchers such as Megbolugbe, *et al.*,(1993) maintained that home ownership has an intrinsic value for households and the communities in which they reside. As a result, the merits of home ownership as a public policy concern reflect the real and perceived social, political and psychological values associated with owning a home. Indeed, Megbolugbe, *et al.* (1993) also stressed that home ownership fuel economic growth by stimulating employment which supports construction and construction-related industries.

Most previous work on housing policies tends to examine and compare the policies among various nations. (Myburg,1993; Chua, B.H., 1988; McGuire, 1981; Sorensen and Epp(eds.), 1993; Troy (ed.), 1995; Weicher, 1982; Yeh and Laquian, 1979). Chua (1988), for example, specifically examined the modes of public housing provision in the United States, the Eastern European socialist states and Singapore. These modes are conceptually treated by Chua (1988) as different models that offer

opportunities for a comparative analysis. The three modes may be placed on a continuum with reference to the play of the market mechanism within the housing sector.

Chua (1988) noted that at one extreme is the United States' housing programme which is characterised by the dominance of the market with little government intervention. In such a system, government provision is restricted to specific groups which are not adequately served by the market itself, namely, the lowest income groups. At the other extreme, he explained, are the socialist countries in which housing is ideologically instituted as a natural right, it is "not a market commodity; and its production and distribution should not be a means of unearned income"; and the state should undertake all the provision. Explaining that the decommodification of housing took place in Eastern European socialist nations after the communist industrial revolution, and citing Szelenyi (1983 :28), Chua (1988) wrote:

As it was developed in the late 1940's, the socialist system was based on these principles: housing should not be a market merchandise, therefore its rents need not necessarily be strictly related to housing quality; rent should be a very modest item of household expenditure; within the limits of economic growth, families should have a natural right to healthy, modern self-contained housing, and they should receive it as distribution in kind, independent of their rent-paying capacities.

For Chua (1988), the consequence of such arguments is that the state's role is to undertake the total provision of housing, and, in the process, reduce the existing inequalities that the socialist government inherited as a legacy of its prehistory. He believed that such a comprehensive position is, of course, consistent with the socialist commitment to collective ownership. However, he also argued that this ideologically motivated position was far from being implemented. He noted that the production of new housing tended to be low and rent was kept artificially low because no economic gains were to be accrued from the provision of such a basic human necessity. He went on to show that between these two extremes is the conceptual possibility of a mode of provision that minimizes the market mechanism without completely eliminating it and aims at universal provision of housing.

Others who advocated such policies include Murison and Lea (1979). The two researchers upheld the idea that housing policies should be based on clear concepts of not only needs, but also rights to housing services. They noted that in many third world countries these policies are affected by a variety of political, economic and social considerations, resulting in inequitable allocation of housing to the people. Murison and Lea (1979) provide evidence that suggests that the repercussions of particular changes through the housing system will be complex. Indeed, the evidence of complexity suggests that housing policy and planning has to be a continuous and comprehensive process involving the constant collection of evidence, and should be monitored and adjusted in the light of social and economic objectives. These must, in turn be supported by broader social and economic policies which are closely linked with the process of housing development. Clearly, this implies that policy objectives must be precise and sufficiently comprehensive to take into account the variety of needs and demands which exist for housing. Otherwise, according to Lansley (1979) and Ha (1987), defects may appear. Indeed, one of the most common defects in housing policy in many developing countries is that of building houses for the better off people, and neglecting those who have the most dire need for better accommodation.

2.6 Housing Models

A number of other housing researchers, such as Golledge *et al.*(1990), Smith and Clark (1982a,1982b) and Timmermans (1983) concentrated on developing housing models based on the various aspects of housing discussed earlier in this chapter. The use of models in housing studies and analysis is not a new concept, though the variety of models in use can be diverse. Golledge *et al.* (1990) assigned the models of housing preferences to six general classes:

- (i) Decision Making
- (ii) Multiattribute preference and choice
- (iii) Environmental Cognition
- (iv) Environmental design
- (v) Information processing
- (vi) Cognitive Cartography

Using such a classification, Table 2-1 presents a summary of models developed by some of the notable past researchers in housing studies. In particular, models developed by Rossi (1955); Baxter (1975); Smith *et al.* (1979); Smith and Clark (1982); Webber (1983); Davies and Pickles (1991); Phang(1992); Munro and Lamont (1995) are further elaborated in the ensuing section.

General Class	Model Type	Example of researchers	Example of context
Decision making	Individual choice	Smith and Mertz(1980) Timmermans (1983) Lundberg(1984)	Expected utility theory Non compensatory decision rules New decision models
	Search and repetitive choice	Smith et al (1979) Smith and Clark(1982) Hanson and Huff (1985;1988)	Expected utility theory Expected utility theory Consumer behaviour
	Constrained decision making	Preston (1986)	Residential evaluation
	Dynamic decision making or choice	Rossi(1955) Dunn and Wrigley(1985) Pickles and Davies(1991)	Life cycle Shopping behaviour Housing career
Multiattribute preference and choice	Repertory grids	Baxter(1975) Timmermans(1984a) Timmermans(1984b) Preston and Taylor Stutz (1985)	Socio-economic groups Spatial choice analysis Prediction of preferences Residential evaluation Housing and transit preferences
	Rating scales	Rowley and Wilson(1975) Aiken (1984,1987)	Gaming approach Residential site selection
Environmental cognition	Computational process models (CPM)	Clark and Smith (1985) Golledge, <i>et al.</i> (1985)	Housing choice Children's navigation
	Cognitive maps	Golledge, <i>et al.</i> (1973)	Cognitive maps
	Cognitive distance Metropolitan change	Allen (1981) Webster (1983)	Children's judged distances Mobility and migration
	Multidimensional scaling	Golledge, <i>et al.</i> (1972) Timmermans(1984)	Cognitive maps of urban areas Store and centre image
Environmental design	Multivariate statistical psychometric	Zube(1983) Amedeo and York (1984) Cutter(1984a;1984b) Hart (1984) Evans and Cohen (1987) Garling, <i>et al.</i> (1988) Munro and Lamont(1995)	Wind perception by pedestrians Emotions and landscapes Nuclear energy and risk Children's playground Stress via pollution Orientation and location in unfamiliar space Multidimensional scaling
Information processing	Computational process models (CPM) and parallel distributive models	Gopal(1988) Leiser and Zibershatz(1989)	Urban wayfinding Wayfinding
	Simulations	Clark and Smith(1985) Phipps and Clark(1988)	Mobility and housing selection Residential choice
	Travel plans	Garling and Golledge (1988)	Urban movement
Cognitive cartography	Map dimensionality and map error	Gilmartin (1981) Downs and Liben (1987)	Cognitive cartography Children's map

Classification and examples of models used in housing research

Adapted from : Golledge, *et al.*(1990)

Table 2-1

Housing Models: 1950s to 1980s

In the 1970s, Baxter (1975) revised a model of housing preferences based on locational attributes. In his approach, a residential location model was developed to generate indices for housing attractiveness among three socioeconomic groups:

- (i) manual
- (ii) nonmanual/nonprofessional
- (iii) professional or managerial

The model's primary assumption is that employees are distributed away from employment according to some "decay function", in this case the negative exponential function. The model is tested on data available from traffic, employment, land use, and housing surveys carried out in the town of Reading, England, in the 1960s. Values for the indices are examined against housing characteristics of space and location to suggest significant causative factors. The interpretation sets out to discriminate between those housing characteristics which have a marked influence when a person makes a location decision, and others whose influence is only marginal. Physical space characteristics which play the most important role as attractors are:

- (i) public/private ownership
- (ii) structural type
- (iii) age of respondents
- (iv) condition
- (v) residential plot area per dwelling

Two other prominent housing researchers, Smith and Clark (1982b) examined the housing preferences of two groups of individuals in Los Angeles and developed a model of search and preferences for housing first presented by Smith *et al.* (1979). The model was derived using utility theory relating to the instigation, duration, and location of search. This theory represents housing preferences in terms of utility functions and the value of search in terms of expected utilities. The model is therefore based on several sets of factors by way of expected utility theory of choice. These factors include household income, preferences both for housing and for nonhousing commodities and beliefs concerning the housing market. An important matter for investigation concerns whether it is possible to determine stable

representations of utilities that are applicable both to the evaluation of real houses and to the evaluation of further search in a given market area. The model expresses an individual's decision of whether to search as a function of the difference between the expected utility of further search and the utility of the best vacancy found to date. According to Smith and Clark (1982b), the process of search may be viewed as follows. Households 'compute' the locational stress for each neighbourhood in the city and commence search in that neighbourhood giving rise to the largest positive stress value. If a vacancy is inspected that provides a higher utility than either the current dwelling or any other available vacancy, the inspected vacancy becomes the best available alternative. The procedure continues until the locational stress is driven to nonpositive values in all neighbourhoods. Changes in beliefs and preferences, as well as the discovery of new vacancies, may change the locational stress for any given neighbourhood.

While working on the model, Smith and Clark (1982a and 1982b) described the investigation of utility function representations for the housing preferences of two groups of subjects, one of which progressed through the housing market, and the other which had completed their search with a purchase. Using a disequilibrium model with complex mathematical analysis, the two researchers concluded that the actual ratings of real houses were found to be in some conformity with ratings predicted from utility function representations on four variables: price, floor space, construction quality, and neighbourhood quality. The technique of obtaining the representations (having subjects rate symbolic houses in an experimental setting) and of testing the representation using real houses, appears to be an extremely valuable approach. Furthermore, the model was characterised by a reasonable, though far from perfect, representation in terms of only four housing variables. Contrary to the findings of researchers cited earlier, they reported that there is little or no relationship between preferences classes and other personal characteristics such as income, education and life-cycle. One obstacle encountered in their studies was that there were difficulties in evaluating houses lying outside the ranges of housing characteristics employed in the model calibration. Smith and Clark (1982b) termed the model as belonging to a group of disequilibrium models, much like those developed by Hanushek and

Quigley (1978), Cronin (1979), and Weimberg *et al.* (1979). In general, these models relate measures of search propensity to the benefits and costs of search.

At a later stage, Clark and Smith (1985) went on to indicate that production system models of sequential decision making can be highly predictive of behaviour in computer-simulated environments. They proceeded to present evidence from a study of housing market search indicating that 'real-world' behaviour is related to behaviour in computer simulated environments and to the behaviour predicted by production system models. Hence, the use of computers to infer models of decision making from behaviour in computer-simulated environments promises to offer valuable insights into real-world decision making behaviour (Clark and Smith, 1985:555). Several other authors also constructed explicit models of decision-making process. These models attempt to take into account both the household's preferences and the internal and external constraints that it faces (see Cox,1975; Smith *et al.*,1979; Thorns,1980; Bourne, 1981; Maclellan, 1982; Timmermans,1983; Tu and Goldfinch,1996).

Other models consider the effect of life-cycle on housing preferences, including the oldest residential mobility theory developed by Rossi (1955). Subsequently, Priemus (1986) observed other cycles such as the income cycle, a consumption cycle, a saving cycle, and a wealth cycle. Rossi (1955) himself considered that the housing decisions made by a household reflect especially its composition at various stages in its development - what can be termed the family 'life-cycle'. Each stage in the cycle is associated with different housing needs and aspirations. Rossi's approach was widely accepted and refined by others who had identified a complex set of possibilities of life-cycle progression, see Bourne(1981) and Timmermans and Noortwijk(1995). Webber (1983b), too, demonstrated the use of life cycle ideas to explain household mobility and its effect on city growth and structure. In his study, he demonstrated how research in urban geography and sociology (mobility) may be used in building an operational model. He did this by first reviewing studies of mobility to determine what must be studied and by introducing and examining the concept of a life-cycle matrix. Next, he developed a model to show that the rate of change of the spatial structure of a city depends on both the demand for change and on the supply of investment to pay for that change. He went on to argue that if there is insufficient

capital to pay for change from local savings and external funds, then the city and its households only slowly respond to new circumstances.

On the other hand, he noted, during those parts of the business cycle when capitalists cannot find other profitable investment avenues, urban spatial structure may evolve rapidly. The spatial and economic structure of a city must satisfy a set of accounting identities, which state that at each time the aggregate population and consumption characteristics of the city are known. These are the aggregate, structural relationships, and the microgeography of the city is deduced from them by information-minimising principles. Into this structure there is inserted a detailed description of one part of the housing market, namely demand. The model derived by Webber (1983b) is therefore only partial, in that the supply of housing is assumed to be given a totally unrealistic assumption in the modelling process. It ignores the factors affecting housing supply as well as the process whereby prices are formed in housing. Also ignored is much of the social context of the housing market.

Earlier, Smith and Mertz (1980) made use of a search model involving the maximization of expected utility to gain insight into two problems relating to individual decision making processes. The first concerns the manner in which the viewing of a given housing vacancy affects the decision criterion by changing the decision maker's beliefs. Given a solution to this problem, the second problem concerns the effects of the sequence in which vacancies are viewed on the outcome of the decision process. The resulting model is developed from the model of individual housing search in Smith *et al.*(1979) described above. In both cases, housing preferences are represented in terms of utility functions. It is generally accepted in traditional consumer theory that systems of demand equations derived on the basis of utility maximizing behaviour are efficient in explaining the allocation of a fixed level of expenditure over various commodity classifications. Thus it is critical to evaluate how a given increase in housing demand will be allocated to various locations within a given city. Andrikopoulos and Brox (1985) applied such allocation models, widely used in traditional demand theory, to evaluate future residential location preferences,

and studied the effects of these location preferences on the overall urban structure and growth in metropolitan Toronto.

Like most models, the allocation model developed by them is econometric and relies heavily on mathematical and empirical means to test ideas based on utility theory. As always, the conclusions are dependent on the model assumptions and on the parameter values chosen, both in numerical computations and in the simulations. Much work remains to be done in this area of modeling, especially in incorporating beliefs of the decision maker concerning the housing market and in filtering the available vacancies. From the above discussion, it can be seen that earlier models developed by researchers such as Rossi (1955), Smith and Clark (1982a), Priemus (1986), Webber (1983a, 1983b) and Smith and Mertz (1980) are based on social and economic conditions of western countries and made use of mainly empirical and mathematical modelling techniques.

Housing Models: 1990s

Several other models were developed in the 1990s. For example, the physical and environmental determinants of urban deterioration and rehabilitation were modeled in Yone and Shechter (1990); a hedonic regression model of house prices in Los Angeles was proposed by Richardson *et al.* (1990); a joint (dual earner households) choice model was presented by Timmermans *et al.* (1992). Of late, Munro and Lamont (1995), in their study of neighbourhood perception, and household mobility in Glasgow, derived a multidimensional scaling model. That model's objective was to uncover the perceived distinctions between objects which vary with respect to a multiplicity of attributes. All these models of housing choice behaviour and preference formation typically assume that housing choice or preference is a (linear) function of housing attributes, including those pertaining to the residential environment and relative location, and individual or household characteristics.

Other models developed in recent years include one by Tu and Goldfinch (1996). In presenting their model, they stressed, along the same line adopted by Lindberg *et al.* (1988), that a buyer's choice of a dwelling is determined by its demand of housing

components and constrained by both its financial budget (such as household income and mortgage availability) as well as housing supply. They stressed that accurately forecasting housing choice behaviours in a large urban private owner-occupier housing market depends on accurately identifying a choice set, collecting choice information, selecting and measuring independent variables, as well as choosing a suitable statistical discrete choice model. The housing choice model they developed is based on random utility approach. In that model, housing choice is thought to be a joint choice of all the components associated with a dwelling. These components create a huge bundle of dwelling alternatives resulting in an empirical calculation problem. To avoid this problem, the model developed separates the joint choice behaviour into two stages: the choices of the key dwelling components which construct the housing sub-markets, and the choices of the non-key dwelling components which distinguish individual dwellings in each housing sub-market.

It is also interesting to note that a number of other conceptual frameworks have been developed in recent years and these are models that examine what is termed 'Housing Career'.

A housing career describes the sequence of dwellings that a household occupies from household formation to dissolution. As such it reflects the housing aspirations of a household and the ability of that household to exploit the restricted opportunities that appear as it progresses through the housing market (Pickles and Davies, 1991a: 629).

Pickles and Davies (1991a) developed a statistical modeling framework in their research into residential mobility and tenure choice. They suggested that one of the concepts which had emerged in housing research, that of 'housing careers', was of major theoretical importance. They attempted to show that the idea of 'housing careers' had a considerable capacity for synthesising, or at least organising, many of the more disparate concepts and interests of housing researchers. Much of their work has been set within relatively distinct theoretical perspectives, notably the behavioural and neoclassical, and more recently, the broadly materialist. Although most behavioural research has tended to be empirically concerned with cross-sectional or short-duration data, the emphasis on life-cycle and equilibrium lends itself naturally to a consideration of the longer-term patterns of housing mobility implicit in the notion of housing careers.

From the above discussion, it can be seen that most of the models developed in the 1990s are extensions of those developed earlier. For example, the work of Pickles and Davies (1991a) and that of Rossi (1955) relate strongly to the study of residential mobility, while those by Tu and Goldfinch (1996) investigated search behaviour much like the work of Smith and Clark (1982b).

2.7 Local Literature

Existing Singaporean literature on housing and housing related topics is scarce when compared to that found in developed Western countries. At local postgraduate level, Teo(1975) investigated the trend in residential mobility among HDB flat dwellers. Matter(1977) conducted a statistical study of traffic noise in private housing estates in Singapore. In the 80s, Peter(1988) and Ching(1988) conducted research at doctoral level: Peter on price movement in the residential properties market and Ching on housing policy and high-rise living. Phang (1992) researched housing markets and urban transportation and related these topics to economic theory. She further conducted econometric and policy analysis in the areas of housing and transportation in Singapore. In addition, there are several minor undergraduate work on housing such as: Ang (1988); Hoe (1988); Toh (1983); Tan (1995) and Lee (1995).

Phang (1992) modified various neoclassical models first developed by Alonso (1964), Muth (1969) and Wingo (1961). These models are related to household behaviour and theories of urban form and take into account policies and institutional peculiarities. In her work, a standard monocentric model is applied to Singapore. Instead of a competitive housing industry, there is a large monopoly supplier of subsidized housing (the Housing and Development Board or HDB), coexisting with a private competitive housing industry. In her analysis, the existence of rent controls and the possibility of compulsory land acquisition for private housing were ignored. She further noted that since the HDB is able to obtain factor inputs (capital and land) at subsidized costs, it is able to sell housing of similar quality at prices below those charged by private housing producers. In order to prevent profiteering and speculation in the public housing market, the HDB also imposes regulations with regard to the

resale of public housing on households residing in public housing. With these considered, she proceeded to introduce a simple model of residential location in Singapore which is based on Muth's monocentric models, but takes into account the special indigenous institutional factors. Furthermore, she made the following assumptions:

- (i) All employment is located in the CBD.
- (ii) Single-worker households have identical utility functions and incomes.
- (iii) There are two pricing regimes in the housing market - for the same housing unit, the private suppliers charge market rates and are willing to sell to any buyer; the HDB charges a 'subsidized' price but sells the housing unit only to buyers who meet its eligibility conditions.

With these considerations she introduced the econometric model of residential location. It should be noted that the model, though comprehensive, is based on a number of unrealistic assumptions as in points (i) and (ii) above. With regional centres and business parks mushrooming throughout the country and with more double income families, it is likely that the model may not be widely applicable. Indeed, Phang(1992:42) had herself commented on the inadequacies of such models :

Standard residential location models developed by Alonso (1964), Muth (1969) and Wingo(1961) generally assume that the city is 'monocentric' in the sense that all employment is located in the Central Business District (CBD) and all workers commute radially to and from the centre. Household's choices of residential location and amounts of land (or housing) and other goods are described by a static utility maximization model. A household, when choosing its residential location, is assumed to prefer a more central location as it reduces commuting costs, hence giving rise to a negative rent or housing price gradient.

These models have limited usage in the local context for the following reasons: firstly, unlike countries with vast resources of land, Singapore is a small island where land area is 648 square kilometres. Within this space live a population of nearly 3 million people and not all the people work within the CBD (Department of Statistics, Ministry of Trade and Industry 1996). There are industrial parks, regional centres, and HDB town centres spreading all over the island. Therefore, the monocentric theories propounded by Alonso (1964), Muth (1969) and Wingo (1961) and Phang (1992) may not adequately represent the actual housing preferences and choices of owner-occupiers in Singapore. Secondly, the models were oversimplified

in that they discounted the extent of governmental policies on housing. Thirdly, except for Phang (1992) the other models make no differentiation between private and public housing choice.

2.8 Concluding Comments

This chapter outlines key debates and controversies in the field of housing studies. Indeed, as can be seen from the work carried out by these researchers, there are many different economic, social, cultural, environmental and planning aspects to the housing field. From the literature review, it is clear that previous studies on housing concentrate heavily on specific areas of housing such as housing mobility, utility theories, housing policies and the development of models. The aspect of housing preferences of owner-occupiers, however, is not fully investigated. Furthermore, the relevance of studies conducted in developed countries to that of an Asian city state such as Singapore is questionable.

Despite these issues, this literature review has assisted the author to locate the main focus of the current research, which is in the chosen field of housing preferences with regard to various aspects of housing discussed. Such a focus examines what people might do or want with respect to their housing needs and aspirations. Furthermore, by reviewing and discussing the work of past researchers, this chapter serves as a reference for this research. Towards this end, it paves the way for more objective discussions in later chapters on housing preferences. Indeed, the approach adopted in this thesis is an amalgamation of some of the ideas of researchers mentioned earlier and that of the author's own observation, studies and research work. Of significance is the fact that the models presented in this thesis are conceptual and descriptive in nature and take into consideration local practices, customs and government regulations. The development of these models is covered in Chapter Four. However, to gain a better understanding of these models, it is useful to have an understanding of the Singapore housing industry. Therefore, the next chapter highlights the emergence of private housing in Singapore.