1991

Consumer spatial shopping behaviour analysis: A case study of the Kitchener CMA (Ontario)

Yalin Wu
Wilfrid Laurier University

NOTICE

AVIS

CONSUMER SPATIAL SHOPPING BEHAVIOUR ANALYSIS:

A CASE STUDY OF THE KITCHENER CMA

By

Yalin Wu

B.A., Normal College of Northwestern China, 1982

THESIS

Submitted to the Department of Geography
in partial fulfilment of the requirements
for the Master of Arts Degree
Wilfrid Laurier University
1991

Abstract

Many marketing geographers concern themselves with the study of consumer spatial choice behaviour. Addressing some of the concerns, this thesis provides an evidence of customers' spatial shopping behaviour at the study region of Kitchener Census Metropolitan Area (CMA).

A customer's spatial choice decision-making in the study area was first assumed to be a two-levelled process: regional and subregional level. This study was to identify the factors motivating consumers' choice on where to shop at thes two levels. A previous 804 households' shopping behaviour survey conducted by Dr. A. Hecht in 1986 was used as the data basis of this study. A behavioral model named Multinomial Logit Model was utilized as a major research method to investigate the factors influencing shoppers spatial choice decision-making process in light of selected attributes of thirteen shopping centres and the characteristics of consumer themselves. A choice frequency analysis was also employed to identify the influencing factors at the different levels.

The results indicate that the distance from a shopper's residence to the shopping centre decreases the probabilities of an individual patronizing that centre at the regional level, while the size of the shopping centre is mostly important for consumers at the subregional level.

ACKNOWLEDGEMENT

As many thesis this study was not possible without the assistance of many people.

Firstly, and most importantly, I would like to thank my advisors: Dr. Alfred Hecht and Dr. Pavlos Kanaroglou for their immeasurable patience, supports and expertise. Without their constant advises and concerns it would not have been to complete this work. I have developed the skills that I have only as a result of their teaching.

More specially thanks goes to Dr. Barry Boots for his careful review of draft copies and his assistance in the statistical part of this work.

A particular thanks is also given to Bob Ellsworth whose input and help in computer programming was invaluable in last two years.

A personal thanks goes to Gehart, Peter and Mark Baherman who have contributed their valuable time to corrected many errors in English of this thesis.

Finally, my deepest thanks also goes to my wife, Fengbei. Without her emotional supports, this study would not have been started.

TABLE OF CONTENTS

iv

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

1.1 Shopping Centre Development

> Born in Europe, matured in North America, the shopping centres now existing
> in cities of widely different cultures and politics...... The centres have become a
> feature of twentieth-century megaculture and as such, a prominent element in
> modern urban landscapes......

> Dobson & Lord 1985, pp.2

Over the past thirty years, planned shopping centres have seen tremendous growth. Today,

they tend to be more elaborate in form and provide a larger number of functions than previous

forms of retailing facilities. However, the basic function has remained essentially the same as it

has always been: to facilitate transfer of goods and services to meet the demands of the

consumers.

1.1.1 Definition and Types

The term "shopping centre" is frequently used rather loosely, simply to signify a group

of shops. In the stricter sense, a shopping centre is defined as:

> A group of architecturally unified commercial establishments built on a site that
> is planned, developed, owned and managed as an operating unit related in its
> location, size and type of shops to the trade area that it serves. The unit provides
> on-site parking in definite relationship to the types and total size of the stores.

> Urban Land Institute, 1986, pp.1

The first value of this definition is that, by implication, it distinguishes the shopping centre from the shopping district. Shopping districts are simply concentrations of individual shops on individual sites providing some sort of general node for shopping activity.

Three major categories of shopping centre have been recognised by developers, planners and geographers, each with a clear and distinct function, trade area, and tenant mix. The three types are: neighbourhood centre, community centre and regio ial centre. (Because of its multipurpose and variety in size, each category has one or two sub-types.) This hierarchy has become one of the established "truths" of modern urban geography, yet it really describes the development process of shopping centres which began in the 1950's.

1.1.2 Evaluation of Development

The concept of a shopping centre, in a loose sense, is not new. "From earliest civilization, sellers grouped together at easily accessible locations to market their goods and services. Collectively, at one location, shops and stalls attracted more buyers than could individual enterprises strung out along a roadway." (Rocha, 1980, pp.35)

However, the rapid development of the shopping centre, in a stricter sense, is predominantly a post-war phenomenon. Since World War II the structure of the urban environment has undergone dramatic change. Brought on by economic prosperity and the development and application of new technology, the form of the city has become more decentralized. This change in form was greatly enhanced by the automobile which allowed for a greater level of mobility than ever previously experienced by urban dwellers.

This increase in the level of mobility facilitated the process of suburbanization. This process saw large numbers of housing developments adjacent to the traditional inner city. Since these inhabitants now possessed the ability to commute to work in the city on a daily basis, the new residential location caused no major problem.

As a direct result of the significant numbers of people who relocated to the suburbs, retailers followed their customers out of the city. From the early days to the present, being accessible to the customer remains the cornerstone upon which the development of all successful shopping centres rests. Not surprisingly in the post World War II period, the market share of retail sales captured by the suburbs increased from 25% to more than 50% of total retail sales (Dabson & Lord, 1985, p87).

However, during the 1980s, shopping centre development has experienced, in terms of their locations, a significant innovation: the regional shopping centre began moving downtown. Here it helped revitalize the downtowns and functioned as "a place to meet people and a place to see people" (Shopping Centre Development Handbook, 1986, pp.23).

1.2 The Subject of This Study

Choice behaviour in humans is influenced by many interacting forces that motivate each individual in different ways. Research on how these forces interrelate and how they motivate people in their shopping behaviour is known as spatial choice behaviour research. Consumer choice behaviour is defined as "the acts of individuals directly evolved in obtaining and using economic goods and services, including the decision-making processes that precede and determine

3

these acts" (Engle et al, 1963, pp.5).

A study of consumer choice behaviour begins with an understanding of how the decision-making process determines one's action. Psychologists have attempted to identify this process in terms of how these forces interact within one's mind while sociologists have been concerned with how the processes function as they reflect on group activity. Geographers' responsibility is to explain how the decision-making process relates spatially to one's environment.

Spatial choice behaviour has been one of the major research themes among geographers for a long time. Prior to the 1970s, the application of aggregate theories and models (central place theory and gravity model, for example) to examine and predict interzonal flows represented the dominant paradigm in this research area. In the later years, spatial choice behaviour, at the disaggregate level (individuals), using discrete choice models, become widely used (Pipkin, 1981). Although the fundamental distinctions of the two approaches have been questioned in several papers (Anas, 1983; Williams & Ortuzar, 1982; Cochrane, 1975; for example), the emphasis on explaining, rather than predicting consumers' behaviour, tends to be the most distinctive new focus in this research area (Manski & McFadden, 1981; Halperin & Gale, 1984).

In line with this new approach in consumer research, the present study is an empirical investigation of consumers' spatial choice behaviour for shopping centres and/or central business districts (CBDs) within the Kitchener census metropolitan area (CMA), Ontario (see Figure 1.1). More precisely, the primary intent of this study is to explain an individual's spatial non-grocery shopping behaviour in light of a number of shopping centre alternatives. Central to this objective is the belief that the different shopping centre attributes are not equally valued by the consumers when making their spatial choice decisions.

4

Figure 1.1   The Region Of The Kitchener CMA
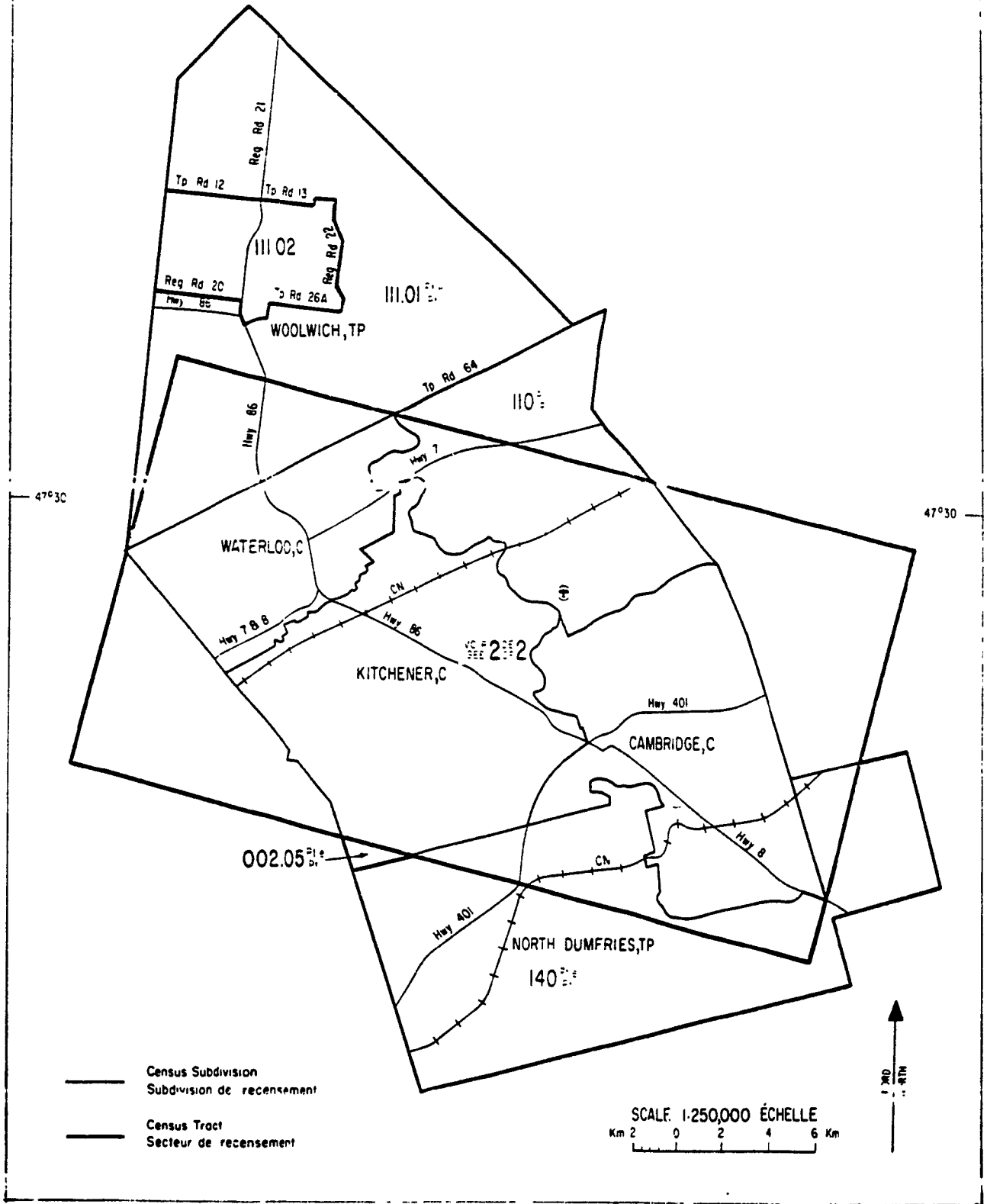
A number of shopping centre studies have been done in the Kitchener CMA in terms of their hierarchical nature (Picton, 1986), their theoretical market (Schwindt, 1986) and the impact of a new proposed regional shopping centre on the existing retail system in the region (Morgan, 1986, 1987, 1988; Thorsen, 1986; Simpson, 1986). All used aggregated data for their analysis. This study will identify the consumers' spatial choice behaviour at a disaggregate (individual) level. In this regard this study will fill a much needed research area from which an individual's non-grocery shopping attitudes relating to the selected centres in the study region are to be derived.

In this geographic area of the Kitchener CMA, a consumer's spatial shopping choice decision-making is assumed as a multiple-levelled process. The factors determining the decision-making are supposed to be varied for each level of the process. The identification of the factors at the different levels is thus the main purpose of the present analysis.

More specifically, this study will test the following hypotheses:

1 that consumers' "Department Store Type Merchandise" (DSTM) shopping destination choices are mainly spatially determined at the regional level (the First level in Figure 3.5.1) at this medium size urban-based study area;

2 that shoppers' preferences to the regional over "local" shopping alternatives can be differentiated by their household characteristics such as number of children and adults in a household.

3 that within the distance consumers are willing to travel, shoppers tend to shop at the centre with the largest DSTM Square Footage at the subregional level (the Second level in Figure 3.5).

6

To test these hypotheses, the multinomial logit model (MNL model), one of the widely used discrete choice models, and some other statistical tests will be employed to interpret a subsample data of 412 responses out of a 804 sample survey, conducted by Dr. Hecht in 1985, which concerns consumers' shopping behaviour in the study region.

Consumers behaviour research relating to the decision-making process can provide a significant input into the urban planning process. Retailers and shopping mall managements can also use this knowledge to comprehend more fully the strengths and weakness of the shopping centres as valued by the consumers. They will be able to correct the negative aspects while reinforcing the positive components.

1.3   The Structure of This Study

This study proceeds as follows:

Chapter II provides a point of reference for the study in general terms. A brief discussion of the relevant literature is presented. Two research approaches, objective and subjective approach, in marketing geography are outlined. First, the objective approach, represented by Central Place Theory and General Interaction Theory, is briefly discussed. Secondly, the subjective approach which studies the effects of people's spatial motivations in a market area is then focused on. Finally, a brief review of the geographical research on this study case is provided.

Attention is then turned to particulars in Chapter III. This chapter refers to the design of the case study undertaken. A brief description of the region being studied is followed by a closer

7

examination of data set and selected shopping centres and CBDs in the study area. The case study methodology will also be presented in this chapter.

A presentation of the case study findings follows in Chapter IV. Particular attention will be given to the behavioral interpretation of the parameters estimated by the MNL model. Furthermore, a choice frequency count analysis which investigates the distance threshold level by an average consumer is fully discussed.

A summary of the study as well as conclusions will be provided in Chapter V. Some suggestions for the further studies will also be presented in this chapter.

LITERATURE REVIEW

2.1 Introduction

Marketing geography is defined as: "that aspect of geography which is concerned with tertiary economic activities and particularly the distributive trades" (Davies, 1977, pp.1). The research in marketing geography has traditionally focused on the relationship between retail centres and their surrounding trade area. Consumer spatial choice behaviour has thus become a major research theme in this subdiscipline of geography. Consumer spatial choice behaviour is defined as: "the spatial acts of individuals directly involved in obtaining and using economic goods and services, including the decision-making processes that precede and determine these acts" (Engel et al, 1968, pp.5). There existed two different but complementary approaches for such behaviour research in marketing geography literature: objective and subjective approach. The former assumes that all consumers act rationally in space and always maximize their shopping opportunities. Essentially, it assumes that all consumers are identical in their needs, desires and behavioral manners. Furthermore, the environmental constraints are presumed to be held constant in the consumer spatial choice decision-making process. This approach usually does not account for the consumer's behavioral factors like age, sex, income, taste differences, etc. This approach is derived from General Interaction Theory developed by Reilly (1958) and Central Place Theory

(Christaller, 1966).

However, numbers of previous studies have shown that consumers do not behave according to the strict limiting assumptions imposed by those objective models (Johnston and Rimmer, 1967; Pacone, 1975; for example). This has led researchers to adopt a subjective approach which provides "a broader conceptual framework to handle problems of consumer spatial behaviour" (Downs, 1970, pp.15). This approach emphasizes the space preferences of an individual. "Each individual behaves according to his/her own satisfying criteria, which may include the fulfilment of deep-seated psychological needs as well as social and/or economic objectives" (Harvey, 1969, pp.53). Therefore, real behavioral differences between individuals are recognized by this approach in terms of differences of consumers' personalities, socio-economic characteristics, knowledge possessed about existing retail facilities, tastes, expectations and so on.

In line with subjective approach, the present study will examine consumer spatial non-grocery shopping behaviour at the region of Kitchener CMA in Ontario. Due to the great amount of literature that exists, however, it is simply not feasible for this study to provide an in-depth review of all literature in this approach. Hence, only those researches relevant to the subject of this study will be discussed.

This chapter will proceed as follows: section 2.2 will provide a brief review of research relevant to this study in the conceptual and methodological sense. Section 2.3 will focus on the introduction of the previous geographical research for this study case and section 2.4 will accordingly sum up the chapter. It is hoped that these reviews lay a foundation of understanding the background of the present study.

2.2 Subjective Approach

Many geographers, Foxall (1977), Davies (1977), Downs (1970), Garner (1977), Huff (1960), Potter (1982), to just name a few, have previously undertaken their valuable research work in the area of consumer spatial behaviour.

In the book, Consumer Behaviour, Foxall (1977) suggests that the consumer buying process begins before the product is purchased and extends beyond it. Such a process includes four stages: "the development and perception of a want or need; prepurchase planning and decision-making; the purchase act itself and post-purchase behaviour which may lead to repeat-buying, repeat sales" (Foxall, 1977, pp.24). Figure 2.1 illustrates this process.

Figure 2.1

CONSUMER BUYING MODEL

```
              Development and perception
                   of a want or need
                  /                    \
    (Repeat buying)                      \
                /                     Prepurchase planning
    Post-purchase behaviour           and decision-making
                \                    /
                   purchase act
```
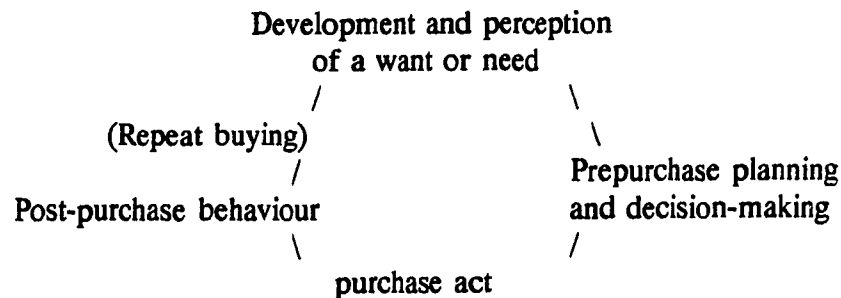
--- Foxall, 1977, pp.20

At the first stage, consumers define their choices as what they want and need. As the choices become clear, consumers begin to collect the information about where and at what costs their wants or needs can be satisfied. As a consequence, this leads to a decision-making and

11

purchase act or the decision not to purchase at this time due to certain reasons. After the purchase, the consumer often reevaluates his buying process and this may lead to repeat-buying. This simple consumer buying model represents a contribution for better understanding of buyer behaviour because it defines four distinctive and complementary stages that characterize a buying behaviour process. However, this conceptual model does not incorporate the influencing variables and the ways of interaction between these variables and thus is less effective to practitioners.

Garner (1977) has developed a general strategy for consumer behavioral research. In his study, "The Analysis of Qualitative Data in Urban Geography: The Example of Shop Quality", he identifies four broad problems needed to be solved in such research. Firstly, there is a need for the nature of images causing attractiveness to be examined and measured with respect to the attitudes of consumers towards shops and shopping centres. Secondly, the study of the motivations of an individual is required for discovering the relationship between different images and different types of needs of the consumer. Thirdly, what parts of the urban retail system are actually known to the consumer and finally, "a greater comprehension of the mechanism by which different images originate is required mainly as a consequence of the continual adjustment that is made from increasing experience and the provision of new opportunities" (Davies, 1977, pp.224).

The present study will deal with the consumer's decision-making process. Particularly, this study will partly answer the first two questions proposed by Garner.

Consumer spatial shopping behaviour (decision-making) is highly complex and affected by many interacting factors. These factors can be generally categorized into three groups: the images (attractiveness) of a shopping area; the social-economic characteristics of the consumer;

and spatial considerations by the consumer. Foxall (1977) suggests that the social-economic nature of consumers is the most important factor influencing consumer decision-making.

Huff (1960) begins his study with the consumer's desires or needs. He says that consumer behaviour is the outcome of stimulus situations and "physiological motivations" and is influenced by three major sets of factors (Huff, 1960, pp.131).

The first is the consumer's value system. It includes such factors as geographical location of a shopping area, an individual's personal characteristics such as sex, age, income, education, taste, etc. The second set of factors is the nature of the retail environment called "behaviour-space perception" (Huff, 1960, pp.163). He states that shopping centres are perceived on the basis of memory and inference and "are evaluated subjectively by the consumer" (Huff, 1960, pp.167). These factors are based on the physical characteristics of the mall, including reputation, range of goods, services provided, price, etc. The third set of factors is the spatial context, such as mode of transportation, travel time and cost, parking condition and so on. Beside these major factors, Huff points out that the interactions between these factors also influence a consumer's spatial behaviour.

Taking the complex interrelationships of the major factors, Huff finds that, by analyzing survey data of the Metropolitan Chicago area, USA (Huff, 1963), the most dominant factor in consumer decision-making was age (26 percent), followed by personality (14 percent), sex (13 percent), education (10 percent) and income (5 percent). His findings have demonstrated that a consumer's spatial shopping behaviour is mainly affected by his/her social-economic characteristics. Spatial consideration is not the only important factor in an individual's decision-making as it used to be considered in the early geographical studies.

Spatial consideration is another one of the major influencing factors on the consumer spatial shopping behaviour. Many geographers have done valuable research work on this factor.

Cadwallader requested the consumer to estimate the distance from his home to shopping centres. He pointed out that, in his study "A Behavioral Model of Consumer Spatial Decision Making" (1975), consumers used three measures of the variable of distance---real distance, time distance, and cognitive scaled distance. He further four'd that consumers were more rational with respect to cognitive distance than they were with respect to real distance (1975, pp.10-15).

"Cognitive Maps of Retail Location: An investigation of Some Basic Issues" (1975) by MacKay and Olshavsky discusses and examines the basic issues in the conceptualization and measurement of cognitive maps aided by an empirical study. One of the valuable findings of their research is that the distance between cognitive and actual maps (real distance) is proportional from town and disposable town (MacKay & Olshavsky, 1975, pp.198-204).

"The image is also one of the major determinants of spatial behaviour" (Downs, 1970, pp.19). In his study, "Cognitive Structure of an Urban Centre" undertaken at Bristol, England, Downs suggests that two types of factors are influencing a consumer's image (attractiveness) of a shopping centre. They are retail establishment factors including service quality, price, shopping hours, shop range and quality of merchandise, etc., and structure and function of the shopping centre, containing such factors as internal pedestrian movement, traffic conditions, visual appearance, parking and so on.

Martineau states: "Image is acceptable and appealing to them (consumers) individually" (1958, pp.49). There is no single common image held by all consumers. In the study, "City Shoppers and Urban Identification: On the Social Psychology of City Life", Stone defines four

14

types of consumers in terms of store selection: economic; personalizing; ethical and apathetic consumers (1954, pp.40). The first type refers to those individuals who are concerned about the economic attributes of a shopping alternative, such as price, quality and variety of goods, etc. The people in the second category are motivated to choose store(s) according to the service and personal attention provided, say environment, comfort, etc. The third type of consumers includes the individuals who shop at specific store(s) because of moral constraints. "They are willing to sacrify lower price and a wider selection c´ goods because some stores have no heart and soul" (Stone, 1954, pp.41). The last type defines the shoppers who select store(s) in terms of convenient location. "Shopping is a burdensome task for this type of consumers (Stone, 1954, pp.42).

In their study, "Location, Location, Location: Analyzing The Retail Environment", Jones and Simmons pointed out that the location of a retail firm was also a significant input into an individual's spatial shopping decision-making process. More specifically, they found that the locational configuration did in fact alter the shopping travel of consumers in term of their shopping trip frequencies and the level of demands (Jones and Simmons, 1987, pp.137).

Stone's research has provided a classification from which consumers can be categorized by their shopping motivations. His classification demonstrates the psychological reasons of how a consumer evaluates shopping alternatives. However, it is worth mentioning that consumers are always cross-typed. An individual of the personalizing type may also be concerned about economic and/or spatial constraints. Thus, a logical consequence of a consumer behavioral study could be to investigate the shopper's behaviour individually. That is to say, the consumer shopping behaviour is very individual and the research on this area is, hence, better to be based

on the full understanding of an individual's decision-making mechanism.

After the 1970's, many researchers, such as McFadden, Ben-Akiva, Wrigley, McCarthy, Hansen, Horowitz, Landau et al, Pipkin, Louviere, Koppleman & Hauser, Recker & Kostyniuk, Southworth, to mention a few, tend to use a discrete choice theory to interpret a consumer's spatial choice behaviour. Since the present study will utilize one of the popular discrete choice models, multinominal logit model (MNL model) and the theory as a major research method, the following part of this section is to review this type of research work relevant to the consumer spatial behaviour using the MNL model.

In his research conducted at the Bay Area, San Francisco, California, McCarthy (1980) analyzes the variables influencing an individual's shopping behaviour and identifies five generalized factors. These generalized factors and their underlying dimensions are: generalized trip convenience including trip and parking cost, trip time, start of trip and return when convenient, trip arrival time known with certainty; generalized trip comfort, including clean attractive, spacious passenger vehicle for shopping trip, protection from bad weather during trip, comfortable ride during trip and easy opportunity to stop at other places on the way to the shopping area; generalized trip safety, including safety from accidents during trip, and safety from robbery or assault during trip; generalized shopping area attraction, including good variety of merchandise at shopping area, and provide reliable repair service at shopping area, can easily get from store to store at shopping area, low price for merchandise and stores open on evenings and weekends; generalized shopping area mobility, including uncrowded walkway and sidewalks at shopping area, cleanliness, and easy to park facilities. By further investigation on the same data set using multinominal logit model (1984), he suggests that all these five generalized factors are

significant inputs into a consumer's spatial shopping decision-making process. Especially, the generalized shopping area attraction is the most significant factor affecting an individual's shopping behaviour. It is followed by distance as a proxy variable of generalized trip costs. Moreover, socio-economic characteristics of a consumer, such as age, income, ability to drive, are found to produce important effects as well.

In the research: "Evaluation of Activity Constrained Choice Sets to Shopping Destination Modelling" (1982), Landau et al suggest that "the constraints on an individual's freedom to move through space and time have an important influence on his likelihood of patronizing a shopping destination". The bottom line of such a concern is that an individual has a limited amount of time to spend on a shopping trip. This automatically restricts his/her choice to those locations which he/she can reach within this limited time. Applying to the sample data of worker and non-worker from Tel Aviv Metropolitan Area, Israel, they find that, properly defining an individual's choice set can improve the accuracy of parameter estimation and prediction when using an MNL model.

"Destination Choice Behaviour For Non-Grocery Shopping Trips" (1978) by Koppleman and Hauser; "Factors Influencing Destination Choice For The Urban Grocery Shopping Trip" (1978) by Recker and Kostynuik, have found the food and non-food shopping trips are actually separated by such variables as off-working time of the shopper, family income and number of vehicles in the family, and retail location and opening hours.

.

17

2.3 The Case Studies Review

The initial intent of this case research was the feasibility study of a new regional shopping centre at the intersection of Highway 401 and 24 (Figure 2.2), proposed by Fidra Realities Incorporated of Toronto in early March, 1986. Based on an extensive consumer shopping behaviour survey, several geographical studies have been done and are briefly reviewed as following.

Picton (1986) investigates the hierarchical nature of the shopping centres in the study area by using central place theory. He identifies three hierarchical levels at the study region: i) regional shopping centre --- Fairview Park Mall; ii) subregional shopping centres --- John Galt Centre in Cambridge, Conestoga Mall in Waterloo, and iii) the neighbourhood centres for the rest of shopping centres in Kitchener CMA. Figure 2.3 and 2.4 illustrate the hierarchy of the shopping centres in the Kitchener CMAs. He further points out that Fairview Park Mall, as the only regional shopping centre in the Kitchener-Waterloo-Cambridge area, attracts the consumers through the region; and the rest of the centres serve the shopper locally.

In his study, "Determining Market Potential For Regional Shopping Centre in the Kitchener-Waterloo-Cambridge Area" (1986), Schwindt investigates the geographical trade areas of six major shopping centres and determines the marketing potential after the new proposed regional shopping centre is to be built. He suggests that, with the exception of Fairview Park Mall, other centres --- Conestoga, Westmount, Waterloo Town Square, Market Square, King Centre, will continue to attract the local consumers. Respectively, Conestoga Mall draws the

Figure 2.2 Major Shopping Centres in Kitchener CMA

Size of Shopping Centre in square feet

- · < 100,000
- ▲ 100,000 – 200,000
- ■ 200,000 – 400,000
- ● > 400,000

Waterloo

Conestoga Mall ■

Waterloo Square ■
Westmount Mall ▲

King Centre & ●
Kitchener Downtown

King St.

Forest Glen ·

Frederick Mall ·

Market Square ■

·Stanley Park

Kitchener

Fairview Park ●

Grand River

HWY 8

HWY 401

Hespler Downtown ·

Cambridge Shoppers Mall ■

Cambridge Mall (new) ■

HWY 24

Bishops Gate & Strip
John Galt Centre ▲

Preston ·
Downtown

King St.

Cambridge

Highland Centre ·

·South Cambridge Centre ■

Cambridge Downtown ■

HWY 8

Figure 2.3 Total Expenditure For Individual Centre: Kitchener CMA - 1985

SHOPPING CENTRE LIST

1 ==> *Proposed Shopping Centre*
2 ==> *Fairview Park Mall*
3 ==> *Kitchener Downtown*
4 ==> *Cambridge Downtown*
5 ==> *Conestoga Mall*
6 ==> *John Galt Centre*
7 ==> *Waterloo Town Square*
8 ==> *Westmount Place*
9 ==> *South Cambridge Centre*
10 ==> *Frederick Mall*
11 ==> *Stanley Park Mall*
12 ==> *Forest Glen Shopping Centre*
13 ==> *Cambridge Shoppers Mall*
14 ==> *The Mall*
15 ==> *Bishop Gate Mall*

MILLIONS OF DOLLARS

CENTRE NUMBERS

Source: 1985 Telephone Survey

Figure 2.4

**Hierarchy of The Shopping Centres
in The Kitchener CMA**

Regional Centre
(Fairview Park Mall)

|

|

Subregional Centres
(Conestoga Mall)
(John Galt Centre)

|

|

Neighbourhood Centres
(Waterloo Town Square)
(Westmount Place)
(Frederick Mall)
(Forest Glen Shopping Centre)
(Stanley Park Mall)
(Market Square)
(Cambridge Shopper's Mall)
(South Cambridge Centre)
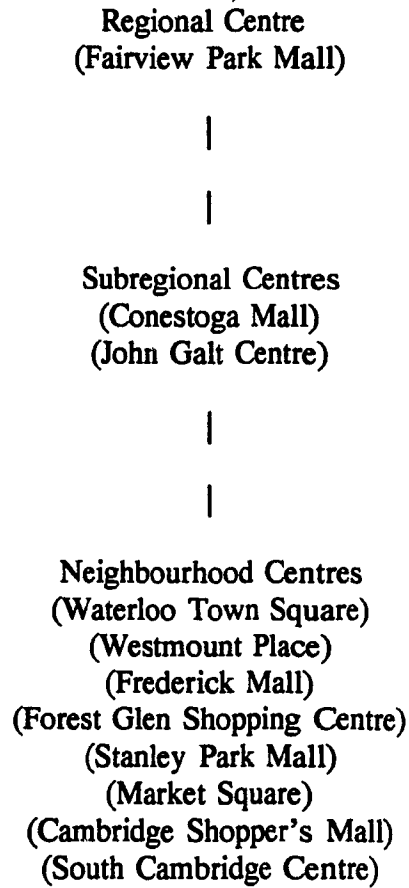
---- Source, Picton 1986, pp.23

21

consumers from the northeast part of the city of Waterloo, Westmount Shopping Centre attracts the shoppers from the west part and Waterloo Town Square interests the individuals in the north, the central and the east portions of the city. In Kitchener, he reports that the attractiveness of Market Square and King Centre covers all of the central parts of the city whereas Fairview Park Mall's drawing power dominates the Kitchener-Waterloo-Cambridge area, except for small portion of Kitchener and the most part of Waterloo (see Figure 2.5 to 2.10). Unfortunately, he does not provide a clear picture of consumers' shopping behaviour spatially for the whole study region, especially for the shoppers in the city of Cambridge.

Figure 2.6 Trade Area of Westmount Shopping Centre

Figure 2.5 Trade Area of Conestoga mall

23
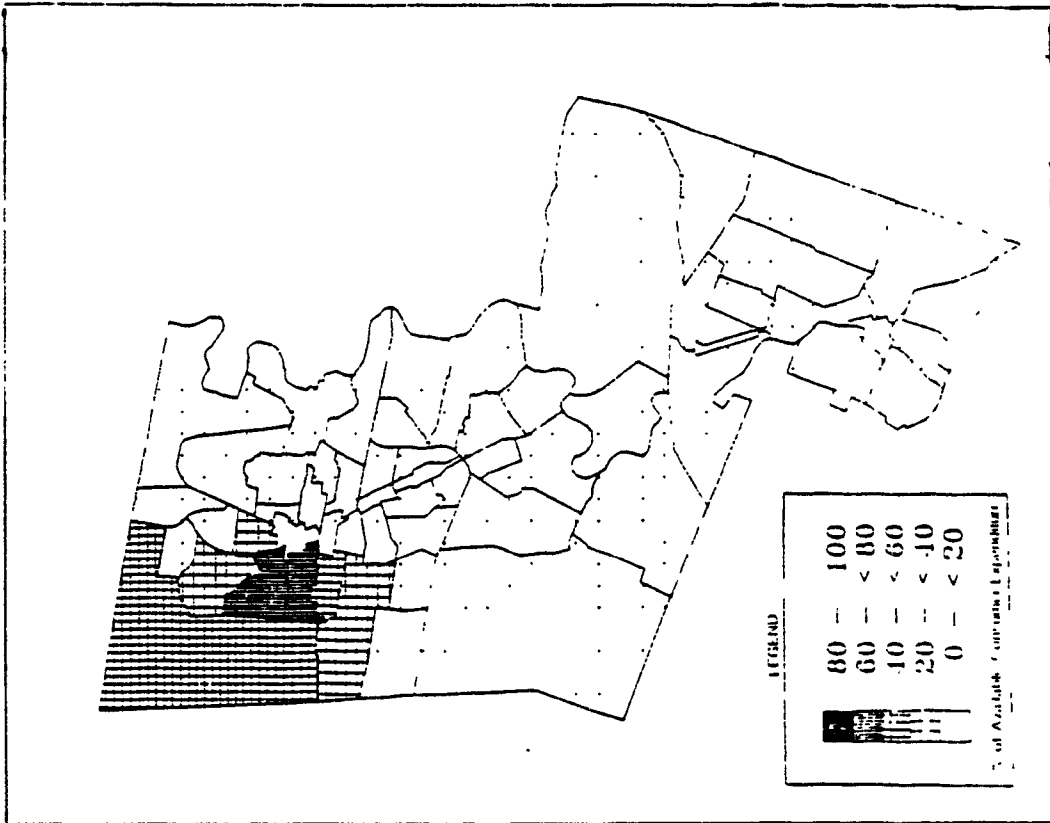
Figure 2.7 Trade Area of Waterloo Town Square

LEGEND

80 — 100
60 — < 80
40 — < 60
20 — < 40
0 — < 20

% of Available Consumer Expenditure
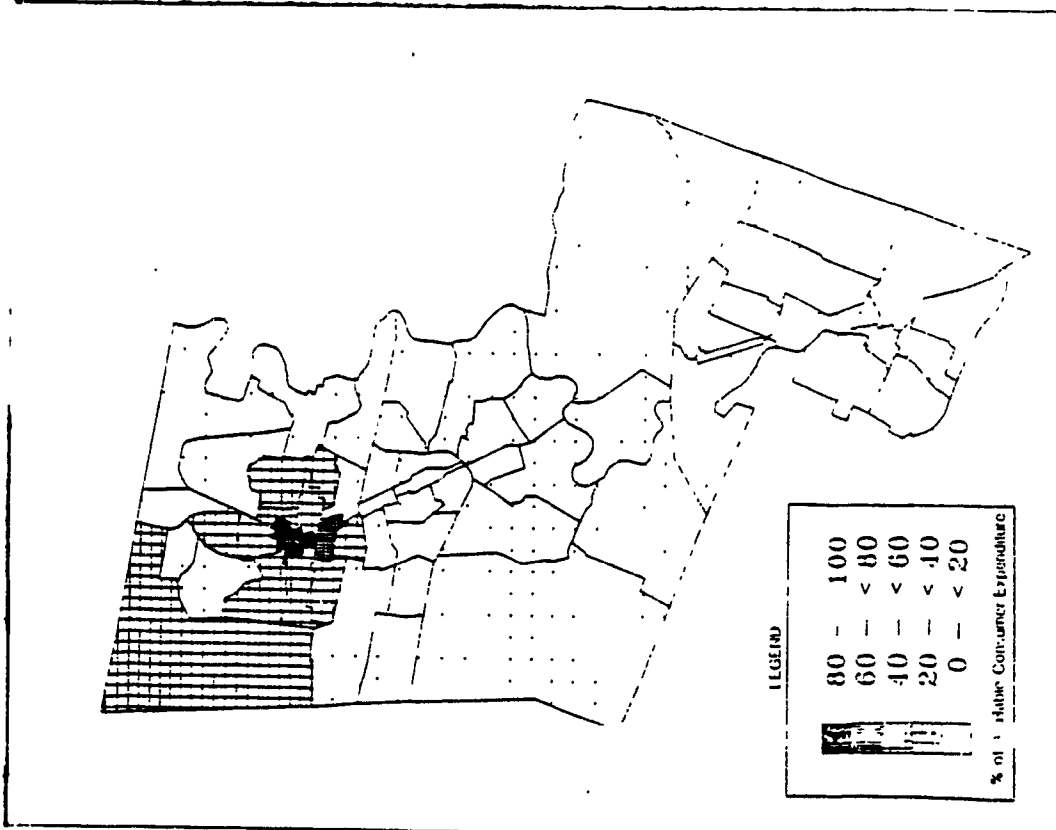
Source: Schwindt, 1986, pp.37

Figure 2.8 Trade Area of Market Square

LEGEND

80 — 100
60 — < 80
40 — < 60
20 — < 40
0 — < 20

% of Available Consumer Expenditure

Source: Schwindt, 1986, pp.37

Figure 2.10 Trade Area of Fairview Park Mall

FAIRVIEW PARK MALL

LEGEND

80 — 100
60 — < 80
40 — < 60
20 — < 40
0 — < 20

% of Available Consumer Expenditure
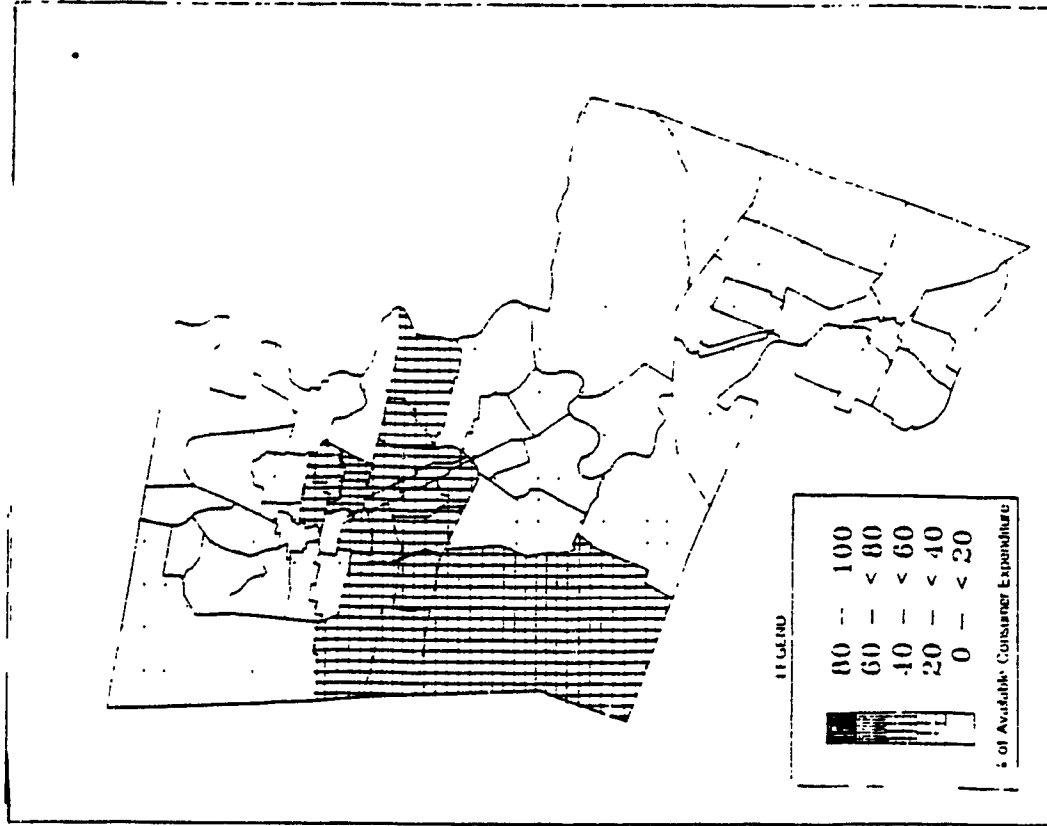
Source: Schwindt, 1986, pp.40

Figure 2.9 Trade Area of King Centre

LEGEND

80 — 100
60 — < 80
40 — < 60
20 — < 40
0 — < 20

% of Available Consumer Expenditure
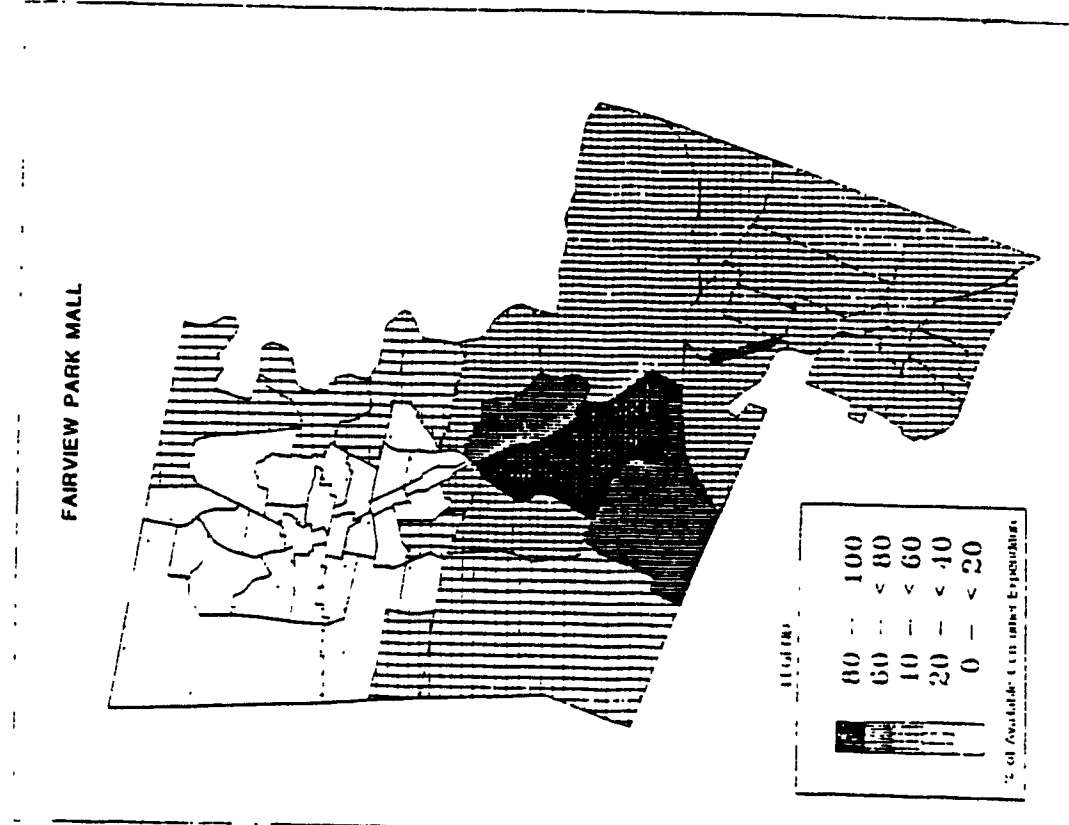
Source: Schwindt, 1986, pp.40

The viability of developing a new proposed regional shopping centre, Cambridge Mall, has been studied by several researchers. Simpson and Hall, in two separate researches, find that a geographical area within 20 driving minutes constitutes the primary trade area of the new proposed mall. The second and third trade areas cover the whole survey area (see Figure 2.11). While the feasibility has been researched, several consulting companies, Morgan, Malone Given Parsons, for example, undertook their studies representing the impacts of the Cambridge Mall on the regional retailing structure. These studies show that the major reason for building a new large scale shopping centre is the lack of such a high level retail facility at the city of Cambridge. The most negative influence on the existing retail environment of the new mall would occur for the Fairview Park Mall and southern parts of the city of Kitchener. As for the city of Cambridge, John Galt Centre which used to satisfy the majority of Cambridge shoppers' needs, is affected significantly by the Cambridge Mall.

Figure 2.11 Estimated Trade Area For Potential Shopping Centre

ESTIMATED TRADE AREA FOR
POTENTIAL SHOPPING CENTRE

LEGEND

■	100
▦	88
▦	75
▦	63
▦	50
⬚	38
☐	25
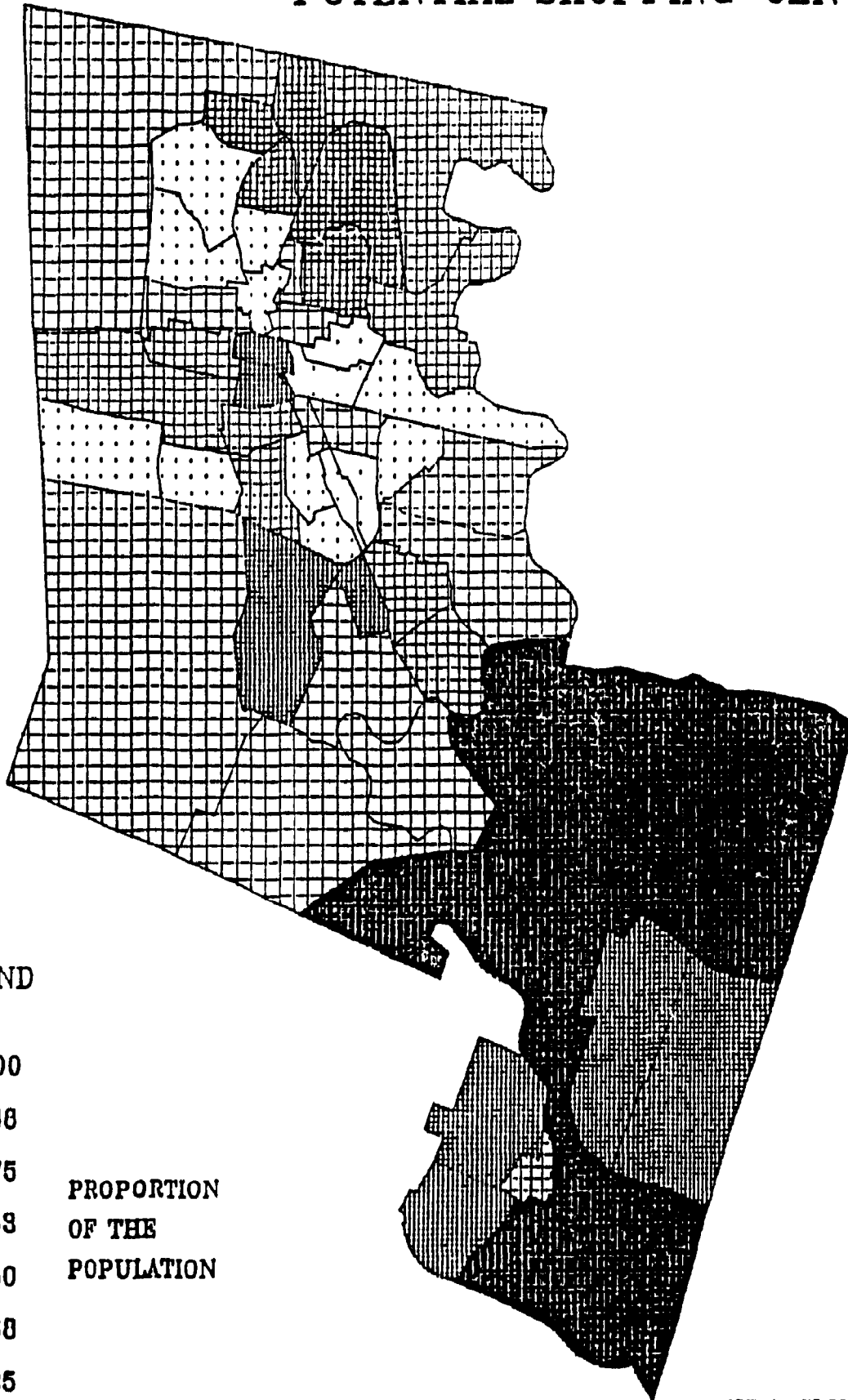
PROPORTION
OF THE
POPULATION

SCALE 1 : 75,000

Dr. Hecht, in his recent paper "The Birth Plan of a New Regional Shopping Centre in the Kitchener CMA", summarizes the case research process in terms of both viability and impact of building such a high level centre given the location and proposed shopping facilities. He further questions the whole procedure of approval by Ontario Municipal Board. He points out: " ...... the total time lag (for its construction) will reach six years. Such a long time lag is too long for a rapidly changing urban structure like the Kitchener CMA" (Hecht, 1989, pp.10).

Some of the researches mentioned earlier have tried to explore the consumer spatial shopping behaviour at the region (Simpson, 1986; Hall, 1986; Schwindt, 1986; Malone Given Parsons, 1986, Morgan, 1986, 1987, 1988) at an aggregate (interzonal) level. However, these studies can not identify such behaviour at a disaggregate (individual) level, which is considered to be the core of behaviour problem solutions. Thus, the present study tries to investigate an individual's attitude towards the existing shopping centres at the same region.

2.4 Summary

This chapter has provided an brief review of the literature necessary to understand the subjective approach employed by geographers in the study of marketing geography. The emphasis has focused on the conceptual framework of the research on the consumer as the decision-maker within his environment. "No two consumers will make the same decision given identical factors within the spatial environment" (Huff, 1960).

Foxall's (1977) consumer buying model and general research strategy provide the initial background for the present study, which is dealing with the consumer DSTM shopping decision-

making in the region of Kitchener CMA in Ontario. Downs's research identified the major

attributes that affect the consumer's attitudes of a shopping centre. Stone (1954) provided an

inside view of the classification of the shoppers with regarding to their shopping motivations.

Huff (1960) has identified the socio-economic characteristics that are used in the consumer spatial

behaviour study. Finally, at a disaggregate level, McCarthy (1982) suggested five generalized

factors influencing an individual's shopping behaviour, and other researchers developed the

practical methods to interpret such a spatial choice behaviour by an individual through the

employment of the MNL model.

The next chapter will describe the study area and examine the research methodology

which is used to test the hypotheses proposed in this study.

Methodology And Research Design

3.1 Introduction

The purpose of this study is to analyze how the selected attributes of shopping centres/CBDs influence the consumer's DSTM shopping behaviour given the consumers' socio-economic background. Dr. A. Hecht's research survey provides the data base for the analysis of this study. Specifically, his larger 804 households survey of consumers' shopping behaviour in the study area makes this research possible. Furthermore, his survey also provides the individuals' information for their socio-economic background from which the so called socio-economic variables were selected.

Specifically, this chapter includes the following:

Section 3.2 provides a brief introduction of the study area and its shopping environment while section 3.3 profiles the data to be interpreted in this study. In this section, the detailed descriptions of the questionnaire design, the surveying technique and the data collection process will be provided. Section 3.4 focuses on the criteria of selecting the shopping destinations used in this study. Section 3.5 discusses the hypotheses proposed for this analysis and the methodology utilized to test them. Section 3.6 addresses, in detail, the specifications of the MNL model and other statistical methods and their applications in this study.

30

3.2 Study Area

The study area, the Kitchener CMA located in southern Ontario, consists of three urban core areas, namely the city of Kitchener, the city of Waterloo, the city of Cambridge and surrounding areas (see Figure 1.1). This industry-based region has been one of the fastest growing urban areas in Ontario during the past decades. In 1986, the region had a total population of 311,195 (Statistics Canada, 95-121), of which the urban core areas of Kitchener, Waterloo and Cambridge, represented 94.4%. The outlying towns, villages and townships accounted for the remainder.

In 1986, there were eleven planned shopping centres which had over 40,000 square feet of gross leasable area within the urban cores, and three central business districts (CBDs), all of which had planned shopping centres located within them (see Figure 2.2).

The shopping environment in the region varies across the cities in terms of commercial facilities that determine the varying shopping behaviour of its consumers. The following provides a brief description of the shopping environment for each city, mainly attributable to the research by Malone Given Parsons Ltd.

3.2.1 The City of Kitchener

The city of Kitchener has the largest urban core in the study area. It hosts many retail facilities which constitute a prominent shopping environment for the shoppers.

31

Fairview Park Mall, located on Fairway Road at Highway 8, is the only existing regional shopping centre in the study region. This centre incorporates two major full line department stores: The Bay, Sears, a large discount department store, Woolco and 143 other tenants representing a broad range of retail stores and commercial services. Its distinctive location, Highway 8 from the north to the south and Fairview Parkway from the east to the west, provides an easy accessibility to the consumers across the research region. The previous studies (Simpson, 1986) illustrate clearly the extent of its domination of the entire market in the region.

The Stanley Park Mall, Ottawa Street North of River Road, Forest Glen Centre, Strasburg Road at Block Line Road, Frederick Mall, southwest corner of Frederick Road and Ottawa Street, are community centres away from the downtown area of the city. Each of them has a major department store and some other tenants providing general DSTM goods and services.

Downtown area, hosting two planned shopping malls: Market Square and King Centre, is another major shopping node in the city. The two shopping centres, each has a principal department store, Eatons in Market Square and Robinsons in King Centre, together with other retail outlets form a continuous retail strip along King Street and the largest retail commercial node in the entire region.

Other Kitchener retail nodes for the most part, congregate around community level food stores. These plazas typically provide an assortment of low-order commodities for neighbourhood and community level consumption.

3.2.2 The City of Waterloo

The city of Waterloo is the smallest subregion in the study area, It has two universities, University of Waterloo and Wilfrid Laurier University, located almost adjacent to the downtown area. The considerable number of students is one of the most distinctive characteristics in terms of the consumer population. Conestoga Mall, the largest shopping centre in the city, is located on King Street north of Highway 86. The major tenants in this mall are Robinson's and K-Mart department stores and 63 other tenants. The previous study (Picton, 1986) identifies that this centre is at the second level, the subregional centre category of the retail hierarchical system in the study area. Westmount Place is situated on Westmount Road north of Erb Street. The principal tenants in this centre are Eaton's department store, Mr. Grocer supermarket and Bargain Harold's plus 30 other stores. Due to its unique location--adjacent to the University of Waterloo, this centre is highly attractive for the student population. Waterloo Town Square is located on King Street between Erb and William Street. The major tenants are K-Mart and Zehr's. The other tenants include Shoppers Drug Mart and a number of clothing/shoes and specialty shops. Because of the downtown location and within walking distance from both universities, this planned shopping centre is also one of the most patronized centres by a considerable amount of students. Other significant retail nodes in Waterloo are characteristically community shopping plazas, Towers Plaza, for example, and others along King Street from Waterloo Town Square north to Bridgeport Road.

3.2.3 The City of Cambridge

The city of Cambridge is the primary area of the survey. It has several planned shopping centres and CBDs. John Galt Centre is the largest of only two community shopping centres in Cambridge. The centre contains 29 tenants providing general merchandise services. This centre was identified by Simpson (1986) as a sub-regional shopping centre in the retail system in the study area. The Cambridge Shoppers Mall, located just north of Highway 401 at Highway 24, is an indoor mall. The principal tenants include Smitty's Furniture, Zehr's Markets. South Cambridge Centre is situated at the intersection of Franklin Boulevard and Main Street in Galt. The principal tenants in this plaza include K-Mart, Zehr's, Bi-Way, etc. The South Cambridge Centre, in conjunction with the nearby Highland Shopping Centre, represents the only community scale commercial node in Cambridge other than the John Galt Centre. The Highland Shopping Centre is located on Dundas Street at Main Street, across from the South Cambridge Centre. The major tenants are Zellers, Canadian Tire and Shoppers Drug Mart. Downtown Cambridge is currently the major commercial node in Cambridge. Most of this commercial development occurs in a continuous strip fashion along Ainslie, Water and Main Streets, and to a lesser extent along Dickson and other nearby streets. Some retail uses are also concentrated at the Shopping Mall and Cambridge Place shopping centres located in the CBD. Other Cambridge commercial facilities include Highway 24 Strip, Preston and Hespeler Commercial areas. They provide shopping alternatives other than the planned shopping centres.

3.3 The Data

The data for present analysis were primarily obtained from a major household survey on shopping behaviour of 804 households at the Kitchener CMA conducted by Dr. A Hecht in 1985 (see questionnaire in Appendix A). This survey was designed to determine the feasibility of a proposed new regional shopping centre, Cambridge Mall, in the city of Cambridge, Ontario (see Figure 1 and 2). Through this survey the shopping environment and households' shopping patterns in the region were carried out. Some other data sources included the physical features of selected shopping centres taken from the research work of Malone Given Parsons Ltd. (1986) and demographic data of the region from Statistics Canada (1986).

3.3.1 The Questionnaire

The 22 questions in the questionnaire (see Appendix A) were developed to gather information regarding both the household's weekly grocery and annual non-food (DSTM) shopping patterns and its demographic, socio-economic characteristics. In the survey, after introducing himself/herself, an interviewee presented with the idea that a new regional shopping centre, Cambridge Mall, with family recreational facilities was proposed at the intersection of highway 401 and 24, across from the Holiday Inn in the city of Cambridge, Ontario. The questions concerning the respondents' present shopping behaviour for 31 DSTM items (see question 1 and 2 of the Questionnaire in Appendix A) and regarding their weekly grocery shopping (see question 3 through 9 of the Questionnaire in Appendix A) were then asked. These

35

questions were interested in where (54 locations for DSTM and 36 for grocery shopping were provided in the Questionnaire, see Appendix A) and how much (coded in dollar values) was spent for both DSTM (annually) and food (weekly) purchases. .

The second section of the Questionnaire (see the question 10 to 18 of the Questionnaire in Appendix A) concerned the respondents' potential shopping at the new proposed shopping centre given the proposed geographical location (the intersection of Highway 401 and 24) and suggested physical attributes (not physically smaller than the Fairview Park Mall in Kitchener, Ontario). In order to determine the impact of the new proposed regional shopping centre, Cambridge Mall, on the existing retail system in the region, the question was also asked to the respondents about how likely they were willing to shop at downtown Cambridge on the same shopping trip to the new mall and where they would likely reduce their expenditures on the same kind of goods.

The last portion of the Questionnaire (see the question 19 to 22 of the Questionnaire in Appendix A) contained the questions asking for the respondents' family size, number of children, age and sex, which allowed the data to be grouped and based on their socio-economic characteristics.

3.3.2 The Survey[1]

The survey was conducted using a systematic sampling technique. The total number of

---

[1]   Please refer to the research of Hall, P., 1986, Picton, C., 1986, Schwindt, T., 1986 and Simpson, R. N., 1986 for more detailed descriptions of the surveying process.

households to be surveyed was predetermined. The individual interviewed was from the names listed in the city directories, Vernon Directory, for each survey area. All entries of each directory was summed and divided by the sampling interval, n, which was also predetermined. Thus, every n^{th} individual was then telephoned. If the individual refused to do the interview or there was simply no answer, the next person on the name lists was called. The reason to do so is that this method allowed the respondent to be located within the same census tract.

The area surveyed included the cities of Kitchener, Waterloo, Cambridge, Guelph, Paris/Brantford as well as rural-Waterloo. These areas together were considered to embody the potential trading area of proposed Cambridge Mall. The Table 3.3.1 reports the sample size taken from each survey area.

TABLE 3.3.1

SURVEY SAMPLE SIZE

AREA	SAMPLE SIZE
Cambridge	399
Kitchener	150
Waterloo	69
Guelph	81
Paris/Brantford	71
Rural-Waterloo	34
TOTAL	804

An unequal number of surveys is shown in the above Table. This is because it was assumed that with the increasing distance from the proposed Cambridge Mall the response would decrease ultimately reaching zero. As a result, the city of Cambridge provided the most respondents, almost fifty percent, as this was the prime region of interest.

Table 3.3.2 reports the survey data grouped by such household characteristics as family size, number of children in the household, age and sex of the household heads. It is worth mentioning that the 804 respondents included those respondents living in the cities of Guelph and Paris/Brantford. These respondents outside the study region were considered to be irrelevant to this analysis and were, therefore, omitted from the entire survey data. The rest of the respondents

TABLE 3.3.2

SURVEY SAMPLE

NAME	FREQUENCY	PERCENTAGE
1 FAMILY SIZE		
1 PERSON	89	11.1
2 PERSONS	225	28.0
3 PERSONS	158	19.7
4 PERSONS	214	26.6
5 PERSONS	88	10.9
6 PERSONS	22	2.7
7 PERSONS OR MORE	8	1.0
	804	100
2 NUMBER OF CHILDREN		
0 CHILDREN	424	52.7
1 CHILD	139	17.3
2 CHILDREN	160	20.9
3 CHILDREN	56	7.0
4 CHILDREN	12	1.5
5 CHILDREN	5	0.6
	804	100.0
3 AGE OF RESPONDENT		
UNDER 18	8	1.0
19 - 24	109	13.6
25 - 34	213	26.5
35 - 44	150	18.7
45 - 54	116	14.4
55 - 64	94	11.7
65 +	114	14.2
	804	100.0
4 SEX OF RESPONDENT		
MALE	221	27.5
FEMALE	583	72.5
	804	100.0

39

consisted of those individuals from the cities of Cambridge, Kitchener and Waterloo as well as the Rural-Waterloo area and came to 652 in total. In order to determine the representativeness of the modified subsample of 652 respondents for the population of the study region, the modified subsample was compared with that of StatisticS Canada for the same geographic region. The Table 3.3.3 through 3.3.6 describe the comparative results grouped by the household's characteristics.

A further point should be made here. The comparison of the modified subsample data with that of Statistic Canada is not as effective a way as one might think to be at the first glance. The survey was an extensive household shopping behaviour poll by means of lengthy telephone interviews. The actual population the survey dealing with was conceptually the population of shoppers which was not identical to the demographic population itself. The direct comparison of these two types of data remains conceptually questioned. However, since there is no practical way to concretely identify the population of shoppers from the entire demographic population, such a comparison is worthwhile in the sense of determining the representativeness of the survey data. It is no wonder, therefore, that the modified survey sample under represented some groups of people, aged under 24, male population, for instance, while over sampled the elderly and the female population. It is common sense that the shopper population normally consists of the adult(s) in a household. Especially, when conducting a shopping behaviour survey by telephone like this case, the respondent was most probably the household head who was responsible for the shopping activities of the whole household and they were most likely the female household head.

TABLE 3.3.3

HOUSEHOLD CHARACTERISTICS
(SUBSAMPLE)

NAME	FREQUENCY	SAMPLE %	STAT. CANADA %
1 FAMILY SIZE			
1 PERSON	81	12.4	20.0
2 PERSONS	186	28.5	30.2
3 PERSONS	126	19.3	18.1
4 PERSONS	170	26.1	28.3[1]
5 PERSONS	68	10.4	
6 PERSONS	17	2.6	3.4[2]
7 PERSONS OR MORE	4	0.7	
	652	100	100
2 NUMBER OF CHILDREN[3]			
0 CHILDREN	353	54.1	
1 CHILD	113	17.3	
2 CHILDREN	135	20.7	
3 CHILDREN	41	6.3	
4 CHILDREN	8	1.2	
5 CHILDREN	2	0.3	
	652	100.0	
3 AGE OF RESPONDENT			
UNDER 18	5	0.8	39.6[4]
19 - 24	90	13.8	
25 - 34	167	25.6	17.8
35 - 44	123	18.9	14.4
45 - 54	92	14.1	9.7
55 - 64	73	11.2	8.8
65 +	102	15.6	9.7
	652	100.0	100
4 SEX OF RESPONDENT			
MALE	183	28.1	49.1
FEMALE	469	71.9	50.9
	652	100.0	100

---

[1] The number is the percentage of 4 and 5 persons family category in Statistic Canada (95-121), 1986

[2] The number is the percentage of 6 and more persons family category in Statistic Canada (95-121), 1986.

[3] There are no identical categories for this household characteristic in Statistic Canada (95-121), 1986.

[4] The number is the percentage of age group of under 24 in Statistic Canada (95-121), 1986.

TABLE 3.3.4

HOUSEHOLD CHARACTERISTICS
(CAMBRIDGE)

NAME	FREQUENCY	SAMPLE %	STAT. CANADA %
1 FAMILY SIZE			
1 PERSON	53	13.3	17.6
2 PERSONS	105	26.3	28.6
3 PERSONS	76	19.0	18.7
4 PERSONS	116	29.1	31.1[1]
5 PERSONS	37	9.3	
6 PERSONS	11	2.8	4.6[2]
7 PERSONS OR MORE	1	0.3	
	399	100	100
2 NUMBER OF CHILDREN[3]			
0 CHILDREN	197	59.4	
1 CHILD	71	17.8	
2 CHILDREN	102	25.6	
3 CHILDREN	23	5.8	
4 CHILDREN	5	1.3	
5 CHILDREN	1	0.3	
	399	100.0	
3 AGE OF RESPONDENT			
UNDER 18	4	1.0	40.0[4]
19 - 24	49	12.3	
25 - 34	111	27.8	16.7
35 - 44	77	19.3	10.6
45 - 54	49	12.3	9.8
55 - 64	41	10.3	8.7
65 +	68	17.0	10.6
	399	100.0	100
4 SEX OF RESPONDENT			
MALE	96	24.1	49.0
FEMALE	303	75.9	51.0
	399	100.0	100

---

[1] The number is the percentage of 4 and 5 persons family category in Statistic Canada (95-121), 1986

[2] The number is the percentage of 6 and more persons family category in Statistic Canada (95-121), 1986.

[3] There are no identical categories for this household characteristic in Statistic Canada (95-121), 1986.

[4] The number is the percentage of age group of under 24 in Statistic Canada (95-121), 1986.

TABLE 3.3.5

HOUSEHOLD CHARACTERISTICS
(KITCHENER)

NAME	FREQUENCY	SAMPLE %	STAT. CANADA %
1 FAMILY SIZE			
1 PERSON	16	10.7	22.2
2 PERSONS	47	31.3	30.5
3 PERSONS	35	23.3	17.9
4 PERSONS	31	20.7	26.5[1]
5 PERSONS	15	10.0	
6 PERSONS	3	2.0	2.9[2]
7 PERSONS OR MORE	3	2.0	
	150	100	100
2 NUMBER OF CHILDREN[3]			
0 CHILDREN	92	61.3	
1 CHILD	24	16.0	
2 CHILDREN	24	16.0	
3 CHILDREN	7	4.8	
4 CHILDREN	2	1.3	
5 CHILDREN	1	0.7	
	150	100.0	
3 AGE OF RESPONDENT			
UNDER 18	1	0.7	38.9[4]
19 - 24	21	14.0	
25 - 34	35	23.3	18.7
35 - 44	33	22.0	14.3
45 - 54	22	14.7	9.6
55 - 64	18	12.0	8.9
65 +	20	13.3	9.6
	150	100.0	100
4 SEX OF RESPONDENT			
MALE	47	31.3	48.9
FEMALE	103	68.7	51.1
	150	100.0	100

[1] The number is the percentage of 4 and 5 persons family category in Statistic Canada (95-121), 1986

[2] The number is the percentage of 6 and more persons family category in Statistic Canada (95-121), 1986.

[3] There are no identical categories for this household characteristic in Statistic Canada (95-121), 1986.

[4] The number is the percentage of age group of under 24 in Statistic Canada (95-121), 1986.

43

TABLE 3.3.6

HOUSEHOLD CHARACTERISTICS
(WATERLOO)

NAME	FREQUENCY	SAMPLE %	STAT. CANADA %
1 FAMILY SIZE			
1 PERSON	8	11.6	19.8
2 PERSONS	25	36.2	31.9
3 PERSONS	10	14.5	18.1
4 PERSONS	16	23.2	27.5[1]
5 PERSONS	9	13.0	
6 PERSONS	1	1.4	2.8[2]
	69	100	100
2 NUMBER OF CHILDREN[3]			
0 CHILDREN	45	65.2	
1 CHILD	11	15.9	
2 CHILDREN	7	10.1	
3 CHILDREN	6	8.7	
	69	100.0	
3 AGE OF RESPONDENT			
19 - 24	17	24.6	
25 - 34	13	18.8	18.5
35 - 44	8	11.6	14.7
45 - 54	12	17.4	9.7
55 - 64	7	10.1	8.7
65 +	12	17.4	8.7
	69	100.0	
4 SEX OF RESPONDENT			
MALE	28	40.6	48.9
FEMALE	41	59.4	51.1
	69	100.0	100

[1] The number is the percentage of 4 and 5 persons family category in Statistic Canada (95-121), 1986.

[2] The number is the percentage of 6 and more persons family category in Statistic Canada (95-121), 1986.

[3] There are no identical categories for this household characteristic in Statistic Canada (95-121), 1986.

44

3.3.3 The data

Since the purpose of this study is to examine the DSTM shopping behaviour of individuals with regard to their preferences in selecting shopping centres and/or CBDs within the study area, a choice based subsample was made from the modified subsample of 652 respondents. Specifically, the data was complied by the following steps:

The first step was that the 652 respondents were narrowed to those individuals who have chosen the selected shopping centres and CBDs in the study region. This implied that those shoppers who have not visited the selected thirteen shopping alternatives during the previous year of the survey would not be included in the data set of this study. However, it must be remembered that there may exist significant differences across the individual's shopping frequencies at the selected shopping centres/or CBDs within that time period. For instance, some consumers may patronize one of the selected shopping centres and/or CBDs once a year while the others may visit more frequently. These behaviourial dissimilarities would lead to a partial interpretations of the statistical analysis if both types of consumers were evaluated equally. Unfortunately, the survey did not provide such information on how often the individual visited the given shopping destinations. A further restriction became necessary for the selection of the data set.

The second step was that the individual selected by the previous step was further limited to those respondents who have spent at least half of their annual DSTM dollars on the selected shopping destinations. Through this step, those consumers who have visited the thirteen alternatives, perhaps quite often, but have not spent fifty percent or more of their annual DSTM

dollars on them, were excluded from the data set. By doing so, the researcher was convinced that the remaining data set represented, at least, half or more of those consumers' behaviour relating to the selected shopping centres/CBDs. The results of statistical analyses grounded on such a data set are thus behaviorally reliable.

Given the above constraints, the valid data set for this study came to 412 respondents in total. The distribution of those shoppers across the study region is shown in Table 3.3.7.

Table 3.3.7

DATA SET SIZE

AREA	SUBSAMPLE SIZE
Cambridge	248
Kitchener	109
Waterloo	42
Rural-Waterloo	13
TOTAL	412

Table 3.3.8 describes the socio-economic characteristics of the data set. The Table represents that the data set statistically remained the same compared to the modified subsample except one group of the consumers, age over 65. This group of shoppers is apparently over represented, from 14.2% in the modified subsample to 19.3% in the data set. This may be due to the behavioral differences between the elderly shoppers and the rest of the consumers. Since there is little research being undertaken on measuring elderly consumers' attitudes towards shopping centres or CBDs at this region, this study has not much to say on that. However, the

46

over representation of the group of elderly shoppers does not significantly affect the major results of the analysis in this study as the variable of the age of the household head is proven as a insignificant explanatory variable. The detailed discussion of this variable is to be given in section 4.2.3 of next chapter.

The behavioral findings of the subsample data along with the estimation results of the statistical methods are to be fully addressed in the next chapter.

TABLE 3.3.8

HOUSEHOLD CHARACTERISTICS
(SUBSAMPLE)

NAME	FREQUENCY	PERCENTAGE
1 FAMILY SIZE[1]		
1 PERSON	50	15.1
2 PERSONS	252	61.1
3 PERSONS	59	14.2
4 PERSONS	33	8.1
5 PERSONS	6	1.5
	412	100
2 NUMBER OF CHILDREN		
0 CHILDREN	220	53.3
1 CHILD	67	16.3
2 CHILDREN	89	21.7
3 CHILDREN	28	6.9
4 CHILDREN	7	1.5
5 CHILDREN	1	0.3
	412	100.0
3 AGE OF RESPONDENT		
UNDER 18	3	0.7
14 - 24	59	14.3
25 - 34	102	24.6
35 - 44	69	16.7
45 - 54	60	14.5
55 - 64	41	9.9
65 +	80	19.3
	412	100.0
4 SEX OF RESPONDENT		
MALE	103	24.9
FEMALE	309	75.1
	412	100.0

---

[1] This variable is calculated as: total family size - number of children in an household. Thus, it actually accounts for the number of adults in a household.

48

3.4 Shopping Destinations

Shopping destinations were selected from the Department Store Type Merchandise (DSTM) shopping location list in the survey (see Appendix A) using the following criteria.

First, all shopping alternatives are, by definition, shopping centres or CBDs. Because of the unique commercial characteristics of these shopping areas, such as great variety of merchandise, comfortable shopping environment, good parking conditions, etc, and the roles they play in the regional retail system of the study area, the consumer often has different attitudes towards these shopping alternatives from those related to other retail forms. This criterion responds to such a practical concern and also focuses the purpose of this study mentioned earlier.

Secondly, all destinations are located within the boundaries of the study region. Consumers do not generally confine their shopping activities to the study region. The survey showed that some of them did shop outside, in the Toronto CBD, for instance. However, it is extremely difficult to study such a variety of consumer shopping activities in this empirical study because:

a) it is practically impossible to appropriately define an individual's feasible choice set as required by the MNL model used in this study;

b) there are technological difficulties in measuring , for an undefined choice set, even straight-line distances on maps, which is the only variable to represent the spatial context; and

c) the data collection relating to the attributes of shopping destinations would make this study unacceptably long should such alternatives as the Toronto CBD be included.

Thirdly, the quantitative measurement of the attributes of shopping alternatives is

obtainable for the researcher. This criterion concerns practical more than theoretical issues.

Taking these theoretical and practical concerns into account, consequently, this study selected thirteen shopping alternatives within the study area. They are:

CAMCBD[1] : Cambridge CBD
CAMJGM : Cambridge John Galt Mall
CAMSHM : Cambridge Shopper's Mall
CAMSCC : South Cambridge Centre
KITCBD[2]: Kitchener CBD
KITFPM : Kitchener Fairview Park Mall
KITFGM : Kitchener Forest Glen Shopping Centre
KITFDM : Kitchener Frederick Mall
KITSPM : Kitchener Stanley Park Mall
KITMSQ : Kitchener Market Square
WATCTM : Waterloo Conestoga Mall
WATTSQ : Waterloo Town Square
WATWMP : Waterloo Westmount Place

Figure 2.2 gives the locations of these destinations.

3.5 Hypotheses

As pointed out earlier, this study is to identify consumers' spatial DSTM shopping decision-making process, which is the second stage of Foxall's "Consumer Buying Model" (see Figure 2.1). In the study area, consumers' spatial non-grocery shopping destination choice decision-making is assumed as a two-levelled process as shown in Figure 3.5.1.

---

[1] The name used in the model estimations.

[2] KITCBD was defined as King Centre and other downtown, Kitchener stores in the survey. (Market Square was not included.)

Figure 3.5.1

Spatial Shopping Destination Choice

<----- *First Level* ----->

Regional Centre   Local Centres
(Fairview Park Mall)   (Waterloo   Kitchener   Cambridge)

<--- *Second Level* --->

N.S.C*   N.S.C   N.S.C
in Waterloo   in Kitchener   in Cambridge

---
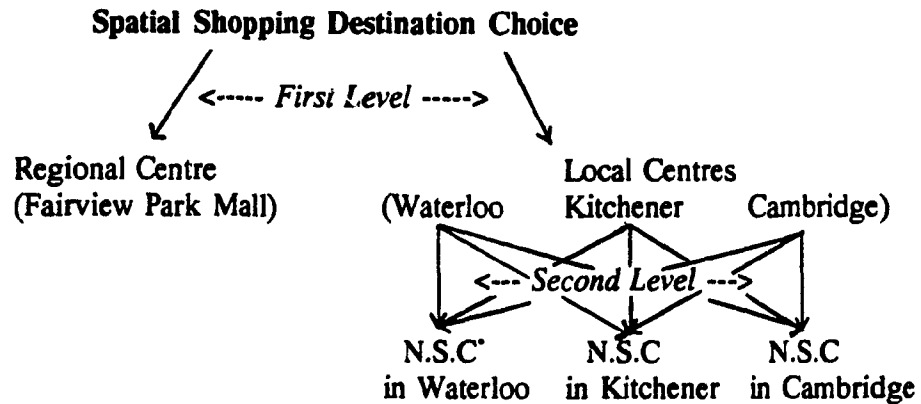
* N.S.C: Neighbourhood Shopping Centre

The reasons for making such an assumption are obvious: on the one hand, a regional shopping centre is indeed attractive for most consumers in this study area, variety of DSTM goods and services, good parking conditions, and comfortable shopping environment including fast food and banking services and so forth. All of these made the regional shopping centre, Fairview Park Mall, significantly distinguished from the rest of the shopping centres. However, on the other hand, its geographical location makes it not easily accessible for the majority of the shoppers throughout the region. The decision that a consumer had to make was thus whether he/she was willing to drive a long way down to Fairview Park Mall in order to maximize his/her non-grocery shopping activities or he/she shops locally. Given the decision of a local shopping, a further consideration a consumer would take into his/her account was that .vhich local shopping centre he/she was willing to go to. The real situation was that, although the selected local shopping centres are theoretically available for all shoppers in the region, some of these centres

practically have little chance to be patronized by a certain portion of the consumers. Actually, there is a very low probability for most shoppers in Cambridge, for instance, to drive a long way down to Westmount Mall in western Waterloo to do their DSTM purchasing. Thus, a multiple level decision-making process by a consumer is both reasonable and practicable.

It is worth mentioning that the assumed decision-making process is multiple levelled. Such a multiple-level process was proven to be best analyzed by the so called 'nested logit model' if the discrete choice model is applied. However, as there was no well developed computer programme available at the time when all computing work was undertaken, this study could not utilize the nested logit model as the major research methodology. Instead, the present analysis is to use two types of statistical techniques to solve the problem. The first is so called 'multinomial logit model' to determine an individual's attitudes towards the selected shopping centres or CBDs at the second level of the decision-making process shown in the Figure 3.1. Secondly, a choice frequency analysis is utilized in examining the choice distribution of the shopper at the first level of the same decision-making process. Together, these techniques will provide a clear picture of the spatial choice decision-making process by the consumer at this study region.

Given the above assumption, this study will practically test the following three hypotheses:

1 that a consumer's DSTM shopping centre choices are spatially determined at the regional level (First Level in Figure 3.5.1) in this medium size urban-based area;

2 that shoppers' preferences upon the regional over "local" shopping alternatives can be differentiated by their household characteristics such as number of children and adults in a

household.

3 that within the distance an individual is willing to travel, consumers tend to shop at the centre with the largest DSTM Square Footage at the subregional level (Second Level in Figure 3.5.1);

The first hypothesis is trying to determine the factors influencing consumers' decision-making on where to shop at, regional or 'local' centres. To test this hypothesis, the MNL model is used to find out an individual's attitude towards the selected variables of each shopping centres. Upon the outcome of MNL model estimation, a further analysis is then needed to determine the actual "shopping space" of consumers. Such a "shopping space" is to be "mapped" using a consumers' DSTM choice frequency analysis which determines the geographical area(s) where the most DSTM shopping activities of consumers occur.

The second hypothesis is intended to reflect the fact that the consumer's attitudes towards the regional and "local" centres are significantly influenced by an individual's household characteristics like number of children and adults. The MNL model is used to test this hypothesis.

The third hypothesis represents that consumers tend to shop at the largest shopping area within the geographical boundaries of the subregion--the city they currently live in. This hypothesis reflects the fact that individuals are always maximizing their shopping satisfactions within a certain distance. To test this hypothesis, the same frequency analysis is made to figure out which centres the consumer mostly patronizes.

3.6 The Method of Analysis

The subsample data were analyzed using the MNL model along with other statistical techniques, such as choice frequency count, T-Test of variable age and sex. The data were analyzed to determine the attitudes of an individual towards the existing shopping centres in the study region in connection with his/her socio-economic characteristics. The attitudes of the shopper were first determined using the MNL model. The choice frequency count and T-Test were then employed to further test the results obtained by the MNL model.

3.6.1 Application of The MNL Model

In this study, the MNL model was employed as a major research method. In order to obtain better data interpretation, the MNL model was specified referring to the general model specification methodology (See Ben-Akiva & Lerman, 1984, pp.20-72).

(1) Dependent Variable

Since the individual in this subsample did not generally shop at a single centre or CBD, appropriately defining the dependent variable was of concern. Given that the total probability of an individual's choosing the shopping alternatives should be equal to 1, in this study the dependent variable is defined as the portion of an individual's non-food expenditure at a particular centre as a percentage of his/her non-food spending at all thirteen centres. This implies that the probability of an individual choosing a centre is equal to the proportion of total non-food expenditure by that consumer at that centre. This yields a statistically rated variable which, from

54

previous studies, is proved to be acceptable in the application of the MNL model for modelling shopping activities by the consumer.

(2) Explanatory Variables

The explanatory variables in this study fall into three categories: the attributes of a shopping area; socio-economic characteristics of the consumers (households) and alternative-specific constants.

The attributes of a shopping destination are used in this study to measure quantitatively the attractiveness of the shopping area. Many ways have been employed to select the attributes in previous behavioral research (Fisk & Boyce, 1984; Spear, 1976; Dobson & Tischer, 1978; Spencer, 1978; Johnson, 1974; for example). Traditionally, square footage is often used. This study follows the tradition and selects different square footage figures to measure the attractiveness in terms of different aspects in a shopping area.

The selected square footage are represented by variables as follows:

SMSF[1] supermarket square footage in the centre
OFSF other food services square footage in the centre
PSSF personal service square footage in the centre
OSSF other services square footage in the centre
ASSF anchor store square footage in the centre
DMSF DSTM square footage in the centre

Table 3.6.1 profiles each centre in terms of these attributes.

---

[1] Name used in the MNL model estimation.

Table 3.6.1

Shopping Area Attributes
(100 Square ft)

	SMSF	OFSF	PSSF	OSSF	DMSF	TOTAL
CAMCBD	448	121	149	39	2818	4818
CAMJGM	291	1	20	5	1374	2487
CAMSHM	196	0	35	0	611	843
CAMSCC	381	42	35	19	966	1793
KITCBD	104	709	201	47	7583	10081
KITFPM	236[1]	40	43	17	5869	10077
KITFGM	406	33	14	12	815	1080
KITFDM	196	14	5	10	626	1051
KITSPM	361	23	8	20	1022	1434
KITMSQ	0	19	0	16	2278	4113
WATCTM	366	30	9	13	2847	4992
WATTSQ	289	43	3	54	1316	2320
WATWMP	208	0	0	31	1343	2212

[1] In 1985, when the survey was undertaken, there was a supermarket (Zehrs) in this centre.

56

Another very important attribute of the shopping destinations is the variable of distance, which characterizes the shopping alternatives spatially. In the survey, the distance was measured in driving time on a map from an individual's residence (taking the centroid point of the census tract the individual lives as a proxy) to each of the shopping centres in his/her choice set.

All these variables are considered to be a proxy of generalized shopping area attractiveness which, from previous studies (McCathy, 1979, 1982; Koppleman & Hausen, 1978; for example), was established as the most important variable in the consumer's behaviour regarding the choice of a shopping centre.

Socio-economic characteristics of the consumer are represented by such variables as income, age, sex, family size and number of children. The specifications of these variables (excluding the variable of income) are listed in Table 3.6.2.

These variables will be treated as categorical variables to identify the choice behaviour of different groups of individuals.

The income variable is a little different from those mentioned above. This variable is considered to be a very important socio-economic characteristic of the consumer in the behaviour studies. Due to the absence of such a variable in the survey, the present analysis will take the total annual non-grocery expenditure as an indicator of household income. In the estimation of the MNL model in this study, this variable will be considered as a continuous variable.

Table 3.6.2

The Specification of Socio-economic Variables

FAMIZS : Number of Adults

        = 1 1 person family
        = 2 2 person family
        = 3 3 person family
        = 4 4 person family
        = 5 5 person family

NCHILD : Number of Children

        = 0 no child
        = 1 1 child
        = 2 2 children
        = 3 3 children
        = 4 4 children
        = 5 5 or more children

AGE   : Age of the Respondent

        = 1 under 18
        = 2 14 - 24
        = 3 25 - 34
        = 4 35 - 44
        = 5 45 - 54
        = 6 55 - 64
        = 7 65 or more

SEX   : Sex of the Respondent

        = 1 Male
        = 0 female

Alternative-specific constants (ASCs) are made up of twelve constant terms which were specified as 0 for Fairview Park Mall and 1s for all other centres. Such codings of alternative-specific constants reflect the fact that Fairview Park Mall is the largest of the shopping centres and serves as the only regional shopping centre in the study area. Hopefully, these variables can represent the individual's choice differences between the regional and the "local" shopping alternatives.

Practically, the first group of variables, attributes of shopping destinations, are to be used as generic variables in the MNL model estimation, while the other two groups of variables, socio-economic variables and alternative-specific constants, are considered as alternative-specific variables.

(3) Estimation of The MNL Model

The above-defined dependent and independent variables are included in the MNL model which has a general functional form shown as equation (1) (Ben-Akiva, 1984, pp.35-75):

$$P_{ir} = \frac{e^{\beta_i V_{ir}}}{\sum_{j\in A} e^{\beta_i V_{ij}}} \qquad\qquad r \neq j \in A \qquad\qquad (1)$$

where: P_{ir} is a choice probability of an individual i choosing alternative r;

β_i is a vector of unknown parameters.

V_{ij} is a vector of empirical functions which depend on unknown

parameters.

A is the choice set by individual i

A well-developed computer programm named "Setup" was used to estimate the model by

59

employing a Newton-Raphson procedure. Specifically, the MNL model estimation included the following steps:

First, the functional form of the MNL model represented in equation (1) was defined as:

$$P_{ir} = \frac{e^{\beta_i V_{ir}}}{\sum_{j \in A} e^{\beta_i V_{ij}}} \qquad r \neq j \in A \qquad (2)$$

where: A is the choice set containing CAMCBD, CAMJGM, CAMSHM, CAMSCC, KITCBD, KITFPM, KITFGM, KITFDM, KITSPM, KITMSQ, WATCTM, WATTSQ, WATWMP.

V_{ir}, V_{ij} = systematic utility function of each shopping area identified by an individual i.

β_i is the vector of parameters to be estimated.

Secondly, the systematic utility function, V_{ir}, was defined initially by including all variables, twelve alternative-specific constants; the attributes of the shopping centres (SMSF, OFSF, PSSF, OSSF, DMSF and DIST) and socio-economic characteristics (age, sex, income, FAMISZ, NCHILD), and is assumed to have the functional form of linear-in-parameters. The purpose of this step was to establish what is called the "base model" (Ben-Akiva & Lerman, 1985, pp.46) from which the researcher could obtain an overall view of the appropriateness of model specification. In this study, the base model had the value of RHO square 0.28, which is acceptable statistically in the application of the MNL model.

Thirdly, the base model was further estimated by eliminating what is termed "irrelevant variable" (Ben-Akiva & Lerman, 1985, pp.46). This variable, statistically, had the lowest value

of T-Statistic,

which is considered to be insignificant at the 0.05 level. More specifically, the variable with such a T-Statistic value, SMSF, in the base model was the first to be eliminated, and a new model specification was obtained. Then, the "most irrelevant variable" in the new model specification, household income, was omitted and, in turn, the variables of age and sex. By eliminating the insignificant variable each time, the final model specification was arrived at as shown in Table 3.6.3. In this final model specification, all variables were statistically significant at the 0.01 or the 0.05 level in terms of their T-Statistic values, and thus, were thought to be behaviorally relevant variables for this study. All findings and their behavioral interpretations rely entirely on the results of the estimation of final model specification.

TABLE 3.6.3 FINAL MNL MODEL SPECIFICATION

NAME	ASC1	ASC2	OFSF	PSSF	OSSF	DMSF	DIST	NCHILD	FAMISZ
1 CAMCBD	0	0	of1[1]	ps1[2]	os1[3]	dm1[4]	dt1[5]		
2 CAMJGM	1	0	of2	ps2	os2	dm2	dt2		
3 CAMSHM	0	0	of3	ps3	os3	dm3	dt3		
4 CAMSCC	0	0	of4	ps4	os4	dm4	dt4		
5 KITCBD	0	0	of5	ps5	os5	dm5	dt5		
6 KITFPM	0	0	of6	ps6	os6	dm6	dt6	nc[6]	fs[7]
7 KITFGM	0	0	of7	ps7	os7	dm7	dt7		
8 KITFDM	0	0	of8	ps8	os8	dm8	dt8		
9 KITSPM	0	0	of9	ps9	os9	dm9	dt9		
10 KITMSQ	0	0	of10	ps10	os10	dm10	dt10		
11 WATCTM	0	1	of11	ps11	os11	dm11	dt11		
12 WATTSQ	0	0	of12	ps12	os12	dm12	dt12		
13 WATWMP	0	0	of13	ps13	os13	dm13	dt13		

---

[1] The name of the variable of the other food service square footage in the shopping centre.

[2] The name of the variable of personal service square footage in the shopping centre.

[3] The name of the variable of the other service square footage in the shopping centre.

[4] The name of the variable of the DSTM square footage in the shopping centre.

[5] The name of the variable of the distance to the shopping centre.

[6] The name of the variable of number of children in a household.

[7] The name of the variable of family size of a household.

62

ANALYSIS OF THE RESULTS

4.1 Introduction

This chapter focuses on the analysis of the subsample survey data. Specifically, section 4.2 presents the findings of the data set of this study and section 4.3 provides the outcome of MNL model estimation. This section includes, step by step, the analyses of individual variables and their behavioral interpretations. The examination of "irrelevant" (Ben-Akiva & Lerman, 1985) variables, which are considered as a major part of this research, is firstly given. The discussions on each of the statistically and behaviorally relevant variables are then presented. The results of a frequency analysis centred at both regional and subregional levels are to be given in section 4.3, and section 4.4 finally sums up the chapter.

4.2 Data Results

Tables 4.1 through 4.3 report the results of subsample data. These tables suggest that:

(1) Table 4.1 shows that consumers in Waterloo have higher average annual DSTM expenditures than the other sub-regions, and followed by shoppers in Cambridge and Kitchener. Expenditures by individuals from Rural Waterloo are observed to be the lowest.

TABLE 4.1

AVERAGE ANNUAL DSTM EXPENDITURE
(SUBSAMPLE)
FOR EACH SUBREGION

AREA	CASES	DSTM EXPENDITURE
Cambridge	248	$3095
Kitchener	109	$2846
Waterloo	42	$3270
Rural-Waterloo	13	$1791
	----	-----
	412	$2751

(2) Table 4.2 reports that there exist four types of centres as categorized by the age of patrons. The first type is those centres which attract mainly young shoppers. These centres are: Downtown Kitchener, Fairview Park Mall and Waterloo Town Square. These shopping areas represent the downtown areas and the primary regional shopping centre. They provide additional services besides DSTM purchasing and thus are attractive for young consumers. The second type is centres to which senior citizens are drawn. Centres with such a consumer age structure include Westmount Mall and Stanley Park Centre. These two centres are neighbourhood centres and provide a relatively comfortable shopping environment: few crowds, easy access and so on. The third type consists of the centres attracting middle-aged shoppers. John Galt Centre, Forest Glen and Frederick Mall have such a consumer age structure. The rest of the centres fall into the fourth category; namely centres which attract consumers in all age groups.

(3) For the variable of the number of children, Table 4.3 shows that the more than half the shoppers for each centre belong to no children families. For three centres, Westmount Mall, Waterloo Town Square and Forest Glen Centre, the number belonging to such households exceeds 70 percent. For the centres in the city of Waterloo, Westmount Mall and Waterloo Town Square, the extremely high percentage of shoppers with no children family could be explained by the fact that these two centres are located within walking distance of two universities with large populations of single students.

TABLE 4.2

SHOPPERS' AGE STRUCTURE
FOR EACH CENTRE

CENTRE NAME	AGE GROUP[1]						
	1	2	3	4	5	6	7
CAMCBD	3	23	43	32	26	20	32
	1.7	12.8	24.0	17.9	14.5	11.2	17.9(%)
CAMJGM	2	26	59	44	24	22	15
	1.0	13.5	30.7	22.9	12.5	11.5	7.8(%)
CAMSHM		15	5	6	4	1	
		48.8	16.1	19.4	12.9	3.2(%)	
CAMSCC	1	21	46	36	20	16	24
	0.6	12.8	28.0	22.0	12.2	9.8	14.4(%)
KITCBD	1	22	26	11	16	13	10
	1.0	22.2	26.3	11.1	16.2	13.1	10.1(%)
KITFPM	2	39	62	47	29	28	27
	0.9	16.7	26.5	20.1	12.4	12.0	11.5(%)
KITFGM		5	12	7	10	11	9
		9.3	22.2	13.0	18.5	20.4	16.7(%)
KITFGM		2	6	7	9	4	3
		6.5	19.4	22.6	29.0	12.9	9.7(%)
KITSPM		6	5	8	6	2	7
		17.6	14.7	23.5	17.6	5.9	20.6(%)
KITMSQ	1	21	46	36	20	16	24
	0.6	12.8	28.0	22.0	12.2	9.8	14.6(%)
WATCTM	1	16	17	11	16	12	7
	1.3	20.0	21.3	13.8	20.0	15.0	8.8(%)
WATTSQ		11	14	5	10	9	7
		19.6	25.0	8.9	17.9	16.1	12.5(%)
WATWTM	1	4	4	4	5	7	3
	3.6	14.3	14.3	14.3	17.9	25.0	10.7(%)

---

[1] Age group is defined as: 1, under 18; 2, 14-24; 3, 25-34; 4, 35-44; 5, 45-54; 6, 55-64; 7, over 65.

TABLE 4.3

SHOPPER'S FAMILY STRUCTURE
FOR EACH CENTRE

CENTRE NAME	NUMBER OF CHILDREN					
	0	1	2	3	4	5+
CAMCBD	96	33	40	8	2	
	53.6	18.4	22.3	4.5	1.1(%)	
CAMJGM	87	37	50	14	3	1
	45.3	19.3	26.0	7.3	1.6	0.5
CAMSHM	15	5	6	4	1	
	48.4	16.1	19.4	12.9	3.2	
CAMSCC	73	31	44	12	3	1
	44.5	18.9	26.8	7.3	1.8	0.6
KITCBD	59	20	13	6	1	
	59.6	20.2	13.1	6.1	1.0	
KITFPM	123	37	52	19	3	
	52.6	15.8	22.2	8.1	1.3	
KITFGM	39	8	6	1		
	72.2	14.8	11.1	1.9		
KITFDM	17	3	7	4	2	
	54.8	9.7	22.6	9.7	3.2	
KITSPM	21	4	8	1		
	61.8	11.8	23.5	2.9		
KITMSQ	73	31	44	12	3	1
	44.5	18.9	26.8	7.3	1.8	0.6
WATCTM	50	13	12	4	1	
	62.5	16.3	15.0	5.0	1.3	
WATTSQ	41	4	7	3	1	
	73.2	7.1	12.5	5.4	1.8	
WATWTM	20	3	5			
	71.4	10.7	17.9			

67

(4) Table 4.4 presents the DSTM expenditure structure for each centre. The table indicates that, except for Fairview Park Mall, the majority of shoppers (more than 90 percent) for all centres falls into the first category (less than $1,000 annually). This structure of the consumer's DSTM spending on the shopping centres/CBDs reflects the fact that, on the one hand, most shoppers do not confine their DSTM shopping activities to a single centre, and on the other hand, however, an individual's DSTM shopping needs can not be fully satisfied by any single centre in most cases. Fairview Park Mall is slightly different from the others. Due to more DSTM services as represented by more DSTM square footage, the percentage of first-category consumers declines to 70 percent, while shoppers in other categories increase accordingly.

TABLE 4.4

**SHOPPER'S DSTM EXPENDITURE CATEGORY
FOR EACH CENTRE**

| CENTRE NAME | DSTM EXPENDITURE CATEGORY[2] | | | | | |
	1	2	3	4	5	6+
CAMCBD	155	14	4	2	3	1
	86.6	7.8	2.2	1.1	1.7	.6(%)
CAMJGM	175	11	4	1	1	
	91.1	5.7	2.1	0.5	0.5(%)	
CAMSHM	29	2				
	93.5	6.5(%)				
CAMSCC	152	10	1	1		
	92.7	6.1	0.6	0.6(%)		
KITCBD	97	1	1			
	98.0	1.0	1.0(%)			
KITFPM	166	38	23	4	2	1
	70.9	16.2	9.8	1.7	0.9	0.4(%)
KITFGM	27			1		
	96.4			3.6(%)		
KITFDM	30	1				
	96.8	3.2(%)				
KITSPM	32	1				1
	94.1	2.9				2.9(%)
KITMSQ	152	10	1	1		
	92.7	6.1	0.6	0.6(%)		
WATCTM	78	2				
	97.5	2.5(%)				
WATTSQ	55			1		
	98.2			1.8(%)		
WATWTM	26	1			1	
	92.9	3.6			3.6(%)	

---

[2] DSTM expenditure category is defined as: 1, <$1,000; 2, $1,001-$2000; 3, $2,001-$3,000; 4, $3,001-$4,000; 5, $4,001-$5,000; 6+, >$5,001.

(5) Figures 4.1 to 4.13 illustrate spatial shopping behaviour by consumers for each of the centres. These figures clearly show that the centres in this study area can roughly be categorized into four groups in regard to distance-decay types.

The first group includes Cambridge Shopper's Mall, Forest Glen Centre, Frederick Mall, Stanley Park Mall, Market Square, Westmount Mall and Downtown Cambridge. These centres display a standard distance-decay pattern; a steady decrease in the consumer's choice probability as distance increases. Such a pattern of spatial decay is probably due to the fact that, most of these centres are small in size and located in residential areas, and hence their influence declines gradually in space.

The second group includes the centres such as Fairview Park Mall, Conestoga Mall and Downtown Kitchener. The distinctiveness of their distance-decay curves is that the choice probability of an individual does not solely decline spatially; rather, the curves rise at a certain distance from each centre (15-20 driving minutes for Downtown Kitchener and Fairview Park Mall and 10-20 for Conestoga Mall). Such a pattern of spatial interaction is mainly the result of their DSTM attractions and the locations: through a major highway or King Street, shoppers within those distances can easily get to the centres in order to have a wider range of DSTM choices.

Centres like Waterloo Town Square and South Cambridge Centre are in the third group. These centres display spatial interactions with the consumer such that choice probability rises up to the first 10 driving minutes and deceases beyond that limit.

The last group consists of John Galt Mall only. It appears that for the first 15 driving minutes, spatial choice remains the same. Beyond that, it drops. The reasons accounting for the

Distance-Decay
Fairview Park Mall

percentage

driving time
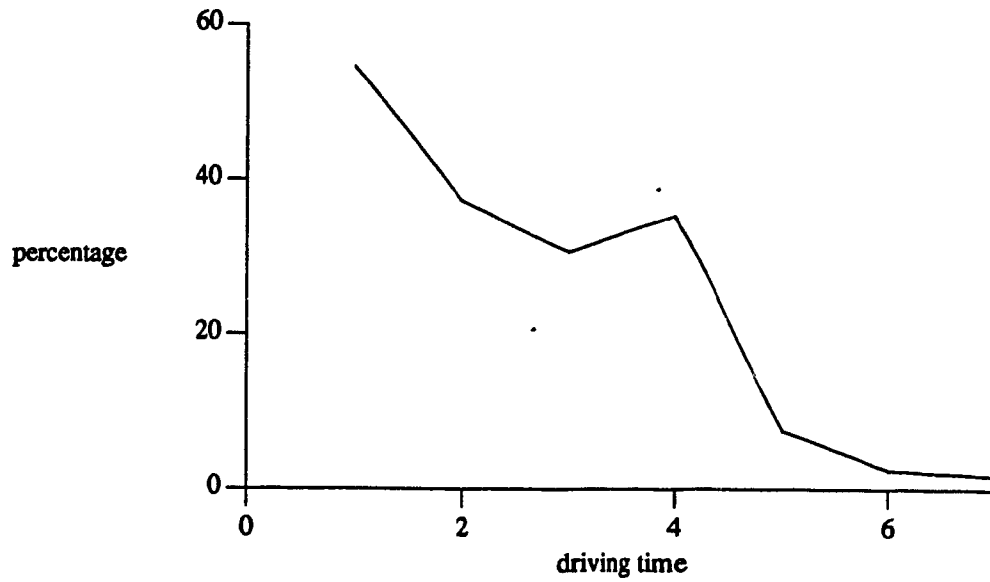
Figure 4.1

Distance-Decay
Downtown Kitchener

percentage

driving time
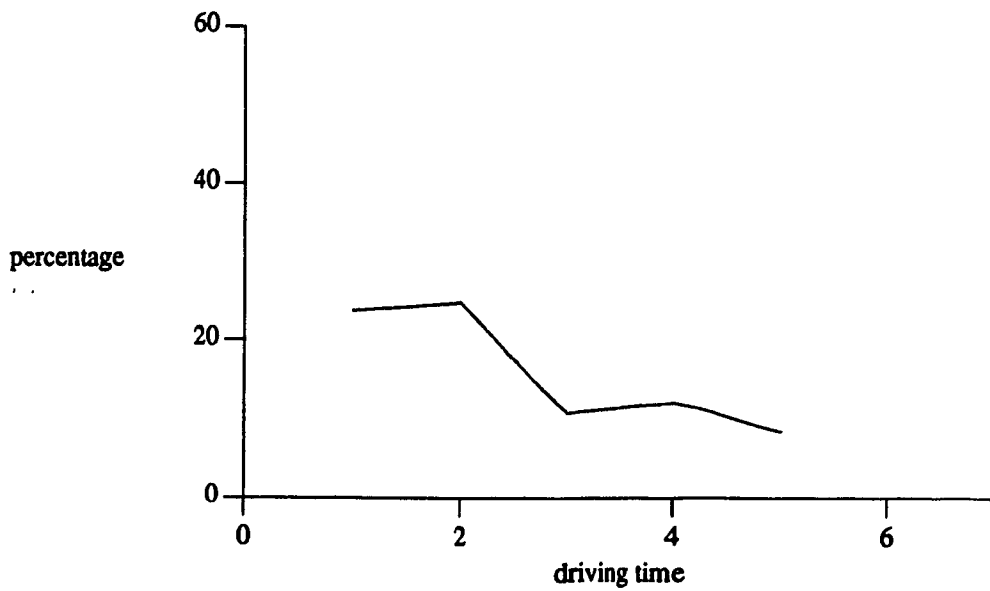
Figure 4.2

Distance-Decay
Cambridge Shopperr's Mall
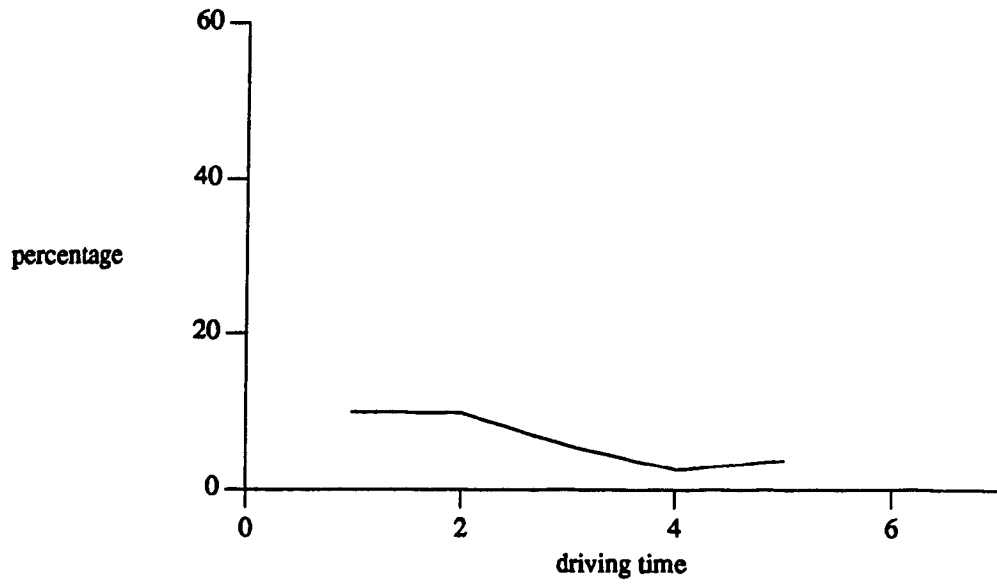
Figure 4.3

Distance-Decay
Downtown Cambridge
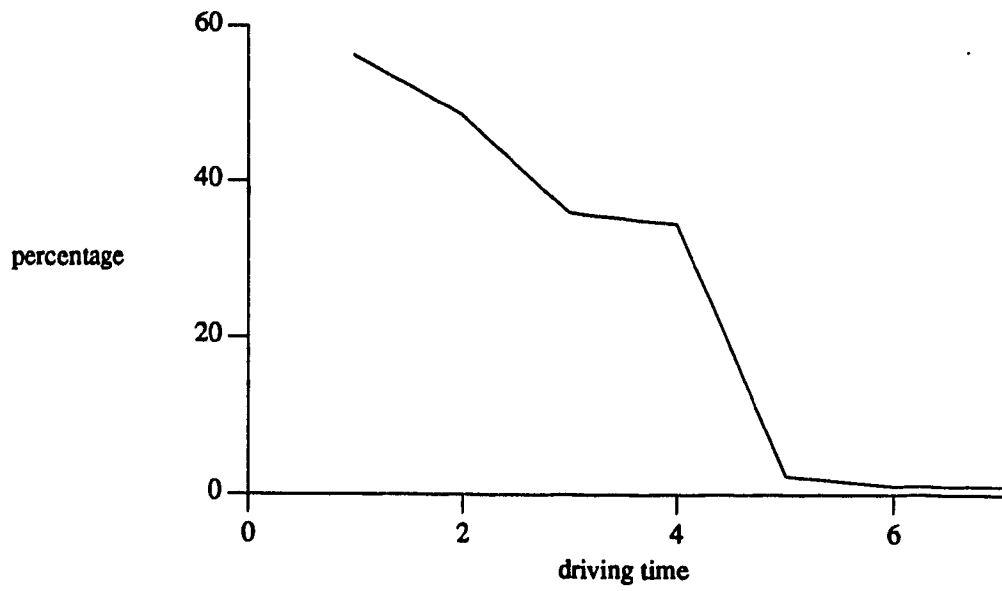
Figure 4.4

Distance-Decay
South Cambridge Centre

Figure 4.5

Distance-Decay
John Galt Mall

Figure 4.6

73

Distance-Decay
Conestoga Mall
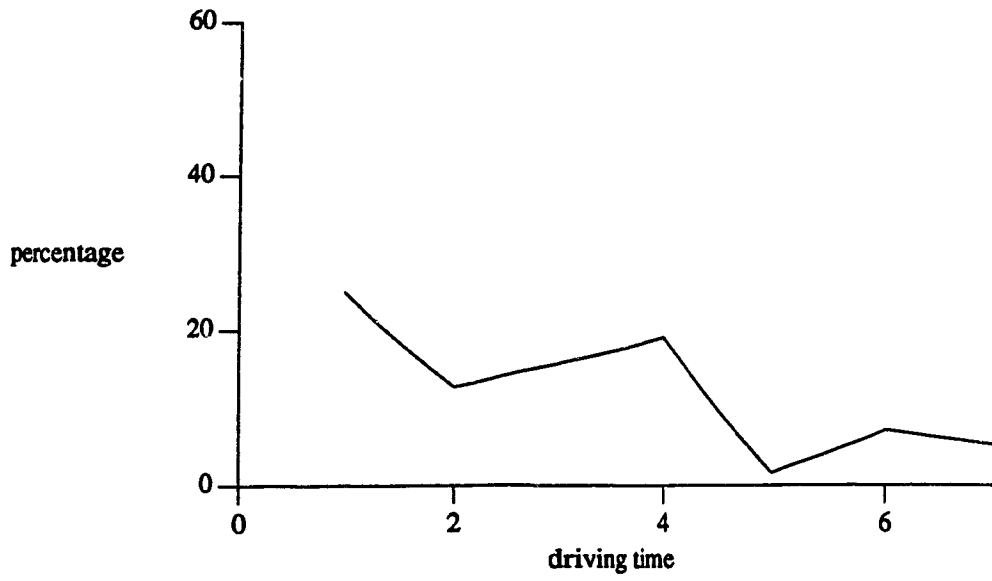
Figure 4.7

Distance-Decay
Waterloo Town Square
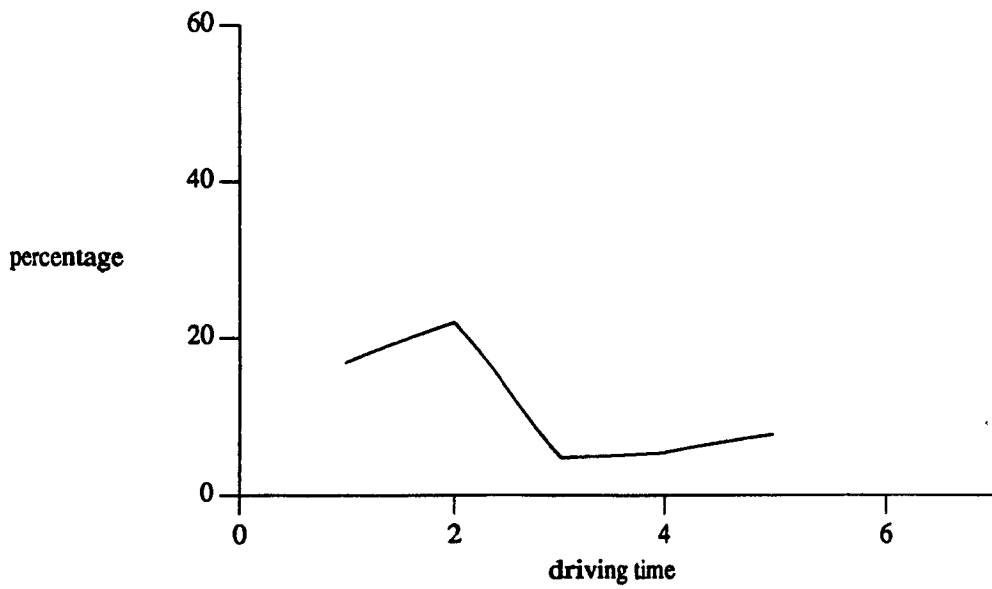
Figure 4.8

Distance-Decay
Westmount Mall
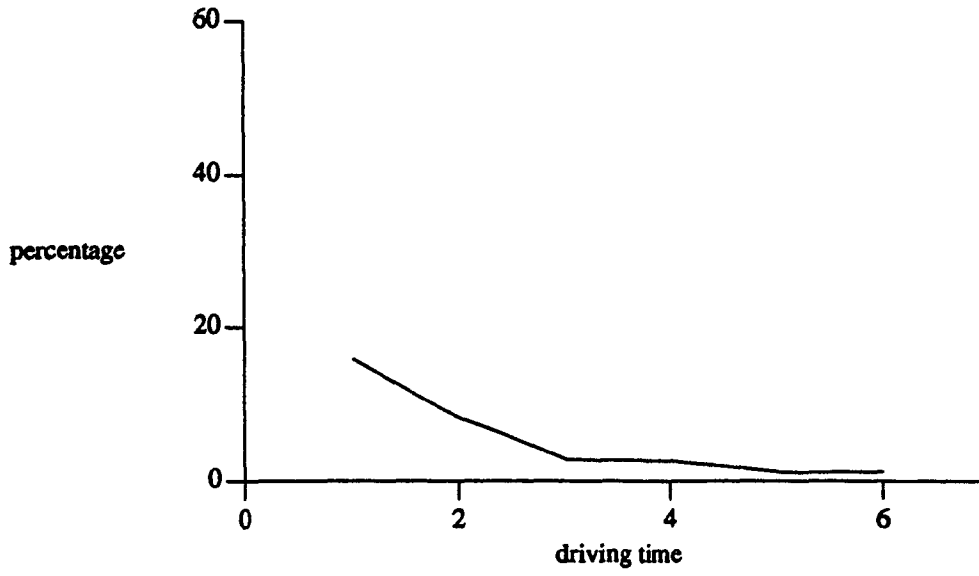
Figure 4.9

Distance-Decay
Market Square
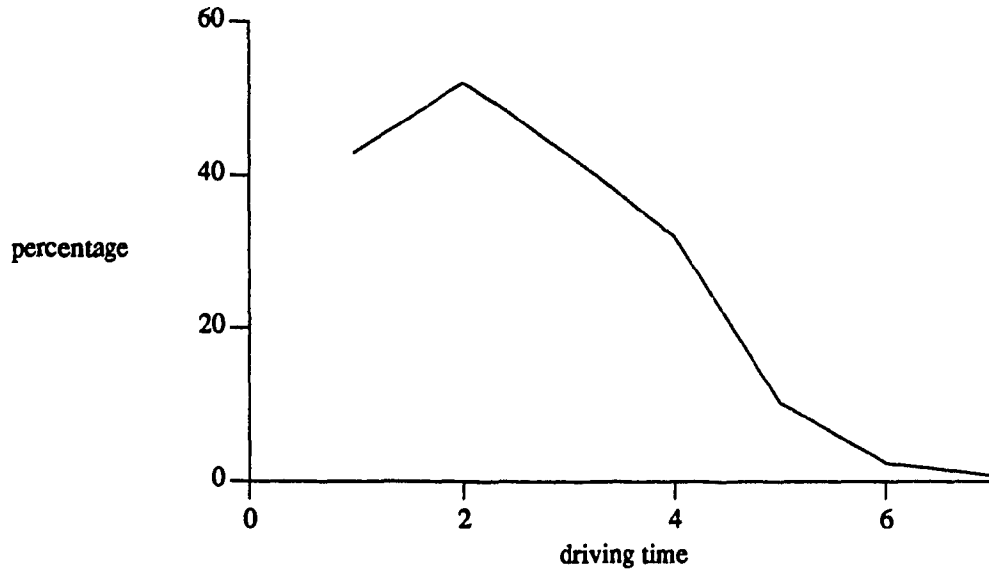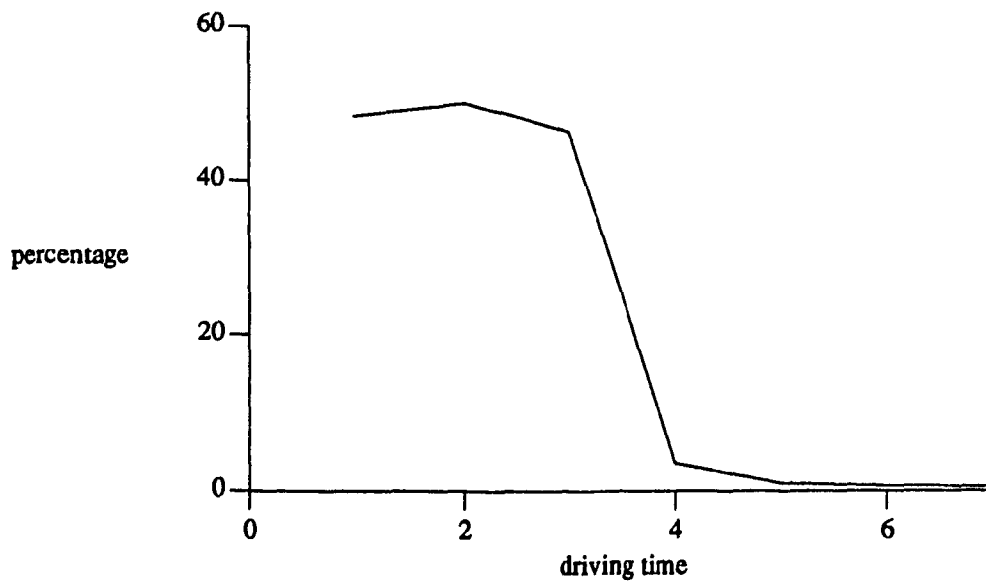

Figure 4.10

75
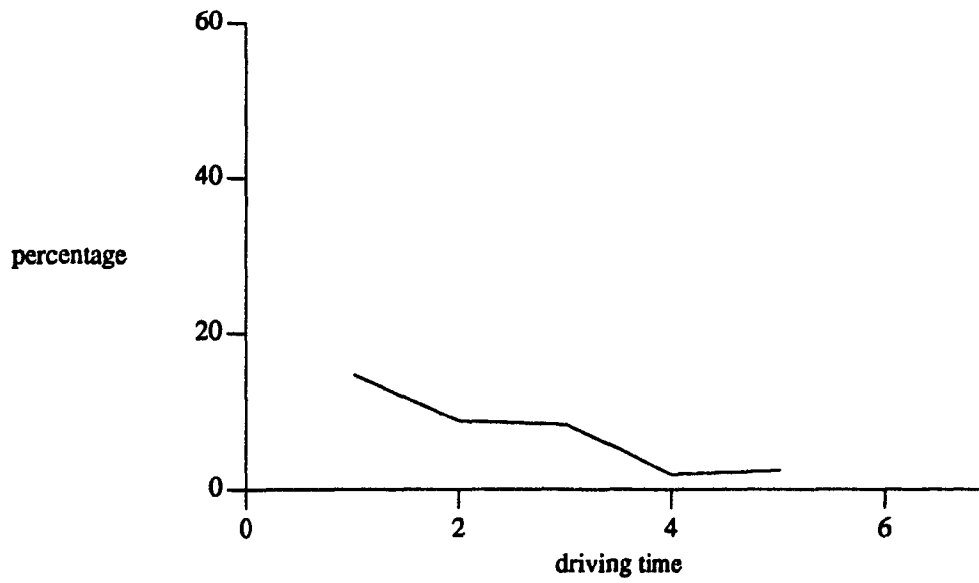
Distance-Decay
Forest Glen Centre
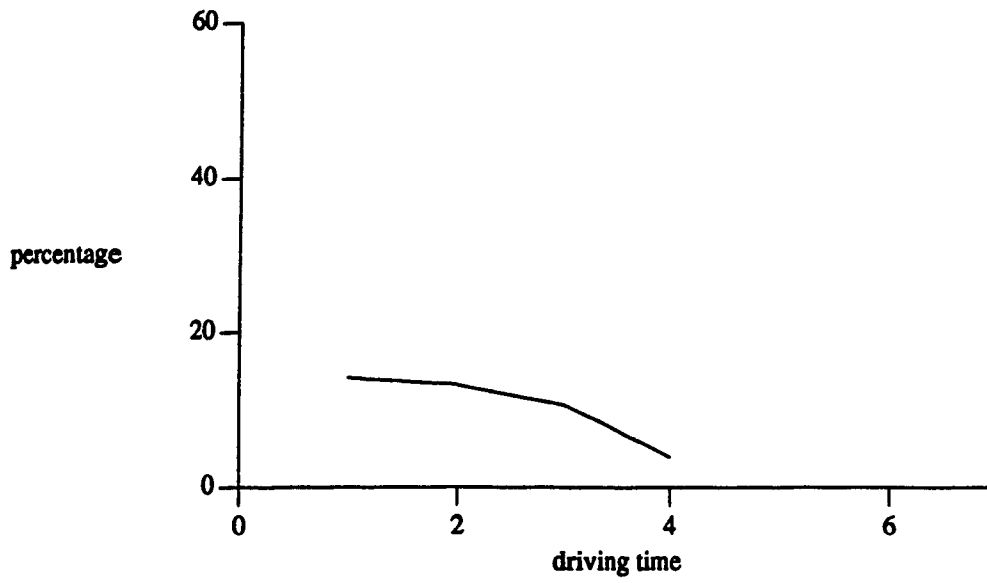
Figure 4.11

Distance-Decay
Stanley Park Mall

Figure 4.12

76
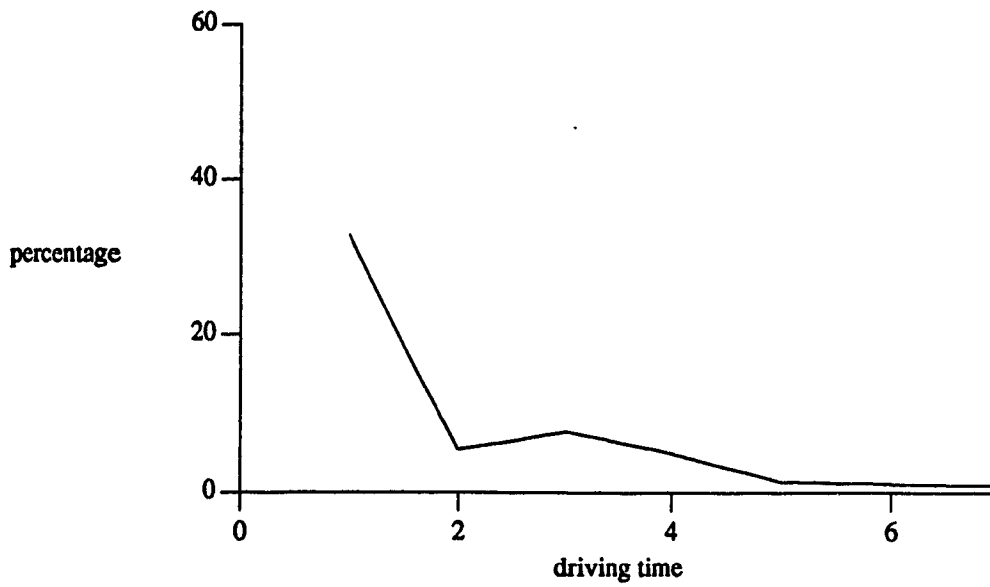
Distance-Decay
Frederick Mall
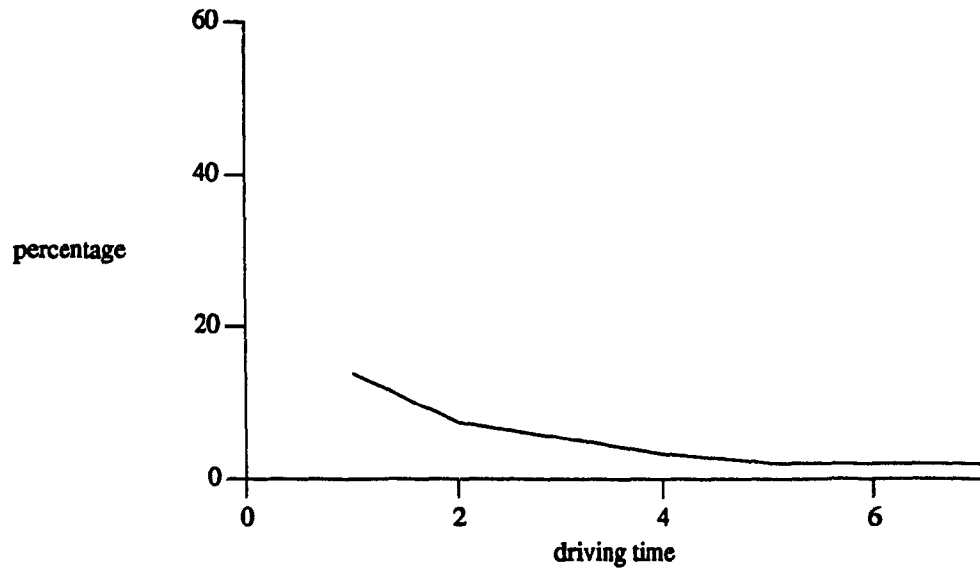
Figure 4.13

last two groups may be location; more precisely, the centres' locations within residential regions.

All these tables and figures illustrate consumer spatial shopping behaviour at the study region. Through the discussions of the subsample data above, the conclusion can be drawn as: the spatial consideration is an important factor influencing the consumer's DSTM shopping activities. Figure 4.1 through 4.13 suggest that shoppers do not generally take long trip (more than 20 driving minutes to regional and sub-regional shopping centres; and 10 driving minutes to "local" ones) to do their non-grocery shopping.

The above finding represent the collective consumer spatial choice behaviour to some extent. Some questions may arise, however, as to how an individual evaluates a shopping centre, what is the most important factor to be considered by the consumer when making his/her shopping decision on where to shop, and how a person's household characteristics like the number of children, influences his/her decision-making process. The next section of this chapter is to examine the shopper's attitudes towards the shopping centre and answer the questions proposed above.

4.3 The MNL Model Finding: Irrelevant Variables

Table 4.5 reports the best results obtained when the MNL model was estimated and the respective estimating equation is to be seen to provide a good fit of the model, as denoted as Rho-Square statistics.

Table 4.5

MNL MODEL ESTIMATION RESULT

Var. No.	Var. Name	Coefficient Estimated	Asytopitic Standard-Error	T-Statistic
1	ASC1 (specific to CAMJGM)	0.27	0.0399	6.3539
2	ASC2 (specific to WATCTM)	0.15	0.0588	2.2509
3	DMSF(generic)	0.024	0.0035	7.2437
4	OFSF(gereric)	0.015	0.0027	5.7479
5	PSSF(generic)	0.028	0.0059	4.7972
6	OSSF(generic)	0.024	0.0061	4.1565
7	DIST(generic)	-0.28	0.0217	-12.9447
8	FAMISZ (specific to KJTFPM)	0.177	0.0091	1.9655
9	NCHILD (specific to KJTFPM)	-0.199	0.108	-1.8308

Summary statistics:

No. of weighted observations:	412
No. of cases:	4932
No. of parameters:	9
Degrees of freedom:	4923
Log likelihood at B=0:	-1054.2
Log likelihood at conv.:	-751.9
Log likelihood ration:	604.7
RHO-square:	.2868
Adjusted RHO-square:	.2854

Before further discussions, some points should be made.

First, it is observed in Table 4.5 that all generic variables are statistically significant at a level of 0.01 and that alternative-specific variables, except for ASCs, are at the 0.10 level. This indicates that an individual's non-grocery shopping destination choice depends mainly upon the generic attributes of a shopping area. Moreover, it also indicates that an individual does not take the SMSF variable, representing supermarket service, into his/her account when evaluating the DSTM attractiveness of a shopping area.

Secondly, it is also observed in Table 4.5 that the variable of distance is dominant over all others, which implies that an individual's shopping mall choice depends on the extent to which an alternative minimizes his/her spatial concerns in the study area. Actually, the concept of distance in behavioral studies does not simply mean the geographical separation, as several studies have already pointed out (McCarthy, 1980; Buchanan, 1982; Louviere, 1981; Landau, Joseph & Alpern, 1982; etc.). Rather, it reflects those concerns related to spatial deterrence, such as trip safety, trip convenience, trip cost and time constraints, etc. Thus it is not surprising that in this medium sized urban-based area, an individual takes spatial intervention as the most important factor to be considered in his/her choice of centres. Table 4.5 further shows that the attributes of a shopping area follow spatial concerns in terms of T-statistic values, as factors to be taken into account by a consumer in his/her spatial choice decision-making. Among these attributes, DMSF is first, followed by PSSF, OFSF and OSSF. This order makes much sense because the attribute of DMSF directly affects the complexity of an individual's shopping activities, while other attributes of the shopping area merely affect his/her non-shopping needs and/or enjoyments associated with shopping activities.

80

In short, the ranked order of the generic variables, according to their T-statistic values, in the estimation equation shows that a consumer's non-food spatial choice behaviour is mainly spatially-determined. Attributes of a shopping area also affect consumers' spatial choice behaviour. However, the influence of each individual variable on an individual's spatial choice behaviour still needs further discussion and section 4.3 will focus on this.

Thirdly, two variables representing an individual's household characteristics, FAMISZ and NCHILD, remain in the estimating equation due to their significant performance statistically. Due to their specifications, this result suggests that an individual's mall choice to regional and "local" shopping centres is obviously influenced by such household characteristics as number of adults and children in the household. The detailed discussions of these two variables will also be given in section 4.3.

Finally, due to the "unexpected" elimination of variables such as shopper's age and sex from the final model specification, a paired T-Test with these two variables was undertaken to ensure the outcome of the MNL model estimation procedure. Table 4.6 fully reports the results of this test and will be referred to when needed in the coming discussions.

TABLE 4.6

PAIRED T-TEST

AT ANNUAL DSTM EXPENDITURE

ON FAIRVIEW PARK MALL

BY SEX AND AGE

Var Name Groups	Observed T-Stat Values	Two-Tailed Probability	Null Hypo -thesis
1. SEX			
Male - Female	-1.70	0.091	Not Reject
2. AGE			
<18 - 14 to 24	-3.30	0.10	R
<18 - 25 to 34	-4.63	0.04	R
<18 - 35 to 44	-4.07	0.002	R
<18 - 45 to 54	-3.71	0.001	R
<18 - 55 to 64	-2.61	0.030	R
<18 - 65 +	-1.46	0.207	NR
14 to 24 - 25 to 34	-0.76	0.449	NR
14 to 24 - 35 to 44	-0.78	0.439	NR
14 to 24 - 45 to 54	-1.30	0.199	NR
14 to 24 - 55 to 64	0.70	0.488	NR
14 to 24 - 65 +	2.16	0.033	R
25 to 34 - 35 to 44 -	0.13	0.900	NR
25 to 34 - 45 to 54	0.86	0.394	NR
25 to 34 - 55 to 64	1.66	0.100	NR
25 to 34 - 65 +	3.74	0.001	R
35 to 44 - 45 to 54	0.72	0.476	NR
35 to 44 - 55 to 64	1.55	0.125	NR
35 to 44 - 65 +	3.19	0.002	R
45 to 54 - 55 to 64	1.87	0.065	NR
45 to 54 - 65 +	2.99	0.004	R
55 to 64 - 65 +	1.52	0.133	R

4.2.1 SMSF, supermarket square footage in a centre:

The elimination of this variable from the final model specification is not without significance. This result shows that supermarket service in a shopping centre is not an influential factor in an individual's decision-making on where to shop for non-food items. More precisely speaking, a supermarket service in a shopping mall does not increase a shopper's choice probability of that shopping centre. Thus, this variable is considered to be an irrelevant variable in this study. This result is consistent with previous studies (Recker & Kostyniuk, 1978; Koppleman & Hauser, 1978, for instances), which demonstrated that consumers' grocery and non-food shopping trips were actually separated. The major concerns by an individual are the factors as time constraints, shopping enjoyment (grocery shopping is always less enjoyable than non-grocery shopping for the consumer, especially for household), and so on.

It is worth noting that an individual's separated grocery and non-grocery shopping behaviour significantly influences the success of mall management in a regional shopping centre like Fairview Park Mall. The fact was that, due to financial difficulties, the supermarket (Zehr's) in this regional shopping centre was closed in 1986 when the survey was undertaken. The successfulness of the mall management was partly because of the consumers' separated shopping behaviour. In fact, a regional shopping centre like Fairview Park Mall interested people primarily by its wider range of DSTM merchandise choices which might not be met by community or convenience centres and strip stores nearby, not by its supermarket services. From this point of view, the failure of supermarket service in this regional centre is not out of a command sense.

83

With this regard, this study would argue the appropriateness of the proposal which suggested a supermarket in the proposed new regional shopping centre, Cambridge Mall, in the city of Cambridge, Ontario.

4.2.2 Household income

This variable was unexpectedly eliminated from the final specification of the model. The elimination of income variable is probably, from a statistical perspective, due to what Manski (1973) termed "instrumental variable error" (Ben-Akiva & lerman, 1985, pp.74), because the measurement of a household income was actually the amount of annual non-grocery expenditure by that household, not its income per se (see Chapter III, section 3.6.1). However, from a behavioral point of view, the omit of income variable may reflect the fact that shopping centres, unlike other retail forms, are not initially designed to provide specific services for a particular group of consumers in terms of their income. Rather, the primary aim of planning a shopping centre is often to attract as many shoppers from as far as away as possible. Therefore, the poor statistical performance of income variable in the estimating equation is not as surprising as it may seem at first glance.

4.2.3 Respondents' Age and Sex

These two variables, characterizing household heads who were often female adults in the survey, are also not included in the final model specification. Upon the specifications in the

84

model, the exclusion of these two variables are behaviorally understandable: the age and sex of a household head do not increase DSTM shopping centre choice probability for the regional shopping centre, Fairview Park Mall, by the household. This makes much sense because non-food shopping activities of a household are not solely determined by its household head. Instead, such shopping endeavour of a household is more often based upon the shopping needs of whole household. This explanation is supported by the fact that, in the same model specification, the variables representing a whole household, such as number of children and adults, are statistically significant and behaviorally meaningful, in contrast to those variables like age and sex of household head. This interpretation is also sustained by that demonstrated by the paired T-test shown in Table 4.6. The Table illustrated that firstly, a similarity in the average of annual DSTM expenditure at the regional shopping centre is found between male and female consumers. The analogy is also found for the age groups except those groups of under 18 and over 65. The behavioral differences for the shoppers aging over 65 are obvious because, on the one hand, these people are probably too old physically to take long shopping trips safely to Fairview Park Mall. On the other hand, their DSTM shopping needs are somehow overmatured. These social and physical constraints make their DSTM shopping behaviour apparently different from other shoppers. For the consumers aging under 18, the subsample data merely provides 2 individuals. The lack of the information required by a behavioral study like this analysis is apparent. This study is thus unable to further investigate the shopping behaviour of consumers in this age group.

Given the discussions above for the irrelevant variables, the findings of MNL model estimation are presented as following.

4.3 The MNL Model Finding: Explanatory Variables

4.3.1 Distance

This variable was estimated as the most influential factor in an individual's DSTM shopping decision-making process in this medium sized urban-based area. The estimating equation indicates that this variable has a negative and exponential relation to the centre choice probability. Behaviorally speaking, the negatively exponential relation implies that each consumer has his/her own acceptable shopping distance (threshold level) regarding how far he/she is willing to travel for non-food purchasing. Within the range of spatial acceptance, the increase of distance significantly decreases the choice probability. On the other hand, the destinations beyond the shopping distance are generally not to be taken into a shopper's choice set. How to determine this threshold level (shopping distance) is still a major concern for behavioral studies in marketing geography. This study is to utilize a mall choice frequency analysis to ascertain average consumers' distance threshold level in this medium size area. Section 4.4 will centre on this frequency analysis and the findings will be represented accordingly.

4.3.2 DSTM Square Footage (DMSF)

This variable is used as a quantitative measurement of DSTM attractiveness of a shopping centre in this study. Such a measurement is not uncommon in studies in marketing geography

for modelling consumers' spatial choice behaviour (Jones & Simmons, 1987; McCarthy, 1980; Koppleman & Hauser, 1978; Potter, 1982; Recker & Kostyniuk, 1978; Spencer, 1978; Picton, 1986; Simpson, 1986, for instance).

The parameter estimated in the model has a positive sign and an extremely low value. The interpretation can thus be that, first of all, the positive sign indicates that DSTM services in a centre increase an individual's choice probability for that centre. That is to say, all else being equal, a consumer is like to choose the centre with larger DSTM square footage to satisfy his/her extensive non-grocery shopping desires. Secondly, the extremely low parameter value reveals that DSTM services in a centre are almost linearly related to an individual's probability of patronage. In other words, changes in DSTM services in a centre will strongly affect a shopper's decision to shop at that centre.

4.3.3 Other Food Services (OFSF)

This variable is treated as a measurement of food services except a supermarket, such as fast food services and restaurants, etc. The model estimation has shown that the effect of this variable varies on the choice probability of a consumer regarding different types of shopping destinations in the study area.

For shopping centres, this variable is estimated having a positive influence. This means that, all else being equal, increases in other food services in a centre will enhance a shopper's patronage of that centre for non-grocery purchasing. This result is behaviourally meaningful. Shoppers are usually prefer the centre with more other food services because that a shopping

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
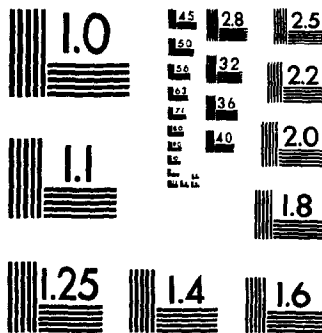
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

activity do not simply mean purchasing. More other food services always marks more pleasure and convenience for consumers. It is especially the case for a household's shopping behaviour like that of this study.

The low estimated parameter value of this variable indicates that other food services in a centre have approximately lineal relation to an individual's shopping centre choice probability. In other words, compared to the estimated value of variable DSTM square footage (DMSF), this variable has a influence on the consumer's choice, but not as crucially as that of DMSF.

However, for the CBDs, the model estimation provides an insignificant parameter (lower T-Statistic value than an acceptable level). The insignificance may reflect the fact that other food services do not affect an individual's the CBDs choice probability. It is the case for this study area in which the CBDs are generally a large geographical area. The retail firms in the CBDs are primarily not planned, managed and owned as a unit in which an internal relationship is managerially essential, like that of a shopping centre. In another word, the "unit effect" in the CBDs is not as obvious as that in shopping centres. Changes in other food services thus do not affect a consumer's CBD choice probability as directly as that of shopping centres.

4.3.4 Services (PSSF and OSSF)

The two variables together serve as a quantitative measurement of general services such as recreational centres, commercial banks, dentist offices, etc. in a shopping centre. The model estimation results in positive signs with relatively low parameter values for these two variables. The positive signs indicate that, the more such services in a shopping mall, the more likely an

individual patronizing that centre to do his/her DSTM shopping. The parameter values estimated display a non-linear interaction between these two variables and a shopper's shopping centre choice probability. That is to say, individuals do not take these two variables into the decision-making process as seriously as other influential variables. This result is consistent with that indicated by previous studies under similar circumstances (McCarthy, 1980; Koppleman & Hauser, 1978; Recker & Kostyniuk, 1978; Recker & Schuler, 1981, for example).

4.3.5 Household characteristics (FAMIZS and NCHILD)

The two variables were designed to reflect the choice differences between regional and "local" shopping centres by consumers. The model estimation shows that both variables notably differentiate a household's mall choice towards the regional shopping centre, Fairview Park Mall. However, while both variables have an exponential relation to the choice probability by a household, the variable FAMISZ, number of adults in a household, positively motivate a household's choice probability, the variable NCHILD, number of children in a household, negatively alters the likelihood. The behavioral interpretations of these two variables are thus that, others being equal, as the number of adults in a household increases, the choice probability of the regional centre by that household rises; in contrast, the increase of number of children in a household leads to a rise of possibility of "local" shopping.

Behaviorally speaking, the increase of the number of adults in a household usually implies a raise in monetary income, mobility and time flexibility. These, in general, result in extensive non-grocery shopping desires of the household. Consumers with such a family structure would

89

be more likely to patronize the regional shopping centre to maximize their shopping needs. By contrast, increasing the number of children in a household always leads to a constricted monetary budget, surrendered transportation difficulties, limited leisure time. All of those constraints more likely lead to a "local" shopping through which the DSTM shopping needs can be easily and economically met.

4.3.6 Alternative-Specific Constants (ASC1 and ASC2)

Through the model estimation, two alternative-specific constants, ASC1 for John Galt Mall in the city of Cambridge and ASC2 for Conestoga Mall in the city of Waterloo, remain statistically significant at 0.01 level. The interpretations of the estimated parameters of these two variables are: all else being equal, a shopper prefers John Galt Centre and Conestoga Mall over the others, except Fairview Park Mall. This is the case because the real situation is that these two centres are the largest centres in the city of Cambridge and Waterloo, respectively, and act as the sub-regional shopping centres in the shopping centre hierarchical system in the study area (Picton, 1986; Hall, 1986). Here, more attention should be paid to John Galt Mall. As a planned shopping centre, John Galt Mall is not a large one in the regional shopping centre hierarchy. However, since it is the largest and best one in the city of Cambridge, John Galt Mall's functional role played in the regional hierarchical system is much different from the others with same size. Shoppers', especially Cambridge consumers' preferences on this centre are thus understandable and reasonable. The estimated result of such a consumers' preference is also consistent with tha: estimated by previous studies using a gravity model at the aggregate level (Hecht, 1989; Morgan,

1986, 1987, 1988, for instance).

The above discussions present the a consumer's attitudes towards the selected shopping malls in this study region. However, one question regarding at what degree the distance variable as the most influential factor in an individual's decision-making process remains unclear, which may lead to incomplete interpretations or misunderstandings of a shopper's real behaviour. With this regard, an mall choice frequency analysis is to be undertaken. From this frequency analysis, together with the model findings represented above, some new conclusions are to be found and presented in coming section.

4.4 Shopping Centre Choice Frequency Analysis

The shopping centre choice frequency analysis was undertaken by using a shopper's choice distribution across the malls and CBDs in the study area. A choice is defined here as an element in an individual's actual choice set. In another word, a consumer's choices are those centres and CBDs he/she patronized during the previous year of the survey regardless of the number of times he/she visited and the amounts he/she spent there. Tables 4.7 through 4.10 represent this distribution.

TABLE 4.7

SPATIAL CHOICE DISTRIBUTION
(KITCHENER)

CENTRES NAME	FREQUENCY	PERCENTAGE	CUM PERCENTAGE
1 CAMCBD	2	.4	.4
2 CAMJGM	7	1.3	1.7
3 CAMSHM	1	.2	1.9
4 CAMSCC	1	.2	2.0
5 KITCBD	90	16.7	18.7
6 KITFPM	101	18.7	37.4
7 KITFGM	31	5.7	43.1
8 KITFDM	43	8.0	51.1
9 KITSPM	49	9.1	60.2
10 KITMSQ	65	12.0	72.2
11 WATCTM	62	11.5	83.7
12 WATTSQ	60	11.1	94.8
13 WATWMP	28	5.2	100.0
	--------	----------	
	540	100.0	

93

TABLE 4.8

SPATIAL CHOICE DISTRIBUTION
(CAMBRIDGE)

CENTRES NAME	FREQUENCY	PERCENTAGE	CUM PERCENTAGE
1 CAMCBD	218	20.4	20.4
2 CAMJGM	218	20.4	40.7
3 CAMSHM	59	5.5	46.2
4 CAMSCC	197	18.4	64.6
5 KITCBD	67	6.3	70.9
6 KITFPM	190	17.7	88.6
7 KITFGM	8	.7	89.4
8 KITFDM	11	1.0	90.4
9 KITSPM	5	.5	90.8
10 KITMSQ	34	3.2	94.0
11 WATCTM	45	4.2	98.2
12 WATTSQ	12	1.1	99.3
13 WATWMP	7	.7	100.0
	--------	----------	
	1071	100.0	

TABLE 4.9

SPATIAL CHOICE DISTRIBUTION
(WATERLOO)

CENTRE NAME	FREQUENCY	PERCENTAGE	CUM PERCENTAGE
1 CAMCBD	3	1.5	1.5
2 CAMJGM	1	.5	2.0
3 CAMSHM	0	0	2.0
4 CAMSCC	0	0	2.0
5 KITCBD	34	17.0	19.0
6 KITFPM	32	16.0	35.0
7 KITFGM	1	.0	35.5
8 KITFDM	6	3.0	38.5
9 KITSPM	5	2.5	41.0
10 KITMSQ	18	9.0	50.0
11 WATCTM	35	17.5	67.5
12 WATTSQ	38	19.0	86.5
13 WATWMP	27	13.5	100.0
	--------	---------	
	200	100.0	

TABLE 4.10

SPATIAL CHOICE DISTRIBUTION
(RURAL WATERLOO)

CENTRES NAME	FREQUENCY	PERCENTAGE	CUM PERCENTAGE
1 CAMCBD	2	3.8	3.8
2 CAMJGM	1	1.9	5.7
3 CAMSHM	0	0	5.7
4 CAMSCC	1	1.9	7.5
5 KITCBD	7	13.2	20.8
6 KITFPM	10	18.9	39.6
7 KITFGM	2	3.8	43.4
8 KITFDM	4	7.5	50.9
9 KITSPM	2	3.8	54.7
10 KITMSQ	4	7.5	62.3
11 WATCTM	9	17.0	79.2
12 WATTSQ	7	13.2	92.5
13 WATWMP	4	7.5	100.0
	--------	----------	
	53	100.0	

These tables show that most of consumers' choices are "absorbed" by "local" shopping centres and CBDs located within the territory of the city they reside. In other words, shoppers are generally not willing to take long trips to shop at other centres and CBDs outside. Specifically, 70.2 percent of choices are "absorbed" in Kitchener, 64.6 percent in Cambridge and 50 percent in Waterloo. It is worth noting that the twin city of Kitchener-Waterloo can not be separated geographically. It would thus not be wise to consider them separately when defining an shopper's choice space (choice set). Accordingly, 98 percent of choices are "absorbed" by local centres and CBDs in this twin city. For the city of Cambridge, the choice percentage goes to 64.6, almost two third of total choices made by Cambridge shoppers. One inference from the above analysis is thus logically that, for average decision-maker, the distance threshold level is the sub-regional boundaries within which they live.

However, it is also worth noting that, from the frequency analysis, the size of a shopping centre also significantly influences an individual's DSTM shopping mall choices. Tables 4.7 to 4.10 show that Fairview Park Mall and Kitchener CBD, the pinnacles of the regional retail hierarchical system, attract considerable potions of consumers' mall choices from each of cities, 35.4, 24 and 33 percent for Kitchener, Cambridge and Waterloo, respectively. These point to the fact that, in this medium sized area, distance is not the only influential factor individuals' spatial choice decision-making process. A closer look also suggests that, except for Kitchener, Fairview Park Mall and Kitchener CBD are not the most favourite choices for consumers in each of subregions in this study area. Hence, we can firmly conclude that distance is the dominant consideration over the others at the regional level, followed by the factor of the size of a shopping centre.

An individual's spatial choice within each of the sub-regions (sub-regional level) appears to be a different picture from that at regional level. At the sub-regional level, a consumer's predominant consideration for DSTM shopping mall choices is the size (attractiveness) of a shopping centre. This conclusion is derived from that indicated in Tables 4.7 through 4.10.

For Kitchener's shoppers, Table 4.7 shows that their choice pattern follows the order of total commercial square footage of those centres within the city, especially that of DSTM square footage (refer to Table 4.6.1). A slight variation occurs between Fairview Park Mall and downtown Kitchener which is larger in total and DSTM size than that of Fairview Park Mall. This nonessential inconsistency is cognitive because the two shopping areas are of different type commercially. For downtown Kitchener, poor parking facility and stressful accessibility from store to store made this shopping area not easily approachable while, in contrast, Fairview Park Mall is, as a well planned shopping centre, has sizable parking space and easy access and many other services which are vital for most of shoppers in the area. Consequently, Fairview Park Mall became the favourite choice for the shoppers in the city.

A analogous result is also found for the city of Cambridge in which consumers' choices ordered according to the size of shopping centres. For Waterloo customers, the choice pattern seems to be somewhat different at first glance. Here, Waterloo Town Square dominates the consumers' shopping choices over Conestoga Mall which is considerably larger in size than that of Waterloo Town Square. However, a further examination suggests that, on the one hand, the attraction of Waterloo Town Square is not only made up by the centre itself commercially, but also by whole downtown area. Shoppers' DSTM shopping attitudes towards this shopping centre are highly related to the entire downtown commercial facilities. On the other hand, for the high

proportion of students in Waterloo's population, Waterloo Town Square provides ease of accessibility for their non-food shopping. Thus it is not a surprise that Waterloo Town Square is the first choice by Waterloo shoppers for their DSTM merchandise purchasing.

For buyer from Rural Waterloo, due to their scattered residences in an extensive geographical area (Rural Waterloo is actually not a geographical area or unit), their shopping behaviour presumably violate the above conclusion. Table 4.10 shows that, based on limited survey cases, their choices came after the size of shopping centres and downtowns, Fairview Park Mall is the first choice (18.9 percent), Conestoga Mall accounts for 17.0 percent, and the Kitchener and Waterloo downtown follow. Given the deficiency of background knowledge of the customer in this area, this study has little to say regarding their non-grocery spatial choice behaviour.

The discussions above represent the picture of individuals' DSTM shopping centre choice behaviour at both regional and sub-regional levels. The analyses indicate that, at the regional level, distance influences customers' choice the most, succeeded by the size of a shopping mall . Sub-regionally, the priority of these two factors in shoppers' DSTM spatial shopping decision-making process is turned over. All of these imply a major rational that consumers' spatial non-grocery shopping choice is determined by the extent to which a shopping centre can satisfy the shopper's needs.

4.5 Conclusions

This chapter presented the results by MNL model estimations and related behavioral

interpretations. These results suggested that consumers' generally considered the distance as the most influential factor when making their spatial non-food shopping mall choice decisions. In another word, customers's choice patterns was mainly determined spatially. The attractiveness of a shopping centre (measured by its size) also affected consumers' behaviour significantly. Household characteristics like number of adults and children can differentiate shoppers' preferences for regional and "local" shopping centres.

Furthermore, due to the lack of a mean for investigation of customers' shopping distance in the MNL model, a choice frequency analysis was employed. From this analysis, the followings were concluded:

Regionally, the distance is a dominant factor to determining individuals' spatial DSTM shopping behaviour. The attractiveness of a shopping centre came next.

Sub-regionally, the sequence of the priority of the two variables was turned over in the same decision-making process.

SUMMARY AND CONCLUSION

The object of this study was to examine customers' spatial DSTM shopping behaviour

at the study region of Kitchener CMA. A subsample survey data of 412 respondents out of a

major 804 households shopping behaviour survey provided a mean to determine the manner of

consumers' spatial choice behaviour regarding thirteen existing shopping malls and CBDs. The

attributes of the centre used for this study was obtained through a couple of previous studies

(Picton, 1986; Simpson, 1986; Malone Given Parsons Ltd., 1986) and the information of

individuals' shopping behaviour and socio-economic characteristics was gained for the city of

Kitchener, city of Cambridge, city of Waterloo and surrounding areas.

With such a background, several statistical techniques, a choice frequency analysis and

paired T-Test, and a behavioral model, the MNL model, were employed for the respective

population, to test the following hypotheses:

1. that an individual's DSTM shopping centre choices were mainly determined spatially

at the regional level in this medium-sized area;

2. that shoppers' preferences upon the regional over "local" shopping malls can be

differentiated by their household characteristics like number of children and adults in the

household;

3. that within the shopping distance, customers tend to shop at the centre with a wider range of DSTM goods choices and services in order to maximize their non-grocery shopping satisfactions at the subregional level.

The outcome of MNL model estimation had clearly shown that, for hypothesis one, individuals took the variable of distance as the most influential factor in the spatial choice decision-making. Together with a choice frequency analysis, this study had further suggested that: at the regional level, customers' DSTM shopping behaviour is mainly determined spatially; and at the subregional level, consumers' shopping choices were primarily "absorbed" by "local" shopping centres. For the second hypothesis, the findings of the choice frequency analysis indicated that, within the geographical boundaries of each subarea, customers shopping mall choices were directed to the centres with more DSTM square footage. In another words, within the shopping distance, consumers were always willing to patronize those centres providing a wider range of DSTM choices and services. This conclusion agreed with those findings by McCarthy (1982), Koppleman & Hauser (1982), who found that shoppers generally maximized their shopping satisfactions under certain physical, economic and psychological constraints. For the hypothesis three, the outcome of MNL model estimation suggested that customers' attitudes towards the regional shopping centre are significantly affected by their household characteristics like number of children and adults in a house unit. While the number of children in a household decrease the probability of using a regional centre, the number of adults in a household increases the probability. Moreover, the MNL model estimation and a-paired T-Test advised that personal characteristics like age, sex and income as measured by total DSTM expenditure of a household head did not motivate the DSTM mall choice by that household.

In summary, this study confidently accepts the three hypotheses and concludes the following:

(1) an individual's spatial DSTM choice decision-making is significantly influenced by the variables of distance, attractiveness of a shopping centre or CBD and household's characteristics.

(2) at the regional level, the distance dominates over the other variables, and by contrast, at the subregional level, DSTM size of centres define a consumer's spatial choices.

Understanding the consumer spatial shopping behaviour will assist mall managers in promoting their centres as a place to shop. From the consumer behaviour study, they will be able to identify not only the positive aspects of the mall, but also its deficiencies which can be improved. Some policy implications can also be identified from this study. First, as previous studies have demonstrated, psychometric techniques are a potent tool to city planners for quantifying quantitative aspects of consumers' spatial shopping behaviour. Secondly, the results indicate that the variety of DSTM merchandise available at a shopping mall, the services besides the supermarket, are significant inputs into a shopping area's attraction.

CAMBRIDGE CONSUMER SURVEY

Good _____! My name is ...., a (graduate) student at Wilfrid Laurier University working in conjunction with the Consulting Firm of W. Scott Margan. We are conducting a shopping survey regarding a large-scale shopping centre and family recreational centre proposed south of Highway 401, across from the Holiday Inn at the Highway 24 Interchange, adjacent to where the new Knob Hill Farms Store will be built. Would you help us by answering some questions?

Q.1 Now, I am going to read you a list of (31) non-grocery items frequently bought in a department store, shopping centre or downtown area. Would you please tell me for each item

(a) where you yourself last purchased it within the past 12 months,

(b) how much you spent for that purchase, and

(c) if you purchased the item in a department store or a catalogue outlet?

Q.2 Now for each location I read, I want you to think of how much you spent there over the past year for non-food items such as you would find in a department store, specialty store or catalogue store? In just the past 12 months, including Christmas, how many dollars did you yourself spend at (LOCATION)? Please try to state your answer to the nearest dollars. I will help you to add up individual amounts as you recall them.

Q.3 Changing the subject for a moment to grocery shopping, what is the average amount your household spends each week in supermarkets and other food stores, such as bakeries and butcher shops?

Q.4 At what one grocery store or supermarket do you most frequently buy your groceries?

Cambridge

(1) Cambridge CBD
(2) Cambridge Farmer's Market
(3) Bishop Gate Mall(Galt), Food Barn
(4) John Galt Centre, Miracle Mart
(5) Preston
(6) Hespeler
(7) Cambridge Shopper's Mall (Hespeler), Zehrs
(8) South Cambridge Centre, Zehrs
(9) The Mall, Dominion
(10) Valdi
(11) Other Cambridge

Kitchener-Waterloo

(12) Kitchener CBD - (King Centre)
(13) Kitchener Farmer's Market
(14) Fairview Park Mall, Zehrs
(15) Forest Glen, Zehrs
(16) Forest Hill, Willow Market
(17) Frederick Mall, Zehrs
(18) Laurentian Hill, Miracle Food Mart
(19) Market Square, Zehrs
(20) Pioneer Park Plaza, Zehrs
(21) Stanley Park Mall, Zehrs
(22) Dutch Boy (specify loc'n)
(23) Other Kitchener
(24) Waterloo Farmer's Market
(25) Conestoga Mall (Waterloo), Zehrs
(26) Waterloo Square (CBD)
(27) Other Waterloo

Brantford

(28) Brantford CBD
(29) Brantford Mall, Loblaws
(30) Colborne Square, Loblaws
(31) Lynden Park Mall, Miracle Mart
(32) Other Brantford

Guelph

(33) Guelph CBD
(34) Other Guelph
(35) Stone Crock, Elmira
(36) Other (please specify Loc'n & name)

Q.5 About how many dollars of your weekly food bill is spent there?

Q.6 Where else do you shop for groceries most often?

Q.7 And about how many dollars of your weekly food bill is spent there?

Q.8 And about how many dollars of your weekly food bill is spent in specialized food

stores such as bakeries, or butcher shop, or small convenience food stores?

Q.9 And about where do you shop for specialty foods most often?

Now before we proceed further, I want you to think about whether you yourself would

shop at a large-scale shopping complex south of the Highway 24 and Highway 401 interchange

across from the Holiday Inn, and next to where the Knob Hill Farms outlet will be built. In

addition to a new high quality Major Department Store, perhaps the size of Simpsons or Sears

in Kitchener, the proposed complex is to contain a new supermarket, a large number of specialty

stores, family recreational and entertainment facilities, a hotel and offices.

Q.10 Now if this new shopping centre were to contain a high quality major department

store perhaps equivalent to the Simpsons or Sears Stores in Kitchener, how much of all

your non-food spending would you expect to do in this shopping centre? Would you

106

expect to do...?

(1) Less than 2%

(2) Up to 5%   (5) Up to 20%

(3) Up to 10%   (6) Up to 25%

(4) Up to 15%   (7) or more? (Please Specify)

Q.11 And if you shopped at this new shopping complex, where would you be likely to reduce your retail (non-food) spending the most, if at all?

Q.12 If the new shopping centre were to contain a large new supermarket, how much of your food spending would you expect to do in this new supermarket? Would you expect to do: (RECORD CODES FROM Q.10)

Q.13 And if you shopped at the new supermarket in this shopping complex, where would you be likely to reduce your food spending the most, if at all? (RECORD CODES FROM Q.10)

Q.14 And how much of your food spending would you expect to do in the new Knob Farms outlet to be built at the same intersection? Would you expect to do? (RECORD CODES FROM Q.10)

Q.15 And if you shopped at Knob Farms, where would you be likely to reduce your food spending the most, if at all? (RECORD CODES FROM Q.10)

Q.16 If you yourself were to shop at this large new centre at the Highway 401 and Highway 24 Interchange, how likely would you be to shop in downtown Cambridge on the same trip?

(1) Highly Likely (2) Likely (3) Less Likely (4) Not at All?

Q.17 Suppose that this centre were to contain a major four-season, indoor and outdoor family recreational centre, with water and winter sports facilities. How likely would this be to cause you shopping at the new centre to increase?

(1) High Likely (2) Likely (3) Less Likely (4) Not at All?

Q.18 And how long do you estimate it would take you to travel to the Highway 401 and Highway 24 Interchange? (RECORD IN MINUTES PLEASE)

And now just a few points so that we can put our interviews into groups.

Q.19 Including yourself and any infants, how many people are living in your household at the present time?

(1) (2) (3) (4) (5) (6) (7 or more) ?

Q.20 How many of these, if any, are children under age 18?

(0) (1) (2) (3) (4) (5 or more) ?

Q.21 In which of the following age groups are you?

Under 18	(1)	45 - 54	(5)
18 - 24	(2)	55 - 64	(6)
25 - 34	(3)	65 or more	(7)
35 - 44	(4)		

Q.22 Record respondents sex: Male (1) Female (2)

(Verify Name, Address & Phone Number)

THANK YOU VERY MUCH FOR YOUR HELP

DSTM LOCATIONS

Cambridge

1 Cambridge Downtown
2 Bishop Gate Mall (Galt at Bishop St. & Hespeler Rd)

John Galt Centre (Hespeler & Dunbar Rds.)
3 Miracle Mart Dep't. Store
4 Other

5 Cambridge Shoppers Mall (Hwys. 401 & 24)

South Cambridge Centre (Hwys. 97 & 8)
6 K-Mart
7 Other

8 The Mall (Main St. & Hwy 24)
9 Canadian Tire
10 Catalogue (e.g. Consumers Distr.)
11 Other Cambridge (i.e. specialty stores, etc.)

Kitchener-Waterloo

Kitchener Downtown (King Centre)
12 Robinsons
13 Other

Fairview Park Mall (Hwy. 8 N of Hwy. 401)
14 Simpsons, Sears
15 Woolco
16 Other

Forest Glen S. C. (Strasburg & Block Line)
17 Towers
18 Other

Frederick Mall (Frederick & Edna)
19 Woolco
20 Other

Kitchener Market Square (King & Fredrick Sts.)
21 Eatons
22 Other

Stanley Park Mall (Ottawa St. N. & River Rd.)
23 Zellers
24 Other

Conestoga Mall (King & Conestoga Pkwy.)
25 G. W. Robinson
26 K-Mart
27 Other

Waterloo Town Square (Downtown)
28 K-Mart
29 Other

Westmount Place (Westmount Rd. & Erb St.)
30 Eatons
31 Other

32 Canadian Tire (Kitchener-Waterloo)
33 Catalogue (Kitchener-Waterloo)
34 Other Kitchener-Waterloo

Brantfort

35 Sears
36 The Right House, Woolco, K-Mart
37 Canadian Tire
38 Catalogue
39 Other

Guelph

40 Eatons & Sears
41 K-Mart, Zellers
42 Canadian Tire
43 Catalogue
44 Other Guelph

Toronto CMA
45 Eatons, The Bay, Simpsons, Sears
46 Zellers, Woolco, Towers, K-Mart
47 Canadian Tire
48 Catalogue
49 Other

Elsewhere

50 Eaton's, The Bay, Simpsons, Sears
51 Zellers, Woolco, Towers, K-Mart
52 Canadian Tire
53 Catalogue
54 Other

DSTM ITEMS

1 Children's clothing and underwear (0-13 yrs)
2 Lingerie, ie. ladies' nightgowns, pantyhose, leotards
3 Woman's sweater, blouse, skirt or slacks
4 Woman's dress
5 Woman's suit or coat
6 Woman's accessories (purse, belt, hat or scarf)
7 Man's jacket, suit or pants
8 Other man's clothing (shirt, underwear, socks)
9 Shoes, boots, sneakers or slippers
10 Area Rugs, Mats, Broadloom (floor coverings)
11 Household furnishings (fraps, bedding, table, linens)
12 Major appliances (fridge, stove, freezer)
13 Small electrical appliances (frypan, coffee maker, kettle, toaster, blender, food
    processor, can opener, Iron, beater, fan, hairdryer, razor)
14 Non-electric kitchen equipm't (pots, pans, knives, spatulas, mixing bowls, press,
    cooler, meas. cups)
15 Tableware or decorative ware (cutlery, fine glass, crystal, china, dinnerware/dishes)
16 Radio, TV/Stereo/Video, tape deck, clock radio
17 Furniture (indoor or outdoor, upholstered, metal, wooden, mattress, box spring)
18 Electric Lighting (incl. lampshades, bulbs)
19 Fabrics, wools or other sewing or knitting supplies
20 Prescription or non-prescription drugs, cosmetics or toilet articles
21 Hardware items (paint, nails, hand or power tools, etc.)
22 Sports equipment of any knob (baseball, hockey, golf)
23 Books, records, tapes
24 Camera supplies (camera, film, etc.)
25 Art work
26 Jewellery
27 Small gift, hobby or craft items
28 Play equipment (wading pool, gym set/swimming/slide)
29 Toys including:
    Board games (trivial pursuit, scrabble);
    Wheeled toys(wagons, trikes, bikes, sit-on toy cars);
    Small toys (dolls, small trucks or cars, frisbee, airplanes, etc.)

30 Computer & Accessories including computer games (e.g. Atari)
31 Stationary, writing or office supplies

.

REFERENCES

Anas, A, 1983, "Discrete Choice Theory, Information Theory and Multinominal Logit and

Gravity Models" *Transportation Research B* 17 13-23.

Ben-Akiva, M.E., & Lerman, S.R., 1985, Discrete Choice Analysis: Theory and Application

to Travel Demand Cambridge, Mass: MIT Press

Berry, B.J.L., 1967, Geography of Market Centres and Retail Distribution Englewood Cliffs,

N.J.: Prentice-Hall

------ 1963, "Commercial Structure And Commercial Blight" *Department of Geography,*

research Paper No. 85 Chicago: University of Chicago Press

Berry, B.J.L. & Baker, A.M., 1968, "Geography Sampling" in Spatial Analysis: A Reader in

Statistical Geography ed. by Berry, B.J.L & Marble, D.F. Englewood

Cliffs, N.J.: Prentice-Hall, pp 91-100

Boyce, D.E., LeBlanc, L.J., Chon, K.S., Lee, Y.J. & Lin, K.T., 1983, "Implementation and

Computational issues for Combined Models of Location, Destination,

Mode and Route Choice " *Environment and Planning A*, 15,

pp 1219-1230

Buchanan, J.T., 1982, Discrete and Dynamic Decision Analysis John. Wiley & Sons, Australia

Cadwallader, M.T., 1974, "A Methodological Examination of Cognitive Distance" in Preiser,

W.F., (eds) *Environmental Design Research*, Vol. 2, Stoudbury: Dowden,

Hutchinson & Ross.

Cochrane, R.A., 1975, "A Possible Economic Basis for the Gravity Model" *Journal of*

Transportation Economics and Policy, 9, pp34-49

Daly, A., 1982, "Applicability of Disaggregate Models of Behaviour: A Question of

Methodology" *Transportation Research A*, Vol. 16A, No. 5-6, pp363-370

Davies, R.L., 1977, Marketing Geography: with Special Reference to Retailing Cambridge,

Northumberland: Retailing And Planning Associates

Dowson, J.A., 1983, "Topics in Applied Geography" in Shopping Centre Development Longman

Group Ltd., New York

Dawson J A & Lord J D, 1985, Shopping Centre Development Polices and Prospects Nichols

Publication Company, New York

Dobson, R., & Tischer, M.L., 1978, "Perceptual Market Segmentation Technique for

Transportation Analysis" *Transportation Research Record*, 673,

pp 145-152

Downs, R.M., 1970, "The Cognitive Structure of An Urban Shopping Centre" *Environment and*

Behaviour, 2 pp 13-39

Engle, J.F. et. al., 1968 Consumer Behaviour (Second Edition) Hinsdale: Dryden Press

Erlander, 1977. "Accessibility, entropy and the Distribution and Assignment of Traffic"

Transportation Research `, pp149-153

Fisk, C.S., & Boyce, D.E., 1984, "A Modified Composite Cost Measure of Probabilistic Choice

Modelling" *Environment and Planning A*, 16, pp 241-248

Foxall, G.R., 1977, "Consumer Behaviour" Cambridge, Northumberland, England: *Retailing and*

Planning Associates Books

Garner, B.J., 1977, "Towards A Better Understanding of Shopping Patterns " In *Geographical*

.

Essays in Honour of K. C. Edwards, R.H. Osborne, el. al. (Eds) Nottingham: University Of Nottingham, Department Of Geography, p179-186

Hall P, 1986, Determining a Potential Trading Area for a Regional Shopping Centre: a Case Study of Cambridge, Ontario Wilfred Laurier University

Halperin W C & Gale N, 1984, "Towards Behavioral Models of Spatial Choice: Some Recent Developments" In *Discrete Choice Models in Regional Science* Ed by Pitifield D E, London Papers In Regional Science 14, P1-28, Pion Limited

Hansen, F., 1972, Consumer Choice behaviour: a Cognitive Theory New York: Free Press

Harvey, D., 1969, "Conceptual and Measurement Problems in the Cognitive-Behavioral Approach to Location Theory " in Cox, K.R. & Golledge, R.G., (eds) *Behavioral Problems in Geography: A Symposium*, Northwestern University, Department of Geography Research Series 7.

Hecht, A., 1989, "The Birth Pains of A New Regional Shopping Centre in the Kitchener CMA" A Paper Presented at *International Symposium on Retail Development: Private and Public Planning Strategies* June 14-16, 1989, Montreal, Canada.

Herbert, D.T. & Johnston, R.J., 1980, "Geography and the Urban Environment" *Progress in Research and Application* Vol. 3, John Wiley & Sons, Australia

Hodder, B.W., & Lee, R., 1974, Economic Geography New York: St. Martin's Press

Horowitz, J., 1982, "Specification Tests For Probabilistic Choice Models." *Transportation Research A* Vol. 16A, No. 5-6, pp383-394

--------, 1981, "Identification and Diagnosis of Specification Errors in the Multinominal Logit

Model" *Transportation Research*, 15B, pp345-360

Horton, F.E., 1971, "Effects of Urban Spatial Structure on Individual Behaviour" *Economic

Geography*, 47, pp 36-49

Huff, D.L., 1963, "A Probabilistic Analysis of Shopping Centre Trade Areas" *Land Economics*,

Vol. 39

----- 1960, "A Topographical Model of Consumer Space Preferences" *Papers and

Proceedings of Regional Science* 6, pp 159-173

Johnson, R.M., 1974, "Trade off Analysis of Consumer Values" *Journal of Marketing Research*,

11, pp 121-127

Johnson, R.J., & Rimmer, P.J., 1967, "A Note on Consumer Behaviour In An Urban

Hierarchy" *Journal of Regional Science*, Vol. 7, pp 161-166

Jones, K., & Simmons, J., 1987, Location, Location, Location: Analyzing The Retail

Environment, Toronto, Methuen

Koppleman, F.S. & Hauser, J.R., 1978, "Destination Choice Behaviour For Non-Grocery

Shopping Trips" *Transportation Research Record*, No. 673, pp 157-165

Landau, U., Joseph, N.P. & Alpern, B., 1982, "Evaluation of Activity Constrained Choice Sets

to Shopping Destination Choice Modelling" *Transportation Research A*,

16A, No. 3, pp 199-207

Louviere, J.J., 1981, "A Conceptual and Analytical Framework for Understanding Spatial and

Travel Choice" *Economic Geography*, 57, pp 304-314

---------- 1976, "Information Processing Theory and Functional Form in Spatial Behaviour"

in <u>Spatial Choice and Spatial Behaviour</u> ed. by Golledge, R.G. & Rushton,

R., Ohio State University Press, Columbus, Ohio

Luce, R. & Suppes, P., 1965, "Preference, Utility and Subjective Probability" In <u>Handbook of</u>

<u>Mathematical Psychology</u> ed. by Luce, R., Bush, R. & Galanter, E., Vol.3,

pp 249-410. New York: Wiley

MacKay, D.B, & Olshavsky, R.W., 1975, "Cognitive Maps of Retail Locations: An

Investigation of Some Basic Issues" *Journal of Consumer Research,* Vo. 2

MaClennan, D. & Williams, N.J., 1979, "Revealed Space Preference theory: a Cautionary Note"

T.E.S.G., 70, pp 307-309

-------- 1980, "Revealed-preference Theory and Spatial Choice: Some Limitations"

Environment and Planning A, 12, pp909-921

Manski, C.F. & Lerman, S., 1977, "The Estimation of Choice Probabilities from Choice Based

Samples" *Econometrica,* 45: 1977-1988

Manski, C.F., & McFadden, D., 1981, <u>Structural Analysis of Discrete Data with Econometric</u>

<u>Applications</u> Cambridge, Mass, MIT Press

McCarthy P S, 1980, "A Study of The Importance of Generalized Attributes In Shopping Choice

Behaviour" *Environment And Planning A* 12 1269-1286

Morgan W S, 1986, 1987, 1988, <u>Retail Gravity Model Study, Residual & Impact Analysis</u>

<u>Combined Effects</u> Feasibility Studies for a Introduction of a New

Proposed Regional Shopping Centre in Cambridge, Ontario

Martineau, P., 1958, "The Personality of a Retail Store" *Harvard Business Review,* Vol. 36

Pacione, M., 1975, "Preference And Perception: An Analysis of Consumer Behaviour " <u>T.E.S.G,</u>

66, pp 84-9

Picton C, 1986, <u>Shopping Centres within the Regional Municipality of Waterloo: Is There Room</u>

<u>for One More?</u> Wilfred Laurier University

Pipkin A R, 1981, "Cognitive behavioral geography and repetitive travel" in *Behavioral*

Problems in Geography Revisited Eds K R Cox & R G Golledge (

Methuen, New York) pp 145-181.

Pitifield D E, 1984, "Discrete Choice Models In Regional Science" London Papers In *Regional*

Science 14, Pion Limited

Potter, R.B., 1982, <u>The Urban Retailing System: Location, Cognition and Behaviour</u> Aldershot,

England: Cower Publish Company Ltd.

-------1979, "Factors Influencing Consumer Decision-Making" *Psychology Reports*, 44,

pp 674

-------1978, "Aggregate Consumer behaviour and Perception in Relation to Urban

Retailing Structure: a Preliminary Investigation " *T.E.S.G.*, 69, pp 345-352

Proudfoot, J.J., 1937, "City Retail Structure" *Economic Geography* Vol. 13, pp 425-428

Recker, W. & Kostyniuk, L. 1978, "Factors Influencing Destination Choice for the Urban

Grocery Shopping Trip" *Transportation*, No. 7, pp19-33

Recker, W. & Schuler, H.J., 1981, "Destination Choice and Processing Spatial Information:

Some Empirical Tests with Alternative Constructs " *Economic Geography*,

No. 57, pp373-383

Richards, M.G., & Ben-Akiva, M.E., 1975, <u>A Disaggregate Travel Demand Model</u> London,

Saxon House, D.C. Health Ltd.

Rocha, 1980, "Market Research for Shopping Centres" International Council of Shopping

Centres

Schuler, H.J, 1979, "A Disaggregate Store-Choice Model of Spatial decision-making" *The*

Professional Geographer, No. 31, pp146-156

Schwindt T, 1986, Determining Market Potential for Regional Shopping Centre in the Kitchener

-Waterloo-Cambridge Area Wilfred Laurier University

Shepherd, I.D. & Thomas, C.J., 1980, "Urban Consumer behaviour" in Retail Geography ed.

by Dawson, J.A., New York: John Wiley and Sons, pp 18-94

Simpson R N, 1986, The Viability of Developing a Regional Shopping Centre: A Case Study

of Cambridge, Ontario Wilfred Laurier University

Southworth F, 1981, "Calibration of Multinominal Logit Models of Mode And Destination

Choice" *Transportation Research A* 15 315-325

Spear, B.D., 1976, "Generalized Attribute Variable for Models of Mode Choice Behaviour"

Transportation Research Record, 649, pp 14-22

Spencer, A. H., 1978, "Deriving Measures of Attractiveness for Shopping Centres" *Regional*

Studies, No. 12, pp713-726

Stone, G.P., 1954, "City Shoppers and Urban Identification: Observations on the Social

Psychology of City Life", *American Journal of Sociology*, Vol. 60,

Chicago: University of Chicago

Strochkarch, F. & Phelps, K., 1948, "The Mechanics of Constructing A Market Map" *Journal*

of Marketing, Vol. 13, pp 493-496

Thorsen S A,1986, Retail Impact Study The Regional Municipality of Waterloo.

Timmermans, H.J.P, 1982, "Consumer Choice of Shopping Centre: An Information Integration

   Approach" *Regional Studies*, Vol.16, pp 171-182

Timmermans, H.J.P, Heijden, R. van den, & Westerveld, H., 1984, " Decision-making

   between Multiattribute Choice Alternatives: a Model of Spatial Shopping

   Behaviour Using Conjoint Measurements" *Environment and Planning A*,

   Vol. 6, pp377-387

Tinkler, K., 1979, "The Reilly Model Revisited" A Paper Presented At The Canadian

   Association of Geographers Conference, Victoria, B.C.

Urban Land Institute, 1986, Shopping Centre Development Handbook (Second Edition) In

   Community Builders Handbook Series

Williams W & Ortuzar J D, 1982, "Travel Demand and Response Analysis---Some Integrating

   themes " *Transportation Research A*, 16 pp 345-362.

Wrigley, N., 1988, Store Choice, Store Location and Market Analysis. London, Routledge

   ------ 1985, Categorical Data Analysis for Geographers and Environmental Scientists

   London, Longman

      ------ 1985, "Categorical Data Methods and Discrete Choice Modelling in Spatial

      Analysis: Some Direction for the 1980s" in Measuring the Unmeasurable,

      ed. by Nijkamp, H., Leitner, H. & Wrigley, N., NATO ASI Series D:

      Behavioral and Social Science - No. 22, Martinus Nijhoff Publishers

   ------ 1979, Statistical Application in the Spatial Science London, Pion Limited

      Wrigley, N. & Dunn, R., 1984, " Stochastic Panel-Data Models of Urban

      Shopping Behaviour " *Environment and Planning A*, Vol. 16, pp 629-650