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Guest Editor
Deborah S. Levy

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Identifying the dimensions to retail centre image

Valerie Kupke

Keywords Perception, Retail marketing, Shopping centres

First feelings and first impressions largely govern and delimit the kinds of experiences one expects and seeks. This paper reviews the application of multidimensional scaling (MDS) to retail market research and discusses how MDS is able to map these impressions and hence explain the retail centre image held by consumers. It proposes that retail centre image is not just relevant to marketers and retailers, but is also of importance to property managers who need an informed and holistic consumer orientation in order to create and sustain property value. By means of illustration MDS is applied to data based on shopper evaluations of seven retail centre items and an interpretation the results is offered.

The decision-making behaviour of office occupiers

Chris Leishman and Craig Watkins

Keywords Decision making, Office buildings

Typically, studies of the occupiers' choice of office property have focused on the influence of location. Following the standard behavioural assumptions of neo-classical economics, the firm is assumed to make the rational profit-maximising decision on the basis of full information. All firms are implicitly assumed to be homogeneous. This general approach eliminates much of the complexity from the decision-making process. This paper uses evidence from a survey of over 100 office occupiers in Edinburgh to examine the influence of a broader range of factors on individual firms' choice of office. Using logistic regression techniques on the survey data, the empirical analysis shows that by taking account of heterogeneity of firms, it is possible to identify the type of property occupied. Firms' decisions are closely related to their

size, business type and whether the market they serve is local, regional or national.

The influence of family members on housing purchase decisions

Deborah S. Levy and Christina Kwai-Choi Lee

Keywords Family, Decision making, Influence, Real estate

Families and households make up a significant proportion of the real estate market. There is, however, little information in mainstream real estate literature on the impact of family behaviour on real estate decisions. This paper clarifies some of these issues by analysing and expanding on many of the findings from the marketing literature, in particular the topic of influence between different family members in the purchase of a new home. This paper presents some important issues to be considered when examining family decision-making. These include the roles played by different family members and their influence at different stages of the decision-making process. It also reports on the findings of a study involving a series of in-depth interviews with real estate agents to determine their perception of the family decision-making process in relation to a house purchase decision. This culminates in a conceptual framework on family decision making specifically for the purchase of residential real estate, before discussing the implications of these findings to the general real estate market, including service, promotion and valuation.

Multicultural examination of valuation behaviour

Julian Diaz III, Paul Gallimore and Deborah Levy

Keywords Value analysis, Individual behaviour, United Kingdom, United States of America, New Zealand

A series of experiments were conducted to examine valuation behaviour in the UK, the

USA, and New Zealand (NZ). Professional valuers from all three countries participated in the study whose findings support the notion that the US normative model is cognitively demanding and that greater departures from it result in reduced cognitive effort. The study also concluded that subjects from cultures requiring disclosure (USA and NZ) examined a significantly greater number of sales than did subjects from the UK where disclosure is uncommon. Finally, while valuers perhaps ought to increase sales search in unfamiliar markets, this research revealed no evidence that they do so. These findings are consistent with the need to seek cognitive efficiency and reduce cognitive effort even at the expense of performance quality.

Editorial

Behavioural property research was introduced as a new approach to the study of property by Diaz (1999). Since then, this approach has grown into an accepted component of mainstream property academic enquiry and, as Gallimore (1999) predicted in the last special behavioural edition of the *Journal of Property Investment & Finance*, a "valid framework for property market analysis". Although behavioural property research still consists only of a small proportion of published papers, recent editions of internationally refereed academic property journals including *Real Estate Economics*, *The Journal of Property Research*, *The Journal of Real Estate Research* and *Journal of Property Investment & Finance* have observed an increased number of publications in this area. There is evidence that this trend will continue with an increasing number of papers investigating the behavioural aspects of the real estate market being presented at academic property conferences worldwide.

The emergence of a behavioural field of enquiry and the questioning of the underlying concept of the rational man and efficient market hypothesis (EMH) is not unique to property, but is a trend throughout a number of related academic disciplines. For example, Shiller (2000) in his book *Irrational Exuberance,* investigates the behavioural aspects of financial markets. This investigation illuminates the complex nature of real markets as compared with academic expectations and models. As with behavioural research in property, Shiller (2000) suggests that behavioural finance "as the years go by, is looking less and less like a minor subfield of finance and more and more like a central pillar of serious finance theory".

Economics as a discipline has also traditionally embraced the overriding concept of the rational man and when behaviour failed to conform with economic theory it was often concluded that this was irrational behaviour, or more embedded in the field of psychology (Green and Kagel, 1987). Over the past 25 years, however, there has been a move away from the traditional insularity between psychology and economics with economists entering into laboratories, traditionally the realm of psychologists, and psychologists beginning to incorporate economic theory into their experimental design and analyses of results (Green and Kagel, 1987). The area of behavioural economics has emerged displaying a transdisciplinary approach to the understanding of behaviour which has continued to attract a growing interest amongst academics as demonstrated by the increasing number of published academic articles in the field in recent years (McFadyen and Wood, 1991).

Consumer behaviour, a subset of the marketing discipline, has also grown from the recognition by economists of the limitations of microeconomic theory in explaining consumer actions. Researchers thus started evaluating markets from the perspective of the behavioural sciences (psychology, sociology, and anthropology). In this context the consumer is viewed as a psychological entity, acting within a social and sociocultural environment (Kassajian and Robertson, 1973).

It is clear from the above discussion that the behavioural approach has proved increasingly attractive to academics from a number of disciplines in recent years. This interest has primarily stemmed from the deficiencies of the theoretical underpinning of the rational man construct to fully explain economic activity. Economic activity, after all, is ultimately human behaviour (Diaz, 1999).

The advent of a behavioural mode of enquiry as an accepted framework for property market analysis has added another dimension to academic research. It could be argued that without it there could, potentially, be dangerous consequences. For example, Shiller (2000) claims that the underlying assumption that all people are thoroughly rational has encouraged many academics to depend on simple and elegant models of market efficiency. This in turn has created a situation where academics are tempted to tackle only problems that can be answered with scientific precision, therefore running the risk of being so narrow as to be irrelevant. If Shiller's argument relating to behavioural finance is accepted in the property context, then an alternative approach to real estate research should be encouraged in order to create an opportunity for theory to become more useful and relevant. This perspective would ultimately lead to a deeper understanding of the more complex aspects of market reality.

Although behavioural research in the property context is a relatively recent development, papers utilising this approach have already contributed major insights into the functioning of property markets. For example, a number of key papers have studied the process of property asset valuation and are throwing light on questions that are fundamental to property economics. Examples of recent contributions from the literature include studies on valuation judgement in terms of different reference points, transaction feedback, transaction price, client feedback and client influence (Diaz and Hansz, 2001; Hansz and Diaz, 2001; Havard, 2001; Gallimore and Wolverton, 2000; Wolverton and Gallimore, 1999; Levy and Schuck, 1999). Findings from these and other published research projects in this area are contributing to such critical issues as real estate market pricing and the construction of real estate indexes.

A substantial amount of recent research effort has also offered a greater appreciation and deeper understanding of the behaviour of participants in the property market including consumers, lenders, brokers, investors, developers and landowners (Gallimore and Gray, 2002; Webb, 2000; Levy and Lee, 2000; Adams *et al.*, 2001; Gallimore *et al.*, 2000). Knowledge of how these players in the market behave is fundamental to the understanding of property.

The behavioural approach to property research has also promoted different tools and perspectives from psychology, which in turn has enabled researchers to expand the type of questions that can successfully be considered. The acceptance of varied research methods and methodologies not routinely employed in the traditional approach to property research is becoming more common. For example there has been a significant increase in the collection of primary data via instruments such as surveys, experiments and interviews in place of the analysis of secondary databases. There is also evidence of a growing acceptance of a qualitative approach to research, which is especially useful for behavioural researchers for its ability in investigating the behaviour of individual players in the property market (Levy and Henry, 2001).

The four papers included in this special edition are authored by academics from the USA, the UK, Australia and New Zealand. These papers display two striking features. First, they demonstrate the diversity of research methods that has been so effectively utilised in gaining a better understanding of the behaviour of participants in the property market. Second, these papers illustrate the range of research questions capable of being addressed by this approach.

Leishman and Watkins analyse evidence from a survey of 119 office occupiers in Edinburgh in order to challenge the standard neo-classical assumption that firms make

rational profit-maximising decisions on the basis of full information. The paper concludes that a firm's decisions are closely related to their size, business type and whether the market they serve is local, regional or national. The use of cluster analysis techniques enables the construction of a classification of property types within the Edinburgh market and thus new empirical evidence of the way characteristics of the firm influence their decision choice. The outcome of this provides an extension to existing behavioural studies.

Diaz, Gallimore and Levy conduct a series of experiments examining valuation behaviour in the UK, USA and New Zealand. The outcome of the study highlights the effects of culture on valuer behaviour and raises the question as to the effect of cultural influence on other players in the real estate market. The findings overall are consistent with the need to seek cognitive efficiency and reduce cognitive effort even at the expense of performance and quality.

Kupke uses multidimensional scaling as a tool in mapping first impressions and the retail centre image held by consumers. Identifying people's first impressions of real estate environments and how they "feel" about property attributes is vital information for property managers and owners desirous of create and sustaining property values. As illustrated in each of the papers included in this edition, the results indicate that the traditional concept of rationality may not be a primary determinant of choice.

Levy and Lee's paper brings into the mainstream real estate literature information relating to the impact of family behaviour on real estate purchasing decisions. In particular, it investigates roles of different family members and their influence at different stages of the decision making process. Unlike work in neo-classical economics (and by extension in most real estate applications) the family is treated as a group of individuals entering into a joint decision making process, rather than as a single individual or as if the paternal head of the household personifies the family as whole. This paper, in contrast to others in this issue, utilises a purely qualitative research approach by way of a series of in-depth interviews.

In conclusion, this behavioural issue brings together four papers which by virtue of their research questions query the underlying assumptions embedded in neo-classical economic theory. By the use of nontraditional research techniques (both qualitative and quantitative), the authors have been able to foster a deeper understanding of property markets and the players within them. Although behavioural property research is relatively recent, still much remains to be done to understand fully the behaviour of players such as investors, lenders, property professionals, consumers and policy makers. The inclusion of this type of research in mainstream academic enquiry creates an exciting synergy between economics and behavioural science, which may be viewed as one of the most important recent developments in the field of property research.

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Identifying the dimensions to retail centre image

Valerie Kupke

School of International Business, University of South Australia, Adelaide, Australia

Abstract *First feelings and first impressions largely govern and delimit the kinds of experiences one expects and seeks. This paper reviews the application of multidimensional scaling (MDS) to retail market research and discusses how MDS is able to map these impressions and hence explain the retail centre image held by consumers. It proposes that retail centre image is not just relevant to marketers and retailers, but is also of importance to property managers who need an informed and holistic consumer orientation in order to create and sustain property value. By means of illustration MDS is applied to data based on shopper evaluations of seven retail centre items and an interpretation the results is offered.*

Introduction

Zajonc (1980) argued that "we are never wrong about what we like or dislike" and that once formed, an evaluation is not readily revoked. He argued against the notion, that before we can like something we must know what it is, that objects must be understood before they can be evaluated. Instead Zajonc suggested it was possible to like something without knowing precisely what it was. Newell and Simon (1972, in Hardin, 1999) have suggested that while an individual may interpret a task and try to formulate it into a known item, through comprehension and problem space definition, processes Zajonc describes as "cold cognition", they also recognise that information processing has an important preconscious component. Information, they suggest, is processed preconsciously even before humans are conscious of the presence of information (Hardin, 1999). Ittelson (1974) argues that first feelings and first impressions largely govern the directions taken and delimits the kinds of experiences one expects and seeks.

These first feelings and impressions are a key factor in understanding retail consumer behaviour. The limited nature of the human attention span results in the need for the selective processing of information especially within retail environments that offer multiple stimuli and choices (Lindquist, 1973; Phillips *et al.*, 1997). Thus initial perceptions play an important role in explaining the images held by consumers of retail outlets, images which in turn account for customer evaluations and patronage. This paper reviews multidimensional scaling (MDS) as a market research methodology that is capable of mapping out the "feelings" or perceptions held by shoppers in terms of retail images. MDS attempts to detect the constructs that frame the highly selective shopping process by identifying the key elements of a store image which are retained by the consumer and influence their purchaser behaviour. This paper emphasises that a research methodology which offers a better understanding of store image should correspond to a more holistic approach to the management of retail centres, management which offers competitive advantage by being more consumer focused. It proposes that retail centre image is not just relevant to marketers and retailers, but is

also of increasing importance to property managers who need an informed consumer orientation in order to create and sustain property value. The paper begins by reviewing the contribution of research within human geography to behavioural studies of property market decision making as well as acknowledging the behavioural focus of recent property research.

Literature review

The importance of the preconscious and the emotional has been recognised within the context of property markets by human geographers over a number of years. This discipline group offers useful insights for those interested in the application of behavioural studies to real estate decision making as it focuses on spatial outcomes and built environments. Writers such as Brown and Moore (1970) and Clark and Cadwallader (1973) have postulated the subjective and idiosyncratic nature of housing market search and residential mobility. Simon (1952, 1957) offered the framework of bounded rationality and decision making as "satisficing" behaviour. Clark and Smith (1982) argued that the household search for a new home is very selective, based primarily on existing feelings for, and awareness of a known locality or action space and is aimed at satisfying rather than optimising utility. Brown and Moore (1970) postulated the classic three stage model of stress, search and evaluation as an explanation for housing location choice. Smith and Mertz (1980) defined a decision frontier to include change in preferences and opportunities throughout the housing search period with special reference to the influence of real estate agents. Potter (1977) applied Horton and Reynolds' (1971) distinction between action space and activity space to shopping behaviour to theorise on consumer information fields versus usage fields. Downs (1970) argued that in terms of explaining shopping centre patronage store image was very complex and that the tangible and intangible elements of a centre could not be separated easily. Rushton (1969, 1976) developed the revealed space preference approach which proposed that consumers rank alternative shopping centres on a scale of internally constructed "preferredness". Rushton argued that shopping behaviour could be predicted from a knowledge of preferences and that these preferences could be measured by means of MDS of pair wise comparison data. Timmermans *et al.* (1982) used the MDS approach to suggest that size and accessibility were the aspects of shopping centres that individuals consider most often.

As a research psychologist Zajonc (1980) has demonstrated that rational decision making, the weighing of advantages and disadvantages is most commonly used to justify original decisions:

> We buy the cars we like, choose the houses that we find attractive and then justify those choices by various reasons that might appear convincing. But we need not convince ourselves. We know what we like.

An important interpretation of real estate market behaviour lies within the context of consumers "knowing" what they like, of feelings predicating decision, of "in the head", often non conscious processes, determining choice. Levy (1995) has argued that for those interested in real estate choices it is "beneficial to draw on marketing research techniques that permit a deeper understanding of how consumers perform in real life situations". Such an approach leads to a consideration of behavioural research methodologies such as MDS that aim to identify "in the head" processes. Within the

area of property market research MDS has been applied as a means of understanding residential choice and hence price (Hourihan, 1979), weighting of property attributes and hence value (Horner, 1984), as well as retail centre image and hence patronage (Jain and Etgar, 1977; Burt and Carralero-Encinas, 2000). Based on a large sample of professional valuers in Sydney, Parker (1997) was able to identify the relative positions in perceptual space of capitalisation rate determinants such as planning, location, alternative investments, economic environment, tenant and risk assessment.

Within retail market research MDS has been used in particular to identify the dimensions underlying the perception of retailing structures as a means of explaining store "image". In 1958 Martineau identified that for most consumers retail centres have an image or "personality" that is composed of at least two dimensions. One dimension that is functional and reflects attributes such as size, range of goods, prices and store layout, and one that is psychological and captures the atmosphere in terms of sense of belonging or friendliness. These are dimensions based on the subjectively judgement of shoppers rather than on the objective properties of the centre. Lindquist (1973) identified three main factors – merchandise, service and location, when isolating the components of retail store image. Using MDS, Mazursky and Jacoby (1986) identified that store image constructs were based first, on information about the merchandise and the visual content of the store, and second, on information related to location, policy and service. More recently image research has been applied to Internet retailing with writers such as Jones and Biasiotto (1999) suggesting that Web pages which mimic and present a virtual store "image" are more likely to be translated into Web page "hits" and thereafter into retail sales.

May (1973) and Hansen and Deutscher (1977) identified how image as viewed by the consumer could be used to improve retail performance. Retailers which met or exceeded customer expectations would enjoy repeat purchasers and increased loyalty. Store image as perceived by consumers could help retailers to measure critical service elements, improve promotions and justify the refurbishment and enlarging of floor areas. More recently MDS has been recognised as important in identifying the extent to which retailer and customer store images are similar (Oppewal and Timmermans, 1997; Birtwistle *et al.*, 1999). Such research has recognised a gap in that retailers consistently overrate their stores image when compared to customer perceptions. MDS has been used also to identify the dimensions existing within managerial perceptions of marketing performance (Clark, 2000).

This paper would propose that customer store image is not just relevant to marketers and retailers, but is also of importance to property managers who need an informed consumer orientation in order to create and sustain property value. Howard (1997) reasons that the emphasis on retail centres as investment assets dominated by pension funds, insurance companies and property companies reinforces the need for retail property management to be more broadly based. Property managers need to recognise that a shopping centre can, and should be marketed as an entity and that a centre has image and brand characteristics that can be managed, promoted and improved. Howard (1997) suggests that property managers need to see their role as more than monitoring security, cleaning and promotions. She argues for customer-led property management based on developing partnerships with retailers and providing the right environment for business rather than simply managing a service to tenants. In this way the manager should be seeking to provide a total shopping product to the

customer based on recognising that a shopping centre is more than a collection of retailers. Property management, which is not only tenant, but also customer oriented, will recognise that shopping centres offer a mix of feelings and impressions, services and functions that need be pleasurable, comfortable and easily understood. This paper would argue that the degree to which this is achieved is reflected by retail image and that this can be illustrated for managers in a practical way by MDS.

Methodology

MDS has been developed to explore the feelings or perceptions which are considered as underlying structures within a set of preferences. MDS is attempting to make observable "in the head" processes or constructs that may determine for example the evaluation of residential views, the choice of commercial office space or the patronage of shopping centres. MDS is useful as it can produce a visual geometrical representation of subjective constructs or dimensions that would otherwise be hidden within the data. It assumes that "geometric space is equal to psychological space" (Ferguson and Kerrin, 1997). It provides a visual representation deemed a "perception map" on which objects that are close together are deemed similar or close together in terms of preference. In MDS the focus is not on the objects themselves, but on how an individual perceives or interprets them. The challenge is to understand the subjective dimensions along which items are placed and then relate these to objective judgements. This in turn should help to predict behaviour with respect to consumer choice.

The first task in MDS is to identify the relevant issues that pertain to a particular object. This may be devised though survey work, focus groups, or talking to experts in order to determine the main items that are likely to dominate a purchasers evaluation of a site, a consumer's preference for a shopping center or a tenant's choice of office space. One must also determine if such issues are really comparable. An implicit assumption within MDS is that there are common characteristics either objective or perceived that the respondent can use for evaluations that will then allow such items to be commonly scaled along one or more dimension.

Typically MDS is carried out in terms of the evaluation of comparison of items. This is based on a rating of similarities between items or preferences for items. Thus in MDS data based on similarities or on preferences can be used. It is a decompositional method which measures only the overall impression of evaluation of an object and then attempts to derive spatial positions in multidimensional space that reflect these perceptions. The second approach is by using similarity data. The researcher is trying to determine which items are the most similar to each other and which are most dissimilar. Respondents are asked to rank or rate the similarity of pairs of items for instance Brand A against Brand B, or View Z against View Y. Measures of similarity can be estimated and used to produce maps where distance between items indicates dissimilarity (Hair *et al.*, 1998). Similarity data can also be based on derived measures. Derived measures are typically based on scores given to objects by respondents using semantic differential scales. MDS techniques can combine respondents and aggregate results. Aggregation is based on an understanding of the overall evaluation of objects and the dimensions employed in those evaluations. MDS, while having no constraining assumptions on methodology, type of data or form of relationships among the variables, does assume that all respondents will perceive an object using the same dimensions though these may not possess the same importance for all respondents.

In 1997 as part of an annual retail market research exercise conducted in Adelaide, South Australia shoppers were surveyed at two competing suburban retail centres. As part of the project which included demographic analyses of the primary trade areas, shoppers were asked a range of questions with respect to distance travelled, frequency of shopping, household characteristics, income levels, mode of transport and evaluation of shopping centre items. A total of 119 shoppers were surveyed, 55 in Shopping Centre A (GLA 11,484m^2) and 64 in Shopping Centre B (GLA 5,143m^2). At Shopping Centre A all of the retail outlets, including a large department store are found within the centre. Shopping Centre B has one large food/department store tenant with a number of smaller, externally accessed shops. Both centres have a comparable mix of retail outlets including newsagency, fast food, florist, bakery and delicatessen. Shoppers were interviewed over two days and represented what was basically a convenience sample of those who were willing to co-operate on the day. Shoppers were asked to evaluate their local centre based on seven attributes using a five-point semantic differential scale from very bad to very good. These items included availability of parking, level of prices, atmosphere, quality of service, fast food facilities, range of shops and opening hours. The responses were aggregated and then evaluated to create similarity measures between the attributes. The proximities and ALSCAL routines within SPSS created distances from the ordinal data based on an Euclidean scaling model of two dimensions. Group plots of the aggregated data were produced, the so-called "perception maps" which placed the seven attributes in geometric space along two dimensions.

Results and interpretation

Optimal statistical fit for a multidimensional model is indicated by two statistics, a "stress" statistic and RSQ (Norusis, 1993). The Kruskals s-stress statistic is similar to the residual sum of squares in regression analysis and as such measures departure from perfect fit (Jain and Etgar, 1977). Stress is minimised when the objects are placed in a map configuration where the distances best reflect the original distances obtained from the respondents. A s-stress value below 0.1 and an RSQ value approaching unity indicate a good fit. However as fit improves with increased number of dimensions a balance has to achieved between complexity and fit (Ferguson and Kerrin, 1997). Generally one should seek the best fit possible with the smallest number of dimensions.

Group plots, s-stress statistics and RSQ values are displayed for each centre (Figures 1 and 2). The position of the attributes relative to each other reflects either their similarity or dissimilarity in terms of shopper evaluation. The dimensions offer the opportunity to explore any relationships that may exist between the seven attributes under evaluation, relationships about which the shoppers themselves may be unaware but will influence overall their patronage of the shopping centre. Descriptive analysis alone of the evaluations based on semantic differential scales would not allow for such links to be identified nor would it allow for the relative positions of the attributes to be identified. Both outputs satisfied the MDS tests in terms of fit (CentreAs − stress = 0.1 RSQ = 0.94, CentreBs − stress = 0.02 RSQ = 0.9) which implies that the two-dimensional configuration are adequate reflections of the original differences in evaluation.

Figure 1 reveals that for Shopping Centre A, parking lies at the extreme positive end of Dimension 1, while range of shops and fast food are both at the negative end of the
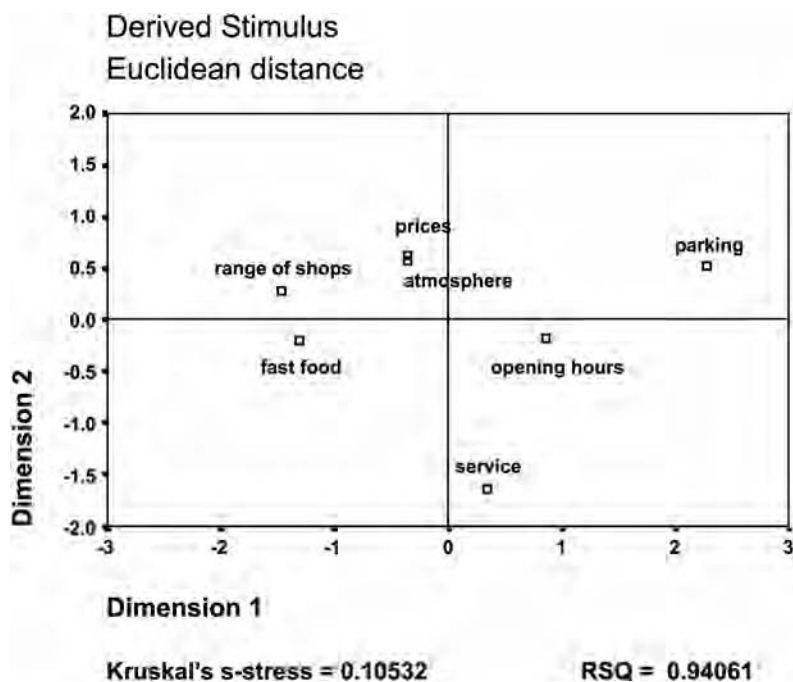
Figure 1.
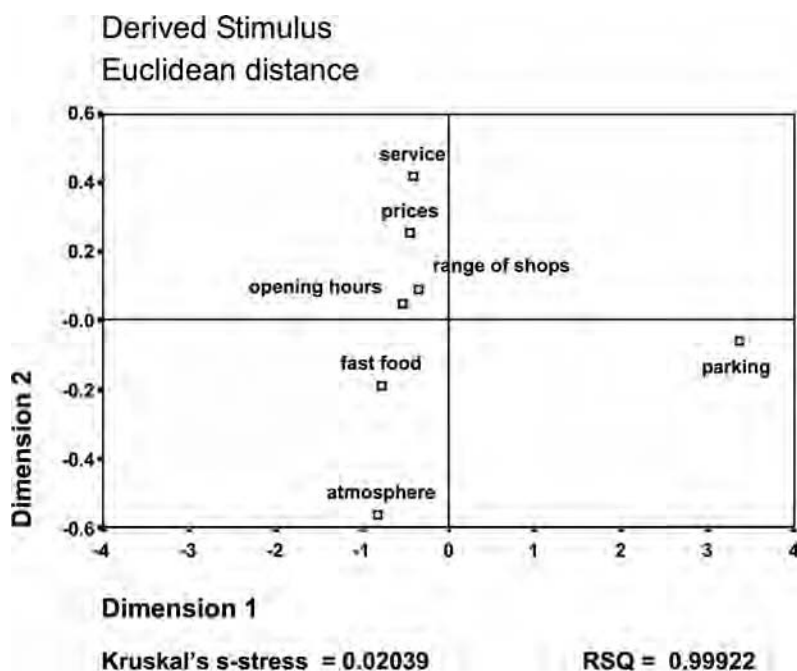Aggregated perception
map Shopping Centre A

Figure 2.
Aggregated perception
map Shopping Centre B

dimension. Along Dimension 2 prices and atmosphere are positive while service is strongly negative with fast food and opening hours in the middle range. This would suggest that Dimension 1 is depicting the functional or physical aspects of the centre based primarily on accessibility issues. Dimension 2 which captures atmosphere relative to service, would appear to represent the more intangible qualities of the centre based on the emotional response of customers to the centre. This interpretation is supported by Martineau's (1958) evaluation of a centre image or "personality" based on a functional dimension linked to service items and on a psychological dimension linked to feelings of comfort and friendliness. It also ties in with explanations by Lindquist (1973) and Mazursky and Jacoby (1986) who have linked retail image to an external dimension based on parking and location items and an internal dimension related to visual content and internal experience of the store. One of the strongest impressions Centre A is making on shoppers is in terms of accessibility, either good or bad depending on the item. Another strong component of retail image is based upon the quality of the internal shopping experience which again is either positive or negative depending on the item.

Figure 2 shows that for Shopping Centre B parking is a strong but single positive along Dimension 1 with all the other attributes positioned closely together on the negative side. Along Dimension 2 service is strongly positive, followed by price with atmosphere strongly negative. In this case Dimension 2 is likely to be depicting the more subjective aspects of the centre. However Dimension 1 is less easily identified. Again it may be capturing the functional qualities of the centre. The quality of the internal shopping experience or "feel" of the centre would appear to be an extremely important in terms of Centre B. Again depending on the item this can be strongly positive as with service, or strongly negative as for atmosphere. The functional aspects of the centre in term of location and access do not appear to be as important in terms of retail image.

Thus the dimensions which are the elements of retail image are similar for both outlets. However shopper impressions of Centre A are more strongly aligned to functional form including access and location, while the image of Centre B is linked strongly to the less tangible aspects of the retail centre. Both these images tie in with the built form of the centre; A has only internal shopping while B retains some external opportunities. This serves to support the validity of MDS in capturing shopper perception. In terms of ongoing management it is important to recognise that for shoppers using Centre A accessibility leaves a particularly strong impression either good or bad. For those managing Centre B it is should be important to appreciate that the internal shopping experience at this centre leaves customers with a very strong feeling either positive or negative. Such interpretations would be especially useful for managers if images could be compared over time across competitive centres and between tenants and customers. The impact of changes such as tenant mix, refits or new stores on shopper evaluation could be monitored and mapped along with levels of patronage.

Conclusion
MDS requires caution in interpretation but can offer interesting insights into market evaluations of property attributes. It is recognised that for retail centre participants MDS is only a first step in appraising the imagery or "in the head" constructs of these

environments but it does provide guidelines as to the direction of further research and should be accepted at least as an exploratory research tool. It enables a feel for the less tangible aspects of a market with findings and suggestions that can be explored using other techniques such as conjoint or correspondence analysis. Property management which is not only tenant, but also customer oriented, will recognise that MDS provides an important step in identifying people's first impressions of real estate environments, of how they "feel" about property attributes. This evaluation of attributes is important where rationality may not necessarily determine choice.

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The decision-making behaviour of office occupiers

Chris Leishman

Department of Building Engineering and Surveying, Heriot-Watt University, Riccarton, UK

Craig Watkins

Department of Land Economy, University of Aberdeen, Kings College, Aberdeen, UK

Abstract *Typically, studies of the occupiers' choice of office property have focused on the influence of location. Following the standard behavioural assumptions of neo-classical economics, the firm is assumed to make the rational profit-maximising decision on the basis of full information. All firms are implicitly assumed to be homogeneous. This general approach eliminates much of the complexity from the decision-making process. This paper uses evidence from a survey of over 100 office occupiers in Edinburgh to examine the influence of a broader range of factors on individual firms' choice of office. Using logistic regression techniques on the survey data, the empirical analysis shows that by taking account of heterogeneity of firms, it is possible to identify the type of property occupied. Firms' decisions are closely related to their size, business type and whether the market they serve is local, regional or national.*

1. Introduction

From a contents analysis of the major US and UK real estate journals, Levy and Henry (2001) provide evidence of the increasing methodological domination of applied neo-classical economics. Although, in a recent review article, Diaz (1999) highlighted the mutli-disciplinary nature of UK property research, and, in particular, work on the development process which adopts institutionalist and structure-agency perspectives, this new evidence suggests that published work in British outlets is starting to follow the lead from the USA where the neo-classical approach has dominated for three decades.

Clapp and Myers (2000) outline the extent to which urban property research has undergone a Kuhnian paradigm shift. The rich tradition of applied "real estate and urban land economics" that can traced from James A. Graaskamp, through Richard Ratcliff, Homer Hoyt and Ernest Fisher back to Richard T. Ely was overthrown by the urban economics paradigm (or the new urban economics (NUE)) in the 1960s and 1970s (Weiss, 2000). This change heralded the substitution of inductive methods, based on the direct observation of facts, by deductive modes of thought that deploy a set of assumptions in order to deduce logical conclusions. The adoption of this mode of reasoning imposes constraints on the types of research questions that might be asked and the methods that can usefully be applied. Consequently researchers have focused on property market outcomes (such as prices, and levels of development activity) and have sought to derive and test parsimonious explanations of these observed phenomena. Typically this has been based on the development of increasingly sophisticated econometric models. The process, by which observed prices and output

levels are established, is treated as a black box, with human behaviour reduced to a number of simplifying assumptions. The neo-classical model is predicated on the notion that the market comprises rational actors operating with perfect information in an environment of costless transactions. It is also assumed that property can be treated as a homogenous commodity and that consumers of space are also homogenous.

McMaster and Watkins (2000) are critical of the extent to which this approach circumscribes the scope of real estate research. They explore the limitations of the NUE and suggest that it might be fruitful to reintroduce some of the ideas from Ely's work. Specifically they highlight the policy impact of the analytical work of Grigsby, Rapkin and others, which is in the Ely tradition (see Grigsby, 1963). They argue that real estate analysts need to learn more about market process and, in particular, highlight the need to examine the role of agents in the market, the property search process, consumer decision making, the nature and flow of market information, and the way in which prices are set. This assessment is reflective of the concerns of institutional economists and the evolving applied behavioural property research agenda (see D'Arcy and Keogh, 2000). The behavioural agenda, in particular, has begun raise new questions about the search process in real estate markets (Baryla *et al.*, 2000); role and influence of agents (Zumpano *et al.*, 1996); the use of market information in the negotiation process (Black and Diaz, 1996); and the influence of actors in the valuation process (Gallimore, 1994; Diaz, 1990).

This paper seeks to add to the behavioural agenda by examining the decisions made by office occupiers. To date studies of office occupiers' choices have taken the form of location choice models. These studies have been based on the textbook theoretical proposition that office location decisions are influenced by factor costs, transport and communication costs, the quality of the urban environment and agglomeration economies (Ball *et al.*, 1998; Evans, 1985; Goddard, 1975). Empirical research has confirmed that the desire of office occupiers to locate in the core of the city has tended to push up rents in the central business district, giving rise to a negatively sloped bid-rent curve (Dunse *et al.*, forthcoming; Bollinger *et al.*, 1998; Mills, 1992). These studies, however, have stripped out the complexity of the decision-making process and, consequently, ignore the importance of factors other than rent and location in shaping decisions. The approach used in this paper combines survey evidence with logistic regression methods in order to assess the relative importance of a range of factors, including the characteristics of the firm, in determining the choice of office space to be occupied. The model developed allows us to identify the firms' choice of property type from its size and business profile and can be used as a marketing device for agents to match office users to available space.

The paper is organised as follows. Section 2 seeks to establish the motivation for this research. It begins by presenting the standard neo-classical treatment of the office location decision and then considers the extent to which behavioural changes have begun to present a challenge to this model. The review concludes by highlighting the need to develop an understanding of factors influencing individual firms' choice of property in the office market. In section 3 we outline the data and research methods used in the paper. Section 4 summarises the empirical results. Using a detailed dataset of physical office characteristics matched to occupier profiles, we consider the extent to which it is possible to establish the office location decisions of different groups of occupiers by allowing for the heterogeneity of firms. In the final section of the paper,

in addition to summarising our findings, we make the case for further research based on survey data. Following Kummerow (2000) we note that real estate research would benefit from the combination of different research techniques. Indeed there is a clear need for a multi-disciplinary and methodologically diverse real estate research agenda.

2. Office location decisions: models and behaviour

Since the seminal contribution of Wingo, Alonso and Muth in the 1960s, economic studies of urban land and property markets have been dominated by the theoretical models of the NUE. A major strand of this literature has focused on the office location decision. The NUE model posits that firms' trade-off access to the benefits of the city centre against space. This model is predicated on several key behavioural assumptions, which include the notion that rational actors are operating with perfect information in a market in which transactions are costless. Demand is highest for central business district (CBD) locations because they offer better access to services, better access to labour, improved communications technology and infrastructure and better client and market information (Daniels, 1991). As Ball *et al.* (1998) explain the central location provides benefits from both agglomeration economies and from the embedded infrastructure and institutions that facilitate communication and investment. Demand declines as we move away from the CBD and gives rise to a negatively sloped bid-rent curve.

These "trade-off" models have given rise to a voluminous literature that seeks to tests, directly and indirectly, its explanatory power and the validity of the behavioural assumptions. Using hedonic rental estimates, Mills (1992), Bollinger *et al.* (1998) and others have provided evidence to support the expected spatial distribution of rental values. The survey work of Wyatt (1999) is also supportive of the pull of the CDB. The evidence, however, is not conclusive. Using a similar approach Dunse *et al.* (forthcoming), for example, demonstrate that while the model usefully explains the spatial structure of the Edinburgh office market, it fails to uncover important cleavages between distinct submarkets in Glasgow. They suggest that, in part, the limitations of the model relate to its failure to capture changes in behavioural influences on the real estate market.

Similarly, Ball *et al.* (1998) argue that shifts in form of business organisation might have eroded the influence of agglomeration economies. The growth of the information technology (IT) sector and changes in functional specification of office space may mean that the traditional spatial distribution of rents may no longer hold. These influences may be compounded by impact of changing working practices on the property market. Gibson and Lizieri (1998, 1999) discuss the likely effects of telecommuting, outsourcing, hot-desking and other trends in business practice. O'Roarty (2001) has highlighted the influence on office user requirements of changes in historical work practices, organisational structures and hierarchies and changing business strategies including the influence of outsourcing and new technology. In addition, Keeble and Tyler (1995) highlight the extent to which institutional factors can distort location decisions. They show that government grants, for example, can lead to sub-optimal location decisions. There is also evidence that, in the case of smaller firms, there are links between office and housing location decisions. In their study of the South-West of England, Keeble and Tyler (1995) show that in excess of a third of location decisions are influenced by nearness to the founders' homes.

3. Data and research methods

In the empirical part of this paper we extend earlier work on two different aspects of office market analysis. In the first study Dunse *et al.* (2001a) examine the spatial structures of the Glasgow and Edinburgh office markets using traditional hedonic techniques. In the second, Dunse *et al.* (2001b) use survey evidence to compare the stated preferences of office occupiers in Edinburgh with agents' perceptions of occupiers' preferences. In this paper we are concerned with the behaviour of different types of firms (office occupiers) in the office user market. Specifically, we examine the (implicit) assumption of neoclassical urban location theory that occupiers are a homogeneous group and consider the extent to which the heterogeneity of office users influences their choice of property.

The empirical results presented below are based on a study of 119 office occupiers in the Edinburgh office market. The dataset links information on the location and physical attributes of individual offices with qualitative data on the occupiers' primary business function and market size. The office stock data are provided by the Scottish Property Network (SPN), which is a joint venture between the University of Paisley and Scottish Enterprise. The qualitative data are drawn from an ongoing study into the characteristics of office occupiers in which data are collected from occupiers using a combination of postal surveys and telephone interviews[1].

The firms' location choices were made between 1995 and 1999. The occupiers are coded into six categories according to their primary business activity. These categories are shown below.

(1) professional services;

(2) financial services;

(3) recruitment and training;

(4) business services;

(5) offices linked to manufacturing or construction firms; and

(6) others.

Our central hypothesis is that firms (office occupiers) are not identical and that the characteristics of occupiers are of value in predicting their location/space consumption decisions. The analysis is developed in two stages. In the first stage we construct a nominal (categorical) variable that describes the important characteristics of office properties taken on by the sample of 119 occupiers. This is achieved by undertaking cluster analysis to group similar observations on the basis of a set of eight categorical variables that together measure variance in the physical attributes of transacted office properties. Although cluster analysis has been applied in property market analysis in order to classify local and regional markets (Jackson, 2002; Hoesli *et al.*, 1997), this approach is closer to that used in the identification of housing submarkets literature (Bourassa *et al.*, 1999). The procedure allows us to reduce the heterogeneous stock into a categorical variable based on four distinct product types.

In the second stage we test our hypothesis by constructing and estimating a multinomial logistic (MNL) regression model in which firms' choice of office property (as measured by the new categorical variable) is a function of their broad corporate characteristics, including main business activity, a proxy for firm size, and the spatial dimensions of the market they serve. The interpretation of the coefficients in this

equation allows us to isolate the factors that most usefully help predict the individual
firms choice of office unit.

4. Empirical results

Table I shows the most common (mode) values of the physical attribute categorical
variables broken down by business category of firm. The physical attribute variables
are defined in Table II.

The figures in Table I show that there is little variation within some of the physical
attribute variables. In terms of construction type (CT), all firms located in "period"
buildings with the exception of those businesses linked to local manufacturing or
construction activity. A majority of these firms located in "traditional construction"
buildings. Similarly, there is little variation in terms of the recorded property condition
(PCOND) of offices occupied by the firms examined.

The variables that describe finish type (FINTY) and size (SIZEBAND) show greater
variation. Professional firms and others (mainly government offices) locate primarily
in high specification space while firms in the business services or recruitment/training
sectors locate primarily in second-hand cosmetically refurbished space. This also
applies to occupiers linked to the manufacturing and construction sectors. Firms in the
financial services sector locate primarily in refurbished space.

| Firm type | CT | | PCOND | | FINTY | | SUB TYPE | | AGE BAND | | SIZE BAND | | Cases |
	n	%	n	%	n	%	n	%	n	%	n	%	
1	6	68.4	6	52.6	7	47.4	4	73.7	5	89.5	2	63.2	19
2	6	50.0	4	42.9	5	50.0	4	57.1	5	71.4	3	50.0	14
3	6	80.0	6	73.3	3	46.7	4	93.3	5	93.3	2	46.7	15
4	6	56.5	6	60.9	3	60.9	4	69.6	5	87.0	2	60.9	23
5	4	43.8	4/6	37.5	3	37.5	1	43.8	5	43.8	3	37.5	16
6	6	62.5	6	65.6	7	40.6	4	68.8	5	90.6	2	43.8	32

Table I.
Most common values of
categorical variables by
firm business type

Variable	Variable description	Category	Description
CT	Construction type	4	Traditional construction
		6	Period building
PCOND	Property condition	4	Good
		6	Unknown
FINTY	Finish type	3	Decorated
		5	Refurbished
		7	High specification
ST	Subtype	1	Cellular
		4	Multi-storey
AGEBAND	Age band	5	Pre-1960
SIZEBAND	Size band	2	100-199m^2
		3	200-499m^2

Table II.
Definition of categorical
variables

Examination of the size band variable indicates that the sample includes firms in the professional service, recruitment and training, business service sectors and others that locate mainly in units of between 100 and 199m^2. Those in the financial service sector and those linked to the manufacturing and construction sectors located mainly in units of between 200 and 500m^2.

As Table I indicates, the number of occupiers within each of the business activity categories is broadly even, ranging from 14 to 32. Table III sets out the mean values of the continuous stock attribute variables including property size, rent (per m^2), distance from the city centre and two measures of specification. Table IV sets out the definitions of these variables in more detail.

Table III indicates greater variation in the office characteristics occupied by the six categories of firm than suggested in Table I. Professional firms and those in the recruitment and training sector occupy relatively small units with a mean of 130 and 141m^2 respectively and low standard deviations. There appears to be some similarity between the unit sizes occupied by firms in the financial service and business service sectors (approximately 300m^2), although it should be noted that the standard deviations are considerable for firms in these sectors. There is less variation in terms of unit rent though rents paid by professional firms and those in financial services are slightly higher and firms in the "other" category (mainly government offices) are slightly lower than average.

Office occupiers linked to the manufacturing and construction sectors occupy space with the highest specification attribute score which is based on lighting type, heating type, number of lifts, ventilation and so on. The lowest scores for this categorical variable are for "other" firms and professional firms. This is broadly in keeping with prior expectations. The highest score for the second attribute score variable is for firms

Firm type	PSIZE Mean	SD	RENT Mean	SD	ATTSCORE1 Mean	SD	ATTSCORE2 Mean	SD	DIST Mean	SD
1	130	63	121	29	0.95	1.08	1.37	1.34	1,274	1,696
2	297	229	124	54	1.79	1.25	1.29	0.73	1,064	1,449
3	141	80	114	26	1.67	1.29	1.67	0.72	563	352
4	305	649	119	48	1.39	1.80	1.48	0.73	1,389	1,067
5	228	171	119	46	2.13	1.50	1.31	0.95	2,297	1,808
6	199	162	109	40	0.91	0.86	1.34	0.90	1,705	2,280

Table III.
Mean values of continuous variables by firm business type

Variable	Description
PSIZE	Property size (square metres)
RENT	Rent (per square metre)
ATTSCORE1	Property specification score (lighting type, heating type, lifts, ventilation and so on)
ATTSCORE2	Property secondary specification score (number of floors, layout of reception area and so on)
DIST	Distance from the city centre (metres)

Table IV.
Description of continuous variables

in the recruitment and training sector. This variable primarily describes floorspace layout and the standard of the reception area.

This simple descriptive analysis tends to suggest that there are some significant differences between the physical and quality aspects of office space targeted by firms in different economic sectors. In the remainder of this section we concentrate on the construction of a simple predictive model of occupiers' choice of office space. There are two basic steps to the construction of the model. In the first, we employ cluster analysis in order to draw the 119 office properties into broadly homogenous "property type" groups using the eight physical attribute categorical variables. In the second step we estimate a simple multinomial logistic regression model in which the probability that firms will locate in each of the property types is postulated as a function of their business activity and geographical focus.

Table V sets out the results of the *k*-means cluster analysis. Based on the results of an earlier round of hierarchical cluster analysis (not shown here for the sake of brevity), the data are drawn into four clusters.

Table VI describes the inherent characteristics of office properties in each of the four clusters.

Tables VIII and IX show the results of the multinomial logistic regression analysis. The model is specified as follows:

	Cluster			
Variable	1	2	3	4
CT	2	5	6	7
PCOND	5	6	5	5
FINTY	4	6	3	6
SUBTYPE	1	3	4	3
AGEBAND	1	5	5	5
SIZEBAND	3	2	2	2
SPECSC1	4	1	1	1
SPECSC2	1	2	1	1
Cases	11	39	48	21

Table V.
Results of cluster analysis

Cluster	Description
1	200-500m^2 of high specification cellular fitted and decorated space in a modern building
2	100-199 m^2 high specification, mixed cellular/open plan space in tenement-style building with unrecorded interior condition or in moderate decorative order
3	100-199 m^2 refurbished mixed cellular / open plan space over several floors in period building
4	100-199 m^2 of new, high specification, mixed cellular/open plan space in a pavilion style building

Table VI.
Description of "property type" clusters

$$\pi_{ij} = \frac{e^{\alpha_j + \sum_k \beta_{1kj} x_{1i} + \sum_l \beta_{2lj} x_{2i} + \sum_m \beta_{3mj} x_{3i}}}{\sum_j e^{\alpha_j + \sum_k \beta_{1kj} x_{1i} + \sum_l \beta_{2lj} x_{2i} + \sum_m \beta_{3mj} x_{3i}}} \tag{1}$$

where:

π_{ij} probability that the ith occupier will locate in the jth property type cluster ($j = 1, 2, 3, 4$).

x_1 occupier market size ($k = 0, 1, \ldots, 3$).

x_2 occupier size proxy ($l = 0, 1, 2$).

x_3 occupier business category ($m = 0, 1, \ldots, 5$).

α constant (intercept); specific to the jth property type cluster.

β_1 parameter on the occupier market size variable (x_1); specific to the jth cluster and the ith value of x_1.

β_2 parameter on the occupier size proxy variable (x_2); specific to the jth cluster and the ith value of x_2.

β_3 parameter on the occupier business category variable (x_3); specific to the jth cluster and the ith value of x_3.

The model includes three independent categorical variables. These relate to market size (MKT) which is defined as international, national, regional or urban; a proxy for firm size (ENTRIES) based on a simple categorisation of the number of yellow page entries for each firm; and business type (BUSTYPE) which is defined in the list of business categories of owner above. The normalisation is achieved by setting the fourth alternative (property type = 4) as a benchmark such that $\alpha_4 = \beta_4 = 0$.

In Table VII the likelihood ratio test is for the hypothesis that the parameters of the independent variables are equal to zero. This null hypothesis is easily rejected. The Cox and Snell, Nagelkerke and McFadden statistics are so-called pseudo-R-square statistics and are standard SPSS output. The Nagelkerke measure is often preferred since it ranges from 0 to 1 while Cox and Snell, for example, has a maximum that is less than 1. The pseudo-R-square measures indicate a reasonable level of fit. Table VIII sets out the parameter estimates.

The empirical results are shown for property type categories 1, 2 and 3. The benchmark is therefore category 4. The exponentiated parameter estimates (Exp(B))

Model	− 2 Log Likelihood	Chi-Square	Df	Sig.
Intercept only	201.610			
Final	125.098	76.51187	30	0.000
Cox and Snell	0.474			
Nagelkerke	0.516			
McFadden	0.256			

Table VII.
Multinomial logistic regression results – model fit

Property type	Variable	B	Std. Error	Wald	Sig.	Exp(B)
1	Intercept	0.198	1.626	0.015		
	Market = national	–	–	–	–	–
	Market = international	19.271	1.280	226.524	***	2.341E+8
	Market = urban	−0.888	1.543	0.331		0.412
	Market = regional	−2.830	1.669	2.876	*	0.059
	One directory entry	–	–	–	–	–
	Two or more directory entries	5.888	1.733	11.545	***	360.559
	No directory entries	21.165	1.687	157.428	***	1.555E+9
	Firm = manuf/construction	–	–	–	–	–
	Firm = other	−21.062	6,064.857	0.000		0.000
	Firm = professional	−22.863	9,131.220	0.000		0.000
	Firm = financial services	−3.235	1.847	3.066	*	0.039
	Firm = recruitment and training	−0.423	1.952	0.047		0.655
	Firm = business services	−0.509	1.722	0.087		0.601
2	Intercept	2.022	1.247	2.630		
	Market = national	–	–	–	–	–
	Market = international	19.255	0.815	557.615	***	2.303E+8
	Market = urban	−0.930	0.891	1.089		0.394
	Market = regional	−0.584	0.894	0.427		0.557
	One directory entry	–	–	–	–	–
	Two or more directory entries	2.591	1.255	4.263	**	13.345
	No directory entries	20.812	0.873	568.619	***	1.093E+9
	Firm = manuf / construction	–	–	–	–	–
	Firm = other	−1.133	1.271	0.795		0.322
	Firm = professional	−2.890	1.319	4.803	**	0.056
	Firm = financial services	−2.759	1.490	3.429	*	0.063
	Firm = recruitment and training	−0.927	1.435	0.417		0.396
	Firm = business services	−1.555	1.442	1.162		0.211
3	Intercept	0.511	1.309	0.152		
	Market = national	–	–	–	–	–
	Market = international	19.327	0.000			2.476E+8
	Market = urban	0.739	0.805	0.842		2.094
	Market = regional	−0.281	0.902	0.097		0.755
	One directory entry	–	–	–	–	–
	Two or more directory entries	2.156	1.279	2.839	*	8.633
	No directory entries	19.193	0.000			2.165E+8
	Firm = manuf/construction	–	–	–	–	–
	Firm = other	−0.087	1.308	0.004		0.916
	Firm = professional	−1.476	1.347	1.201		0.228
	Firm = financial services	−1.432	1.553	0.850		0.239
	Firm = recruitment and training	0.205	1.426	0.021		1.227
	Firm = business services	0.727	1.412	0.265		2.068

Notes: * Significant at 10 per cent; ** Significant at 5 per cent; *** Significant at 1 per cent

represent the probability of a change in the dependent categorical variable in response to a change in category of the individual independent variables. In other words, when we examine the Exp(B) value for "Market = regional" in relation to property type 1 we are considering the change to the probability that a firm will locate in property type 1 rather than property type 4 if that firm had a regional market rather than a national

market. There is a benchmark category for each of the independent variables. The benchmarks are national market, one yellow pages entry and firms with their main business linked with the manufacturing or construction sectors. The key empirical results can be summarised as follows:

(1) Firms are more likely to locate in type 1 property than type 4 if:
- their market is international rather than national;
- they have 2 or more yellow page entries; and
- they have no yellow page entries.

(2) Firms are less likely to locate in type 1 property than type 4 if:
- their market is regional; and
- their main business is in financial services.

(3) Firms are more likely to locate in type 2 property than type 4 if:
- their market is international;
- they have two or more *Yellow Page* entries; and
- they have no *Yellow Page* entries.

(4) Firms are less likely to locate in type 2 property than type 4 if:
- their main business is in professional services; and
- their main business is in financial services.

(5) Firms are more likely to locate in type 3 property than type 4 if:
- they have two or more *Yellow Page* entries

Overall, these results are broadly in line with expectations. One surprising aspect of the results, however, is that several of the business type categories are not significant. Nevertheless, the results indicate that even simplistic categorisation of occupiers provides some ability to predict their behaviour with respect to location decisions and space consumption. As Table IX indicates, the model may be used to predict the property type selected by the firms included in the sample with the model predicting correctly 58 per cent of the time.

5. Conclusions

In mainstream neo-classical economic analyses urban office markets are depicted as coherent, unitary entities. Individual firms are assumed to be rational, profit maximisers whose selection of office property will be dominated by a trade-off between

Observed	Predicted 1	2	3	4	Percent correct
1	6	2	3	0	54.6
2	1	23	10	5	59.0
3	0	15	29	4	60.4
4	1	4	5	11	52.4
Overall %	6.7	37.0	39.5	16.8	58.0

Table IX.
Classification/prediction table

accessibility and space. There will be an observable negatively sloped rent gradient that can be explained by the influence of agglomeration economies and transport costs.

In reality, however, the process by which firms match themselves to office units is much more complex than a simple location choice decision. Some observers have noted the tendency towards decentralisation with the growing importance of IT requirements and flexible working practices (Ball *et al.*, 1998). This implies that the influence of rent and location may now be dampened by additional concerns. Other observers highlight the tendency of consumers to engage in satisficing behaviour and to enter into sub-optimal location decisions (Alexander, 1979).

In the empirical part of this paper, we seek to take a less restrictive view of the way in which firms match themselves to particular units. We do this by analysing evidence from a survey of 119 office occupiers in Edinburgh. Using cluster analysis techniques, we construct a classification of property types in the city. We then test whether the choice of property type can be identified from knowledge about the characteristics of the firm. The results suggest that firms' choice of property type will be contingent on their size, type of business and the geographical extent of their market. This innovative approach provides new empirical evidence of the way firm characteristics influence their decision choice. Although it is unclear whether the results are specific to our case study city, by relaxing the assumption that firms are homogenous, the empirical work augments existing insights (from mainstream location decision models) about the structure and operation of urban office markets.

At a general level, this paper seeks to add to the growing "behavioural property" literature. In focusing on office users' choice of units, the paper provides an extension to the existing behavioural studies that have tended to focus on the valuation process and the role of agents. To a lesser extent, the paper also seeks to make a contribution to ongoing methodological debates. In discussing the limits inherent in the dominant quantitative research paradigm, Kummerow (2000) notes that, a partial remedy for coping with complexity and uncertainty in real estate markets is to combine research methods. Although Kummerow specifically suggests the combination quantitative and qualitative techniques to improve information in local applications, this observation could equally be applied as a rationale for combining data collected by survey methods with rigorous methods of statistical analysis. This paper is illustrative of the way in which the analysis of data of this sort can allow us to augment existing empirical facts. It is also illustrative of the principle that a multi-disciplinary behavioural research agenda should be developed in order to develop a better appreciation of the market process occurring in the "black box" that tends to be assumed away in most quantitative studies of market outcomes.

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The influence of family members on housing purchase decisions

Deborah S. Levy

Department of Property, The University of Auckland, Auckland, New Zealand

Christina Kwai-Choi Lee

Department of Marketing, The University of Auckland, Auckland, New Zealand

Abstract *Families and households make up a significant proportion of the real estate market. There is, however, little information in mainstream real estate literature on the impact of family behaviour on real estate decisions. This paper clarifies some of these issues by analysing and expanding on many of the findings from the marketing literature, in particular the topic of influence between different family members in the purchase of a new home. This paper presents some important issues to be considered when examining family decision-making. These include the roles played by different family members and their influence at different stages of the decision-making process. It also reports on the findings of a study involving a series of in-depth interviews with real estate agents to determine their perception of the family decision-making process in relation to a house purchase decision. This culminates in a conceptual framework on family decision making specifically for the purchase of residential real estate, before discussing the implications of these findings to the general real estate market, including service, promotion and valuation.*

1. Introduction

Traditionally the study of real estate has been based on neoclassical economic theory that assumes individuals make rational economic decisions with a view to maximising utility. This is reflected in property valuations which are primarily based on physical characteristics rather than more intangible non-financial factors which are often important to the purchasers of real estate (Smith *et al.*, 1992) and thus fail to take into account behavioural issues and processes. To date, research relating to the behavioural issues relating to the purchase of residential real estate has largely been confined to areas such as buyer search duration and location and tenure choice (Anglin, 1997; Baryla and Zumpano, 1995; Elder and Zumpano, 1991). Generally these studies do not focus on the dynamics relating to the decision-making process within the family.

Traditional or neoclassical theory in the past has either ignored the family as an institution or treated it as if it was a single individual or as if the paternal head of the household personified the family as a whole (Hodgson, 1999). Hodgson (1999) suggests that the only mainstream attempt to model the family was undertaken by Becker (1976, 1991), however Becker's model assumed a market where marriage and relationships are formed under contract. Hodgson (1999) asserts that both traditional theory and mainstream attempts have ignored moral, cultural and institutional distinction. The implication therefore is that different techniques are required in order to explore family decision-making behaviour.

The study of consumer behaviour within the marketing literature however, has examined many issues regarding the purchasing behaviour of families. Our belief is

that the knowledge gained from this line of research may assist in a better understanding and prediction of decision-makers' actions in the real estate market (Gibler and Nelson, 1998). The focus of this study is, therefore, to determine whether the extant literature relating to family decision making and family member influence mirror the decision making process in the purchase of a family home. The purpose is not to produce definitive conclusions, or to provide generalisable results, but to provide a basis from which academics and practitioners in real estate can begin to understand and explore this under-researched area.

Part 2 of the paper examines the extant literature relating to family member influence in the area of purchase decisions and the implications for real estate purchase decisions. Part 3 reports on the results of a series of individual in-depth interviews with experienced real estate agents in the Auckland area. From the review of the literature and information collected from the interviews a revised model of family decision making relevant to the real estate purchase decision is proposed. This is followed by a discussion of the implications to the marketing and valuation of real estate and explores possible avenues for future research.

2.Family and family decision making

A family is defined as "a group of two or more persons related by blood, marriage or adoption, and residing together as a household" (Lawson *et al.*, 1996). Since the family is the crucial decision-making unit, the interaction between family members is likely to be more significant than those of smaller groups, such as friends or colleagues. Several studies in family decision making have investigated the relative amount of influence exerted by family members and their influences at each stage of the decision-making process (e.g. Ferber and Lee, 1974; Haley, Overholser and Associates, Inc., 1975; Davis, 1970; 1971; Beatty and Talpade, 1994; Na *et al.*, 1998; Lee and Marshall, 1998).

Influence involves actions by family members that make a difference during the decision process (Beatty and Talpade, 1994). Two major types of influence have been identified, first, direct influence which is "based directly on the decision maker's own needs" (Rossiter, 1978). Second, indirect influence "in which the decision maker takes another family member's needs indirectly into account" (Rossiter, 1978).

Figure 1 (adapted from Lee, 1992) presents a conceptual framework of family decision making as it relates to the purchase of a family home. A brief description of the characteristics identified in this framework are set out below:

- *Family characteristics*. These include the family life cycle, social class, sex-role orientation and culture (these aspects are discussed in the next section of this paper).

- *Situational characteristics*. These include the concept of perceived risk and how it relates to time pressure. Sheth (1974) suggest that the higher the risk perceived in a particular purchase decision the more likely it is for the decision to be joint. But, the greater the time pressure on a family to make a decision the more likely it is for the decision to be an individual decision.

- *Individual characteristics*. Many consumer purchasing decisions are made within a family unit comprising a small group of individuals, who have different personalities, preferences, interests, and tastes. When this group of individuals come together to make a decision, it is inevitable that conflict may occur
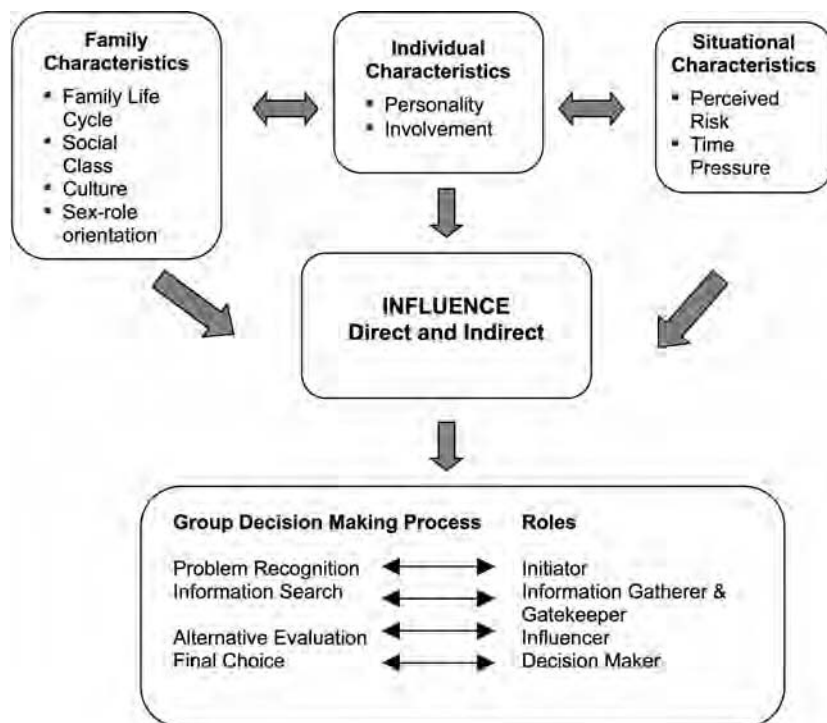
(Sheth, 1974). Conflict occurs when there is a disagreement among the family members, and this is directly related to the desire to influence other members to accept one's own point of view.

The amount of influence exerted by different family members is dependent on how interested or involved the individual member is in the purchase. For example, if the woman in the household is interested in the local residential property market and keeps up to date with recent sales, it is quite possible that she will have most influence in the housing decision. Similarly, children may not be as interested in the purchase of the family home and hence may not have a strong influence on the decision.

The following section reports on the outcome of a number of consumer behaviour studies relating to the different elements of the conceptual framework as presented in Figure 1; specifically the impact of family characteristics, stages in the decision-making process, decision-making roles and influence strategies.

2.1. Family characteristics

2.1.1. The family life cycle. The family life cycle describes the changes that occur in family and household structures as they progress over time. Families in similar stages of the life cycle share similar demographic, financial and purchasing characteristics. Families at different life cycle stages may have different interaction patterns with other family members and use different communication strategies Foxman *et al.* (1989).

The postponement of marriage and rising divorce rates has given rise to a new family structure. These new structures include smaller family sizes (the nuclear family) and single-parent families (Lawson *et al.*, 1996).

2.1.2. Social class (family income). Participation in the family decision-making process by individual family members also varies by social class (Granbois, 1963, 1971; Komarovsky, 1961; Slama and Taschian, 1985. For example some studies indicate less joint decision making in upper and lower socio-economic groups (Granbois, 1963; Komarovsky, 1961). Granbois (1971), however, found the lower the family income and the greater the cost of the product or service being considered, the greater the tendency for two of more family members to be involved in the decision making process.

2.1.3. Culture. There is a limited number of cross-cultural studies on family decision making, but the few which exist suggest that there are differences in influence patterns between cultures (e.g. Hempel, 1974; Lee *et al.*, 1997; Pervan and Lee, 1998). For example, while Chinese parents allow their children to voice their opinions in decisions regarding schooling and restaurant meals, they tend to control how a decision should be made (Lee *et al.*, 1997; Pervan and Lee, 1998).

2.1.4. Sex-role orientation. Sex-role orientation (SRO) is a theoretical construct that is used to identify different types of families, based on their family ideology (Qualls, 1987). Families can be identified as being either modern or traditional. This is a reflection of a family's attitude toward roles played by husbands and wives. A family with a modern SRO usually has a more democratic influence structure, and displays a more positive interaction during the decision-making process (Brinberg and Schwenk, 1985). In more traditional families, however, the roles played are more gender specific, with a clear distinction between feminine and masculine type roles where husbands tend to dominate the decision making process (Green and Cunningham, 1975).

2.2. Stages in the decision-making process

It is well documented that the decision-making process follows a number of stages, although there has been little consensus on the number of stages an individual goes through before making a final choice (Lee and Marshall, 1998). Studies using self-reports have included three stages (Davis and Rigaux, 1974), four stages (Moschis and Mitchell, 1986) and nine stages (Woodside and Motes, 1979).

For the purpose of this study a four-stage approach was used as a guide when conducting interviews, four stages were considered appropriate as these cover all the important decision-making stages. Using too many stages would be cumbersome and structured and may stifle the interview. It is also used by most consumer behaviourists in explaining consumer decision making (e.g. Solomon, 1999). As the interview structure was relatively open, opportunity was provided for respondents to include other stages if they occurred. The four stages are problem recognition, search, evaluation of alternatives and final choice. The problem recognition stage is when a member or members of a family recognises that there is a problem that needs to be solved. For example, in the context of a house purchase a couple expecting their third child may realise that they need more space since their current home has only three bedrooms and no family room. It could be the wife who highlights the problem, as she could be the person who is always looking for space to store the children's toys.

Then comes the stage where the couple starts searching for a house. In this case, one member of the household may be more involved than another in the search for

information. There could be several reasons for this. For example, that family member may have more time to look at different open homes, or may have generally more interest in real estate.

The third stage, alternative evaluation, is where interested members of the family evaluate their different options in order to make a final decision. For example, a couple may jointly evaluate the different properties they have inspected. Both husband and wife will have their own views and preferences and it is at this stage that some form of conflict could arise which may require the need for conflict resolution. The last stage of the decision making process is when the family makes the final choice, that is, the couple makes an offer to purchase the house they have both agreed on. Again either husband or wife could be a major influence at this stage.

Although previous research assumes that the decision-making process occurs in a linear, step-by-step process, others (e.g. Fisher, 1970; Gersick, 1988; Lee and Marshall, 1998) have suggested the process to be non-linear, proceeding in iterative cycles.

2.3. Decision-making roles

The stages in the decision-making process are usually linked to the decision-making roles (Assael, 1987). These roles include:

- The "initiator" who recognises the problem or need for an item.
- The "influencer" who exerts personal influence on other family members with regard to a particular purchase situation.
- The "information gatherer". The individual or individuals who assemble/s the information related to a possible purchase.
- The "gatekeeper" who controls the flow of information to other family members.
- The "decision-maker" who has the authority to make the buying decision.
- The "purchaser" who acts physically to complete the purchase process.

Past studies (e.g. Davis, 1971; Davis and Rigaux, 1974; Woodside and Motes, 1979; Assael, 1987) have noted that role specialisation occurs in many family purchase decisions. Husbands tend to specialise in instrumental roles, which means that he has most influence in decisions which are related to the functional[1] or economic aspects of the decision, e.g. maintenance, finance, location, structure. Wives, on the other hand, tend to take on expressive roles, which relate to the aesthetic and emotional needs of the family. Thus wives would have most influence over decisions relating to colour and design, or flow of the house, or the needs of the children.

Engel *et al.* (1986) suggest that there is a blurring of roles played by husbands and wives because of the changes in the roles and occupations of men and women in society.

2.4. Influence strategies

Family conflict in most group decisions is highly probable, as a joint decision involves a combination of individual preferences of multiple family members (Sheth, 1974). Researchers have used different terminology to classify the different types of decision strategies used to influence the decision-making process (e.g. Davis, 1976; Sheth, 1974; Spiro, 1983; Qualls and Jaffe, 1992). The following sets out the different strategies used to influence a family decision (Lee and Collins, 2000):

- *Experience*. Using experience and knowledge as a source of information that will influence the outcome of the decision.
- *Legitimate*. Emphasising a role stereotype in order to obtain influence. For example, a mother may assume or point out that she is the one who deals with the provision of food and therefore should dominate this decision.
- *Coalition*. Two or more members of the family decision-making unit collude in order to obtain a particular outcome.
- *Emotion*. A member of the decision-making unit tries to persuade or dominate others by using emotive appeals, crying, pouting and other non-verbal techniques in order to achieve influence.
- *Bargaining*. Giving in on this occasion in return for getting their way on some other occasion.

2.5. Influence of children in the family decision-making process
A number of research findings indicate that children have a significant influence in the purchase of products for which they are the primary consumers, such as food, toys, children's clothes and school supplies (Atkin, 1978; Foxman and Tansuhaj, 1988, Foxman *et al.*, 1989; Jenkins, 1979; Lee and Beatty, 2002). They also have a significant influence on the purchase of leisure activities or where the purchase decision has a personal relevance to the child (Filiatrault and Ritchie, 1980; Szybillo and Sosanie, 1977). In contrast, children have less influence on decision making for products that are used by the entire family, especially for high cost products, such as cars, furniture and life assurance (Foxman and Tansuhaj, 1988). This may be explained by the fact that parents are likely to restrict children's involvement and also that the children may be less motivated to participate in the decision making process as the product is not personally relevant to them (Mangleburg, 1990). This may imply that children might not have a very strong direct influence in the purchase of a family home, as it is a high cost product to be used by the whole family. Part of the objective of this research is to determine if this is reflected in the purchase of a family home.

The model described in Figure 1 suggests that family, individual and situational characteristics work together to help determine which members will exert a direct and indirect influence on the group decision-making process. The model also acknowledges that influence (both direct and indirect) of each member will relate to different roles and thus stages in the decision-making process. The findings, however, are limited to a small range of products which may not parallel the decision-making process for residential real estate. The focus of this study is to determine whether the extant literature relating to family decision making and family member influence mirror the decision-making process in the purchase of a family home.

3. Research approach
In order to reflect the family decision-making process accurately and to identify factors from the literature that may be applicable to the real estate environment in-depth interviews were carried out. The use of in-depth interviews encourages interviewees to speak openly and frankly and also allows the interviewer to explore different areas with a large degree of freedom. This approach concurs with the recommendations of Anastas (1988) who suggests that in-depth interviews should be utilised in situations

of sensitive subject matter and complex decision-making processes. Several other advantages of this type of interview include the encouragement of personal thought, maintenance and attentiveness of respondents to questions and the interviewer's consequent ability to sense non-verbal feedback (Sokolow, 1985).

The interviews were carried out by one of the authors and once completed were transcribed and independently examined and audited by both authors. This audit included an examination of the transcripts to identify the main issues highlighted by the interviewees in order to assist in a deeper understanding of the family decision making process and how it may work in the light of the purchase of a family home.

3.1. Research design

On completion of the literature review and the formulation of a conceptual framework of family decision making the current study was embarked on. The research design took the following steps:

- In-depth interviews were conducted to identify how real estate agents perceive the decision making process for the family home and in particular the influence of individual family members.
- The development of a revised framework for family decision making in the purchase of a family home incorporating interview results.

3.2. Data collection

Nine real estate agents participated in this study, four of the respondents were male and five were female. Each real estate agent had in excess of two years' experience in the selling of residential real estate in the Auckland area. Real estate agents were chosen for this study as they provide an objective, expert opinion based on observation and experience thus distilling information relating to the decision-making process of many families. The idea of using expert opinion has been expounded as a valid and useful approach in gaining valuable information on a particular subject or a particular group of people. This is because experts know their subjects in-depth and their evaluative minds generally mean they may even know more about their subjects' motivation and behaviour than the subjects themselves.

An attempt was made to include real estate agents who worked in different socio-economic and ethnic groups to capture information representative of the market. Six of the respondents worked in the upper to middle socio-economic areas, three represented the lower socio-economic areas. In terms of ethnicity, five were Caucasian, three were Asian, and one was a Maori/Polynesian. Although only nine experts representing different socio-economic and ethnic groups were used in this research, the wealth of information, and the recurrent nature of the information provided by these experts suggest that these informants were reliable. Miles and Huberman (1994), Eisenhardt (1989) and Morse (1994) argue that it is not the number of subjects interviewed that is important but the quality of the interviews, and that if recurrent information is provided, then one has sampled exhaustion. As the purpose of this research is to develop a conceptual framework to guide future research, gaining an overall view of family decision making for the purchase of real estate through the literature and through the eyes of a few experts, is the key issue.

4. Summary of findings

The main issues affecting the decision-making process of each of the family members as perceived by the real estate agents interviewed may be categorised as follows:

- roles and stages in the decision-making process;
- class differences;
- cultural differences; and
- children's influence.

A discussion of each of these categories is set out below.

4.1. Roles and stages in the decision making process

The interviewees suggested that the roles played by each of the family members can be related to the stages in the group decision-making process. It was also evident from the study that the different stages in the process were associated with different aspects of the real estate decision. (Details of the results are contained in Table I.)

4.2. Stages in the decision-making process

The initial model illustrated in Figure 1 contained four main stages in the decision-making process. The results of the interviews reflected the complex nature of the family decision-making process in relation to the purchase of the family home and an in-depth analysis of the interview transcripts suggested the introduction of an additional stage to the typical family decision-making literature. This additional stage has been identified as the product specification stage. Thus the five stages identified by the real estate agents were as follows:

(1) problem recognition;
(2) product specification;
(3) information search;
(4) alternative evaluation; and
(5) final choice.

The study identified the problem recognition stage as being the first stage in the process of purchasing of a family home, this mirrors the outcome of the consumer behaviour literature. Problem recognition within the family home context is when changes in family circumstances require the family to seek alternative accommodation.

The product specification stage follows on from problem recognition and can be likened to that identified in the industrial buying decision literature. This stage can be described as "determination of product characteristics" and "description of product characteristics" (Robinson *et al.*, 1967), or the "formation of decision participants preferences" or "choice criteria" (Sheth, 1973; Webster and Wind, 1972). At this stage, the family members specify the attributes of their new home, the price range they are prepared to pay and the general location of the property.

Once the family has identified the main criteria of their search, information is sought in order to locate possible alternatives. The study identified a number of actions undertaken by members of the family. These include an initial inquiry to a real estate agent, keeping in contact with that agent and/or a number of agents, inspecting properties and gathering information from a variety of other available sources.

General model		Real Estate Decision Process	Group decision member's role and direct influence structure	Family member's indirect influence	Factors affecting influence
Group decision process	Roles and influence structure				
Problem recognition	⇔ Initiator	Whether to purchase a family home	*Woman* more predominant especially with young family. Affected more by the way the house fulfils the emotional and functional needs of the family. *Man* more predominant in older couples considers more the practical aspects of the home i.e. too much maintenance. *Both* more predominant when no children and in particular in the purchase of the first home	*Children*, taking into account the changing needs of the children	Family characteristics Stage of life cycle Experience Sex role orientation
Product specification	⇔ User/stakeholder	General location Price range Main attributes	*Bank/Financial consultant* may be required to assess price range and suitability of properties. Seems to be more prevalent in families of lower socio-economic status. *Man* seems to have more influence in determining the general area of the property, associated with prestige and resale value. When main income earner. *Both* when parents see closeness to school is a priority. *Woman* more concerned about issues relating to how the family will live in the house, whereas man more concerned with practical aspects such as structure materials maintenance, resale value etc. *Children* will voice their requirements, e.g. younger children will want a tree in the garden to climb, older children will want their own space and be close to their friends (direct influence)	Woman for more *Children's* specific needs, e.g. number of bedrooms, play area etc. (indirect influence)	*Individual characteristics* Gender (women more expressive roles, men more instrumental roles) *Family characteristics* Sex role orientation including resource contribution
Information search	⇔ Information gatherer and gatekeeper	Information gathering about properties on the market Point of contact with real estate agent First inspection	*Woman* when not working, especially in higher socio-economic families. *Either* (tending towards the woman) in lower socio-economic families depends on the time available to the individual partners. Male participation on the increase. Open homes have encouraged more joint inspections	*Children* will again have indirect influence in parents anticipating their requirements	*Family characteristics* Socio-economic status Sex role orientation

(Continued)

Table I.
Summary of interviews

General model					
Group decision process	Roles and influence structure	Real Estate Decision Process	Group decision member's role and direct influence structure	Family member's indirect influence	Factors affecting influence
Alternative evaluation	⇔ Influencer	Subsequent inspections of the property	*Both* partners will inspect the property at this time *Children* may then be introduced to the property at this stage as they have a hectic social life and see the family home as short-term accommodation Over 15 year olds may not find the time to come Children more influence in higher price range Children more influential in Asian families *Family and friends* may also be introduced at this stage Family and relatives more influential in Pacific Island and Asian families, Caucasian families more independent Family more influence in first home purchase	*Children's* needs taken into account	*Family characteristics* Socio-economic status Family life cycle (age of children)
Final choice	⇔ Decision maker	Negotiation of price and purchase of the property	*Financier* will need to approve the deal and thus influence price and suitability of property *Both* partners must agree to buy *Either* or *Both* The spouse liking the home more will be pushing more for the purchase *Either*, the personality of the partner will determine who pushes the deal through more *Either* – the main income earner or the one who has the most information about the market		*Individual characteristics* Personality Information Involvement (emotional attachment) Sex role orientation

Table I.

This information-gathering stage is then followed by the evaluation of alternatives. From the study, the main action taken by the family at this stage is the inspection of alternative properties until a suitable home is found. This stage is followed by final choice, which includes the negotiation of the price and contract and the purchase of the property. Figure 2 sets out this process in more detail and includes the concept of favourable and unfavourable outcomes to the different stages of the process.

4.3. Decision-making roles
The roles of the individuals in the decision-making group can best be understood when related to the decision-making process. As the decision-making process progresses different roles are played out by different members of the family. In the problem recognition stage an initiator will become apparent.
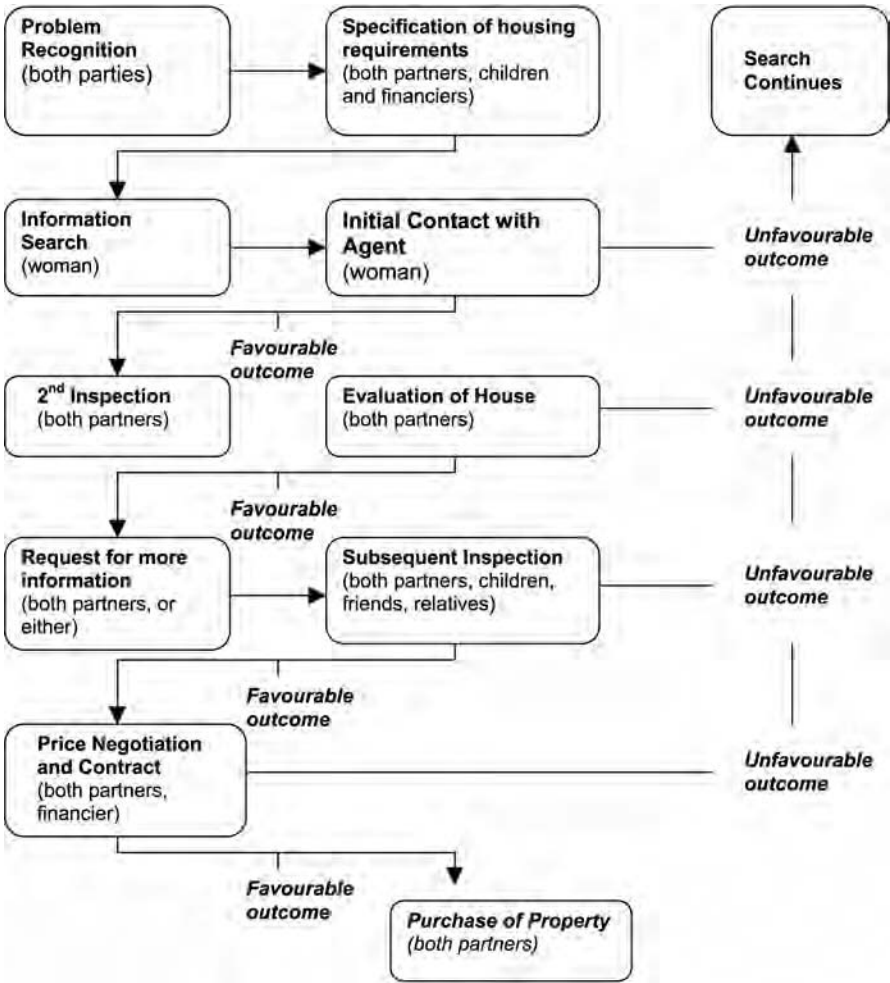

Figure 2.
Role players and the family decision process when purchasing a family home

The interviews suggested that the woman tends to be more dominant as the initiator, especially in the case of a family with young children, where the mother recognises the changing needs of the family. The influence exerted by the man may prevail in cases where he feels the home is too big or requires too much maintenance. In the case of couples with no children, and in particular when embarking on the purchase of a first home, there may be equal influence from both parties. The reason for this may be because the couple has not yet taken up individual roles (Filiatrault and Ritchie, 1980), but also may reflect the high perceived risk of purchasing a first home, especially when neither partner has had experience in such a purchase previously. These results indicate that the family life cycle is an important factor in determining who influences and how they influence the decision at this stage.

The interviews also suggest that even in this early part of the decision-making process the wife plays a more expressive role when determining the requirements of a home, she is taking into account the emotional needs of the family. The husband, however, tends to take a more instrumental role. These differences are demonstrated further in the next phases of the decision-making process.

In the product specification stage, the man, woman, children and stakeholder will be involved in determining the main requirements of the house, general location and price range. At this phase evidence seems to suggest that the man has more influence in determining the general location of the property, issues that seem to be important to him at this stage are the prestige to be gained by the property and the resale value. Both parents will be equally as influential in the location decision when closeness to a certain school is their priority.

When determining the main physical requirements of the house, men and women tend to take on different roles. Women will be more concerned with issues relating to how the family will function in the home, for example women with young families tend to be more concerned with the functional aspects of the kitchen, including appropriate size and site lines to the play area. However if the man is the main cook (especially evident in higher socio-economic families where both partners work) he may also be interested in the kitchen from a functional aspect of cooking. Men in general are more concerned with attributes such as a double garage and workshop. Children, at this stage, may also have a direct influence, requesting space of their own or a location near to their friends. They may also hold a substantial amount of indirect influence as parents will be anticipating their needs thus reflecting such attributes as the number of bedrooms they require, the closeness to schools and a safe and secure play area.

The bank or financier may be the person who will determine how much a family will be able to pay for a property. This is especially prevalent for families of lower socio-economic status. There is evidence to show that the main income earner (usually the man) will be more dominant in determining how much the family will put aside for the purchase of the home. The concept of the main income earner determining the amount to be spent endorses the concept of the resource contribution theory (Blood and Wolfe, 1960). This theory proposes that the influence over decisions comes from the resources the individual can provide to meet the need of the other partner. Other more recent research also endorses this concept (e.g. Lee and Beatty, 2002; Strober and Weinberg, 1977; Weinberg and Winer, 1983). The current study also suggests a more democratic process in circumstances where the wife is the person keeping track of the family's finances.

The information search phase as perceived by the real estate agents in the current study reflect families' socio-economic status and sex role orientation. The interviews suggest that in families of higher socio-economic status, where the woman is not working that she will take on the role of information gatherer and gatekeeper. She will make the initial inquiry to the real estate agent and become the main point of contact; she will also make an initial inspection of the property. In lower socio-economic families the choice of partner undertaking this role will depend on the time available to each partner. There appears to be an overall trend of increased male participation in this role, which has been encouraged by the growing number and scheduling of "open homes" making inspections more accessible to both partners.

The alternative evaluation stage includes subsequent inspections of the property. Here there is the opportunity for other family group members to influence the final decision. At this stage both partners will inspect the property. Children may also play a direct role. Their ability to influence decisions seems to depend on the family's socio-economic status, cultural background and age of children, with children from families purchasing more expensive homes having more say in the purchase of the home. Children from Asian families tend to be more influential in the decision than families from a Caucasian background. Children over 15 years may not find time to inspect the property due to "a hectic social life" and the fact that they consider the family home as only short term accommodation before they move to their own residence. Children from approximately nine to 15 years will have the greatest impact, although they will most likely be overruled if the parents are keen on buying a property. However, parents may be prepared to enter into a bargaining situation with them to keep them happy. For example: "once we have bought the property we will see about putting in a swimming pool".

The alternative evaluation stage in many cases introduces family and friends into the process. These players are more influential in Pacific Island and Asian families, with Caucasian families being more independent in their decision making. The study also indicated that parents of couples purchasing their first home are influential at this stage of the process.

The final stage of the process includes the negotiation of the price, the terms and the purchase of the property. The players influencing this stage of the process will include both partners. Overall the final choice will be a joint decision and in most cases both partners will have to sign the sale and purchase agreement. There may be situations where one spouse may push for the completion of the purchase more than the other partner, this will tend to be the one liking the home more or with the personality to push the purchase through. There is evidence to suggest that in some families the partner with the most influence at this stage will be the one who is the main income earner or the one who has collected and assimilated the most information about the market and comparable properties. Another influential player at this stage will be the person financing the purchase, as they will need to approve the loan required to complete the deal.

Overall, however, the study suggests that either husband or wife may be dominant depending on a number of family, individual and situational characteristics as set out in Figure 3. This tends to support Engel *et al.*'s (1986) contention that there is a blurring of role specialisations between males and females.
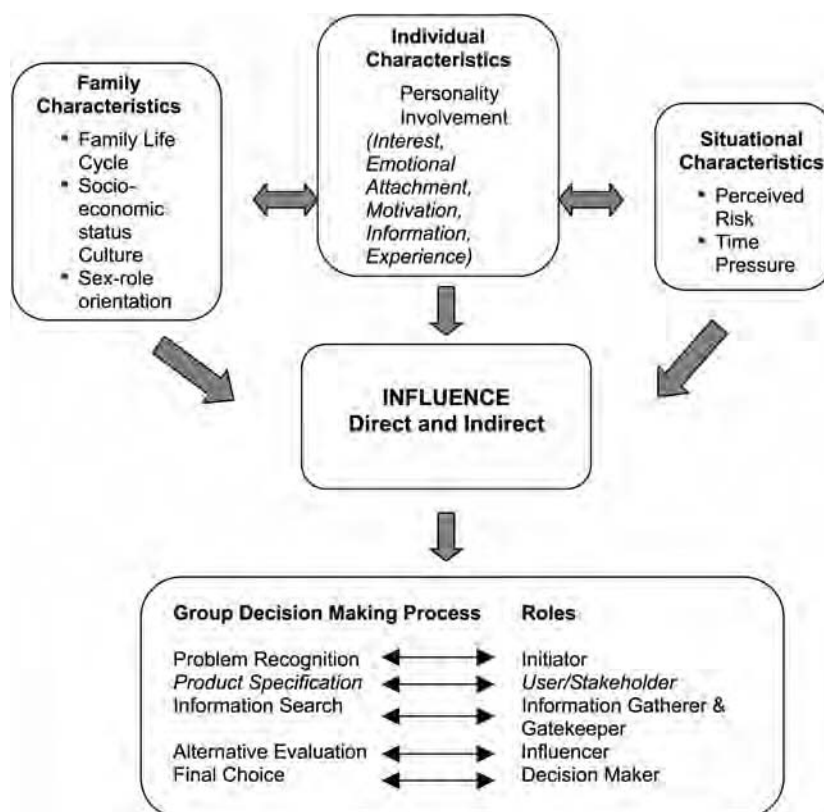
Figure 3.
Revised framework of
family decision making in
the purchase of a family
home

4.4. Class differences

The interviews suggest that there are a number of class differences that affect which
partner may be more dominant in the decision-making process. In the case of the
upper/upper middle class, wives do not work and thus have more time. They therefore
tend to take up the role of information gatherer and gatekeeper. In these families,
however, the husband has a strong final say. In these families it was also evident that
the more the family are to the upper end of the social class the less likely it was for the
children to be involved in the decision-making process.

These findings were very similar for the lower/lower middle class scenario with the
wife being the information gatherer and gatekeeper and the husband making the final
decision. In the middle class category however the decisions tended to be made jointly
with the children more strongly involved in the whole process. An interesting finding
here was the strong influence of the extended family, especially in Poynesian and
Maori communities.

4.5. Cultural differences

Cultural differences were also reflected in the interview transcripts. In the case of Asian
families the woman was very much a powerful "behind the scenes" influence, whereas
the husband acted more as the "front man" dealing with all of the negotiations.

Another aspect of these families was the importance of the views and opinions of family and friends. Children also had a strong influence in these families.

4.6. Children's influence
The influence of children in the family house purchase is of great importance both from a direct and an indirect viewpoint. From an indirect viewpoint, their needs as perceived by their parents form important criteria for the choice of a house; for example, how many bedrooms, location close to a school, safe environment, near to a bus stop and size of the yard. Their direct influence varies with age. Interviewees suggested that children from about the age of eight or nine to about 15 have the most influence. They will be looking for a bedroom of a decent size and being close to their friends. Children below this age will normally love to move to a new house and in most cases tend to endorse their parent's decision. Older children, in many cases are beginning to distance themselves from the family and are less interested in the home and may not influence the decision. An interesting observation from one real estate agent was the influence that a very young child can have in the Chinese family:

> [...] they like to bring a small child under 5, they say that if the child going into the house is always crying they will give it up ...

5. Development of revised model
This study has provided an insight into the family decision making process relating to the purchase of a family home. By analysing the extant consumer behaviour literature and the input of a number of in-depth interviews a conceptual model reflecting the purchase of a family home has been constructed. Figure 3 illustrates this framework and highlights the inclusion of the product specification stage not usually included in consumer decision-making models. The inclusion of the product specification stage reflects the complex nature of the house purchase decision. This complexity encourages the family to specify the choice criteria for their search, which reflects more of the process within organisations when making business decisions.

As with other family decision-making situations, situational characteristics, individual characteristics and family characteristics were seen as instrumental in determining the role and influence of each family member. This study highlights the importance of sex role orientation, family life cycle, culture, socio-economic status, personality and involvement. The study also indicates that, with current societal changes, family roles may be in a stage of transition and roles that have been predominantly the domain of the man or woman of the household may be blurring.

6. Implications and conclusions
The results of this study identify the complex decision-making process relating to the purchase of residential real estate that may not always reflect a rational process with the sole purpose of maximising utility.

There are a number of implications from this study for both practitioners and academics. It is advantageous for real estate agents to be aware of the dynamics of the decision-making process of the house purchase decision. By understanding the role and influence of different family members real estate agents are able to provide the most effective advice and information at the different stages of the decision making process.

An awareness of the individual preferences of the decision makers and the difference between the expressive and instrumental roles will also assist in a real estate agents marketing and communication strategy to ensure that the right message is going out to the right people. It is also important to understand the changing societal makeup. Agents must not make assumptions about the role of each of the members.

Valuers should also be aware of the roles, preferences and influence of each family member and how families make decisions. In particular they need to know what attributes of a building are important to the family and why. Gaining a deeper understanding of family purchasing behaviour will enable them to more fully understand the value of different family homes to different cultures and different socio-economic groupings.

This study assists property academics in understanding the behaviour of the purchasers of family homes within the residential real estate market and how this behaviour differs from the traditional family decision making model. There are a number of limitations to the study, the main one being the interviewing of real estate agents only. To gain a deeper and more accurate framework academics should now collect data from families involved in the decision-making process. As this study observes, however, both male and female partners in the decision-making process may have different priorities and perceptions of the process; any further research, therefore, should ensure that each family member is interviewed individually in order to gain a full picture of the decision-making process.

Note

1. As it relates to physical aspects rather than the how it works for the family living together.

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Multicultural examination of valuation behaviour

Julian Diaz III
Georgia State University, Atlanta, Georgia, USA
Paul Gallimore
The Nottingham Trent University, Nottingham, UK
Deborah Levy
The University of Auckland, Auckland, New Zealand

Abstract *A series of experiments were conducted to examine valuation behaviour in the UK, the USA, and New Zealand (NZ). Professional valuers from all three countries participated in the study whose findings support the notion that the US normative model is cognitively demanding and that greater departures from it result in reduced cognitive effort. The study also concluded that subjects from cultures requiring disclosure (USA and NZ) examined a significantly greater number of sales than did subjects from the UK where disclosure is uncommon. Finally, while valuers perhaps ought to increase sales search in unfamiliar markets, this research revealed no evidence that they do so. These findings are consistent with the need to seek cognitive efficiency and reduce cognitive effort even at the expense of performance quality.*

Introduction

Valuation behaviour has been the focus of an expanding literature recently reviewed in Diaz (1999) and Hardin (1999). For example the processes actually followed by valuers, as contrasted with those prescribed to them, have been investigated in Diaz (1990a). Here evidence was developed that residential appraisers from the USA do not follow prescribed (normative) processes. This finding was expanded in Diaz *et al.* (2000), who concluded that the actual valuation processes of New Zealand (NZ), US and UK valuers deviated from processes prescribed in the USA, but that NZ valuer processes were more normative than US valuer processes, which were in turn more normative than those of UK valuers. Further, the actual processes of NZ valuers did not vary significantly from US valuer processes, but both varied significantly from the processes actually employed by UK valuers.

Diaz (1990a) argued that normative processes are cognitively demanding and that valuers depart from them in a subconscious search for efficiency. Compelled by cognitive limitations characterising all humans, this search for efficiency is ubiquitous in all human problem solving. Because increasing cognitive efficiency is associated with decreasing time on task, an expectation is that the more normative (cognitively demanding) a valuation process is, the greater the time on task. Finding evidence supporting this expectation is one goal of this research.

The process of selecting comparable sales has been studied in Diaz (1990b), Wolverton (1996), and Gallimore and Wolverton (1997). Diaz modelled the sales selection processes of expert US residential appraisers and contrasted these processes with those of novices. Wolverton discovered that knowledge of subject transaction

price could bias the comparable sales selected by US residential appraisers. Gallimore and Wolverton extended this study to the UK and concluded that UK valuers were less susceptible to price knowledge biases during sales selection than were their US counterparts probably because of cultural differences in the transparency of comparable sale selection. In the USA, comparable sales used to form a value opinion must be disclosed. Such disclosure or transparency is not common in the UK.

Gallimore and Wolverton also discovered that in their experiments, UK valuers engaged in significantly less sales search effort than did US subjects. Once again this was attributed to transparency (disclosure). Disclosure requirements of NZ valuers are similar to those of US appraisers. This suggests that sales search effort expended, measured by number of sales examined, by NZ valuers should be similar to US appraisers but significantly different than that of UK valuers. Examining this expectation is the second goal of this investigation.

Some research has indicated that valuer behaviour may change when property settings change from familiar geographic settings to unfamiliar ones. For example Diaz (1997) discovered that US appraisers valuing properties in areas familiar to them were not susceptible to the value opinions of other anonymous experts, but Diaz and Hansz (1997) reported that US appraisers valuing property in unfamiliar areas were susceptible to such influences. Diaz *et al.* (2000) rejected the hypothesis that valuer processes would be driven toward normative models when valuers value property in areas unfamiliar to them. Nevertheless a compelling prescription for optimal valuation performance suggests that valuers unfamiliar with the geographic area of the subject being appraised need to expend more effort to become knowledgeable about an unknown market, that is, prescriptively they should examine more sales to value property in unfamiliar markets than in familiar markets. Arguing against this expectation is the need for cognitive efficiency and the associated reduced time on task as well as the routinisation of production rules such as "to value property you need about three sales." Providing evidence of sales search effort in familiar versus unfamiliar markets is the third goal of this research.

Research hypotheses
The goals of this investigation suggest three research hypotheses. The first derives from the expectation that the more normative a valuation process is, the more cognitively demanding it is and therefore the more time on task it will require. From Diaz *et al.* (2000) comes the finding that while NZ, US, and UK valuation processes are not US normative, NZ processes are slightly more normative than US processes which are significantly more normative than UK processes. Research hypothesis 1 (*H1*) is therefore that NZ valuers will spend more time on valuation tasks than will US valuers (although perhaps not significantly more) who will spend more time on valuation tasks than will UK valuers:

$$T_{NZ} > T_{US} > T_{UK} \qquad (1)$$

where

T = time on task;

NZ = New Zealand valuers;

US $=$ US valuers; and

UK $=$ UK valuers.

The second goal of this research is to examine the expectation that comparable sales disclosure, labelled transparency by Gallimore and Wolverton, is associated with sales search, that the number of sales examined is smaller for valuation tasks in cultures not requiring disclosure. Since New Zealand and the USA require similar levels of disclosure which are uncommon in the UK, research hypothesis 2 (*H2*) is that the number of sales examined by NZ and US valuers will be similar to each other and greater than the number examined by UK valuers:

$$S_{NZ} = S_{US} > S_{UK} \qquad (2)$$

where $S =$ the number of sales examined.

The third study goal is to develop evidence which addresses the issue of sales search effort in familiar versus unfamiliar markets. The need for cognitive efficiency is hypothesised to overwhelm the prescription that increased sales search in unknown markets increases the probability of satisfactory performance. Therefore research hypothesis 3 (*H3*), which can be decomposed by culture, is that sales search effort will not vary when valuers move from properties in familiar markets to those in unfamiliar ones:

$$S_{NZf} = S_{NZu} \qquad (3a)$$

$$S_{USf} = S_{USu} \qquad (3b)$$

$$S_{UKf} = S_{UKu} \qquad (3c)$$

where:

$f =$ subject properties in familiar markets; and

$u =$ subject properties in unfamiliar markets.

Methods
To examine the three research hypotheses, data were developed from one-factor, repeated measures experiments modeled after Diaz (1990a). The one-factor, repeated measures design reduces unwanted variability ("noise") by focusing on one variable of interest thereby maximising the probability of finding statistical significance. The factor examined, geographic familiarity, was fixed at two levels, high positive geographic familiarity and high negative geographic familiarity. While there is no scale or precise measure of geographic familiarity, generally valuers will be highly familiar with areas in which they routinely value property and unfamiliar with areas in which they have never valued property. Therefore to operationalise the two factor levels, two appraisal cases were constructed for the UK experiment and two for the NZ experiment. High positive familiarity was implemented for the UK experiment with a case developed from Nottingham, UK, the city in which participating UK experimental subjects practice, and high negative familiarity was implemented with a case set near the city of Atlanta, USA, an area unfamiliar to these subjects. For the NZ experiment,

experts were recruited from the city of Auckland and an Auckland property served as the high positive familiarity case with the Atlanta property used as the high negative familiarity case. Slight differences in the Atlanta case used in the UK experiment versus the Atlanta case used in the NZ experiment were due to differences in the respective vernacular.

The experimental cases were constructed to be representative of real world residential appraisal assignments and were developed from actual appraisal assignments and their resulting reports. Several expert appraisers were used to validate the representativeness of the cases. Geographically familiar cases are representative of the type of assignments encountered in practice by the participating experts. Geographically unfamiliar cases, while constructed to be representative of real world assignments, are by design not representative of realistic assignments faced by participating experts. They are therefore realistic problems, but for the participating expert, not realistic assignments. The objective of this design is to see if expert behaviour will vary when experts are taken out of their area of expertise. Will experts seek and consider more sales data when confronted with realistic valuation problems in areas unfamiliar (unrealistic) to them compared to realistic valuation problems in areas familiar (realistic) to them?

A total of 12 expert valuers participated in the UK experiment whereas ten experts participated in the NZ study. Also 12 experts participated in the original US study (Diaz, 1990a). Experts were defined as practising appraisers of no less than five years valuation experience with appropriate professional credentials. These experts performed both the familiar and unfamiliar tasks. Each task required the subject to estimate market value based upon the available information. Sessions were initiated by presenting the subject with a brief written introduction and request for basic demographic information. When the demographic information sheet was returned to the experimenter, the experimenter gave the subject detailed written instructions for the experiment followed by a worksheet restating briefly the instructions and providing a list of available data (cues). These alphabetically ordered cue labels represented the information suggested by the US normative model and therefore available to the subject during the experiment.

The subject was required to select verbally a desired cue label. The experimenter then recorded the request, provided the subject with the requested information, and began to time cue usage. When finished with the information, the subject returned it to the experimenter and requested the next desired information. The experimenter refiled the used information, recorded the time of usage, recorded the new request, provided the newly requested information, and began to time usage of the newly acquired cue. Among the recordings made by the experimenter was the number of sales examined. A total of four packets containing three sales each or a total of 12 comparable sales were available for each case. Subjects were free to examine as many or as few sales packets as they desired. To minimize deviation in the response variable due to extraneous factors, strict quality control was observed. The same written instructions were used for all study subjects. All verbal communications between experimenter and subject were kept to a minimum during experimental sessions. The first experimental session in Nottingham occurred on July 8, 1999 and the final one on January 11, 2000. The Auckland sessions began on July 21, 1998 and ended on July 30, 1998. US data came from the original Diaz (1990a) experiments.

Results

Data were analysed using the most statistically powerful tests appropriate. Parametric tests are generally more powerful than non-parametric analogues, that is, given equal sample sizes, parametric tests are more likely to detect true significance than similar non-parametric tests. Parametric tests are not always appropriate however. For example, parametric tests require continuous data. Discrete data must be analysed with non-parametric tests. Further, parametric tests have more restrictive assumptions. To ensure that assumptions are generally met, sample sizes of 30 or more are generally needed to use parametric tests. Databases of fewer than 30 observations may meet parametric assumptions, but they may not. Since the data of these experiments are in small samples, both powerful parametric tests, whose assumptions may not be met by the data, and the less powerful non-parametric analogues whose assumptions are met by the data are employed when appropriate in the study.

Total time, in seconds, spent on geographically familiar tasks is reported in Table I. This table records the time taken by each subject to complete the experimental task including gathering all the desired data and performing whatever analysis the subject deemed necessary to determine an estimate of value. This variable does not include time taken to write a report or document or support the value judgement. Once the valuer determined a value estimate, time measurement ceased. A quick check of the mean time for task completion across the three cultures reveals results consistent with $H1$ (equation (1)). For all NZ subjects when performing valuation tasks in familiar locations, the mean time to complete is 2534.4 seconds, for US experts 2,091.1 seconds, and for UK experts 1,846.4 seconds. To determine whether these differences are significant, a parametric analysis of variance and a non-parametric Kruskal-Wallis test were conducted. P-values for these tests are 0.002 and 0.001 respectively indicating that there is an overall significant difference in central tendency among these data. A series of two-sample comparisons were made to clarify where the significant differences are found. The parametric t-test and the non-parametric Mann-Whitney test were employed. The difference between total time on task for NZ versus US subjects, while in the anticipated direction, is not significant (p-values of 0.186 and 0.385). The difference between US and UK time on task is significant (p-values

Observation	New Zealand	USA	UK
1	1,529	1,553	1,704
2	1,199	2,903	955
3	5,400	1,888	906
4	3,263	2,494	949
5	1,292	1,717	1,490
6	1,670	2,855	1,050
7	2,225	3,263	1,380
8	1,662	1,365	760
9	2,701	2,306	860
10	4,403	2,940	760
11		913	1,140
12		896	385
Mean	2,534.4	2,091.1	1,028.3

Table I.
Time to complete familiar task (in seconds)

of 0.001 and 0.0005). To summarise the findings for RHI, results are in the expected directions, but the difference in time to complete task is not significant between NZ and US valuers whereas for US versus UK valuers the difference is significant. (By extension the difference between NZ and UK valuers is also significant.)

Data on number of comparable sales examined are reported in Table II. Since these data are discrete, only non-parametric Mann-Whitney tests were conducted. These tests generally support RHII. A comparison of the number of sales examined by NZ versus US valuers when performing valuations in familiar locations shows that NZ valuers generally tended to examine an insignificantly greater number (two-tailed p-value of 0.177 is reported since there is no a-priori expectation of direction of difference). In other words, the difference between the number of sales examined was insignificant for the two cultures with transparency. Combining the NZ and US data and comparing them to the UK results reveals a significant difference in the expected direction (one-tailed, $p - \text{value} = 0.0065$) between the number of sales examined by cultures with transparency (NZ and US) compared to without (UK). When the US data are uncoupled from the NZ data, the results are less convincing. While there is a highly significant difference between the number of sales examined by NZ valuers compared to UK valuers (one-tailed p-value of 0.0025), the difference between the number of sales examined by US valuers versus UK valuers is marginally significant (one-tailed p-value of 0.0605). While these results do generally support the research hypothesis that valuers in cultures requiring transparency will examine a greater number of sales than those who are not, the marginal difference between US and UK valuers suggests that other factors worthy of investigation may be important as well.

Pitting the prescription that more sales should be examined for valuations in unknown markets against the theoretical need for cognitive efficiency and reduced search, $H2$ posits that familiar and unfamiliar area sales search effort will be similar. This hypothesis was examined using non-parametric tests applied to the data on number of comparable sales examined. The Wilcoxon Signed Ranks Test was used since the observations were matched pairs, that is each subject produced both a familiar location observation and an unfamiliar location observation. With paired observations, comparison can be made at the individual level rather than at the group

| | New Zealand | | USA | | UK | |
No.	Familiar	Unfamiliar	Familiar	Unfamiliar	Familiar	Unfamiliar
1	12	9	3	3	9	12
2	6	6	9	12	12	12
3	12	12	9	6	3	6
4	12	9	12	12	6	6
5	9	6	12	12	9	12
6	12	12	12	12	6	6
7	6	6	12	9	9	9
8	12	9	6	6	6	3
9	12	6	6	12	3	3
10	12	12	6	6	6	9
11			12	12	6	3
12			6	6	6	3
Mean	10.5	8.7	8.75	9	6.75	7

Table II.
Number of sales examined

level. Tests based on individual level comparisons are more powerful than those based on group level comparisons. Test were conducted for the NZ data (familiar versus unfamiliar) the US data (familiar versus unfamiliar) and the UK data (familiar versus unfamiliar). The results of the tests are mixed. None support the prescription of greater sales search in unfamiliar markets. Two, the US data and the UK data (both with p-values of 0.705), support the no difference hypothesis. The significant difference in the NZ data ($p - value = 0.034$) is in the wrong direction to support the suggestion that valuers should engage in greater sales search in unknown markets. New Zealand valuers participating in the experiment examined significantly fewer sales in the unfamiliar case.

Conclusions

The amount of time spent on task by valuers from the three cultures represented in this investigation support the notion that the US normative model is cognitively demanding and that greater departures from it result in greater reductions in effort. The processes of NZ valuers which were closest to the US normative model, were associated with the greatest time on task. The US processes, less normative than the NZ processes but not significantly so, resulted in less time on task compared to the NZ valuers but again not significantly so. The UK processes, significantly less normative than those of US valuers, resulted in significantly less time on task.

Data from this investigation generally are consistent with the idea that disclosure requirements (transparency) are associated with sales search effort. Subjects from cultures requiring disclosure, the USA and NZ, tended to examine a greater amount of sales than did subjects from the UK where disclosure is uncommon. Valuers from the US and UK did not significantly increase the number of sales examined when moving from familiar to unfamiliar geographic settings. NZ valuers significantly decreased the number of sales examined when moving to unfamiliar markets. While valuers perhaps ought to increase sales search in unfamiliar markets, this research does not find any evidence that they do. Rather the findings are consistent with the ubiquitous need to seek cognitive efficiency and reduce cognitive effort even at the expense of performance quality.

Other factors not specifically addressed in the experiments probably play a role in the time-on-task and number-of-sales-examined behaviours discovered in this study. Fee levels may be important. The general perception among experts in all three cultures is that fee levels for valuation services are low across all property types and while stable in nominal terms, are eroding in real terms. Information availability, greater in the USA and NZ than in the UK, likely exacerbates the impact of transparency and may contribute to cultural differences. The opinion among some experts is that the UK will move closer to the USA in terms of reporting requirements although there is no current sign that UK education is anticipating this by more explicit promotion of formalised approaches to valuation procedures that embody aspects of the US normative model. Such a move toward greater transparency will likely be accompanied by increased information availability as comparable sales information moves into the public domain. These movements may require greater time-on-task and sales-search from UK experts. The current UK fee structure, already perceived as low, and the lack of an education response are factors that contravening factors.

Why NZ valuers participating in the experiment, unlike those from either the USA or the UK, examined significantly fewer sales in the unfamiliar case is a matter for speculation. There are no normative reasons for this behaviour, but it is consistent with a strategy to minimise cognitive effort by reducing sales search through early closure perhaps by anchoring onto comparables encountered at the beginning of the search process. The finding is clearly worthy of more investigation.

This study involved valuation experts valuing single family homes. Further research is needed to extend these conclusions into commercial settings. Nevertheless these results add to our growing understanding of actual valuation behaviour and the role of distinct cultural environments. Of future interest is the quality of performance among processes of varying cognitive efficiency. In a shrinking world characterised by a global economy, greater understanding of the differing valuation processes and their impact on valuation performance is an acute need.

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