A MULTI-ATTRIBUTE ATTITUDE MODEL APPROACH TO RESIDENTIAL PREFERENCE: TOWARDS A MODEL OF HOUSING CHOICE

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ABSTRACT:

This paper examines the relationship between a multi-attribute attitude model and residential preference as a step towards developing an attitudinal model of housing choice. The use of multi-attribute attitude models, similar to those employed in marketing research, is suggested as a viable means of measuring residential preference, on the basis of measures of individual affect. Conceptual and measurement problems with each component of the suggested model are discussed and two attitude models of residential preference are presented. These models are empirically tested in a pilot study which deals with the housing preferences of a sample of on campus residents at McMaster University. The relationship which is shown to exist between attitude and preference in the pilot study, supports proposals for recommending an attitude model approach to the analysis of housing choice, in a more intensive enquiry.

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CHAPTER I

INTRODUCTION

1.1 Aims and Purpose of the Study

In this paper a multi-attribute attitude model is discussed and empirically tested in the context of student residential preferences. The aim of the paper is to examine the relationship between attitude and preference in order to assess the value of this approach in a housing context.

The attitude model which the study focuses on was developed in the field of social psychology by Rosenberg (1956). His original formulation was subsequently modified by Fishbein (1967) and in recent years marketing psychologists have frequently used multi-attribute attitude models to predict consumer choice. This paper therefore serves as a preliminary step towards the application of a multi-attribute attitude model, similar to those used in marketing research, to the process of residential choice.

The factors which cause a person to move have been given close attention since Rossi's (1955) original study of the decision to move. At the same time however, there has been a surprising lack of attention paid to the subsequent process of choosing a new residence. Little is known about how a mover evaluates a set of residences before deciding which one he/she will move to.

The attitude model measures a person's affective evaluation on the basis of two separate judgements. Initially certain salient attributes are identified in each residential alternative. An attribute may be defined as a denotative or connotative characteristic of a residence, which together with other attributes defines the meaning of an alternative for a person. Attitude is measured according to a 'belief' in each attribute. In this case, belief is measured according to the satisfaction a person has with each attribute in a specific alternative. Also, since some attributes will be more important than others, the person assigns relative importance weights to each attribute.

The attribute satisfaction ratings and judgements of importance are then combined together to form an overall attitude toward an alternative. Depending on how well, or how poorly, a residence performs according to the above criteria, each person develops a favourable, unfavourable or indifferent attitude towards it. It is suggested that this attitude largely influences his/her preference for the residence, which will subsequently influence the predisposition to choose it.

No reference can be made to choice predisposition for the data which were gathered in the present study as each respondent was only required to evaluate their own residence. In order to test the validity of attitude as a measure of evaluation, data pertaining to the preference ranking of several different residence types were also gathered. This approach allows problems with the attitude model to be identified, such that they can be rectified in a more intensive study. To this end, the relationship between attitude and preference which is examined in this paper, offers the advantage of identifying areas of concern, for the

future use of multi-attribute attitude models in a residential context.

1.2 Scope and Structure of the Paper

The major objective of this paper is therefore to examine the relationship between a multi-attribute attitude model and residential preference. The study is organised such that conceptual and methodological problems with this approach may be identified. The objectives of the study are fulfilled by (i) critically reviewing existing approaches to housing evaluation and choice, (ii) outlining the meaning of 'attitude' and how this is incorporated into the recommended model, (iii) discussing problems which have emerged from the use of multi-attribute attitude models in marketing studies and how these problems apply in a residential context, and (iv) considering the results of a pilot study which deals with the relationship between attitudes and student housing preferences.

The problems which have faced previous housing choice studies are reviewed in section 1.1 of the following chapter. This review outlines several approaches which have characterised geographic enquiry into the housing problem during the past decade. It will be apparent that the conceptualisation of residential choice has not moved far away from the inaugural descriptive studies, even though recent work is essentially more inductive. In section 2.2 of Chapter II the proposed multi-attribute attitude model is outlined.

Chapter III explores general conceptual and measurement problems of multi-attribute attitude models, drawing mainly on the marketing experience. This is backed up by several points from the geographic literature. Each component of the model outlined in equation 2.1 is

discussed individually and two multi-attribute attitude models of residential preference are presented in the final section of the chapter.

In Chapter IV, the two models outlined in the final section of the preceeding chapter are tested in a pilot study. For the purposes of the test, two separate samples of university students were drawn from three types of on-campus residences. Data pertaining to each student's attitude and preference ranking of his/her residence was obtained and analysed. This approach allows examination of the attitude model's efficiency as an indicator of preference. After the analysis is discussed in detail, the major findings are summarised in the final section of the chapter.

The concluding chapter reflects on the aims and objectives expressed in the introduction. The relationship shown to exist between attitude and preference in the previous chapter, lends support to using attitude models in the analysis of housing choice. Thus, the concluding section takes the form of recommending proposals for the direction of future research.

CHAPTER II

WHY ATTITUDE MODELS?

The first section of the following review concentrates on previous approaches to housing evaluation and choice in geography. The major research issues which these studies have focussed on are identified and their contribution towards developing a testable model of housing choice is evaluated.

The second section of the review supplements the first. Whereas geographers have largely failed to develop a methodology for explaining and predicting choice, marketing psychologists have adopted a basic attitude model, developed in social psychology, for this purpose. The nature of attitude theory is briefly outlined and its application in consumer orientated marketing studies is discussed.

2.1 Geographic Approaches to Housing Evaluation and Choice

Little existing work in geography has examined the process whereby households select a new residence. Instead much of the residential relocation literature has concentrated on identifying the factors which influence the decision to move, within the framework of a mobility model such as that of Brown and Moore (1970). Despite this, some general concepts and assumptions about the nature of the housing choice process have been proposed.

Wolpert (1965) for example, introduced the concept of 'place utility' into the literature. The place utility of a residence is determined by a mover, according to his/her perception of the combination and intensity of its attributes. This approach suggests that once a person's present residence falls below an idiosyncratic level of residential expectations (due to a change in family size, for example) the person will begin to search for another residence which possesses a more satisfactory combination and intensity of important attributes than his/her present home. Once a suitable residence is located the person will move there,all other things being equal. If no alternative is encountered with a higher place utility level than the present residence, the relocation process will cease.

Several models of housing choice have incorporated measures of place utility or similar concepts (Wolpert, 1965; Brown & Longbrake, 1969; Demko and Briggs, 1970). These approaches suffer from their common ambiguity. Because of the difficulty in defining such terms as Brown and Moore's (1970) 'aspiration region' in a quantitative model, much of the possible empirical work has tended to stagnate. Harman (1975) agrees with this, criticising place utility approaches on the grounds that their conceptual terminology is too difficult to operationalise and develop.

Recent housingchoice research has primarily concentrated on defining the nature of housing attributes and explaining the way in which they are conceived during the evaluation stage of the choice process. Two schools of thought have developed over issues involving the definition of residential attributes and how they are evaluated by

potential movers. The first finds its initial support in the place utility studies which were referred to earlier.

The concept of place utility assumes that each housing attribute is interpreted independently of all other attributes such that the movers level of satisfaction with salient attributes can be traded off among alternatives. The idea of evaluative trade offs is not confined to the earlier studies. Menchick (1972), Flowerdew, (1973) and Brummell (1977, forthcoming) also adopt approaches to residential evaluation which assume attribute independence.

Several geographers have considered the above approach to be unsatisfactory. Gale (1972) for example, questions the validity of assuming attribute independence. He indicates that many of the mental concepts relevant to behaviour are characterised by overlapping 'fuzzy sets' that may be neither discretely nor explicitly defined. Burnett (1972) agrees, in pointing out that people evaluate environmental alternatives using complex, subjectively interpreted attributes which may not be related to objectively measured attributes in a simple way. Cadwallader (1975) adds empirical support to this assertion.

The conceptual divergence between these two viewpoints, centres on whether the trade off between attributes involves independent, objectively defined attributes or overlapping, interdependent attribute combinations.

In the latter case, an attribute is not regarded as an explicitly definable residential characteristic, which is interpreted independently of all other attributes. Rather, it is regarded as part of a subjective concept, derived from a pattern of sensory stimulation and interpreted

by complex mental processes (Downs and Stea, 1972). This approach requires the use of inductive methods of analysis, such that housing concepts are derived from the research, rather than assumed at the outset. For this reason, inductive studies are by nature hypothesis generating rather than hypothesis testing.

One of the major proponents of an inductive form of enquiry with respect to housing choice is Harman (1975). She argues that housing attributes are subjectively defined entities, idiosyncratic to each potential mover. When alternatives are being evaluated, these subjective attributes are integrated in some complex manner to form subjective housing concepts that the mover uses in his/her evaluation. A housing concept is therefore regarded as a bundle of subjectively defined housing attributes. Harman's analysis, which incorporates personal construct theory and multi-dimensional scaling, merely tends to confirm the general attributes and dimensional concepts which previous studies (Rossi, 1955; Butler et al., 1969) had assumed to exist. She identified ten frequently used 'concept classes' including such attributes as: dwelling size - with particular emphasis on the number of bedrooms, dwelling age and maintenance, lot size related to external privacy and external privacy related to separation from neighbours. The ten concept classes were generalised into three 'concept dimensions': the dwelling, the lot and location and accessibilities.

In contrast to earlier studies by Peterson (1967) and Peterson and Flaschbart (1973), Harman's 'concept dimensions' were not orthogonal, independent criteria. Although her accessibilities dimension seemed to be relatively independent, the dwelling and lot/location concepts were

related through their common association with 'parking and garage concerns'. Thus a great deal of effort on behalf of the researcher concludes that 'housing concepts are not at all precisely defined and many are related to a greater or lesser degree in that use of one implies the use of another'. This does not help to explain why residences are chosen, it merely tends to confirm what previous research had already identified.

The contributions of Peterson (1967) and Peterson and Flachsbart (1973) attempt to clarify the dimensions of neighbourhood and residential preference. In his initial study, Peterson chose a number of environmental variables such as greenery, age, safety, and privacy from a review of associated literature. A set of respondents were then asked to rate twenty-three different residential environments according to the perceived amount of each attribute present and the quantity of preference associated with that amount. This information was collapsed by factor analysis into four orthogonal factors which explained a somewhat staggering 99% of the neighbourhood preference for respondents.

Essentially the same study was repeated in 1973 with Flachsbart as a co-author. This time housing, as well as neighbourhood preference, was included in their analysis. While the two studies have much to recommend them, they are in no way related to theories of choice behaviour and neither the exact meaning of each attribute, nor its major reference (whether it pertained to housing or neighbourhood characteristics) is clearly established.

Despite their drawbacks and explicit disassociation with consumer behaviour, Peterson's studies represent something of a breakthrough in understanding the processes of residential evaluation and choice. In the

first study, the critical link between evaluation and preference is made explicit for the first time. This is where Harman's (1975) work falls short. She discusses the evaluation of residential alternatives coherently,but does not attempt,nor recommend any viable methodology to link evaluation with preference or choice.

Although the attributes which people in the relocation process evaluate are now well known, the relationship between these attributes and a mover's preference for them is still unclear. Compounding this problem, the relationship between housing preferences and housing choice has received only sporadic attention. Two studies (Menchik, 1972; Flowerdew, 1973) which relate multi-attribute residential evaluation to preferences have resorted to assuming attribute independence in order to develop operational models of housing choice.

Menchik (1972) attempts to develop a model of residential preference which considers quantitative measures of a person's preference for different aspects of residential areas. The four aspects of the residential environment which Menchik draws his attributes from include the quality of the natural environment, the quality of the man-made environment, characteristics of the house and lot,and accessibilities. At the same time, quantitative measures of parallel characteristics of each respondent's present residence were gathered. The basis for this somewhat unusual approach was Menchik's idea that relating an indivudal's stated preferences to characteristics of their present residential environment, is one way to assess the 'realism' or behavioural validity of any preference approach. Menchik was therefore interested in seeing whether preferences as defined and measured, do manifest themselves in

actual market choice.

Although his approach has several problems, it also has several important implications. It does indicate that people trade off certain elements of the residential environment (such as a large lot), for a particular type of residential development (the environmental quality of a cluster development). Problems relating to the measurement and definition of preference and choice variables compounds his two-variables-at-a-time form of analysis. This excludes many non-preference influences upon choice and contributes to his small correlation coefficients between preference and the respondent's market choice.

What his paper attempts to do is perhaps more important than its results, in that the behavioural validation which Menchik attempts to account for, does seem to shed some light upon the 'realism' of preference measures as a means of predicting residential choice.

Flowerdew (1973) adopts a conceptual framework which focuses on strict attribute independence. He attempts to derive preference rankings of residential alternatives, by making simple assumptions about the decision making process. The nature of his assumptions initially relate to Brown and Moore's (1970) concept of the 'aspiration region', which is consistent with a place utility approach to residential choice. Flowerdew assumes that a migrant household has established a set of values which it regards as satisfactory for each of n attributes considered to be important. Each residential alternative is then evaluated, and the attributes which are acceptable with respect to the aspiration level on their individual dimension are identified.

Flowerdew's analysis assumes that the evaluation has taken place

and that each alternative may be ranked according to their differing acceptibility with respect to the important attributes. While this approach seems reasonable, if only in terms of establishing some basic residential choice decision 'rules', it assumes attribute additivity. In other words the residence which possesses the best combination of satisfactory attributes (that is, the highest overall utility) will more than likely be chosen by the mover. This indicates that the approach which Flowerdew recommends is based solely on the 'structure' of attribute evaluation, which relegates the relative importance of each attribute to a subordinate role in the actual choice.

While Flowerdew's approach is in a sense, too rigid, it is similar to Menchik's (1972) in that it attempts to uncover the relationship between housing evaluation, residential preferences and the choice of a dwelling. Although Flowerdew assumes attribute independence during evaluation and choice, he mentions that it is possible to consider correlations between attributes and the effects of interdependence on the preference structure. However, he fails to explain *how* this is achieved.

This identifies one of the basic problems of the residential choice literature. Intuitively attributes are evaluated interdependently. The absence of an operational framework which incorporates this notion into a model of housing choice relates to the nature of the studies which have been reviewed. It is emphasised in the review that approaches which attempt to account for residential choice, use objectively defined, independent housing attributes which are traded off between alternatives (Wolpert, 1965; Menchik, 1972; Flowerdew, 1973). On the

other hand, the approaches which stress attribute interdependence do not attempt to outline an operational method of predicting choice (Gale, 1972; Harman, 1975). Some research lies between the two extremes and deals with ideas of evaluation and preference without achieving any succinct expression of either concept (Peterson, 1967; Peterson and Flachsbart, 1973).

The problems associated with the studies which have been discussed cannot be solved easily. The lack of success in accounting for housing choice is indicative of the empirical difficulty in measuring the processes involved.

Generally, the geographic approaches to residential evaluation and choice leave a great deal of room for improvement. It seems that recent approaches have not progressed very far from the approaches to residential choice suggested a decade ago by Wolpert (1965) and Butler et al. (1969). It is not suggested that the synthesis of an inductive approach which stresses attribute interdependence and a descriptive approach which incorporates notions of trading off attributes among alternatives, is necessarily the optimal aim of residential choice research. This paper suggests that a methodology which is capable of predicting choice or choice predisposition on the basis of a multi-attribute attitude model may prove useful in this respect. Although the methodology which this paper recommends is based on linear independence assumptions, the attitude model can be modified to allow for the inclusion of attribute interdependencies in residential evaluation. The conceptual and empirical background of the suggested model is outlined in the following section.

2.2 Attitude and the Use of Multi-Attribute Attitude Models in Marketing Research

The concept of attitude and its application in marketing studies of consumer choice is now discussed. Fishbein and Ajzen (1975) define an attitude as "... a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object" (1975; 10). This definition allows the identification of three basic features of an attitude: (a) attitudes are learnt, (b) they predispose action, and (c) such actions are consistently favourable or unfavourable towards an object.

Most research on attitudes has emphasised either their explanatory or predictive value. Day (1972) notes that the utility of the concept depends on achieving a combination of both of these. This means that attitude analysis is not only a basis for explaining evaluation, but is also a means of predicting choice.

There is general agreement in the theoretical literature that attitude structures have three component parts. These are affect, cognition and conation. The explanatory or structural approach deals with the affective and cognitive components, whereas predictive studies focus on the relationships of affect, intentions and overt behaviour. A schematic representation of these concepts is depicted in figure one.

The evaluative component has frequently been cited as the most distinctive feature of an attitude. This is mainly because it is our affective or evaluative consistency which allows us to behave in a characteristically favourable or unfavourable way with respect to an object. This component deals with a person's overall feelings of like or dislike for a situation, object, person, or concept. It is usually

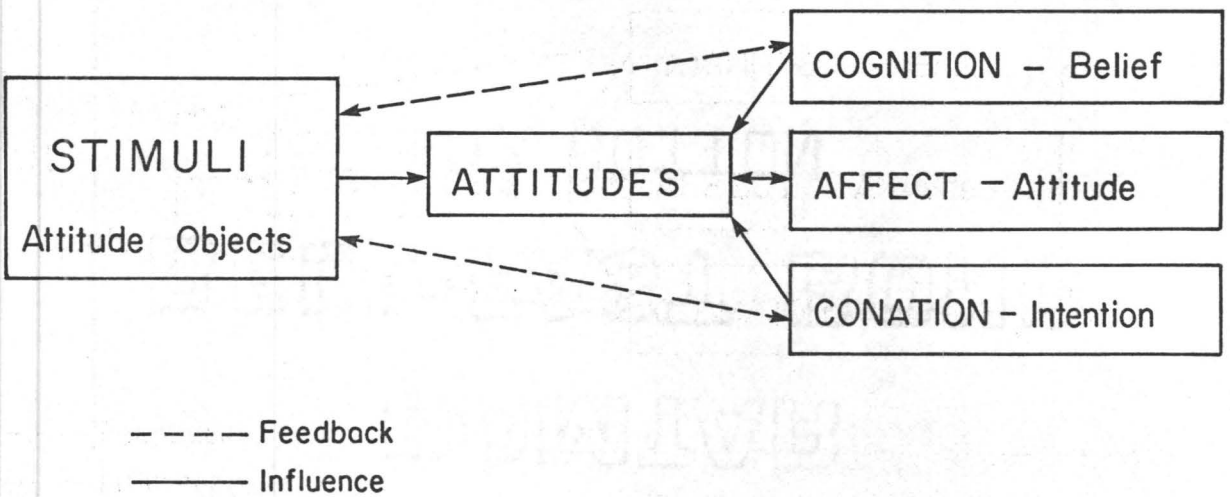


FIGURE ONE:

SCHEMATIC CONCEPTION OF ATTITUDES.

Adapted from Halloran (1970).

measured on a unidimensional scale typical of the classical scaling procedures (for example, Osgood, et al., 1957).

The cognitive or perceptual component (Day, 1972) represents a person's information about an object. This includes his/her knowledge, opinion, beliefs and thoughts, which can be classified as either beliefs in the existance of an object, or evaluative beliefs about the object (Fishbein and Raven, 1962). Thus, evaluative beliefs provide information about the judgements a consumer makes when comparing one brand or product with a number of others.

The third attitude component refers to behavioural intentions and actions with respect to, or in the presence of an object. Fishbein and Ajzen (1975) note that since attitudes represent predispositions to behave rather than behaviour itself, it seems desirable to make a distinction between behavioural intention and actual behaviour. This then suggests a classification of components consisting of four broad categories: (i) affect (feelings, evaluations), (ii) cognition (opinions, beliefs), (iii) conation (behavioural intentions) and, (iv) behaviour (observed overt acts).

As stated earlier, most theorists regard the affective component as the core of the attitude concept. In fact Fishbein and Ajzen (1975) equate affect with attitude. It is also commonly agreed that overall affect is derived from the more significant cognitive components of an attitude. However, the extent to which the overall affect is based upon specific evaluative beliefs about salient attributes is disputed. Day (1972) points out that one set of models grounded in cognitive consistency theory, assumes that affect is a function only of evaluative

beliefs. A competing view holds that the affective component is only partially determined by them (Bem, 1970).

Fishbein and Raven (1962) have suggested a definition of belief that is analagous to the definition of attitude given earlier. In this case, two kinds of judgement are involved. On the one hand there is an affective or evaluative dimension of a concept or object, while on the other hand there is an indication of its probability dimension, or more specifically, a 'belief'. Belief in an object therefore links the object to some attribute. Both the cognitive and action components of an attribute can be regarded as beliefs about the nature of the object and its relations to other objects. In this case, the conative component of attitude refers to beliefs about what should be done with respect to the object.

Marketing psychologists have generally adopted a cognitive consistency approach to attitude theory, which accounts for the overall consumer affect of multi-attribute objects, such as products or brand types. These objects are viewed as 'bundles' of attributes which lead to costs and benefits of differential desirability for individuals or segments of the market (Wilkie and Pessemier, 1973). Overall affect is considered to reflect the net resolution of an individuals cognitions (beliefs) as to the degree to which given objects possess certain attributes, weighted by the importance of each attribute to the individual. On the grounds that a marketing manager can to some extent control the physical characteristics and image of his brand or product, careful assessment of consumer attitudes offers a sensible approach to formulating important aspects of a marketing strategy.

The value of multi-attribute models over simple unidimensional scales measuring overall affect is that strengths and weaknesses for specific product attributes can be established. The way in which this is usually calculated is by incorporating measures for the belief in, and importance of, a particular attribute into a linear compensatory model of the following form:

$$Ajk = \sum_{i=1}^{n} Iik\ Bijk \qquad (2.1)$$

where n = number of attributes

i = attribute or product characteristic

j = brand

k = consumer

such that

Ajk = consumer k's attitude score for brand j

Iik = the importance weight given attribute i by consumer k

Bijk = consumer k's belief as to the extent to which attribute i is offered by brand j.

Issues related to model inputs, structure, and function have characterised recent marketing research. The interest which marketing psychologists have shown in developing model variations is a function of the model's ability to identify the influence of attribute strengths and weaknesses in consumer choice predisposition, for a wide variety of objects. Attitude objects actually studied include: grocery stores, restaurants, television shows, toothpaste, mouthwash and other regularly purchased consumer goods (Wilkie and Pessemier, 1973). The model is

therefore highly durable in that it can be applied to a number of different objects with equal success.

The basic purpose of the multi-attribute model is to gain an understanding of purchase or choice predisposition. In this respect the model is used as a static approach for describing an existing attitudinal structure. The difference in purpose between this model and dynamic utility or decision models of information processing suggest that results from the basic model must be carefully evaluated before translation to information processing tasks are made. Hudson (1970) elaborates on this by noting that a change in the alternatives considered in a choice causes a redefinition of the attributes we relate to.Learning theory approaches to choice therefore contrast with attitude structure approaches in that the former focus on evaluative consistency over time while the latter relate to static attitudinal structures at specific points in time.

One of the most important issues which faces the attitude model involves the selection of attributes. Several marketing studies have discussed this point. Pessemier (1972a, 1972b) and Hansen (1969) indicate that attributes must reflect consumer perception dimensions, rather than product characteristics directly measurable and controllable by a marketing manager. In contrast, Heeler et al. (1973) use objective product characteristics in a study of new product selections by supermarkets. Methods which have been used to generate attributes include expert judgement, unstructured interviews and psychological procedures such as Kelly's repertory grid technique (Sampson, 1972). In general, marketing studies have initially specified few attributes and thus

generated restricted ranges of data available for model analyses. Problems such as attribute independence, saliency versus importance and the number of attributes to be included in the model will be given more precise attention in the following chapter.

The summative manipulation of the basic model gives rise to its linear compensatory character. Both belief ratings (Bijk) and importance weights (Iik) are presumed to add to its explanatory power. However the basic difference in purpose between the attitude model developed in social psychology and the application of multi-attribute attitude models to consumer choice studies in marketing, has given rise to different methods of analysis. In social psychology the purpose has generally been to study the attitudes of different people for a single object (Anderson and Fishbein, 1967). The analysis is therefore cross-sectional in many cases. Several marketing studies have also correlated the preference ranking for a brand with the attitude towards that brand, where the correlations were computed across people. This is also essentially cross-sectional. Bass and Wilkie (1973) argue that inter-personal utility cannot be given rigorous meaning with this approach, hence cross-sectional comparisons of attitude and preference relationships should be viewed with skepticism.

It is the usual practice in marketing studies to obtain an individual's attitudes and preferences for several different brands. In these studies, individual level analysis is possible by using a person's attitude score for a brand to predict its preference ordering. While cross-sectional analysis offers practical benefits in summarising results, individual level analysis offers an intrinsically appealing

aspect of the basic model - that of a unidimensional measure of attitude which is idiosyncratic to the individual (Wilkie and Pessemier, 1973).

Several aspects of attitude theory remain substantially unresolved in the marketing literature. Wilkie and Pessemier (1973) point out that "the multi-attribute attitude model, as presently constituted is far from a falsifiable theory, hence the 'theory' is not testable. The direction of cumulative research and thought on this model is, however, moving toward the sort of construct specifications characteristic of a mature theoretical discipline" (p. 439).

The following chapter draws on much of the groundwork which has been made in the marketing literature. Applying an attitude model in a residential context is not simply a matter of direct replication. General theoretical issues and problems associated with the measurement of each variable will be discussed in light of the marketing experience.

CHAPTER III

THE COMPONENTS OF A MULTI-ATTRIBUTE ATTITUDE MODEL

The function of this chapter is not only to provide a general discussion of each attitude model component, but also to identify measurement problems which previous marketing studies have exposed. Following a general introduction, issues pertaining to attribute selection and measurement are outlined. The function and measurement of the belief (Bijk) variable and the importance weight (Iik) are also discussed. In light of the issues which are raised with respect to each component, two forms of a multi-attribute attitude model of residential preference are presented in section 3.5, for empirical examination in the following chapter.

3.1 Introduction

In section 2.1 of the previous chapter there was a strong inference that geographers have lacked a means of translating inductive housing research into measures of choice predisposition or actual choice behaviour. Meanwhile much of the recent marketing research, discussed in section 2.2, has concentrated on multi-attribute attitude models which transform consumer cognitions of brand offerings on several dimensions, to unidimensional measures of brand affect. These models are typically derived from 'expectancy' theories (Fishbein, 1967). Expectancy theory asserts that an individual's predisposition to behave

in a certain way is governed by the probability of obtaining as much satisfaction as possible from this behaviour. Marketing's use of expectancy type theories in multi-attribute attitude models has developed an approach which not only explains but also predicts consumer choice. It is therefore worthwhile to pursue this approach with respect to the housing problem.

The original impetus for the marketing work was provided by Rosenberg (1956) and more recently by Fishbein (1967). Their formulations have been quite extensively altered in order for the attitude model to operate more efficiently in a consumer context. Some of the most significant changes have involved the use of importance ratings for each attribute, in order to allow for differential weightings in satisfactions sought rather than evaluations of whether or not the attribute is desirable; measurements of brand 'beliefs' on each attribute in terms of degree of satisfaction expected rather than probability of attainment; simultaneous consideration of competing brands as alternative attitude objects; specification of attributes which are idiosyncratic to product perceptions; and, a resultant capability of 'within individual' analysis, as opposed to the former necessity of cross-sectional approaches (Bass and Wilkie, 1973). Methods of analysing attitude data have generally been restricted to a comparison of predicted preferences or choice with stated preferences or choice. The model is therefore tested on a correlational basis. Attention now turns to an examination of the problems involved in applying the model to residential preferences.

Issues discussed in section 2.2 are thought to extend previous geographic studies of housing evaluation and choice. Use of an attitude

model which combines a measure of belief (expected satisfaction) in a residential attribute, with the importance (differential weighting of satisfaction sought) of that attribute in the overall affect, is recommended. On the assumption that our attitudes towards certain objects or concepts predispose our behavioural intentions and behaviour, it seems fair to suggest that we will consistently prefer an alternative which we have a favourable attitude towards.

The relationship between attitude and preference has been consistently identified in recent marketing studies. While this does not necessarily convert directly into choice, it has been shown that the two are sufficiently related to assume that what is most preferred will be chosen (Bass and Talarzyk, 1973). At this preliminary stage of enquiry, the aim is merely to establish a relationship between attitude and preference, in a housing context. Consequently each individual only evaluates one attitude object in the present study.

The array of factors involved in applying an attitude model to residential evaluation is complex. Perhaps the most significant of these relates to the selection and measurement of attributes. This is discussed in the following section.

3.2 Attribute Selection and Measurement

The attributes which an individual evaluates are basic to the attitude model. Hence, the nature of these attributes is of major theoretical importance. In a research sense, the attribute identification problem operates at two levels. One level is concerned with the specification of attributes in data gathering and the other is concerned

with the inclusion of the evaluative responses to these attributes in the model.

The basic criteria for the initial specification of attribute lists requires that they are exhaustive, semantically meaningful, subject to unidimensional interpretation and reflections of possible variations in choice or use contexts (Pessemier, 1972a). Standard methods of attribute generation have been used in most marketing studies. A notable exception to this is the use of personal construct theory by a number of British marketing psychologists (Sampson, 1972). Rather than using the typical attribute lists, they have attempted to employ attitude scale items or constructs, worded in the language of the consumer. This is the same approach which Harman (1975) used to obtain housing concepts worded in the language of potential movers.

It was pointed out in the last chapter, that attributes must reflect consumer perceptual dimensions. These perceptual dimensions are usually exhaustive lists of product characteristics which are derived from unstructured interviews. Most of the marketing studies have directly entered the response to all attributes into the model. However, some studies have formed subsets of original attribute lists for inclusion in the model. Subsets of large attribute lists may be comprised of attributes which have interdependent properties or attributes which are salient. Each of these issues is now to be discussed.

The concept of attribute interdependence is prominent in geographic approaches to housing choice. When a person is evaluating a house, several attributes are likely to be related. For example, the size and state of repair of a house may be associated with the price. This

relationship is mentioned by Flowerdew (1973) and Harman (1975) who both voice a case for considering the interdependence of attributes in the evaluation process. However, the linear compensatory nature of the multi-attribute attitude model assumes independence between attributes. In order to ensure attribute independence,factor analyses have been used to reduce large numbers of attributes down to three or four independent factor dimensions. Pessemier (1972b) suggests that prior multi-dimensional scaling as well as factor analysis may be appropriate in order to derive independent attributes for inclusion in the model. This however may unnecessarily complicate the interpretability of the model, as it is not always possible to ascertain a sensible meaning of multi-dimensional scaling or factor analytic dimensions.

Although the structure of the attitude model assumes attribute independence, it is possible to allow for attribute interdependencies within this framework. By factor analysing the belief ratings, factor scores on orthogonal factor dimensions can be correlated against preference. This gives a measure of attitude which includes identifiable interdependent 'attribute bundles' within each factor dimension. Thus the model is not completely inflexible in this respect.

Questions concerning the number of attributes which should be included in the model are important in terms of the model's explanatory ability and its correctness in diagnosing attitude structure. If the responses to unimportant attributes are included in the summed measure of overall affect, this may tend to weaken the relationship between attitude and preference. Thus, the response to lengthy attribute lists is often edited before attitude is measured, such that only the responses

to salient attributes are included in the measurement of attitude.

Used in this context, saliency refers to those attributes which are actually utilised by consumers in evaluating alternatives. Marketing researchers agree that only salient attributes should be included in the model (Day, 1972). Various attempts to overcome the problem of including the response to non-salient attributes in the measure of overall affect have been made in recent marketing studies. A common method involves adopting a disaggregate approach (models in which the attribute ratings are not summed) using multiple regression, in order to find the number of attributes with significant coefficients. This approach has resulted in a considerable reduction in the original number of attributes. The method is however cross-sectional. Consequently reference to the interpersonal utility of attributes is automatically suspect (Wilkie and Pessemier, 1973).

Within individual analysis seems to be a more precise approach to the problem. At this level, provisions can be made for allowing individuals to differ in the number and nature of attributes to be evaluated. Thus the number of attributes which are important to each individual is established before his/her attitude is measured. This, however, raises problems in comparing the results of enquiry across individuals.

Obviously there are many problems associated with the selection and inclusion of attributes in the attitude model. In this respect geographic studies which consider neighbourhood and housing concepts in the context of residential preferences are only of peripheral value. Inclusion of housing attributes into the model should concentrate on

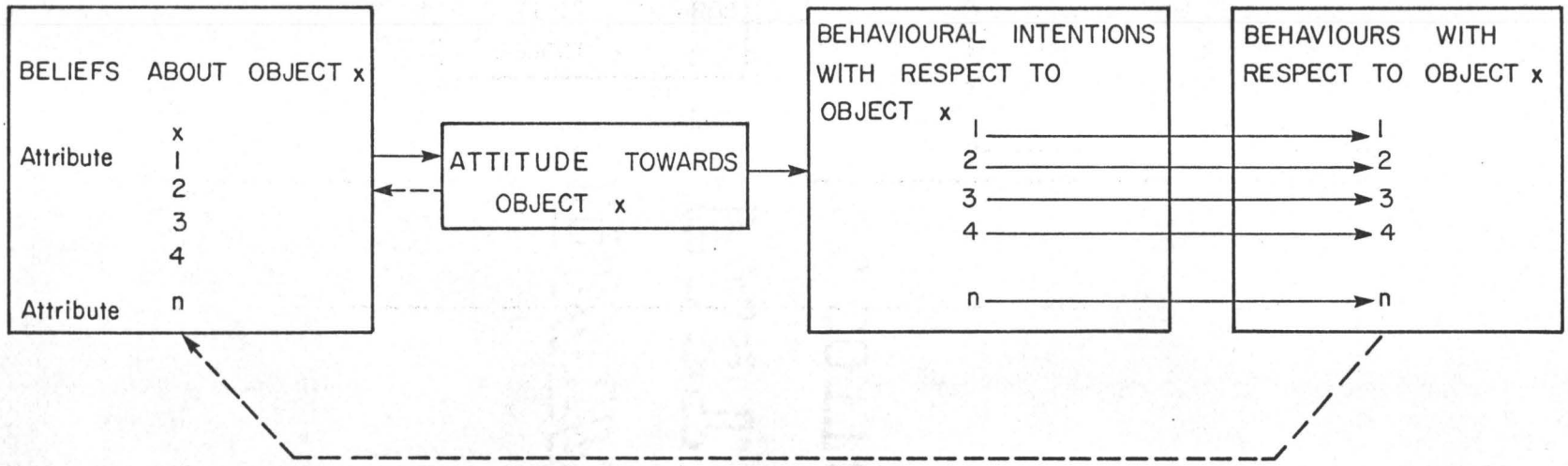
the basic concepts which geographic enquiries have identified.

The theoretical and measurement implications of these housing concepts are severely limited within the scope of the present paper. Empirical potential such as including different types and numbers of attributes in the model is considerably reduced because of the limited nature of the data. In the following two sections, conceptual and measurement issues which concern the belief and importance weight variables are discussed.

3.3 Beliefs (Bijk)

Beliefs are the building block of the schematic framework depicted in figure two. On the basis of (i) direct observation, (ii) information received from outside sources, or (iii) by any of various inference processes, a person learns or forms a number of beliefs about an object. Specifically, a belief links an object to some attribute belonging to that object. The totality of these beliefs serve as an informational base which ultimately determine attitudes, behavioural intentions and behaviour with respect to the belief object.

Individuals may differ in the strength of their belief regarding any attribute-object association. Considerable attention has been paid, in both the marketing and social psychology literature to the question of what belief measures are and are not intended to represent. It is generally agreed that the purpose of this variable is to reflect a respondent's perceptions of the association between a particular attribute and a given object. Whether this association should represent pure cognition or a combination of cognition and affect is not, however,



——— INFLUENCE

– – – – – FEEDBACK

FIGURE TWO :

FRAMEWORK RELATING BELIEFS, ATTITUDES INTENTIONS & BEHAVIOURS WITH RESPECT TO A GIVEN OBJECT

Adapted from Fishbein & Ajzen (1975)

agreed upon.

The former approach suggests that people who differ in their belief strength, differ in terms of the perceived likelihood that an object has, or is associated with a specific attribute. Thus, belief strength or more simply, belief, should be measured by "... a procedure which places the subject along a dimension of subjective probability involving an object and some related attribute" (Fishbein and Ajzen, 1975; 16). The use of importance weights (Iik) is more likely to increase the explanatory power of this approach, as the belief that an object possesses or is associated with a specific attribute does not have any explicit reference to attribute importance.

In contrast, the latter approach recommends measurement of the degree to which an object possesses a given attribute and/or the satisfaction associated with this amount. In this case cognition is associated with an affective judgement of the object. Combining cognition and affect into one judgement may reduce the explanatory power of the importance variable (equation 2.1). The degree of satisfaction a person has wtih the amount of a given attribute present in an object, may implicitly contain the importance he/she places on this attribute.

Despite the basic differences in approach, both methods have commonly used bi-polar rating scales to measure the extent of an individuals belief with respect ao a specific attribute. Almost all of the marketing studies reviewed by Wilkie and Pessemier (1973) have pursued the second approach, incorporating satisfaction in the Bijk rating and including importance weights in the model. The cognitive

method has been mainly restricted to research in the field of social psychology.

The main analytical problem encountered with respect to the belief variable concerns the variance of attribute ratings for a given object. Any suppression of variance in the belief rating is thought to be the product of a 'halo effect'. This is essentially a spreading of affect across the dimensions of attitude structure and is related to attribute interdependencies. While a halo effect may not necessarily hinder predictive tests, it may impair diagnostic analyses of the relative strengths and weaknesses of alternatives.

Most of the theoretical literature considers the belief variable basic to the attitude model. The inclusion of a second, independent weighting variable in the model has been considered superfluous by several writers, while others have argued for its inclusion. The case for including attribute importance weights will now be discussed, before a multi-attribute attitude model of housing preference is presented.

3.4 Importance Weights (I_{ik})

Importance weights provide for within-individual differences in the relative importance of attributes. As measures of attribute importance, it is assumed that they contribute to the measurement of an individual's overall affect or satisfaction with an object. There are two model issues which are related to importance weights. Each of these issues is discussed separately, in order to eradicate any ambiguities over the inclusion of this variable in the model.

The question of whether or not importance weights belong in the basis model has received more attention in marketing studies than any other issue (Wilkie and Pessemier, 1973). The controversy focuses on whether or not they reduce the explanatory power of the attitude model. In Rosenberg's (1956) original study, it was concluded that "importance represents a distinguishable and important dimension of the attitude related cognitive structures" (p. 371).

Two forms of the model have been used in recent analyses. One form combines both the belief variable (Bijk) and importance weights (Iik), as in equation 2.1. The other model includes only the belief variable, on the grounds that belief has an implicit importance weight.

A number of papers conclude that the inclusion of importance weights decreases the predictive power of the model (Seth and Talarzyk, 1972; Moinpour and MacLachlan, 1971). Others argue that there is little difference between the predictive ability of the two models (Churchill, 1972). While Lehmann (1971) provides evidence to support an increase of predictability with the addition of importance weights. Generally, the studies which find a reduction in predictability with importance weights included have utilized cross-sectional methodologies. On the other hand, studies which note an increase in predictability with the inclusion of importance weights have utilized individual level analysis. It is therefore possible that the analytical procedure adopted may be the cause of variation in the model's predictive ability.

Evidence concerning the inclusion of importance weights suggests that they are not likely to reduce the explanatory power of the model. Neither, however do they seem to add strikingly to prediction. In many

cases respondents may implicitly incorporate importance into their belief ratings. If this is the case, then the Bijk variable may be weighted twice, once implicitly (within Bijk) and once explicitly. Further, if respondents feel that all of the attributes are important, this will give the importance variable less variance and add little to the models predictive power.

Despite these drawbacks, Bass and Wilkie (1973) conclude that importance weights should be left in the model if only because in disaggregate form they do offer benefits in the diagnosis of attitude structure.

The second problem area concerning importance weights relates to their measurement. The typical instrument used to attain a measure of attribute importance is a simple bi-polar,multi-point rating scale. Alternative measurement methods have been quite extensively compared in the marketing literature. Lehmann (1971) for example, reports little variation between the use of rank orders of importance versus measures obtained on a 1 to 6 bi-polar scale, for predicting television programme preferences. Rank ordering and bi-polar rating scales both have measurement disadvantages. The main advantage of these two measurements is that while essentially ordinal they are assumed to possess interval properties, within the attitude model.

To this point analytical and theoretical problems have been outlined for each variable in the attitude model. Although discussion has tended to be in a general rather than a specific context, the groundwork has been laid for the two models which are presented in the following section.

3.5 A Multi-attribute Attitude Model of Residential Preference

This section is by way of a summary of the earlier discussion such that points of model structure are related to residential evaluation and preferences. The form of the model remains essentially the same as equation 2.1 with the following alterations:

$$Pjk = f(Ajk) = \sum_{i=1}^{n} Iik\ Bijk \quad \text{(Belief times Importance)} \quad (3.1)$$

$$Pjk = f(Ajk) = \sum_{i=1}^{n} Bijk \quad \text{(Belief only)} \quad (3.2)$$

where k = resident

j = housing alternative

i = residential attribute

n = number of attributes

such that

Pjk = Preference rank of residential alternative j for decision-maker k

Ajk = Decision-maker k's attitude score for residential alternative j

Iik = the importance weight given attribute i by decision-maker k

Bijk = the degree of satisfaction associated with the amount of i believed by k to be present in j

In order to establish the relevance of importance weights, two forms of the model are suggested. Equation 3.1 measures attitude according to belief and importance weights for each attribute, while equation 3.2 measures attitude according to beliefs only. When equations 3.1 and 3.2 are correlated against preference, the success

of the model form excluding importance weights can be compared to the success of the model form utilising both belief and importance measures.

Resolving this issue is neither the primary objective of the paper, nor the model. The main aim of applying the model in a housing context is to see how accurately the conceptualisation of attitude, discussed in section 2.2, correlates with preference for given residential types. Thus a person's preference for their residence is considered to be a function of their attitude towards it, which is in turn, a function of their belief about certain attributes and the importance of these attributes in satisfying the person's accommodation requirements.

Providing the attitude model performs well for various residence types individually, it is not a very big step to applying it in a context where two or more alternatives are evaluated by each respondent. From a movers point of view, several residences are usually evaluated before one is chosen. Since the basic purpose of the attitude model is to measure affective evaluation (attitude) and predict choice predisposition on this basis, it seems likely that it can be used to predict housing choice where several alternatives are evaluated. In the following chapter, the two models outlined in this section are empirically tested.

CHAPTER IV

A PILOT EMPIRICAL EXAMINATION OF THE MODEL

In order to judge whether there is a sound basis for the approach outlined in previous chapters, equations 3.1 and 3.2 are tested in this chapter. There are two primary requirements for an empirical test of this nature.

First, certain types of data were gathered. This data was necessarily selective. The type of questions asked and their implications in terms of model structure are discussed in the following section.

Once the data requirements were decided upon, a questionnaire was distributed to a sample of on campus residents attending McMaster University. Aspects of the sample design and the method of data collection are important to the structure of the pilot study. They are discussed before the data analyses are presented. Finally, the findings of the analyses are summarised in the concluding section of the chapter.

4.1 Data Requirements

Basically, two types of data are required to test the model. One type relates to the individual's present residence and the other type relates to his/her preference for a predefined set of different residential types. Initially, the residence which each respondent lived in at the time of the interviews was recorded. Residence types were

divided into three categories: single sex residences; including both male and female; a co-ed residence; and a university operated apartment-style residence.

Each person was asked to evaluate their present residence according to nine pre-defined residential attributes. The theoretical nature of these attributes is extremely important, as they determine the dimensionality of the respondents' attitude towards his/her residence. It was assumed that the attributes included in the survey were salient for all residence types. It subsequently appeared that this was not the case.

The attributes were carefully selected according to three main criteria: one, that the list be representative, while certainly not being exhaustive; two, that each attribute be subject to unidimensional interpretation; and three,that they be reflections of respondent perceptual dimensions.

Peterson (1967), Menchik (1972), Peterson and Flachsbart (1973) and Harman (1975) have all discussed the nature of housing and residential environment attributes, in terms of residential preferences and housing choice (section 2.1). These studies recognised several important attributes which were included in the present study. Also attributes which other studies (Butler, et al., 1969) have recognised were included. Three broad dimensions or categories of environmental and locational attributes have been consistently identified in these studies. They relate to (a) accessibility, (b) characteristics of the house and lot, (c) characteristics of the natural and man made residential environment.

Because the pilot study deals with an on-campus student population, attributes which were intuitively considered to be salient were selected from each of the three above dimensions. For category (a) distance from campus was included. Although this is the same for all respondents, it may not necessarily elicit the same affective response. Category (b) has traditionally been regarded as the most important dimension of the residential location. Hence, six of the nine attributes represent this dimension. They include noise, cost, studying environment, privacy, maintenance and facilities, and living space. Category (c) includes the social life associated with each residence and the attractiveness of the surrounding area. All nine attributes sharply contrast off campus and on campus housing characteristics.

Although the basic attitude model assumes attribute independence, it is possible to examine the relationship between interdependent 'bundles' of attributes and preference. Thus the response format does not necessarily preclude consideration of interdependence among attributes.

The discussion concerning the belief variable in section 3.3 recommended that the association between attribute and attribute object is best accounted for by an approach which combines the cognitive and affective aspects of evaluation. Belief is therefore considered to be more than the degree to which a residence is associated with, or possesses, a specific attribute. For this reason, respondents were asked to rate their satisfaction with each attribute on a seven point bi-polar scale, having the following response categories:

very satisfied

moderately satisfied

slightly satisfied

neutral

slightly satisfied

moderately satisfied

very satisfied

This approach establishes the degree of satisfaction associated with the amount of each attribute present, for each respondent. It is therefore a combination of the respondent's perception and evaluation of specific attributes possessed by the residence. As used within the model, this measurement scale assumes that the respondent's evaluation has interval properties.

Discussion in section 3.4 suggested that importance weights should be included in the model in order to provide differential stress on specific attributes. It was also pointed out that combining measures of satisfaction with separate importance weights is susceptible to overemphasising the relative importance of certain attributes, as the satisfaction rating may incorporate an implicit importance weight. Using two forms of the basic attitude model (equations 3.1 and 3.2) overcomes this problem.

The importance of each attribute was judged simply by asking the respondent to rank the nine residential attributes in order of importance. The usual method of generating importance data in marketing studies is with a multi-point bi-polar scale, similar to that used to judge satisfaction (Wilkie and Pessemier, 1973).

Using a ranked scale of importance may cause a respondent to assign a disproportionate level of importance to an attribute which could in reality, be only marginally more important than several other attributes. The converse is also true in that one or more attributes which may be completely unimportant in structuring a person's attitude toward his/her residence may be given a high ranking, because of the restricted number of categories. The ranking of attributes also negates the possibility of two attributes being of equal importance. The number and nature of attributes included in the model and the methods of measuring the attitude variables (Iik Bijk) are therefore of critical importance in attaining a meaningful measurement of affective evaluation according to this approach.

In order to test the validity of the model, a measure of the dependent variable was also required. Data was initially gathered as part of a wider survey of student accommodation which contained preference information for seven different residential types, including four types of off campus residences. These were: room and board, renting an apartment in a house, renting an apartment in an apartment building, and the shared rental of a house. Combined with the three on campus residence types, these alternatives were ranked in order of preference from one (most preferred) to seven (least preferred).

These data then allow for each person's attitude score with respect to his/her present residence to be correlated with their preference ranking for the residence. Section 3 of this chapter contains the results of the test. The following section summarises the sample design and data collection methods.

4.2 Sample Characteristics and Data Collection

It was decided to use an on-campus student population primarily for ease of data collection and becuase of time and manpower constraints. Two surveys were performed at different points in time. Data were initially gathered as part of a wider survey undertaken in February, 1976. This was a systematic random sample of three on campus and four off campus residence types, drawn from the McMaster University student directory. This source provides information concerning course enrolled in, home address, present address and year at university. The present study draws only on data from the on campus sample of this survey.

Sixteen students were selected from each category. They were subsequently contacted and asked to complete a questionnaire containing the data used in the present study as well as data pertaining to other apsects of their accommodation. The response was 100% giving a sample size of 48.

Data collection was undertaken by three different students, including the author and the interviews were performed at the address of each respondent.

The second sample was drawn from a second year geography class in November, 1976. The purpose of this sample was to supplement the information gathered previously. The survey was performed in class time. All students living on campus were asked to complete a questionnaire containing only the questions relevant to this study. Ten of these questionnaires were taken from each category, bolstering the total sample size to 78. It was assumed that the same student had not filled out a questionnaire in the earlier survey. This was not

verified in any way.

Because both samples are restricted to an on campus population, no inferences can be made with respect to student residential attitudes and preferences as a whole. Further, the small sample sizes and the specificity of the data limits generalisation of the results.

4.3 Data Analysis

The two forms of the attitude model, in equations 3.1 and 3.2, were tested in several ways. In order to avoid ambiguity, equation 3.1, which measures attitude by belief (Bijk) and importance weights (Iik), will be referred to as model I from this point on. Similarly, equation 3.2, which measures attitude by belief (Bijk) only, will be referred to as model II.

Initially the relationship between attitude and preference was tested for each residence type, using all nine attributes and assuming attribute independence. Secondly, an attempt was made to improve the importance weight measurement, as it was thought that this variable was causing problems for model I. Thirdly, attributes which did not correlate well with preference were excluded, and the correlations were repeated for both models I and II. Because only one attribute correlated with preference for the respondents' in single sex residences, this residence type was omitted from the third analysis. Finally, a factor analysis of the satisfaction variable (Bijk) was performed and the resultant factor scores were correlated against preference for each residence type. These analyses will be discussed sequentially under the sub-headings of Analysis 4.3.i through to Analysis 4.3.iv.

Analysis 4.3.i

Initially, each respondents' attitude score was calculated in model I and model II. This measure was then correlated against preferences (Pjk) using Kendall's τ and Spearman's Rho. If measurement of attitude and preference is achieved such that every respondent can be given a rank on both the Ajk and the Pjk variables, then τ and Rho will give a measure of the degree of association or correlation between the two ranks. Because of the likelihood of tied ranks it was decided to only include the Kendall correlation coefficients in tables IV.1 through IV.8 and table IV.10, as τ is more sensitive to tied ranks than Rho.

One of the major problems outlined in preceeding chapters became apparent when the first set of results were obtained. The assumption that the same attributes were appropriate to all three types of residence proved to be unfounded, based on the substantial difference in correlation between Pjk and Ajk for each residence type. The norm in the marketing literature is to use a different set of attributes for each product specific brand. It would seem that this should also be the case for each different residence in a housing context.

Only one attribute showed any relationship with preference for single sex residences (hereafter referred to as Residence Type A) in both model I and model II. Table IV.1 illustrates the very low coefficients only privacy (.409) correlated with preference at the .01 confidence level. This result implies that preference is associated with privacy but not with any of the other attributes for this residence type. The very low coefficients for model I (.051) and model II (.041)

TABLE IV.1
CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR ALL ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY
RESIDENCE TYPE A

MODEL	RESIDENCE TYPE A - SINGLE SEX									
	var 1 NOISE	2 COST	3 STUDY	4 DIST	5 PRIV	6 MAINT	7 SPACE	8 SOCIAL	9 NEIGHD	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.078	.103	.070	.149	.409[b]	.116	.116	.026	.137	.051
$Ajk = \sum_{i=1}^{n} Bijk$	.074	.220	.015	.074	.032	.132	.049	.013	.076	.041

[b]Significant at .01 level.

indicate that preference is not significantly related to attitude, as measured, for this residence.

The results for the co-ed residence (hereafter referred to as residence type B) and the apartment style residence (referred to as residence type C) both show a stronger relationship between Pjk and Ajk (tables IV.2 and IV.3). These correlations still do not realise coefficients as high as those reported in the marketing studies. This however, may simply be the result of marketings' use of different measures of association (Pearson correlations, for example).

The only attribute related to preference for residence type A did not correlate with Pjk in model I for residence type B. However, the overall number of attributes which correlate with Pjk increases considerably (table IV.2). Studying environment (.281), distance from campus (.230) and amount of living space (.297) are all related to preference at the .05 significance level. One noticable feature in this table is that model II has generally higher correlation coefficients than model I. However, model I (including Iik) has one more significant attribute. When Ajk is correlated against Pjk for this residence type, model I gives a coefficient of .147 and model II has a coefficient of .247 which is significant at the .05 significance level. This seems to contradict the majority of empirical evidence concerning the use of importance weights. The point is even more apparent when the correlations for residence type C are examined (table IV.3).

The relationship between Pjk and Ajk is much stronger for the apartment style residence - for both forms of the model. Almost all of the nine attributes relate to the residents' attitude towards their

TABLE IV.2

CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR ALL ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY

RESIDENCE TYPE B

MODEL	RESIDENCE TYPE B - CO-ED									
	var 1	2	3	4	5	6	7	8	9	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.049	.069	.281[a]	.230[a]	0	.031	.089	.297[a]	.118	.147
$Ajk = \sum_{i=1}^{n} Bijk$	.159	.165	.243[a]	.179	.139	.197	.085	.349[b]	.086	.247[a]

[a]Significant at .05 level.

[b]Significant at .01 level.

TABLE IV.3

CORRELATION OF PRESERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR ALL ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY
RESIDENCE TYPE C

MODEL	RESIDENCE TYPE C - APARTMENT STYLE									
	var 1	2	3	4	5	6	7	8	9	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.279[a]	.086	.408[b]	.150	.313[a]	.274[a]	.041	.321[a]	.026	.421[b]
$Ajk = \sum_{i=1}^{n} Bijk$	.265[a]	.371[b]	.190	.329[b]	.317[a]	.448[c]	.303[a]	.390[b]	.072	.444[c]

[a]Significant at .05 level.

[b]Significant at .01 level.

[c]Significant at .001 level.

accommodation. For model I there are five significantly correlated attributes. All except studying environment (τ = .408, p = .01) are significant at the .05 confidence level. Preference correlates with attitude at the .01 confidence level (τ = .421). Attitude and preference are therefore quite strongly related, at least as far as this residence type is concerned.

When importance weights are excluded, in attitude model II (table IV.3), seven attribute co-efficients are higher than those in model I. Only studying environment, which is very high in model I and neighbourhood attractiveness which is very low in both cases, are lower. Noise (.265); privacy (.317) and space (.303) are all significant at the .05 confidence level. Cost (.371), distance from campus (.329) and social environment (.390) are significant at the .01 confidence level and maintenance and facilities (.448) is significantly correlated with preference at the .001 confidence level. These attributes combine to give Pjk and Ajk a correlation coefficient of .444, which is also significant at the .001 confidence level. Model II therefore has a stronger relationship between attitude and preference than model I for both residence types B and C.

There are several important points which stand out in the first analysis. Initially, model II exhibits a stronger relationship between attitude and preference than model I. This is contrary to empirical evidence regarding the inclusion of importance weights discussed by Bass and Wilkie (1973). Although there is a difference in the number of significant attributes between each model, neither model I nor model II correlates Pjk very strongly with Ajk for residence types A or B.

This may be related to either or both of two problems discussed in section 1 of this chapter: (a) the assumed salience of attributes for all residence types, and (b) the properties of the importance measure. The following two analyses were undertaken in order to test the basic model allowing for each of these problems.

Analysis 4.2.ii

The reliability of ranking the attributes in order of importance was questioned earlier, because of the forced weighting which is caused by this method. It was decided to aggregate the importance variable into four ordinal categories rather than nine, to see if this affected the correlations in any way. The most important attribute remained unchanged; the second, third and fourth ranked attributes were compressed into one category; the fifth, sixth and seventh ranked attributes into another category and the eighth and ninth ranked attributes formed the fourth category.

The attitude score for each person was then recomputed using the compressed importance weights. This score was correlated with preference for model I and the results showed that there was hardly any difference from the original correlations. Rather than discuss all of the coefficients for each residence type,only the relationship between Ajk and Pjk is included in table IV.4.

These coefficients are almost identical to those for model I in tables IV.1, IV.2 and IV.3. The similarity of the coefficients suggest that the importance weights may not necessarily be the cause of the low coefficients in analysis 4.3.i. In the following analysis, the responses

TABLE IV.4

CORRELATION OF PREFERENCE (Pjk) WITH OVERALL ATTITUDE (Ajk)
ADJUSTED IMPORTANCE WEIGHTS

RESIDENCE TYPES A, B, AND C

MODEL	RESIDENCE TYPE A	RESIDENCE TYPE B	RESIDENCE TYPE C
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.051	.203	.426[b]

[b]Significant at .01 level.

to non-salient attributes are excluded from both models and the relationship between attitude and preference shows a marked improvement.

Analysis 4.3.iii

There is hardly any relationship between attitude and preference for the students living in residence type A (table IV.1). This indicates that the residential attributes used in the study are irrelevant to the preference ranking these students gave their residence (with the exception of privacy). In order to try and improve the model's efficiency, it was decided to exclude the non-significant attributes and retest the model including only attributes which correlated with preference at or beyond the .10 level of significance. This discounts residence type A from the analysis altogether, as there was only one significant attribute for both model I and model II. Consequently the following discussion focusses on residence types B and C. When only the significant, or salient attributes were included in the models, the correlation between preference (Pjk) and attitude (Ajk) increased.

It was observed in analysis 4.3.i that there were more significantly correlated attributes in model II than in model I. This means that the number of attributes included in the attitude measure varies between model I and model II for each residence type.

Three attributes have significant correlations with preference in model I for residence type B (table IV.5). Study environment (.281); distance from campus (.230) and social environment (.297) combine to create a correlation coefficient of .456 for the relationship between Pjk and Ajk. When this is compared to the coefficient of .147 in table

TABLE IV.5

CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR SALIENT ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY: MODEL I

RESIDENCE TYPE B

MODEL	RESIDENCE TYPE B - CO-ED			
	var 3 STUDY	4 DISTANCE	8 SOCIAL	TOTAL Ajk
$Ajk = \sum_{i=1}^{N} Iik\ Bijk$	.281[a]	.230[a]	.297[b]	.456[c]

[a]Significant at .05 level.

[b]Significant at .01 level.

[c]Significant at .001 level.

IV.2, the effect of excluding the non-significant attributes from the model is clear. The relationship between attitude and preference is now significant at the .001 confidence level.

Model II contains four significant attributes for residence type B (table IV.6). Maintenance and facilities is added to the same three attributes which were significant in model I (study, distance and social environment). These attributes combine together to give a coefficient of .417 for the relationship between Ajk and Pjk. This is significant at the .01 confidence level (table IV.6).

When the value of τ and its significance level for residence type B is compared between models I and II (tables IV.5 and IV.6) an important change from the relationship observed in the original correlations (table IV.2) can be seen. When the non-significant attributes are excluded (tables IV.5 and IV.6) model I has a higher coefficient and is more significant than model II. This is the opposite to that evidenced in table IV.2. Therefore, the reason for the low correlations between Ajk and Pjk in Analysis 4.3.i seems to lie with the salience of the attributes which are included in the model. This observation is supported by the results for residence type C.

For model I, residence type C has six significantly correlated attributes (table IV.7). Noise (.279); study environment (.408); distance from campus (.150); privacy (.313); maintenance and facilities (.274) and the social environment (.321) all correlated highly with preference. The relationship between Ajk and Pjk has a coefficient of .550 which is significant at the .001 confidence level. This not only improves the coefficient (.421) when all attributes were included in

TABLE IV.6

CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR SALIENT ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY: MODEL II

RESIDENCE TYPE B

MODEL	RESIDENCE TYPE B - CO-ED				
	var 3 STUDY	4 DISTANCE	6 MAINT	8 SOCIAL	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Bijk$	.243[a]	.179	.197	.349[b]	.417[b]

[a]Significant at .05 level.

[b]Significant at .01 level.

TABLE IV.7

CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR SALIENT ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY: MODEL I
RESIDENCE TYPE C

MODEL	RESIDENCE TYPE C - APARTMENT STYLE						
	var 1 NOISE	3 STUDY	4 DIST	5 PRIVACY	6 MAINT	8 SOCIAL	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.279[a]	.408[b]	.150	.313[a]	.274[a]	.321[a]	.550[c]

[a]Significant at .05 level.

[b]Significant at .01 level.

[c]Significant at .001 level.

model I (table IV.3), but the significance of the relationship between Ajk and Pjk is also improved from .01 to .001.

All nine attributes, with the exception of neighbourhood attractiveness are significantly correlated with preference for residence type C in model II (table IV.8). The relationship between attitude, as measured by these attributes, and preference yields a correlation coefficient of .491. This is significant at the .001 confidence level.

Similarly to residence type B, model I exhibits a higher coefficient between Ajk and Pjk than model II for residence type C. This tends to support Wilkie and Pessemier's (1973) contention that the inclusion of importance weights in the attitude model does not suppress its explanatory ability. The performance of model I and model II in tables IV.1, IV.2 and IV.3, compared with the performance of model I and model II in tables IV.5, IV.6, IV.7 and IV.8 indicates that Wilkie and Pessemier's contention is only true when salient or significant attributes are used to measure attitude. The importance weight problem, which is somewhat overshadowed by the attribute salience problem, should not be forgotten. Had a different measure of importance been used, the correlations for model I may have been even better. However, this is pure speculation.

Analysis 4.3.iv

Issues relating to attribute independence have been raised in several parts of the text. In section 3.2 the attribute independence assumption of the linear compensatory attitude model was discussed. As

TABLE IV.8

CORRELATION OF PREFERENCE (Pjk) WITH ATTITUDE (Ajk)
FOR SALIENT ATTRIBUTES INDIVIDUALLY AND CUMULATIVELY: MODEL II
RESIDENCE TYPE C

MODEL	RESIDENCE TYPE C - APARTMENT STYLE								
	var 1 NOISE	2 COST	3 STUDY	4 DIST	5 PRIVACY	6 MAINT	7 SPACE	8 SOCIAL	TOTAL Ajk
$Ajk = \sum_{i=1}^{n} Bijk$	.265[a]	.371[b]	.190	.329[b]	.317[a]	.448[c]	.303[a]	.390[b]	.491[c]

[a]Significant at .05 level.

[b]Significant at .01 level.

[c]Significant at .001 level.

both model I and model II operate under this condition, each respondent is assumed to evaluate the nine residential attributes independently.

Strong arguments have been forwarded for evaluative interdependence among attributes (Harman, 1975 for example). In this respect the satisfaction variable (Bijk) was factor analysed to see if there were any clear interdependencies among the residential attributes included in this study. Three factor dimensions with eigenvalues >1.0, accounting for 57.3% of the variance, emerged (table IV.9).

In the first factor maintenance and facilities, living space and the social environment all have high loadings. This factor is difficult to describe as it contains three seemingly unconnected attributes. However, the response for these attributes was such that they are interrelated. The second factor has high loadings for studying environment and noise, two attributes which one would expect to find related. Similarly another predictable relationship, between living space and privacy occurs in the third factor dimension.

Factor scores were calculated on each factor for each respondent. The factor scores represent a composite index of satisfaction ratings, based on weighted linear estimates of the factor score coefficients on each factor dimension. This provides a measure of attitude derived from the original satisfaction ratings which allows interrelated attributes to be identified within each orthogonal factor. Thus the factor scores replace the original satisfaction ratings in model II. This model was then correlated against preference for each residence type. Table IV.10 shows that there were no significant relationships between preference and attitude (as measured by the three factor scores)

TABLE IV.9

ROTATED FACTOR MATRIX - Bijk (n=78)
VARIMAX ROTATION - KAISER NORMALIZATION

VARIABLE	FACTOR 1	FACTOR 2	FACTOR 3
Sat noise	.10694	.60612*	.26676
Sat cost	.36125	.26456	.07016
Sat study	.13980	.80066*	-.06001
Sat Distance	-.07282	-.04524	.28065
Sat Privacy	.11871	.31522	.71097*
Sat Maintenance	.56921*	.14154	-.19876
Sat space	.46341*	.29457	.42149*
Sat social	.66623*	.03451	.03014
Sat Neighbourhood	.26695	.31003	.02006
Percentage of variance accounted for	29.8%	15.5%	12.1%

*Loading ≥ .4.

TABLE IV.10

CORRELATION OF PREFERENCE (Pjk) WITH OVERALL ATTITUDE (Ajk) MEASURED BY FACTOR SCORES: MODEL II RESIDENCE TYPES A, B, AND C

MODEL	RESIDENCE TYPE A - SINGLE SEX		
	FACTOR SCORE 1 Maintenance;space, social	FACTOR SCORE 2 Noise;study	FACTOR SCORE 3 Privacy;space
$Ajk = \sum_{i=1}^{n} Iik\ Bijk$	.003	.040	.032
	RESIDENCE TYPE B - CO-ED		
	.129	.155	.032
	RESIDENCE TYPE C - APARTMENT STYLE		
	.453[c]	.204	.146

[c]Significant at .001 level.

for either residence type A or residence type B. Only factor scores for the first factor dimension in residence type C (maintenance and facilities, personal space and social environment) correlated strongly with preference (τ = .453; p = .001). The absence of significant correlations between attitude and preference based on factor scores again reflects the fact that many of the attributes used in the study simply had no relevance for the occupants of residence types A and B.

The method of using the same attributes for each residence type seems to be at the root of the empirical problems which have been exposed in this section. Several important points are contained in the discussion. The following section briefly summarises the major issues in the pilot study, before they are given more detailed attention in the concluding chapter.

4.4 Implications of the Analyses

The two most important findings of the analysis section relate to (a) attribute selection and (b) the measurement of attitude. Findings in analysis 4.3.iii indicate that both models perform better when only salient attributes are included. Under these conditions attitude model I correlates better with preference than attitude model II. This tends to confirm the assertion that the model operates more efficiently including a separate importance variable.

Efforts made to improve the relationship between attitude and preference by aggregating the importance weights into fewer categories (analysis 4.3.ii) and allowing for attribute interdependence (analysis 4.3.iv) both proved to be fruitless. This reflects the singular

importance of attribute saliency. Thus various alternative methods of measuring each attitude variable can improve the model's performance, only if the attributes which represent the attitude object are known to be salient. The satisfactory performance of model I in analysis 4.3.iii tends to validate the measurement methods which were used in this study.

The nature of the relationship between attitude and preference discussed in analysis 4.3.iii gives good support to the hypothesis that preference is a function of attitude. However the nature of the relationship is dependent upon attribute saliency. It is therefore very important to ascertain the evaluative relevance of each attribute before analysing any data.

This paper has shown that attitude and preference are related. While preference is not synonymous with choice it has been shown that the two are highly related (Bass and Talarzyk, 1973). This, however, does not necessarily mean that attitude and choice can be related in any simple way. This study has served to recognise problems which must be taken into account when a measure of attitude is related to housing choice.

The concluding chapter assesses the extent to which the present study has aided the development of a model of housing choice, by reflecting on the objectives and purpose of the paper, outlined in Chapter I. Directions for future research are recommended in light of the findings discussed in this chapter.

CHAPTER V

CONCLUSIONS AND REFLECTIONS

The objective of this study was to empirically examine the relationship between attitude and preference using a multi-attribute attitude model. The success of this approach in the context of on campus student accommodation gives considerable support to using the model more generally in the analysis of residential choice. The achievements of the present study are summarised in the following section before a proposal for future research is outlined in the final section of this chapter.

5.1 An Assessment of the Study

The analyses of the pilot study discussed in section 4.3 indicate that attitude is related to preference for the apartment style and co-ed residences, but not related to preference for respondents living in single sex residences. This inconsistency was ascribed to the unsuitability of using the same attributes for all three residence types. The utilisation of the attitude components (cognitive/affective beliefs and importance weights) in the basic attitude model (equation 2.1) appear to be substantially confirmed by these results.

Preference was correlated with the attitude score for each attribute as well as with overall affect for each residence type. This provides a measure of the relationship between each individual attribute

and preference, such that the important and unimportant attributes can be identified. Thus salient and non-salient attributes were defined according to the strength of their relationship with preference ($p \leq .10$).

Not only does the attitude model assume attribute independence, it also assumes that overall affect (the combination of attitudes toward each separate attribute) will have a stronger association with preference than any single attribute. The results of analysis 4.3.i show that this is not always the case. In tables IV.1, IV.2 and IV.3 there is at least one attribute which has a stronger correlation with preference than overall affect. The reason for this is a function of the number of unimportant attributes which contribute to the overall measure of attitude for each residence type in analysis 4.3.i.

When the response to non-salient attributes are combined with the response to salient attributes, the summative function of the attitude model tends to weaken the relationship between overall affect and preference. The differing number of salient attributes between single sex residences (noise) and the apartment style residence (noise, cost, privacy, distance, maintenance and facilities, living space and social environment) illustrates this point well.

Single sex residences exhibited almost no correlation between attitude and preference, as there was only one attribute among the original nine which was salient with respect to preference for these students (table IV.1). On the other hand, the relationship between overall attitude and preference was significant for the students living in the apartment style residence. This is because of the large number of attributes which have significant correlations with preference

individually.

When attributes which did not have significant correlations with preference were excluded from the model in analysis 4.3.iii, the measure of overall affect showed increased correlations with preference in both model I and model II. Thus,only when attitude is measured by a combination of salient attributes, is its relationship with preference stronger than the relationship between any single attribute and preference. This reinforces the need to include only salient attributes in the model.

The effect that non-salient attributes have on the model's relationship with preference was apparent in the results of all four analyses discussed in the preceeding chapter. Thus problems which have been exposed concerning the measurement of importance weights and attribute interdependence can also be related to attribute saliency.

In section 4.1 a certain amount of doubt was expressed over the method which was used to measure attribute importance in an attempt to improve the importance measurement, the nine rank ordered importance weights were compressed into four ordinal categories. When overall affect was correlated against preference for each residence type, using the compressed measure of importance, there was no noticeable change in the correlations attained in analysis 4.3.i.

The reason why the correlation between attitude and preference did not improve, does not necessarily reflect on the method which was used to measure attribute importance. The correlation coefficients between overall attitude and preference in table IV.4 includes the response to all nine attributes. Thus the response to several unimportant attributes are included in the calculations for each

residence type. It is suggested that this is the reason for the low correlation coefficient.

The method of measuring importance which was originally used does not seem to have any adverse affects on the attitude model's performance. In fact, when the non-salient attributes are removed from the measurement of overall affect (analysis 4.3.iii) attitude model I (which includes important weights) correlates higher and more significantly with preference than attitude model II (beliefs only). This confirms Wilkie and Pessemier's (1973) contention that the inclusion of importance weights increases the explanatory ability of the model. If the measure of belief has an implicit importance weight, it does not seem to contribute to the overall affect as well as a separate importance variable.

This discussion highlights two important model issues: (a) that only the response to salient attributes should contribute towards the measure of overall attitude, and (b) that, under this condition, separate importance weights improve the performance of the model.

The relationship between attitude, measured by factor scores of the satisfaction (Bijk) response for each attribute, and preference was tested in order to allow for a crude measure of attribute interdependence. In order to arrive at each persons factor scores, the satisfaction rating for all nine attributes was factor analysed,producing three orthogonal factors. Factor scores were then calculated on each factor dimension. These scores replaced the original satisfaction ratings in attitude model II (equation 3.2) and were correlated against preference.

The results of this test contained in table IV.10 are not especially promising. The main reason for this hinges on the fact that factor scores are essentially composite indexes of satisfaction based on the response to all nine attributes. Although each factor is defined according to attributes with loadings ≥ .4, this is purely arbitrary. For example, factor II is defined by the response to noise and studying environment (that is, these two attributes are interrelated), however, the factor scores for this factor dimension are calculated on the basis of the factor score coefficients for all nine attributes. Thus the problem of including non-salient attributes in the measure of attitude again tends to weaken its relationship with preference (table IV.10).

This paper has examined the application of a multi-attribute model to the study of residential preferences. In doing so it has served to identify several problems associated with this approach. Using an attitude model to account for the process of residential choice will involve problems over and above those which have been discussed in this section. Some initial strategies towards using the model to incorporate notions of residential choice are discussed in the concluding section.

5.2 Suggestions for an Attitude Model Approach to Residential Choice

Expanding the scope and objectives of this paper to account for residential choice is a difficult, but by no means impossible task. Each person in the present study was only required to evaluate their own residence type. In order to examine choice among a number of alternatives, attitude must be measured toward each alternative.

Attaining a measure of attitude toward n number of housing alternatives, involves a problem which did not affect the present study. In section 2.2 it was indicated that the attitude model represents a static attitudinal structure at one point in time. When a mover is evaluating residential alternatives, the number of alternatives which are considered is likely to increase over time. Hudson (1970) points out that a learning theory approach to evaluation focuses on evaluative consistency over time. However, any change in the alternatives considered in a choice, causes a redefinition of the attributes which the decision maker relates to. Thus,the attributes which are salient to a mover may be subjectively redefined each time a new alternative is considered. The difficulty in allowing for this complicates the implementation of an attitude theory approach to residential choice.

Temporal changes in the subjective definition of attributes is only a problem if a longitudinal study, which focuses on a mover's evaluation of actual housing alternatives is attempted. A controlled, experimental study design which tests the model's predictive ability in an artificial choice situation would overcome this problem. If an experimental study is successful in predicting housing choice on the basis of mover attitudes toward alternatives, recommendations can then be made for implementing the model in a 'real world' choice situation. Therefore it is suggested that further pilot studies should preceed use of the model to examine the process of housing choice on a wide scale.

Harman (1975) and Brummell (1977, forthcoming) focus their studies on people at the post decision to move stage of the

residential relocation process. If a sampling technique similar to either of theirs was used to identify people actually in the process of moving, the enquiry would tend to reflect the kinds of evaluative decisions which are made with respect to actual residential alternatives in the housing market. In an experimental study, the movers would not be evaluating alternatives which they have actually visited, but rather, a set of residential alternatives which represent a cross section of residence types. The alternatives can be presented in a number of ways. Peterson (1967), Flaschbart (1971), and Peterson and Flaschbart (1973) recommend the use of colour slides. Several other studies (Sanoff and Sawhney, 1972 for example) have used similar techniques for a variety of purposes. Information relevant to the location and characteristics of each residence could accompany the visual presentation. This approach was used by Harman (1975) in her study of housing concepts.

Attitude toward each residential alternative would then be measured by the attitude model and the alternatives would be ranked according to preference. This would provide the attitude data for several residential alternatives which is required to examine choice predisposition.

This general approach seems quite feasible on the basis of (a) the success of the attitude model for a single residence in this paper, and (b) the success of similar experimental designs in other studies. Once the hypothesised relationship between attitude, preference and choice is empirically established in a controlled study, a longitudinal enquiry of actual market choice can be undertaken.

These recommendations differ considerably from the attitude/ preference relationship which this paper has shown to exist. Although the examination of residential choice necessitates a more intensive scope of enquiry many of the points made in the present study are relevant to this end. Issues concerning attribute saliency, the measurement of attitude variables and attribute interdependence which have been recognised in this paper, offer considerable benefits to further attitude studies of residential choice.

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