

PASSENGER PREFERENCES

FOR

AIRLINE FARE PLANS

By

Bruce J. McWhirter

A Thesis

submitted in partial fulfilment
of the requirements for the degree of
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ABSTRACT

PASSENGER PREFERENCES FOR AIRLINE FARE PLANS

The passage of the Airline Deregulation Act (1978) in the United States has created a new economic operating environment for airlines in that country as a result of a relaxation of regulatory controls on market entry and pricing. The new environment has been marked by an increase in competitive activity as airlines attempt to position their products through fare and service attributes. There is little research to support or justify many of the current product offerings. No attempts have been made to segment the air travel market on the basis of consumer preferences for the attributes of the product. Airline pricing in the United States has been described as chaotic as a result of deregulation. Recent government actions have indicated a shift towards less regulation and increased competition in the Canadian airline industry. Unless studies of consumers' responses to airline pricing are undertaken, less regulation in Canada may result in a similarly uncertain competitive environment.

One objective of the paper is to explore the sensitivity of airline demand to changes in the levels of selected attributes of air travel in two Canadian markets. A second objective is to investigate the market segmentation of air travellers based on their preferences for various combinations of attributes associated with air travel.

Market segments were developed using consumers' differing preferences for various combinations of levels of selected air travel product attributes. This approach to market segmentation is particularly valuable because it avoids prespecification of segmenting variables and it allows the consumers to be segmented in ways that might not be obvious or traditional. The preference data for each segment was upgraded to interval scaled data using conjoint measurement. Discriminant analysis was employed to identify the segments by selected demographic or psychographic variables and to determine whether these variables might be used as predictor variables for segment membership.

The study found two distinct market segments. The first segment was comprised of vacation travellers. The segment members were female and exhibited deal prone characteristics such as shopping at sales. In terms of preferences, vacation travellers were found to be most sensitive to price.

The second segment was comprised of business travellers. Members of the segment were most sensitive to the minimum stay and advance booking restrictions placed on fare plans. Price was the third most important attribute to these travellers. Business travellers believe that safety varies from one carrier to another. Given the airline objective of keeping the segments separate and distinct, the minimum stay attribute appears to be the most effective means of preventing high yield business travellers from taking advantage of low fares offered to vacation travellers.

There was no evidence to support the contention that preference behavior differed between long and short haul flights. While airline name or image varied in relative importance within each segment, it was not a major criterion in the consumer's selection of a particular fare plan.

The results may be valuable to air carriers in the design and evaluation of fare plans that more closely appeal to each of the market segments.

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CHAPTER 1

OVERVIEW AND INTRODUCTION

OVERVIEW

* A recent article predicted an upsurge in the degree of competition to be allowed airlines operating in Canada ("Deregulation Triggers Air Race," B.C. Business February, 1980), p. 49). At this point in time, competition between airlines is rigidly controlled by the Air Transport Committee of the Canadian Transport Commission. The Committee has statutory authority to control fares and access to the market. Recent decisions by the Committee appear to substantiate the journal's claim.

On March 23, 1979 the Committee lifted transcontinental capacity restrictions from CP Air. The airline had previously been restricted to offering no more than 26% of the capacity provided by Air Canada on its transcontinental routes. In September of the same year, Pacific Western Airlines was granted permission to compete on an unrestricted basis with CP Air between Vancouver and Prince George, in British Columbia. Prior to the granting of this authority, Pacific Western had been obliged to make at least one enroute stop between the two cities. Charter carriers such as Wardair were given more flexibility to compete with scheduled airlines in a February 1980 decision. This decision allowed charter airlines to eliminate advance booking provisions from 33% of their available seats on charter flights within Canada and, for the first time, permitted Wardair to operate charter flights wholly within the country.

The February charter decision was of particular interest because it indicated a marked shift by the Air Transport Committee from the more restrictive policies it once pursued. The shift toward less airline regulation in Canada paralleled a similar situation that occurred in the United States during the late 1970's. In 1978 legislation was passed in the U.S. to effect a controlled deregulation of the airline industry. The Airline Deregulation Act called for the gradual phasing out of all statutory controls on market access and pricing, and announced the eventual dismantling of the Civil Aeronautics Board. The Civil Aeronautics Board is the American counterpart of the Canadian Air Transport Committee.

Increased competition within the Canadian airline industry can benefit both the consumer and the carriers. For the consumer, increased competition implies a broader range of choice in carrier selection and the likelihood of improved service at lower rates. From the point of view of the airlines, the new environment allows the expansion of previously restricted revenue bases and the tailoring of their product more closely to market demand.

Where the Canadian Transport Commission has allowed more than one carrier to operate, a degree of price and service variation exists on the more heavily travelled Canadian air routes. Competition in these markets has resulted in price differentials in excess of two hundred and fifty percent for seats on the same aircraft flying between Point A and Point B. These differentials reflect airline attempts to increase market share or stimulate new traffic by discounting.

The discounted air fares normally associated with airline competition are advertised and sold under the trade names assigned to them by individual carriers. The actual fares, and restrictions governing their use, vary not only from carrier to carrier but from season to season and, in some cases, from day to day. For example, during July 1982, Air Canada listed twenty-eight different fare plans between Calgary and Toronto. Pacific Western listed fourteen, and CP Air offered thirty six. While some duplication existed, each of the three airlines offered plans unique and restricted to its own system. The lowest fare was CP Air's Skybus priced at \$274.00. Skybus is essentially a 'no frills' service and does not include inflight meals. Air Canada offered its Super Sky Buy (also advertised as a One Way One Day Advance Purchase Excursion) at \$282.00 but included an inflight meal to justify the \$8.00 Surcharge over Skybus. Super Sky Buy and Skybus were restricted in seat availability and purchase conditions. Both Air Canada and CP Air offered full economy fare with no restrictions for \$572.00 while Pacific Western featured its Touchdown fare, also without restriction, for \$448.00. Passengers travelling on Pacific Western are obliged to make a twenty minute enroute stop between Calgary and Toronto whereas those flying on Air Canada or CP Air fly nonstop. At the top end of the fare structure, both Air Canada and CP Air offered First Class at \$916.00. CP Air provided Premier Class at \$972.00 for flights on aircraft equipped with full length reclining sleeper seats.

There are indications of consumer confusion as a result of the proliferation of fare plans and the conflicting advertising claims of the

carriers. This confusion extends to the travel agents who represent the primary channel of distribution between an airline and the consumer. Given the present state of price and service differentiation in the Canadian air transport marketplace, the anticipated increase in competition can only serve to accelerate this confusion. There is a need to examine airline fare structures to determine consumer reaction to them. There is also a need to determine if carrier attempts at product positioning through fare and service attributes are significant to the consumer.

INTRODUCTION

The study of airline competition as related to fare discounting is relatively new from an academic research perspective. While discounting began on a modest scale during the 1950's, it has only been during the last decade that it has assumed a significant role in the air transport marketplace. (Cooper 1979:23)

The term "discounting" is actually a misnomer when used to describe the differential pricing policies practised by airlines today. A more appropriate and descriptive term would be fare plans. Price represents one component or attribute of a fare plan. From the consumer's perspective, the selection of a particular fare plan may be viewed as an exercise in multiattribute decision-making. A fare plan may be described according to specified levels of a set of attributes. The attributes would include factors such as price, schedule, and the advance booking or minimum stay provisions associated with a particular plan. The levels represent how much or how little of each attribute is present or perceived to be present in the plan. For example, the levels of the attribute "price" in a hypothetical fare plan might be \$100.00 or \$200.00, and the levels of the attribute "minimum stay" (at destination) might conceivably be three days, or seven days, or a month.

The airline practice of differential pricing entails varying the levels of the attributes, or the attributes themselves, in order to meet two basic objectives. The first objective is to stimulate new traffic

where excess capacity exists. The second objective is to prevent existing traffic from taking advantage of any fare reductions that may be offered to potential new traffic. The complexity and diversity of fare plans that have been marketed in the United States is largely attributable to a recent change in the regulatory environment.

The phasing out of regulatory controls on market entry and pricing in the United States has resulted in a "chaotic" competitive situation in many air travel markets according to Brenner. (1982:14) Describing the impact of the Airline Deregulation Act, Ritchie (1980:17) states that the complexity and speed of change have permitted very little systematic study of deregulation.

"Governments have been busy implementing or resisting deregulation, the airlines have been preoccupied with adjusting to real or anticipated changes in the competitive environment, and consumers have simply become euphorically confused as they rush to obtain the benefits of lower air fares. As for academics, it is only now that they have become aware of the scope and significance of deregulation and have grasped the need for broad scale research." (Ritchie, 1980:17)

Baumgarner (1979:22-27) quotes a respected Wall Street analyst of the U.S. airline industry as saying that few in the airline business know how to price their product. The previously regulated environment in which carriers operated provided them little opportunity for pricing experimentation. The industry practice had been one of matching or bettering the competition because little was known about

consumer reaction to the attributes of various fare plans or service levels.

Baumgarner predicts that differential pricing will become much more a part of airline marketing strategy. Fare plans will become even more complicated as marketers attempt to increase travel in slack periods. The future of the industry will depend, in large part, on the carriers' ability to price their product. Their economic health will depend upon their skill in managing pricing to achieve both maximum volumes and revenues.

The competitive situation in the United States exists largely as a result of deregulation. The airline industry in Canada very much remains regulated by the Air Transport Committee. While deregulation of the Canadian industry on a scale comparable to that of the United States is unlikely, recent decisions by the Committee indicate that a more relaxed attitude appears to be emerging towards competition on major routes.

The limited competition that has existed in Canada to date has resulted in some price and service variation on routes where more than one carrier has been allowed to operate. Tables 1 and 2 present a sampling of fare plans available to travellers on two major Canadian air routes. Table 1 shows sample airline fare plan offerings (as of July 1982) between Calgary and Vancouver, a high density short haul route on which three carriers compete. The difference between the highest and lowest economy fares in the market is 100%. Table 2 presents a

similar comparison for the Toronto - Calgary route, a major long haul service where three carriers also compete. Fares in this market vary from a low of \$218.00 to a high of \$572.00, a difference of 162%. First class fares have not been included in the tables.

TABLE 1

SELECTED AIRLINE FARES AND RESTRICTIONS
CALGARY - VANCOUVER

July 1982

FARE NAME	AIRLINE	ADVANCE PURCHASE	MIN. STAY	DEPARTURE FREQUENCY*	EN-ROUTE STOPS	RTN PRICE	LEVEL OF DISCOUNT
Regular	Air Canada CP Air PWA	None None None	None None None	2 Hours 4 Hours 4 Hours	0 0 1	\$228 228 228	0 0 0
Skybus	CP Air	1 Day	None	4 Hours	0	118	48%
Solid Savings	PWA	1 Day	3 Days or Sat. Night	4 Hours	0	125	45%
Touchdown	PWA	None	None	4 Hours	1	180	21%
Skysaver	Air Canada	7 Days	3 Days or Sat. Night	2 Hours	0	171	25%
Skysaver	Air Canada	21 Days	7 Days	2 Hours	0	148	35%
Super Skysaver	Air Canada	45 Days	7 Days	2 Hours	0	114	50%
Take-Off	PWA	7 Days	Sat. Night	4 Hours	0	114	50%
1 Day/1 Way	Air Canada	1 Day	None	2 Hours	0	126	45%

* Departure frequency based on average weekday schedules.

Source: North American Passenger Tariff, Airline Tariff Publishing Company, Washington, D.C. July 20, 1982, Page 199

TABLE 2

SELECTED AIRLINE FARES AND RESTRICTIONS
CALGARY - TORONTO

July 1982

FARE NAME	AIRLINE	ADVANCE PURCHASE	MIN. STAY	DEPARTURE FREQUENCY*	EN-ROUTE STOPS	RTN PRICE	LEVEL OF DISCOUNT
Regular	Air Canada	None	None	4 Hours	0	\$572	0
	CP Air	None	None	8 Hours	0	572	0
	PWA	None	None	12 Hours	1	572	0
Skybus	CP Air	1 Day	None	8 Hours	0	218	62%
Super Skysaver	Air Canada	45 Days	7 Hours	4 Hours	0	286	50%
Skysaver	Air Canada	21 Days	7 Days	4 Hours	0	364	36%
Skysaver	Air Canada	14 Days	Sat. Night	4 Hours	0	332	42%
Touchdown	PWA	None	None	12 Hours	1	448	22%
Take-off	PWA	7 Days	Sat. Night	12 Hours	1	315	45%
1 Day/1 Way	Air Canada	1 Day	None	4 Hours	0	226	60%

* Departure frequency based on average weekday schedules.

Source: North American Passenger Tariff, Airline Tariff Publishing Company, Washington, D.C. July 28, 1982, Page 199

The consumer reaction to the assortment of fare plans offered by Canadian carriers in recent years has been favourable. Airlines such as Air Canada have posted passenger traffic growth figures of 20% for fiscal 1979. Much of this growth has been attributed to the success of the fare plans offered by the Company. Average revenue per passenger for the same year increased only 2% for the Air Canada system, while the Canadian Consumer Price Index jumped 9.1%. (Air Canada, 1980:9) In other words, average airline fares have increased at a lesser rate than the cost of living.

Even on the limited scale found in Canada, the assortment of fare plans has created some confusion in the market. Figure 1 depicts the response of a major travel agency chain to the market confusion over pricing.

FIGURE 1
 CONFUSION IN THE MARKETPLACE
 (Reprinted from Skyword, April 1980)

CONFUSED?!?

NO WONDER WITH EVERY AIRLINE HAVING ITS OWN FARE AT DIFFERENT TIMES AND DIFFERENT RULES TO DIFFERENT PLACES.

Well, Marlin Travel can help! Because Marlin Travel represents all airlines. Our professional consultants will determine which fare and routing best suits your needs, make your reservations and issue your tickets for the same price as the airlines. Also be more than happy to make your hotel and u-drive reservations free of charge.

Vancouver
 Calgary
 Edmonton

Fort McMurray
 Red Deer
 Medicine Hat

Bonnyville
 Regina
 Saskatoon

Marlin
 travel service

Airline discounting is related not only to competition but to factors inherent in the supply and demand characteristics associated with the industry. The airline industry is characterized by relatively high fixed costs and proportionately low variable costs (Grumbridge, 1966:57). Least cost production is attained when supply and demand are perfectly matched. Unlike most other industries, the production of air transport service surpluses in periods of slack demand cannot be held in inventory. Once a flight departs with an empty seat, the potential revenue from that seat is lost forever. Production can seldom be tailored exactly to demand. The service must be put on the market in lots or increments equal to aircraft capacity. For example, if the market demand for a given flight is 80 seats, and the smallest aircraft in an airline's fleet contains 100 seats, it is difficult not to produce the surplus 20 units of air transport. The empty seat moves with the full seat and the marginal cost of having a passenger in it is minimal.

While production is organized on a relatively regular basis, the demand for air service has exhibited severe cyclical variation. The Boeing Commercial Airplane Company has conducted extensive research into demand peaking. Boeing has concluded that the demand for a particular flight is a random variable with a probability distribution whose parameters depend on the market segment, the geographic flight segment, departure time, and direction as well as the season and day of the week. (Boeing, 1977:2)

Boeing has studied demand peaking for a number of years in conjunction with several major U.S. carriers. The Boeing analysis of aggregated traffic data for the United States indicated that there were peak periods of demand by month, by day of week, and by time of day. However, there was significant variation within those periods. Individual geographic markets or origin - destination pairs did not necessarily show average behavior. Individual flights showed even more variation. There were no common peak or off-peak months. For example, of 33 major markets studied in detail which averaged more than 900 daily passenger emplanements during the year ended June 30, 1976, only one market had the highest load factor during the months of June, July and August. Peak and off-peak days of the week also showed considerable variation for different markets. There was no universal pattern.

The peak time of day also varies considerably for different markets. In particular, there is a significant interaction between direction of travel and time-of-day demand. Eastbound and westbound travellers exhibit completely different patterns of demand. These last conclusions of the Boeing research are based on derivation of time-of-day demand curves as a function of difference between local arrival and departure times. The data base used in the Boeing study covered all North American geographic markets of American Airlines and United Airlines. Studies conducted by Canadian Pacific Airlines regarding traffic directionality peaking by time of day suggest that similar demand patterns characterize the Canadian industry. (C.P. Air, 1975:1-8)

The combination of a fixed production rate and low variable costs, coupled with an inherently cyclical market demand, has led airlines to search for ways and means to influence demand characteristics. The obvious answer is to practice price discrimination or differential pricing. Haynes and Henry (1974:386) defined price discrimination as the practice of charging different prices to different segments of the market for either the same services or for slightly differentiated services whose difference in marginal costs does not correspond with the price differentials. One objective of airline price discrimination is to smooth the fluctuations in demand in an effort to attain least cost production. A second objective is to stimulate new traffic by lowering rates while at the same time preventing existing customers from taking advantage of the low rates.

A parallel may be drawn between the airline industry and utilities such as power companies who face similar fluctuations in demand. In the case of utilities, the practice of differential pricing is known as peak load pricing. If electricity is sold at constant prices, consumption varies by day and by season due to changes in demand. Electricity cannot be stored economically in significant quantities and the production - distribution system fails under sustained overload. Thus, the peak hourly sales quantity, or peak load, determines the necessary capacity of the system. By increasing prices in peak periods, sales quantities (and necessary capacity) can be reduced. At the same time, quantities in off-peak periods can be increased by reducing offpeak prices. (Haynes, 1974:395) The aim of airline discounting is this shifting of demand as well as the stimulation of new traffic in off-peak periods.

In order to successfully implement price discrimination (peak load pricing or in the case of the airlines - off-peak discounting), three market conditions must be present:

1. The seller must have some monopoly control over the market.
2. The seller must be able to separate the market into subgroups of consumers and prevent resale of the product from one group to another.
3. Differences must exist in the price elasticity of demand from one group to another.

Designed to take into account the varying price elasticities of different users, discount or promotional fares were conceived as a means of increasing total revenue at a rate greater than total costs. By filling otherwise empty seats with new passengers that either could not or would not pay full fare, the carriers could increase revenues without significantly increasing operating costs.

The three necessary market conditions (i.e. some degree of monopoly control, the ability to separate the market, and differing elasticities) are present in the air transport marketplace. These conditions form the basis for the design of the fare plans currently available. Market control is achieved through regulation of the industry. Separation is achieved primarily through restrictions or 'fences' placed on the use of the plans. These 'fences' are normally based on a curtailment

of the travel flexibility afforded full fare passengers or a reduction in the level of service provided to the passenger. Examples of 'fences' involving a reduction in flexibility would include advance booking provisions, minimum trip duration, cancellation fees, etc. Service reductions generally involve cutbacks in on-board service or a requirement to fly on overnight or multi-stop flights. Resale of the product from one segment to another is minimized by strict enforcement of the fences. The third market condition, differing price elasticities, is assumed to exist on the basis of the ability of discounted fares to stimulate new traffic. One study (Air Canada, 1979) has shown that discounted fares have stimulated new traffic. Thus, the existence of differing price elasticities of demand has been established.

While the economic theory underlying differential pricing in the airline industry is well established, the application remains largely a matter of guesswork. The situation in the marketplace is best summarized by Brenner (1982; 14) who stated that there is widespread agreement within the industry that something is seriously wrong with airline pricing policies. Brenner quotes "a TWA executive as describing industry pricing as irrational, the label 'dumb' by an American Airlines executive, nonsensical by Salomon Brothers (investment brokers), craziness by Air Florida and destructive by Western."

CHAPTER 2

BACKGROUND OF THE STUDY

a) REVIEW OF LITERATURE

There have been three Canadian studies aimed at determining consumers' preferences for airline fare and service attributes. Fare and service characteristics are the basic competitive tools of carriers in a market characterized by imperfect competition. These studies have attempted to ascertain the importance of various attributes to air travellers. Secondly, the studies have attempted to determine how changes in attributes or levels of attributes influence the consumer's purchase decision.

The Air Transport Committee of the Canadian Transport Commission commissioned a study in 1972 with the objective of developing a Quality of Service Index for air services in Canada (Market Facts, 1972). The study surveyed 2,200 air travellers in 6 urban areas. The study concentrated on identifying the relative importance of various air travel attributes and establishing importance weights for these attributes.

The conclusions of the study were that:

1. Air fares are the predominant attribute in the consumer purchase decision. The second most important feature to the consumer is the availability of non-stop flights.

2. Elapsed flight time, certainty of departure and frequency of scheduled flights are of some significance to consumers but much less so than price and number of stops.

This study was performed in 1972, several years prior to the proliferation of fare plans now characteristic of the market. In recent years, the number of attributes or alternatives has increased the complexity of the consumer's purchase decision.

A more recent Canadian study of airline pricing and service was conducted at the University of Calgary (Johnston, et al, 1979). This paper focused on the examination of air travellers' views regarding the merits of airline competition and the variables which define and give rise to that competition. Analyzing fares, service, and schedules on the Calgary - Toronto route, Johnston, et al, concluded that:

1. Consumers favour more competition between airlines in Canada.
2. Business and vacation travellers are two very distinct market segments, each having different priorities in terms of the levels of attributes sought from airline services. Vacation travellers are more sensitive to fare related attributes while business fliers emphasize scheduling. Safety considerations, including the past safety record of the airline, the quality of aircraft maintenance, and inflight attention to safety procedures, were of major concern to both segments.

3. Consumers' perceptions of carrier image and service differ markedly. These perceptions were reflected in preference behavior.
4. The importance of various attributes is situationally specific. The survey concentrated on the relatively long haul Calgary - Toronto route. They concluded that passenger views and choice behavior may differ in a short haul situation such as Calgary - Vancouver.

Johnston's (1979) conclusions substantiated and updated the earlier Transport Commission (1972) results. Beyond this, Johnston found significant differences between the preferences of business travellers and those of vacation travellers in their preferences for alternative fare plans. He concluded that soft or intangible variables such as airline image influenced consumer's purchase decision, and that attribute evaluation is situational in nature. In other words, Johnston's findings regarding long-haul flights would not likely apply to a short-haul situation.

In a third study, conducted by the Transport Commission (Dodd, 1980), Dodd attempted to assess the effectiveness of the restrictions placed on discount airfares. The study attempted to determine whether current advance purchase and minimum stay requirements effectively segmented airline markets. Analyzing the domestic, transborder, and North Atlantic markets, the author concluded that changes in current restrictions would more effectively segment "on demand" and price

sensitive travellers. "On demand" travellers were defined as those prepared to pay a premium for additional flexibility in their travel.

, These three studies focused on flier preferences in a Canadian context. In the U.S., Green (1978:493) found that the importance fliers placed on service related attributes differed according to trip purpose and length. The service related attributes included airport and in-flight service as well as attributes such as cabin decor. The major air carriers have conducted research similar to the studies mentioned but are unwilling to release their findings for proprietary reasons.

b) STUDY OBJECTIVES

Existing research on Canadian airline pricing policies is limited both in scope and in extent. In light of the anticipated increase in competition within the industry, additional knowledge must be made available to both carriers and consumers if Canadians are to continue to enjoy a viable and responsive air transport system. The existing research forms a base or starting point for further study.

The Johnston (1979) study and the Canadian Transport Commission research (Market Facts, 1972) found airline travellers to be extremely price sensitive. However, preference and purchase behavior were strongly influenced by other attributes of the airline product such as schedules, enroute stops and service features. Johnston (1979) found that business travellers tended to exhibit different preferences for product attributes than vacation travellers. He concluded that trip purpose was a valid basis for market segmentation because business travellers emphasized flexibility and the absence of restrictions on their selection criteria while vacation travellers were most sensitive to prices. No attempts have been made to segment the market solely on the basis of different preferences for product attributes or fare plans.

The objectives of this paper are:

1. To explore further the sensitivity of demand of air travellers to changes in the levels of selected attributes of air travel in two Canadian markets.

2. To investigate the market segmentation of air travellers based on their preferences for various combinations of attributes associated with air travel.

The following attributes of air travel were considered:

1. Price
2. Airline
3. Minimum Stay Requirements
4. Advance Booking Requirements
5. Departure Frequency
6. Enroute Stops

These attributes were selected for study because they represent the primary competitive tools of the airlines in the market. Price, departure frequency and enroute stops have been shown to be of major importance in the consumer purchase decision (Market Facts, 1972). Minimum stay and advance booking requirements are the major fences placed on the availability of discount airfares. These five attributes are controllable by the airline in terms of how much or how little of each is included in the product. Airline was included as an attribute in response to Johnston's (1979) finding that consumers' perceptions of carrier image varied considerably and that these perceptions might conceivably outweigh more tangible product attributes in the purchase decision. A more concrete indication of the importance of this attribute is required.

The aim of segmentation research is to identify and describe more homogeneous subgroups of consumers and then to develop a means of predicting segment membership (Frank, et al, 1972). Research results should be environmental or descriptive as well as actionable. Actionable refers to managerial significance in terms of reaching the segments defined by the research. The objective of the study was to segment the market on the basis of preferences for the attributes of air travel. Segmentation in this fashion may assist air carriers in the design and evaluation of alternative fare plans where attribute levels more closely match the preferences of the various segments. This alone may assist in the rationalization of current service offerings that appear to be based more on 'one upmanship' than on meeting market needs. Correspondingly, a rationalization may bring about a reduction in the level of confusion for consumers and travel agents. Given a market segmentation based on preferences, other criteria were sought to assist in predicting, describing, and actioning the segments that were defined. The other criteria provide the marketer with clues regarding how the segments are similar or dissimilar statistically. Further, they show how to reach or action the segments in ways that have implications for promotional strategy and media mix.

Three types of variables normally associated with segmentation research were employed for this purpose. Previous research had indicated that preference behavior with regard to air travel was situationally specific. This study attempted to determine whether business travellers exhibited different preferences for fare plans than vacation travellers and whether preferences differed for long flights (4 hours)

as opposed to short flights (1 hour). Demographic variables were employed to determine whether segments might be identified on the basis of age, sex or occupation. Psychographic variables were employed to determine whether the segments might be identified in terms of deal proneness, media exposure or readership patterns, perception of safety, and feelings towards some of the service elements associated with air travel. These service elements included in-flight and airport service.

c) METHODOLOGY

i) Plan of Attack

Before detailing the methodology employed in the study, a brief overview or plan of attack may assist the reader in understanding some of the conceptual elements of preference and segmentation research. The methodological framework of the study may be divided into three distinct steps. These steps are illustrated in Figure 2.

The first step was to segment the market on the basis of preferences. The selection of a particular fare plan by the consumer is an example of multi-attribute decision making. That is, a fare plan may be described according to varying levels of a set of attributes. The attributes of an object or product are assumed to be evoked by the decision maker. They may or may not be related to objective characteristics of the product. For example, in the case of judging a beauty contest, the judge may assess contestants on the basis of height, weight, poise, and overall beauty. Height and weight are objective characteristics. Poise and overall beauty are attributes that are intangible and, in many cases, very difficult to verbalize. In the case of fare plans, the study has assumed that the predominant attributes of the service are price, enroute stops, departure times, advance purchase and minimum stay requirements, and airline. Each attribute may be described in terms of the levels that underlie it. For example, the price of a ticket might be \$402.00, \$252.00, \$202.00 or \$186.00. A consumer purchasing an airline ticket may be required to spend a

specified minimum amount of time at his destination as a condition of purchase. A flight may operate from origin to destination nonstop or it may stop enroute. The levels tested in the study are detailed in Appendix B, and they are representative of the range of attribute levels available to the consumer flying from Calgary to Toronto or Vancouver during the Spring of 1980. The objective of Step 1 was to find groups of individuals expressing similar preferences for the combinations of attribute levels (or fare plans) presented to them. Each group of individuals expressing similar preferences was identified as a market segment based on their rank order preferences of the fare plans.

Step 2 was designed to convert the rank order preferences of each of the segments to interval scaled data. One approach to analyzing preferences is to consider preference judgments as reflections of the utility of the levels and attributes under consideration.

In simple mathematical terms:

$$u(x) = u(a_1 l_1) + u(a_2 l_2) + \dots + u(a_n l_n)$$

where:

$u(x)$ = the utility of a particular airfare

a = the attributes of the fare plan

l = the levels of the attributes

Theories of utility provide both a rationale for the choice process and an approach to measuring preferences. The basic ingredients of a utility theory are a set of items which are the objects of preferences

and the individual's preference-indifference relations for these items. A particular utility theory is a set of internally consistent postulates and assumptions about the individual's preference-indifference relationships for a set of alternatives and the predictions of behavior which can be deduced from them. A fundamental assumption of any utility theory is connectivity; all items in the set are related to each other by the preference-indifference relations. Two additional assumptions are inherent in this approach to preference measurement. They are consistency and transitivity. Consistency means that an individual who prefers A to B cannot prefer B to A or be indifferent as between A and B. Transitivity means that if A is preferred to B and B is preferred to C, then A must be preferred to C. Essentially, the consistency and transitivity assumptions establish the rationality of the consumer.

The assumptions of connectivity, consistency, and transitivity are sufficient to establish a rank ordering of a set of items from the least preferred (one that provides the least utility) to the most preferred (one that provides the most utility). These three basic assumptions are adequate to generate an ordinal scale of utility for an individual with reference to a set of alternatives. In this case, the alternatives are the fare plans that are comprised of attributes and levels. Conjoint measurement was employed to convert these ordinal preference scales to interval scaled utility measures.

Step 1 formed groups of individuals expressing similar preferences for the fare plan combinations tested. Step 2 provided a means of

assigning utility values to the preferences of the groups or segments. Step 3 developed a profile of each segment, and determined whether there existed statistical differences between the segments that might assist in predicting segment membership and behavior. Whereas Step 1 concentrated on finding similarities in the data, Step 3 sought differences. The study investigated possible differences in the areas of flight length, trip purpose, and demographics. Potential differences were also sought from a set of psychographic variables describing other aspects of the individual's lifestyle and feelings towards some of the service related or soft variables associated with air travel.

FIGURE 2
PLAN OF ATTACK

	<u>TASK</u>	<u>MEANS</u>
<u>Step 1</u>	Segment Market on Basis of Preference	Search for similarities in preference rankings of fare plan attributes and levels.
<u>Step 2</u> €	Determine Attribute Utilities	Upgrade rank order data to interval scaled utility scores.
<u>Step 3</u> z	Identify Segments and Predictor Variables	Search for differences in the data on the basis of situation specific, demo- graphic or psychographic variables.

ii) The Survey

Data for the study were collected using a questionnaire. A convenience sample was employed in lieu of a more stratified sample of the population. In light of the complexity of the attributes and levels being tested, individuals generally familiar with air travel were selected as respondents. The overall demographic statistics of the sample were compared with similar data provided by Pacific Western Airlines Ltd. as being representative of its passengers in Western Canada. The objective of this comparison was to determine whether the demographics of the sample roughly matched those of a known group of air travellers.

¶ The survey was comprised of two parts. Part One consisted of a structured questionnaire designed to elicit descriptor data from each respondent. The questions included general demographic, situation specific and psychographic variables. Part Two consisted of twenty index cards each describing a different combination of levels of the air travel attributes under study. The respondents were asked to rank the cards from "Most Preferred" to "Least Preferred" in order to provide a descending rank order of preference. The ranking procedure was accomplished by having the respondents first divide their twenty cards into three piles based on preferences. The three piles were then consolidated into two, and two into one, representing an overall rank order of attribute level combinations.

The results of a pretest conducted with a community group had indicated that the complexity of the survey demanded considerable

attention and concentration on the part of the respondents. Accordingly, the respondent groups were "warmed up" for approximately twenty minutes before commencing the survey forms. The "warm up" consisted of a discussion of fare plan alternatives where the respondents were urged to verbalize their decision criteria. The pretest also indicated that air travellers tended to differentiate strongly between attribute utilities for business oriented travel versus those for pleasure trips. As a result, the respondents were asked to complete the survey on the basis of the purpose of their last flight (business or pleasure).

A total of 187 respondents attended one of ten group interview sessions held in Calgary during December 1980 and January 1981. The respondents were selected from Club and community association membership lists. The solicitation of respondents was conducted by the clubs or associations in return for a donation of ten dollars per respondent to the association. Respondents were at least 18 years of age and had flown on a commercial airline at least once during the twelve months preceding the test. The ten group sessions were arranged so that five groups were asked to respond on the basis of a short haul Calgary - Vancouver trip while the remainder answered on the basis of a hypothetical long haul flight between Calgary and Toronto.

The twenty cards listing attribute level combinations utilized the concept statement approach to data collection used extensively by Green in conjoint measurement studies (1973,1974,1978). Given the six attributes under study, three with four levels, two with three, and one

with two levels, there exist 1,152 possible combinations of attributes and levels to be considered. Using a fractional factorial design called an orthogonal array, it was possible to estimate the uncorrelated main effects of the 1,152 combinations using only 20 pre-selected "trials" or combinations of levels (Addelman, 1961:144). These trials were printed on the concept statement cards, and the cards placed in rank order of preference by each of the respondents. Eberts (1977) found an order bias based on the order of presentation of the concept statements to respondents. In order to prevent this order bias from occurring, the concept statement cards were shuffled by the researcher before presentation to the respondents.

The concept statement means of data collection is one of two approaches to preference data collection that have evolved over the last few years. Respondents are asked to provide rank orders of preference for product concepts which differ simultaneously with respect to some or all of the levels of attributes being studied. In other words, the respondent is given a series of sentences or paragraphs containing varying levels of the attributes being studied. He is then asked to rank order the sentences or paragraphs, taking into account the varying levels of each attribute simultaneously. This approach allows respondents to choose between combinations that are elaborately specified. Several examples of the concept statement cards ranked by the respondents in this study follow in Figure 4.

FIGURE 3
CONCEPT STATEMENTS

Card 204

ON YOUR TRIP TO VANCOUVER

- Your return ticket would cost \$101.00
- You would fly on Air Canada
- There would be no minimum stay required at your destination
- You could reserve and pay for your seat at any time prior to departure.
- Your flight would leave within 4 hours of your most preferred departure time
- Your flight would make on enroute stop

Card 907

ON YOUR TRIP TO VANCOUVER

- Your return ticket would cost \$88.00
- You would fly on Air Canada
- You would have to remain at your destination for at least 7 days
- You would have to reserve and pay for your seat at least 7 days prior to departure
- Your flight would leave within 2 hours of your most preferred departure time
- Your flight would be nonstop

The second approach, described by Johnson (1974: 121-127), is referred to as the pairwise matrix technique. Respondents are given booklets in which each page contains a trade-off matrix with rows representing various levels of one attribute and columns representing levels of a second attribute. The respondents are then asked to rank those combinations of attributes presented in each matrix according to their preferences. An example of this approach would be:

FIGURE 4
PAIRWISE TRADE-OFF MATRIX

ON YOUR TRIP YOU COULD PAY ...	<u>\$8</u>	<u>\$12</u>
<u>AND GET:</u>		
Full Meal Service	1	3
No Meal Service	2	4

The respondent completing the matrix in Figure 5 preferred to pay the minimum amount for his trip and receive full meal service. His second most preferable alternative was to pay the minimum amount and forego meal service. In essence, the respondent has traded-off between price and meal service in the example.

Each approach has unique advantages under given sets of research requirements. The concept evaluation technique has the advantage of greater realism as a result of the elaborate specification and repetition of attribute levels. However, for many product categories it is desirable to study more than a dozen product attributes. It is hard for the respondent to handle this many attributes if all concepts are to be given a specified level of each attribute. The pairwise approach has

the advantage that the number of attributes to be studied is limited only by interview length and respondent endurance. A second advantage is that respondents provide information about trade-offs among pairs of attributes in such a direct form that one can infer relative importances of attributes by simple tabulations of the data. Tests conducted by Johnson (1972) with the two forms of input data demonstrated the results of the two approaches to be comparable. The concept evaluation approach was employed for this study because of the small number of attributes and the desire for elaborate specification of alternatives to the respondents in order to aid comprehension of the choices available.

iii) Method of Analysis

Figure 3 presents a schematic version of the first two steps analysis procedure. Market segments were formed on the basis of clusters of respondents exhibiting similar preferences for the attributes under study. The ordinal preference data for each segment were converted to interval scale data using conjoint measurement. The interval scales provided estimates of the utility of each of the attribute levels tested.

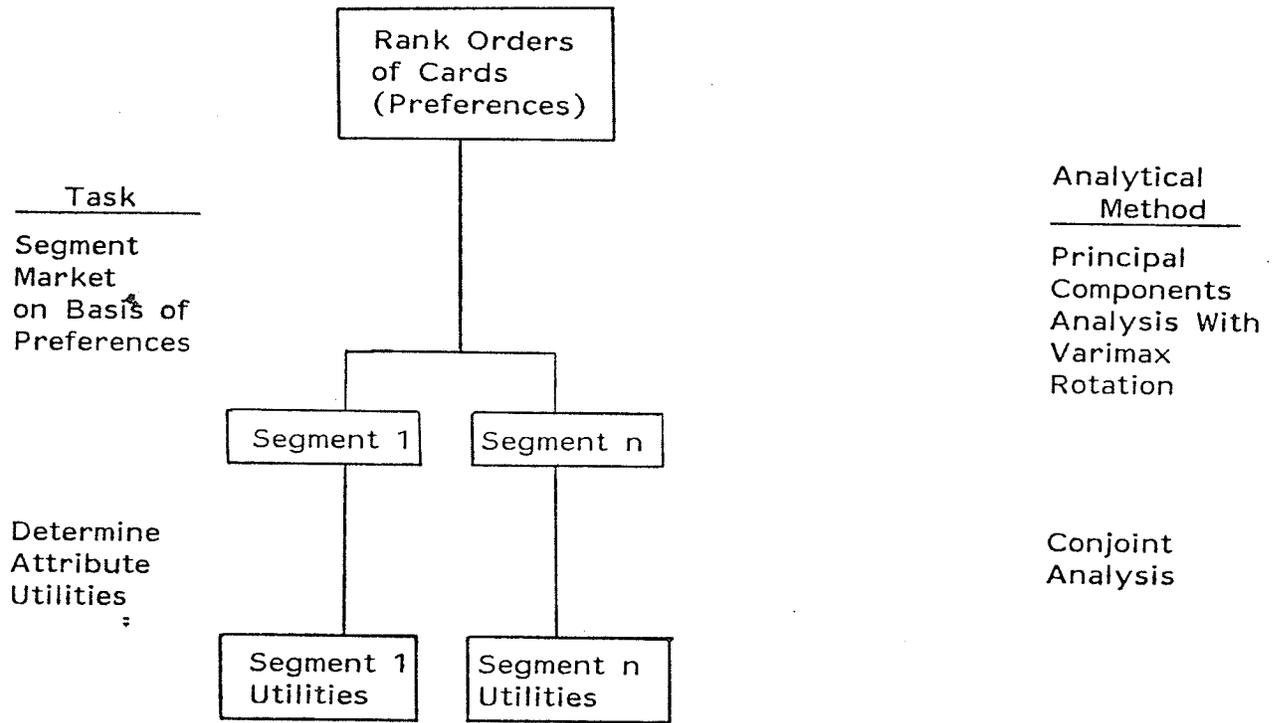
Segment Formation

The objective of this phase of the study was to determine whether the respondents might be segmented on the basis of their preferences for the differing attributes and levels of the fare plans under study. In other words, could segments be formed on the basis of similarities between the respondents' on the basis of their ranking of the concept statement cards? Principal components analysis provided a means of extracting groupings of respondents, or components from the data. The first component extracted may be viewed as the single best summary of relationships exhibited in the data. The second component is the next best combination of respondents, and is uncorrelated to the first. To be uncorrelated to the first component, the second component must account for variance not accounted for by the first. In essence, the second component may be defined as the combination of variables that accounts for the most residual variance after the effect of the first component is removed from the data. Subsequent components are defined similarly until all the variance in the data is explained.

FIGURE 5

METHODOLOGY SCHEMATIC

STEPS 1 & 2



Since each component is defined as the best summary of variance left in the data after the previous components have been extracted, the data reduction capability of principal components analysis can be significant with just a few composite components explaining most of the variance in the data. The primary strength of principal components analysis, however, is its ability to group or cluster data in ways that might not inherently obvious. Because parameters to delineate clusters or components are not prespecified, principal components analysis can identify clusters of data exhibiting similarities that might not be inherently obvious to the researcher.

A parallel may be drawn between the use of principal components analysis in this study and work conducted in the field of perception testing by Tucker and Messick (1963:333). Tucker and Messick developed a quantitative system for determining multidimensional perceptual spaces for individuals having different viewpoints about stimulus interrelationships. Prior to their work, perception researchers were forced to assume that respondents had homogeneous perceptions of the stimulus objects. Early approaches concentrated on averaging the responses of groups of individuals to arrive at an average respondent. The problem was that the results for the average respondent may not accurately describe the responses of individuals in the sample. An alternative to averaging was to work with respondents individually. This posed difficulties when researchers attempted to generalize individual responses to the population at large. Tucker and Messick proposed taking a respondent's data vector, comparing it to other respondents data vectors and then grouping the respondents on the basis of having similar vectors. The statistic used to describe the degree of similarity is the component loading in a principal components analysis. Within the context of this study, respondents were grouped on the basis of having similar preferences for the attributes under consideration.

Principal components has been described as a means of data reduction and segment formation. Components are formed on the basis of summarizing relationships between variables. This is referred to as R-type analysis (Rummel, 1970:194) and consists of analyzing a correlation matrix with the variables (columns) referring to the characteristics of the entities; the cases (rows) are the entities themselves. The

objective of this study was to cluster individuals or respondents into segments with similar preferences. The principal components analysis was conducted between pairs of individuals rather than variables in order to derive components representing the points of view of groups or segments of the respondents with regard to the attributes under study. This is referred to as Q-type analysis (Rummel, 1970:196) and involved transposing the matrix of input data such that the variables (rows) referred to the fare plans and the columns to the respondents.

The initial components derived may be viewed as vectors. The spatial configuration of the component structure is not unique, ie. a component solution may be transformed into another without violating the mathematical properties of the solution. There are many statistically equivalent ways to define the underlying dimensions of the same set of data. A vector space has an infinite number of bases. Each base contains the same number of independent dimensions and each is a transformation of any one of the other bases.

5

The initial solution was rotated to a terminal solution. The method of rotation selected was varimax, an orthogonal rotation described by Rummel (1970:376) as the best analytic orthogonal rotation technique. The purpose of rotation is to enhance the interpretability of the solution with a goal of simplifying the structure. In the unrotated solution, the first component is fitted to the data to account for maximum variance and is often located between clusters of interrelated variables or individuals. The simple structure goal of rotation is achieved by rotating the components around the origin until each component is

maximally colinear with a cluster of respondents' data vectors. The shift is from components maximizing total variance to components delineating separate groups of highly intercorrelated points of view. Each respondent primarily loads on one of the components. If the components are considered to be points of view or segments, the rotation has formed the number of segments needed to account for the variation in the data. Each rotated component has been identified with a distinct cluster of interrelated respondents.

The input data were clustered into groups or segments of respondents exhibiting similar preferences for the attributes of air travel under study. The question of how many of the rotated components or market segments are needed to explain the data was addressed by Rummel (1970:368). While little research has been conducted on this subject, Rummel suggests employing a discontinuity test and a scree test for determining how many components to retain. Discontinuity refers to a characteristic that occurs when the last substantively important component is extracted; the eigenvalues for the remaining components will show a discontinuity, or a sharper drop than for adjacent components. The components prior to discontinuity will have a fairly constant slope for their eigenvalues. The "scree test" refers to the curve measuring the proportion of total variance, the slope of which will diminish sharply, graphically similar to debris at the base of a mountain, when the last important component has been extracted. These tests were employed in this study to determine how many of the components to retain as market segments.

Within components or segments, a minimum acceptable loading of 0.7 was established. This meant that approximately 49% of the variance of a respondent's data would have to be represented by, or load on a particular component in order for the respondent to be viewed as a member of the segment defined by the component. The data for those respondents not loading at least .7 on one of the rotated components was discarded because they did not clearly belong to the segment represented by that component or any other component.

Development of Utility Scales

Once the segments had been formed, the next step was to convert the ordinal scaled rank order data to interval scaled data. Conjoint measurement is a relatively new procedure employed for this purpose.

Clear and accurate measurements of preferences are often difficult to obtain. The data for preference measurements are usually in the form of judgements or opinions about the relative desirability of various alternatives available to the respondent. Preference judgements are relative rather than absolute, and the derivation of an overall pattern from a set of relative judgements requires a large number of comparisons.

Early research into preference measurement appears to have been based on the simplest possible notion of preference. Preference for one object over another was treated as an intrinsic attribute of the individual which was reflected in his behaviour in preference tests (Ferber, 1974:3-102). Much of the literature of preference measurement appears to be based on a simple categorization of subjects. In the

categorical models, the individual is assumed to be in one of three states relative to the preference object or objects. In the evaluation of a pair of items A and B, the three states are "prefer A to B," "prefer B to A," and no preference. The model was strictly categorical and inherently situationally specific. The major difficulties in this early research were twofold: First, the preferences of individuals were not quantifiable on an interval scale. Secondly, there was a significant degree of instability in respondents' preference behaviour from one situation to another.

Advancements in the field of consumer behavior research led to the application of economic utility theory as a rationale for the choice process and an approach to measuring preferences. The basis of a corporate marketing orientation is the determination of what consumers want. The key to successful marketing is to manufacture a product or service that satisfies consumers at a profit in terms of (a) product characteristics and; (b) how much of each characteristic is deemed optimal. In other words, what attributes should a product or service have, and what levels of each attribute are most acceptable. Early investigation into "ideal" attributes and levels provided researchers with some basis for product attribute and level determination, but ran into difficulties because consumers frequently wanted the highest level of each attribute. (Johnson, 1974:121-127) From a competitive standpoint, it is exceedingly difficult to make a product with consistently higher or more favourable attribute levels than the competition and at the same time sell it for a consistently lower price.

What was needed, according to Johnston (1974:121-127) was a method of simulating actual consumer choice behavior in the marketplace. Conjoint measurement is a mathematical technique that converts rank order to interval scaled data. Consumers are presumed to trade-off levels of one attribute for levels of another attribute in order to maximize their utility. While consumers may not be able to articulate their trade-off process, the compromises may be revealed through actual choice behavior. When subjects are presented with product concepts having characteristics which are varied in systematic ways, they are forced to choose between desirable alternatives. "Conjoint" refers to the joint measurement of relative values of levels of attributes which might be unmeasurable taken one at a time.

The approach used with conjoint measurement is:

1. Collect data using a questionnaire structured to force respondents to choose between or trade-off among desirable service offerings. This essentially simulates consumer choice behavior in the marketplace.
2. Derive consumer values or utilities for each level of service offering.

Consumer choice behaviour is characterized by a series of product attribute and attribute level evaluations. In the purchase decision, consumers evaluate various product attributes and determine the extent

to which they are prepared to forego or trade-off a high level of one attribute in order to attain a higher level of another. The purchase decision is then based on the consumer maximizing the sum of the utilities or values of the levels and attributes deemed important to him. Each level of each attribute has a "part worth" or partial utility to the consumer.

First proposed in a marketing context by Green and Rao (1971) conjoint measurement had its roots in the mathematical psychology and economics literature of the 1960's. Luce and Tukey (1964:1-27) developed a method that permitted the simultaneous evaluation and ordering of dependent variables. Lancaster (1966) approached the subject of attributes and attribute levels from an economics perspective. The study of utility and indifference curve analysis has long been a basic element of microeconomic theory. The traditional economic assumption has been that commodities or products themselves were the basic objects of utility. Lancaster (1966) postulated a theory of consumer utility in which goods are evaluated in terms of preferences for the attributes and attribute levels presumed to underlie the goods, rather than the goods themselves. In economic terms, utility is not derived from goods but from the want satisfying attributes of the goods. Thus, goods or services are ranked according to utility only indirectly, through values assigned to the attribute levels that they are perceived to possess. Lancaster assumed that consumers' perceptions of the goods' attributes are identical and that only their points of maximal preference vary.

Conjoint measurement is fundamentally different from those types of measurement with which most researchers are familiar. Although it requires only rank order data, it produces measurements which are stronger than rank orders. The input data are ordinal scale, but the output measurements are interval scale.

Conjoint measurement is particularly appropriate for marketing problems involving new product design or product positioning research. The method lends itself to studies of multiattribute alternatives such as airline fare plans. There are several technical aspects of conjoint measurement that should be reviewed:

1. The conjoint model assumes that the attributes studied are nonredundant. The utility for a collection of attributes is assumed to be the sum of the utilities of each of its attributes. For the purposes of this study, it has been assumed that the attributes tested are nonredundant and they represent the major criteria in the consumer's purchase decision.
2. A second assumption is that the attributes studied are independent, i.e., there is no interaction between attributes. For example, the extent to which a respondent prefers to fly with Air Canada is independent of price, enroute stops, etc.

The model is able to recover main effects from either full factorial or fractional factorial designs for data collection. (Green, 1973:121) When the number of alternatives is large,

there is a risk of respondent burnout. Using the concept statement data collection approach for this study, each respondent would have had to evaluate and rank 1152 concept evaluation statements in a complete factorial design. Using a balanced incomplete block design or orthogonal array, it was possible to estimate the main effects with only twenty concept statements. (Addelman, 1961:144) In using a fractional design one must assume that interactions (those arising from several attributes simultaneously) are relatively small compared to main-effects. There is a cost in using fractional factorial designs. This cost is particularly apparent when significant interaction exists in the data, and confounding or co-mingling exists between higher-order interaction and main-effects (Ferber, 1974:2-489). For the purposes of this study, the advantages with regard to respondent fatigue far outweighed the risks associated with interaction effects. Therefore, the decision was made to employ a fractional factorial data collection plan. If significant interaction did exist in the data, the conjoint measurement procedure provides an indication of the extent of the interaction.

In this study, principal components analysis was used to find groups of individuals with similar rank orders of preference for differing levels of the fare plan attributes. Kruskal's Monanova (1951), a conjoint measurement algorithm, was employed to convert the rank orders to interval scale data. The program performs an iterative set of dummy-variable regressions of the criterion values adjusted so as to

retain the original rank order of the input data. The program then finds that set of parameter values (the part worths) so that their approximate sums correlate maximally with a monotonic function of the original ranks. Since each successive analysis of variance maintains the original rank order constraints, the procedure is called monotonic analysis of variance.

Monanova develops utility scales for one individual's data. Each rotated component was treated as an individual. The rank order data for each of the components were averaged. While each rotated component contained data for a number of individuals, the preferences or points of view of the individuals were consistent within each component. The averaging procedure at this point in the study facilitated analysis between segments and met the input requirement for Monanova. The averaging was conducted after the principal components had been extracted from the data. Thus, the pitfalls associated with averaging discussed earlier were minimized.

Stress is a measure of how well Monanova recovers the main effects of the original input data. High stress indicates that significant interaction exists between variables. Both Green (1974) and Cattin (1975) have found that Monanova has been unable to recover the main-effects of the original input data when significant interaction existed. There is no universally recognized level of acceptable stress. Green (1974) regarded 15 percent as being acceptable while Dubin et al (1975) found 16 percent to be tolerable. Therefore, for this study, maximum stress limits of 15 percent were established.

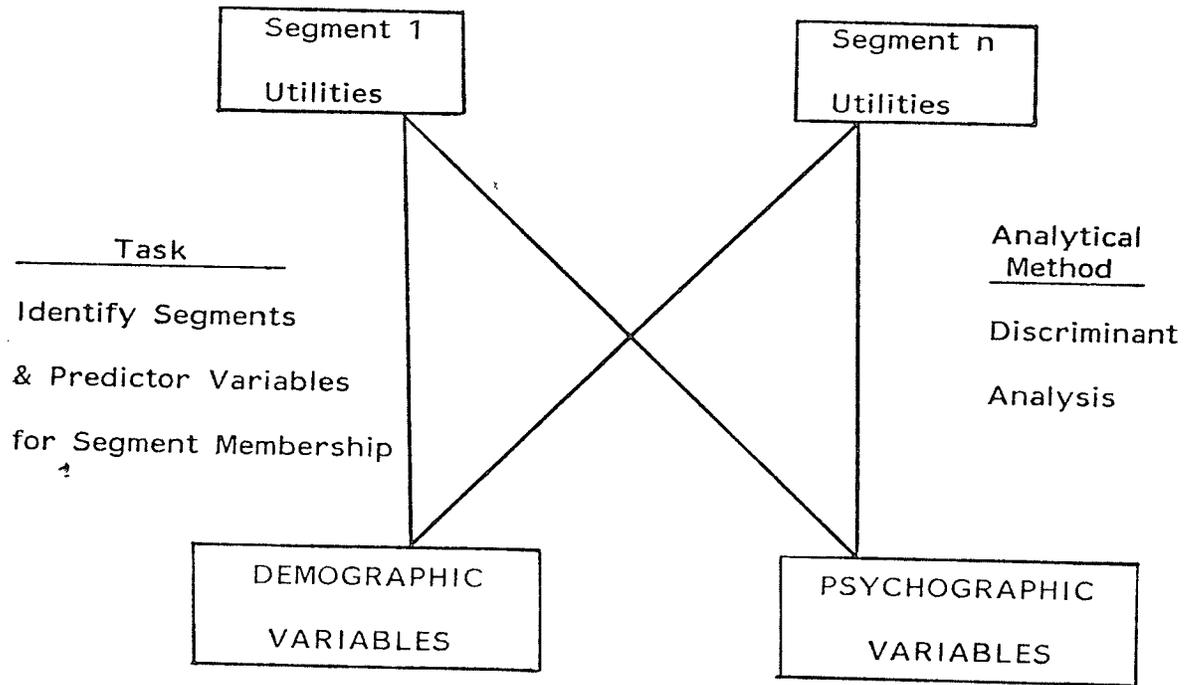
Segment Descriptors

With the exception of Johnston's (1979) finding that business and pleasure travellers comprise distinct market segments, little work has been done to describe the characteristics of groups of air travellers exhibiting similar preference behavior. The third aspect of this study was the exploration of segment descriptor data. Market segments had been formed on the basis of similar preferences. Those points of view or preferences were measurable on both relative and absolute scales. The objective of this third step was to see if segments with similar preferences were also similar demographically and psychographically. In other words, could the knowledge of prospective customers' demographic or psychographic profiles be used to predict their preferences for fare plans? If the answer was yes, with what precision could this be done? Figure 6 outlines this third step.

The first step in the methodology sought to find similarities in the data and resulted in the formation of market segments comprising individuals with like preferences. Conceptually, the objective of the third step was to find differences in the data that might assist in identifying and actioning the segments. Actioning refers to finding criteria that are managerially relevant for strategy formation. In other words, the aim of the third step was to find segment predictors that would assist carrier management in the development of marketing strategies geared to the segments that had been formed. Multiple discriminant analysis classifies objects into mutually exclusive and exhaustive categories on the basis of a set of independent variables. Technically,

discriminant analysis assigns a score to each individual or object. This score is a weighted average of the individual's numerical values of his independent variables. On the basis of this score, the individual is assigned to the most likely category. Based on the strength of the scores, it is possible to determine which variables contribute most to an individual's being assigned to a particular category. The analysis can provide a basis for identifying the segments. For this study, the categories are the segments; the independent variables are a series of demographic and psychographic variables.

FIGURE 6
METHODOLOGY SCHEMATIC
STEP 3



Each respondent was asked to complete a self rating scale on thirteen psychographic variables. The scales employed were six point rating scales ranging from 'This does not describe me' to 'This does describe me.' The purpose of these questions was to ascertain whether segments might be identified by factors such as deal proneness, media exposure patterns or perceived importance of several subjective attributes of air travel.

The use of psychographic characteristics as potential segment predictors for air travellers has not been attempted in any of the published literature. The selection of the particular characteristics employed was based on an objective of developing actionable predictor variables. In light of Johnston's (1979) and the CTC (1972) findings that price was the major attribute considered by vacation travellers, there might exist a means of actioning this characteristic through the development of unique marketing strategies targeted towards this group. Wind (1978:320) found that psychographic variables related to deal proneness provided excellent segment descriptors in price sensitive markets. Media exposure and readership patterns might assist carriers in media selection to reach the segments formed and described by the study. The relative importance of some of the soft attributes such as in-flight and airport service might assist in developing distinctive marketing strategies for each segment. Similarly, the perceptions of relative safety might assist in the formation of marketing plans.

The psychographic data (as well as age, sex, and trip frequency information) for each of the respondents provided the input to a multiple

discriminant analysis. Multiple discriminant analysis predicts segment membership on the basis of sets of group means for each variable, together with the set of sample covariances of the variables. Discriminant analysis provides a set of aggregate similarity indices for each segment and assigns individual respondents to the segment possessing characteristics most like his own. Since actual segment membership is known in advance, the predictive accuracy of the variables under study may be assessed.

Sample estimates of predictive power in discriminant analysis are subject to a strong upward bias. (Frank; 1965:250) The bias occurs because discriminant analysis tends to fit the sample data in ways that are systematically better than would be expected by chance, even if the underlying populations are identical (ie., no predictive power truly exists).

In order to detect possible upward bias in the initial classifications, a split half validation procedure was employed in this study. The validation procedure consisted of randomly splitting the sample in half and determining how well the coefficients estimated from the first half could predict the correct classification of the second half of the respondents. (Frank, Massy, Morrison; 1965). Five independent validation tests were conducted on the data using a split half sample selected on a random basis.

In summary, the three steps outlined on the preceding pages form the analysis plan for the study. The respondents were categorized into

market segments based on their preferences for various fare plan alternatives. The preferences of the segments were converted to interval scaled utility values. Finally, the segments were identified and described on a series of variables that would conceivably have managerial relevance in terms of developing unique marketing strategies geared to specific segments.

CHAPTER 3
ANALYSIS OF DATA

a) , Forming the Segments

Of the 187 completed surveys, fourteen were found to be missing sufficient information to conduct any form of analysis. The rank order data of the remaining 173 respondents were submitted to the principal components analysis in order to form clusters or segments. The principal components solution was rotated simple structure. Using Rummel's discontinuity and scree test criteria, the first two components were retained for further analysis.

The components represent two groups of individuals having similar within-group preferences as expressed by their ranking of the concept statement cards. A minimum acceptance value for group membership or component loading had been established at 0.70. The individual respondent loadings on each of the two components were examined and the data for individuals loading less than 0.70 on either of the two components was discarded. Using this criterion, a total of 95 respondents' data sets were retained for further analysis.

Results

Prior to examining the two defined groups or segments, the aggregate demographics of the remaining 95 respondents were compared with comparable data supplied by Pacific Western Airlines (1980) as being

representative of Pacific Western passengers in Western Canada.

Table 3 illustrates this comparison.

TABLE 3

A COMPARISON OF RESPONDENTS' CHARACTERISTICS
WITH AIR TRAVELLER STATISTICAL DATA

	<u>NUMBER OF RESPONDENTS</u>	<u>PERCENT OF RESPONDENTS</u>	<u>PACIFIC WESTERN PROFILE PERCENT</u>
Occupation:			
Executive/Managerial/Professional	58	61.1	55
Craftsman/Tradesman	3	3.2	11
Military/Protective	1	1.0	2
Service	1	1.0	3
Student	0	0.0	6
Homemaker	17	17.9	7
Sales	1	1.0	7
Office Worker	7	7.4	5
Other	7	7.4	4
Type of Business:			
Agriculture/Forestry/Mining	3	3.2	12
Service	17	17.9	11
Retail	1	1.0	6
Utilities/Energy/Resources	29	30.5	14
Government/Public Administration	6	6.3	11
Transportation/Communications	8	8.4	9
Manufacturing	5	5.3	9
Sports/Recreation	0	0.0	3
Other	26	27.4	25
Age:			
Under 18	0	0.0	3
18 - 21	2	2.1	8
22 - 29	14	14.7	23
30 - 39	47	49.5	27
40 - 49	25	26.3	18
50 - 64	4	4.2	15
65 and Over	3	3.2	6
Sex:			
Male	58	61.1	70
Female	37	38.9	30
Business Trips Taken in Preceding 12 months by air.	Mean 3.24 trips		Mean 4 trips
Pleasure Trips Taken in Preceding 12 months by air.	Mean 1.71 trips		Mean 2 trips

The sample does not appear to be entirely representative of air travellers in Western Canada when compared with the statistical data provided by Pacific Western Airlines (1980). The sample does however include some members of most classifications.

The respondent group was drawn primarily from the Executive/Managerial/Professional occupation category as are air travellers in general. The sample was predominantly male and clustered in the 22-49 years of age categories. The respondents' trip frequency was similar to the Pacific Western traveller population. The representation of respondents in energy related occupations is somewhat higher than the air traveller population. In the opinion of the author, this bias is related primarily to the setting of the survey, i.e. Calgary, and does not materially affect the research results. This concentration in the energy industry is a characteristic of Calgary. The method of recruiting respondents through community associations would tend to attract property owners that were active in community affairs. This has resulted in a clustering of respondents in the 22-49 years of age categories, and a less than proportional representation at the very young and very old poles of the age scale.

Table 4 illustrates the travel characteristics of the two groupings of respondents identified by the principal components analysis. These groupings represent market segments based on the respondents' rank ordering of the concept statement cards, or preferences for the air travel attributes being tested.

TABLE 4

A DESCRIPTION OF SAMPLE
CHARACTERISTICS BY SEGMENT

<u>CHARACTERISTIC</u>	<u>SEGMENT #1 n=55</u>	<u>SEGMENT #1 PERCENT</u>	<u>SEGMENT #2 n=40</u>	<u>SEGMENT #2 PERCENT</u>
Purpose of Last Trip:				
Business	6	10.9	35	87.5
Pleasure/Vacation	49	89.1	5	12.5
Interview Based on:				
Short Haul Flight	29	52.7	19	47.5
Long Haul Flight	26	47.3	21	52.5
Experience With Canadian Airlines in Preceding 12 months:				
Air Canada	37	67.3	35	87.5
CP Air	25	45.5	23	57.5
Pacific Western	26	47.3	25	62.5
Wardair	12	21.8	5	12.5
<hr/>				
Business Trips Taken in Preceding 12 months by air:				
Mean		1.65		5.42
Standard Deviation		2.84		3.54
Pleasure/Vacation Trips Taken in Preceding 12 Months by air:				
Mean		1.73		1.68
Standard Deviation		0.97		1.75

Table 4 indicates a very clear dividing line between the respondents answering the questionnaire on the basis of vacation/ pleasure trips and those responding in relation to business travel. Segment 1 was almost exclusively pleasure/vacation travellers while segment 2 was comprised of business travellers. There appears to be little differentiation of response for long versus short flights and the respondents' preferences do not appear to be governed by trip length.

Almost all the business travellers had flown on Air Canada during the twelve months preceding the survey. Over half had flown on C.P. Air and Pacific Western. Wardair had a much stronger presence in the pleasure/vacation travel segment. This was to be expected given Wardair's position as a major carrier in the Canadian holiday market.

The apparent wide range of experience with different airlines suggests that the respondents were well versed in matters pertaining to air travel. This supposition is corroborated by the trip frequency statistics which show the respondent group to be frequent users of the air transportation system. The mean number of business related trips taken by members of the Segment 2 was 5.42 trips annually. The members of this segment also flew on pleasure/ vacation trips during the twelve months preceding the survey. Segment 1 members flew at least once each year. Members of this segment also flew for business purposes.

Table 5 provides a breakdown of the demographic characteristics of each of the segments. Segment 1, the largest of the two consisted of managers, homemakers and clerical workers employed in a wide range of businesses. Over half the segment fell into the 30 - 39 years of age category and fifty-eight percent of the respondents in the segment were female. The demographics of Segment 2 were characterized by the majority of the respondents being employed in a managerial capacity for the utilities/ energy/resources sector of the economy. The respondents in this segment were predominantly male, and slightly older than those in Segment 1.

TABLE 5

SAMPLE DEMOGRAPHICS BY SEGMENT

	Segment #1 N=55	Segment #1 Percent	Segment #2 N=40	Segment #2 Percent
<u>Occupation:</u>				
Executive/Managerial/Professional	24	43.6	34	85.0
Craftsman/Tradesman	3	5.5	0	0.0
Military/Protective	1	1.8	0	0.0
Service	1	1.8	0	0.0
Student	0	0.0	0	0.0
Homemaker	15	27.3	2	5.0
Sales	1	1.8	0	0.0
Office Worker/Clerical	7	12.7	0	0.0
Other	3	5.5	4	10.0
<u>Type of Business:</u>				
Agriculture/Forestry/Mining	2	3.6	1	2.5
Service	11	20.0	6	15.0
Retail	1	1.8	0	0.0
Utilities/Energy/Resources	11	20.0	18	45.0
Government/Public Administration	5	9.1	1	2.5
Transportation/Communication	5	9.1	3	7.5
Manufacturing	3	5.5	2	5.0
Sports/Recreation	0	0.0	0	0.0
Other	17	30.9	9	22.5
<u>Age:</u>				
Under 18	0	0.0	0	0.0
18-21	2	3.6	0	0.0
22-29	10	18.3	4	10.0
30-39	28	50.9	19	47.5
40-49	11	20.0	14	35.0
50-64	2	3.6	2	5.0
65 and over	2	3.6	1	2.5
<u>Sex:</u>				
Male	23	41.8	35	87.5
Female	32	58.2	5	12.5

b) Development of Utility Scales

The principal components analysis defined a set of market segments or clusters of respondents exhibiting similar preferences for the air travel attributes tested. Kruskal's Monanova was employed to convert the ordinal rankings to interval scaled data for each segment.

Using an iterative procedure, Monanova (Monotonic Analysis of Variance) seeks to find a response or utility scale for each attribute that best preserves the original rank ordering of the attributes.

The input data were the average of the rank orders of the twenty concept statement cards provided to each of the respondents in Part II of the survey. The rank orders of the preferences or concept statement cards within each segment were averaged cell by cell, and the means became the average rank order for the segment.

Interaction was present to some degree in each of the market segments tested. The ranking of airline preferences exhibited interaction across both segments. Other instances of interaction were found in each of the segments but without apparent pattern. The attributes affected by the interaction were generally attributes of lesser importance to the respondents in each of the segments.

The stress level is a measure of how well the model is able to recover the main effects of the original input data. High stress would indicate that significant interaction effects were present. The stress

levels for the segment data were well within acceptable limits with Segment 1 indicating a stress of 0.8% and Segment 2, 13.6%.

Table 6 illustrates the utility scores for each of the attributes and levels by segment. Each entry in the table corresponds to the part-worth or utility of that particular attribute level to the members of each segment. The value of a particular product offering to a segment member may be calculated by adding the part-worths associated with the various levels and attributes under consideration. An examination of Table 6 reveals that, in the case of prices, the highest price offered has a negative part-worth or utility to Segment 1 of -2.268. The lowest price has a positive part-worth of 3.153.

There was some indication that the utility scales for two of the attributes were not linear for respondents in Segment 1. In the case of the attribute advance booking, Segment 1 respondents found a thirty day advance booking requirement slightly less onerous than a seven day. Similarly, for departure times, members of Segment 1 indicated that flight departures within four hours of their most preferred departure times were slightly less favourable than departures within twelve hours of their most preferred time. These results indicate that either the respondents had difficulty differentiating between the levels of these attributes, or that they do prefer to book their travel at least thirty days prior to departure and depart within twelve hours of their most preferred time.

TABLE 6

UTILITY SCORES BY SEGMENT

<u>Attributes & Levels</u>	<u>SEGMENT #1</u>	<u>SEGMENT #2</u>
Price:		
0. \$402/162	-2.268	-0.707
1. \$252/101	-1.079	-0.270
2. \$202/88	0.104	0.006
3. \$186/78	3.153	0.971
Airline:		
0. Air Canada	-0.337	0.097
1. C.P. Air	0.095	0.172
2. Pacific Western	0.071	-0.109
3. Wardair	0.170	-0.159
Minimum Stay:		
0. None Required	1.479	2.951
1. At least one Saturday night	-0.265	0.562
2. At least seven days	-0.501	-1.040
3. At least fourteen days	-0.713	-2.473
Advance Booking:		
0. None Required	0.156	0.952
1. At least seven days	-0.088	-0.123
2. At least thirty days	-0.068	-0.829
Departure Times:		
0. Within 2 hours of pre- ferred time	0.558	0.295
1. Within 4 hours of pre- ferred time	-0.327	-0.042
2. Within 12 hours of pre- ferred time	-0.231	-0.253
Enroute Stops:		
0. None	0.129	0.462
1. One	-0.129	-0.462

The additivity assumption of conjoint analysis dictates that the values of the levels within each attribute and segment represent the partial utility or part-worth of that particular attribute and level to the consumer in the decision process. The sum of the attribute values, one level for each attribute, represents the total utility of any combination of attributes and levels.

The following examples illustrate the application of the additivity assumption. The utility scores from Table 6 have been applied to two of the airline product offerings detailed in Table 1.

Example 1:

CALGARY-VANCOUVER

	<u>Segment Utility Scores</u>	
	1	2
Price \$162	-2.268	-0.707
Airline: Air Canada	-0.337	-0.097
Minimum Stay: None	1.479	2.951
Advance Purchase: None	0.156	0.952
Departures: 2 Hours	0.558	0.295
Enroute Stops: None	0.129	0.462
	<hr/>	<hr/>
TOTAL UTILITY	-0.283	4.050

Example 2:CALGARY-VANCOUVER

	<u>Segment Utility Scores</u>	
	1	2
Price \$101	-1.079	-0.270
Airline: Pacific Western	0.071	-0.109
Minimum Stay: Saturday	-0.265	0.562
Advance Purchase: 7 days	-0.501	-0.123
Departures: 4 Hours	-0.327	-0.042
Stops: One	-0.129	-0.462
	_____	_____
TOTAL UTILITY	-2.230	-0.446

Example 1 indicates the appeal of the full fare product to each of the segments. The highest total utility for this particular combination of attribute levels was evidenced by Segment 2 and the lowest by Segment 1. While this particular fare type features the fewest or most liberal restrictions it also involved the highest dollar expenditure.

Example 2 details the utility scores assigned to a discount fare offered by Pacific Western Airlines. The fare involves advance booking provisions, minimum stay conditions and enroute stops but provides a saving of \$61 in air fare. The segment with the highest utility for this combination of levels was again Segment 2. If one views Segment 1 as pleasure/vacation travellers and Segment 2 as business fliers, the discount plan in Example 2 appeared more attractive to those travelling for business reasons.

The range of utility scores within each attribute determines the importance of the attribute in the overall decision process. Table 7 shows the importance weights or ranges of each of the attributes by segment.

TABLE 7

IMPORTANCE WEIGHTS OF ATTRIBUTES BY SEGMENT

(RANGE OF UTILITIES)

<u>ATTRIBUTE</u>	SEGMENT SEGMENT	
	#1	#2
Price	5.421	1.678
Airline	0.507	0.331
Minimum Stay	2.192	5.424
Advance Booking	0.244	1.781
Departure Times	0.885	0.548
Enroute Stops	0.258	0.924

The individuals in Segment 1 viewed price as being more than twice as important as minimum stay conditions in their choice of a particular discount fare. These factors were the two most important attributes to this Segment. The members of Segment 2 found restrictions on minimum stay to be most important in their preference ranking followed by advance booking provisions and price. Figure 7 presents a graphic depiction of the relative importance of each of the attributes in the preference behavior of segment members. The figure is based on the range of each attribute's utility as a percentage of the total range of the utilities of all attributes.

FIGURE 7

A GRAPHIC DEPICTION OF RELATIVE ATTRIBUTE IMPORTANCE

SEGMENT 1

PRICE

AIRLINE

MINIMUM STAY

ADVANCE BOOKING

DEPARTURE TIMES

ENROUTE STOPS

SEGMENT 2

PRICE

AIRLINE

MINIMUM STAY

ADVANCE BOOKING

DEPARTURE TIMES

ENROUTE STOPS

PERCENT

0 10 20 30 40 50 60 70

RELATIVE IMPORTANCE OF ATTRIBUTES

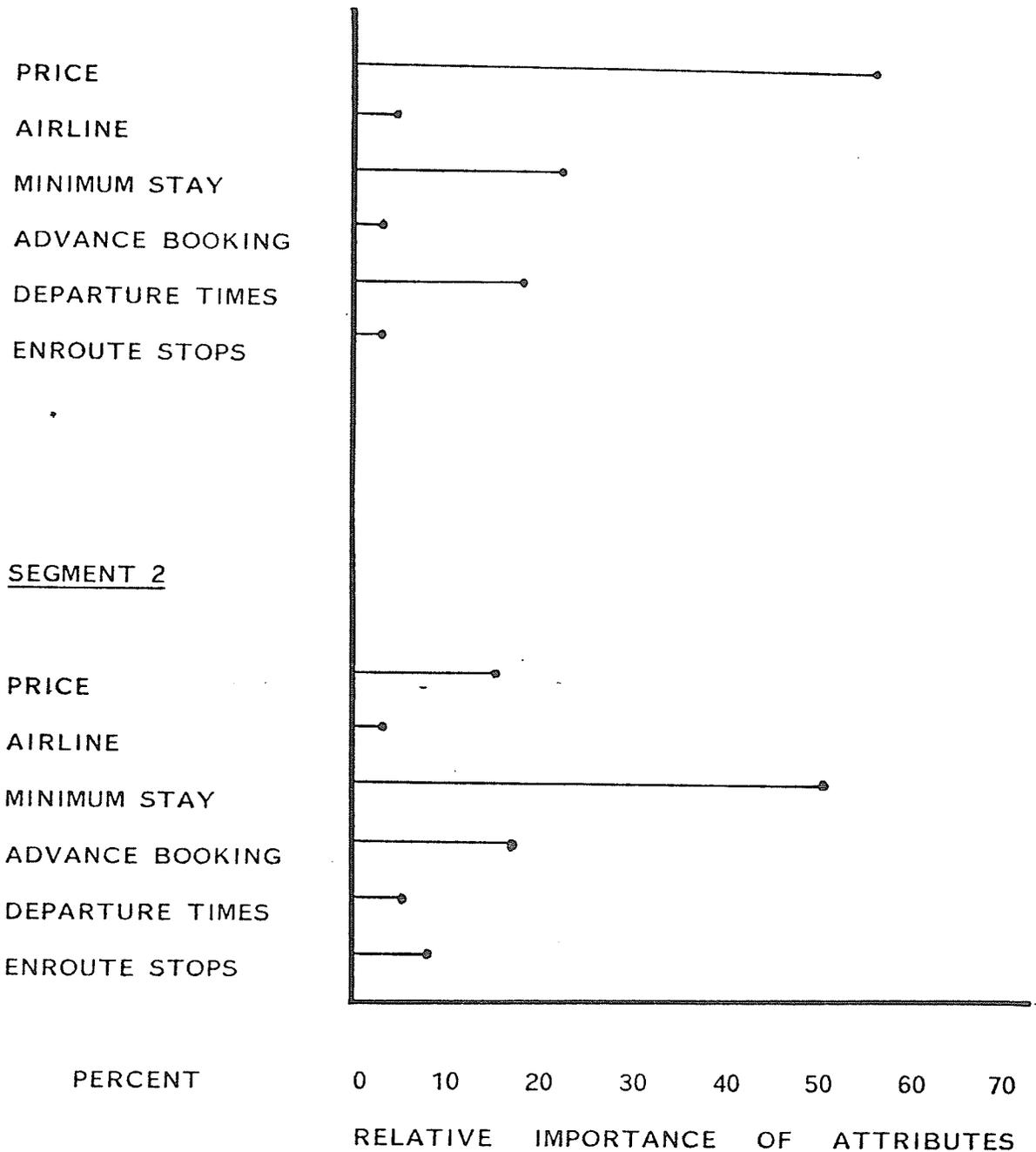


TABLE 8

A RANKING OF ATTRIBUTE IMPORTANCE BY SEGMENT

SEGMENT 1

Price
Minimum Stay
Departure Times
Airline
Enroute Stops
Advance Booking

SEGMENT 2

Minimum Stay
Advance Booking
Price
Enroute Stops
Departure Times
Airline

Table 8 ranks the attributes in descending order of importance for each of the segments. Combining the information presented in Tables 4 and 5 with that in Table 8, it was possible to draw a profile of each market segment.

Segment 1 preference behaviour was most influenced by price. Minimum stay conditions were of secondary importance to members of this segment. Membership in this segment was comprised primarily of vacation travellers and was equally split between male and female respondents.

Segment 2 members were more sensitive to minimum stay conditions on air travel than to any of the other attributes tested. Membership of this segment was almost exclusively male executives who travelled on business.

Given that Segment 1 comprises primarily pleasure/ vacation travellers, and 2 business fliers, similarities were apparent between the attribute importance rankings on the basis of trip purpose.

Business fliers found advance booking provisions, minimum stay conditions and, surprisingly, price to be of greatest importance. Pleasure/vacation travellers in Segment 1 tended to be somewhat more divergent on their attribute importance rankings. Price was important to both segments. Minimum stay conditions were important to those in Segment 1. Pleasure/vacation travellers tended to put more emphasis on choice of carrier than did business travellers. Enroute stops was of greater importance to Segment 2 members.

c) Segment Identification

Multiple discriminant analysis was employed to develop a unique psychographic/demographic profile of travellers based on segment membership. The procedure predicts segment membership on the basis of a score which is generated as a result of weighting numerical values associated with the psychographic and demographic variables. Because actual segment membership is known, multiple discriminant analysis facilitates the identification of variables that might act as significant discriminators between the segments.

Table 9 presents a confusion matrix showing the correct and incorrect classifications for each of the respondents based on a discriminant analysis of thirteen psychographic and four demographic variables. Table 10 shows the same information in percentage form.

TABLE 9

CONFUSION MATRIX FOR 17 CHARACTERISTICS

TOTAL SAMPLE

<u>ACTUAL</u> <u>SEGMENT</u>	<u>PREDICTED SEGMENT MEMBERSHIP</u>		<u>TOTAL</u>
	<u>1</u>	<u>2</u>	
1	46	9	55
2	8	32	40

TOTAL HITS = 78 PERCENT HITS = 82.1%

TABLE 10

NORMALIZED CONFUSION MATRIX FOR 17 CHARACTERISTICS

TOTAL SAMPLE

<u>ACTUAL</u> <u>SEGMENT</u>	<u>PREDICTED SEGMENT MEMBERSHIP</u>	
	<u>1</u>	<u>2</u>
1	.84	.16
2	.20	.80

TOTAL HITS = 78 PERCENT HITS = 82.1%

Entries on the main diagonal of the matrices denote correct classifications or hits while the off-diagonal entries represent misses. The hit rate for the characteristics was 82.1%. This correct classification rate suggested that at least one of the variables tested acted as a strong discriminator. Given the probability of membership in any one segment equal to fifty percent, the discriminant analysis was able to assign over eighty percent of the cases to the correct segment. The objective of discriminant analysis is to correctly classify individuals into mutually exclusive and exhaustive segments on the basis of a score derived from a weighting of independent variables. The score may be transformed into a decision rule for probability of membership in any given segment.

One decision rule is that of a linear discriminant function. That is, the mathematical function derived from the weighted variables is a straight line and acts as a boundary between the two segments. Individuals are classified into either one segment or the other depending on which side of the function their scores fall. If a discriminant function is not linear, the decision rule becomes more complex and the task of isolating the effects of each variable more onerous. The stability and reliability of the linear discriminant procedure is based on equal or approximately equal dispersion of the covariance matrices of each of the segments. The discriminant procedure found the dispersion of the matrices to be sufficiently similar to provide a significant degree of reliability to the analysis. (Significance = .008)

Given the tendency of the procedure to overestimation, the data were analyzed a second time. The second analysis entailed splitting the sample in half and determining whether the classification functions derived from the first half of the sample could be used to successfully classify cases in the second half. This procedure was repeated five times using randomly drawn assignments. The results of this validation procedure are presented in Table 11. The average correct classification rate from the analysis cases to the V1 or validation cases showed some deterioration across all five replications. The classification function was still however able to classify more cases correctly than would be expected by chance.

TABLE 11

DISCRIMINANT ANALYSIS

A COMPARISON OF ANALYSIS AND V1 SAMPLE RESULTS

Percent Classified Correctly

<u>Replication</u>	<u>Analysis Sample</u>	<u>V1 Sample</u>
1	95.8%	71.4%
2	89.4%	75.0%
3	81.3%	80.9%
4	87.5%	76.6%
5	85.4%	61.7%
Average	87.9%	73.1%

Using the results of the total sample as a base, five of the characteristics were shown to be significant discriminators of the two segments. The five characteristics are listed with their levels of significance in Table 12.

TABLE 12
SEGMENT DISCRIMINATING VARIABLES

	<u>F-Statistic</u>	<u>Significance Level</u>
1. I like to look for sales where I shop	7.604	0.0070
2. I usually compare prices when I shop	6.616	0.0117
3. I feel one major airline is as safe as another	3.842	0.0530
4. Sex	27.65	0.0000
5. Business trip frequency	33.20	0.0000

(Significant at the .10 level. Trial F Value 2.77)

The discriminant function coefficients presented in Table 13 detail the contribution of each of the characteristics to the separation of the segments. A variable contributes most to the probability of classification in that segment for which it is most positive. Conversely, negative coefficients indicate the extent to which high scorers on a variable are not likely to be associated with the particular segment. Variables near zero for any group have little impact on the probability of classification.

TABLE 13

DISCRIMINANT FUNCTION COEFFICIENTS BY SEGMENT

<u>CHARACTERISTICS</u>	SEGMENT #1	SEGMENT #2
1. I like to look for sales where I shop	3.92	3.81
2. I usually compare prices when I shop	-0.22	-0.62
3. I feel one major airline is as safe as another	0.47	-0.18
4. Sex	6.85	5.06
5. Business Trip Frequency	0.55	1.00
CONSTANT	-63.87	-67.25

A review of Table 13 indicates that members of Segment 1 are more likely to be deal prone than their counterparts in Segment 2. They tend to look for sales when they shop and are more likely to compare prices.

Perceived safety acted as a discriminator between segments. Pleasure travellers feel that one major airline is as safe as another whereas the more frequent business travellers believe that safety standards or performance varies from carrier to carrier.

The members of Segment 1 are more likely to be female, and those in Segment 2 take more business trips.

CHAPTER 4

FINDINGS

The discussion of the findings of this study is divided into three sections; first, a summary of the major conclusions; second, a comparison of how these conclusions relate to the literature in the field; and third, a discussion of the practical relevance of the methodology and the findings.

This study represents the first endeavour at segmenting the air travel market on the basis of product attribute preferences. The results represent an addition to the body of public knowledge in the areas of preference behaviour and market segmentation. The results are valuable from a practical perspective in light of current and anticipated market conditions in the air transport industry.

The study identified two market segments on the basis of preference behaviour. A summary description of each segment is as follows:

Segment 1: Price Sensitive vacation travellers.

Segment 2: Travellers most sensitive to minimum stay provisions of fare plans; business travellers; male.

The study attempted to find additional ways of describing these segments. Segment 1 members were found to exhibit deal prone characteristics. This finding may assist carriers in merchandising strategy for their product. The concept of a 'sale' on airline services might be expanded to appeal to this segment.

The perception of safety was inversely related to trip frequency in that the members of the segment that travelled most frequently also believed that safety varied from carrier to carrier. Previous findings in this regard (Johnson: 1978) indicated that safety was an important attribute but did not attempt to determine whether the perception of safety varied from one segment to another. Safety is a subject not usually included in airline advertising. Carriers might attempt to inject the subject into their promotional mix as an appeal to business fliers. The traditional means of segmenting the air travel market into business and pleasure fliers appears to have some basis given the descriptor data.

The results both corroborate and contradict previous research findings. The CTC (Market Facts:1972) found price and enroute stops to be the major factors in the consumer purchase decision. This study found price to be the major attribute for one of the segments, and enroute stops to be important to business travellers but not important to members of the pleasure/vacation oriented segment.

Johnston (1979) concluded that attribute preference ranking was situationally specific and that rankings would differ based on trip .

length. This study tested respondents on both long and short-haul trips. There was no appreciable difference in their attribute importance rankings. Johnston also suggested that soft variables such as carrier name and reputation would influence attribute rankings. The results of this research indicate that carrier name and reputation did play a role in preference behaviour but that the role was more important to pleasure/vacation than to business travellers.

Conjoint measurement was used to develop utility scales for the air travel attribute preferences. While the procedure did provide utility scales both within and across the attributes tested, there are some cautionary notes that must be considered when assessing the merit of this approach for further research. The respondents were asked to simultaneously evaluate twenty situations, each containing six varying levels of attributes. The respondents had difficulty with the simultaneous evaluation despite an overall familiarity with the attributes being ranked. The implications stemming from this are that conjoint measurement must be viewed with some caution as an analytical procedure in situations involving large numbers of attributes and levels. Similarly, the need for respondent "warm up" and elaborate specification of the data collection procedures to the respondents must be taken into account when determining project funding and staffing levels.

The study examined a small group of travellers with regard to their preferences for airline fare plans. While the demographics of the sample were consistent with a known group of air travellers, they do not necessarily represent the entire air travel market. Discount fares

are designed not only to stimulate additional travel by current flyers but to encourage travel by non-flyers. The prospect of new flier stimulation was not examined. The study looked at air traveller demand sensitivity but did not consider whether travellers might shift to another mode of transportation or communication because of an unattractive combination of attributes and levels.

The findings of the study are of some practical relevance to both the industry and the body of public knowledge concerning air traveller behavior. It provides a numerical base for the design and evaluation of fare plans and indicates that some current fare offerings designed for leisure traffic are indeed more attractive to business travellers. While alternative fare plans continue to proliferate the market, they are in some cases not achieving their objective of discouraging business use. The findings with regard to deal proneness and perception of safety may be of some assistance to carriers in the development of their marketing strategies. The overall results appear to confirm that the issues raised earlier regarding confusion are not restricted to the deregulated environment in the United States.

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APPENDIX A

THE QUESTIONNAIRE

APPENDIX AFOR INTERVIEWER TO READGOOD EVENING LADIES AND GENTLEMEN

My name is _____ . We have asked through your Community Association that you join us this evening. We would like to talk to you about air travel in general and about discount airfares in particular.

Each of you has travelled at least once by air during the last twelve months. In choosing which airline, or which flight you travelled on, you were presented with a number of alternatives. You could have flown on Air Canada, CP Air, Pacific Western, Wardair or another airline. You could have departed at 8:00 in the morning or 6:00 at night.

Perhaps you took advantage of one of the many discount airfares currently on the market. I am sure that you have all heard about Charter Class or Sear Sale, or Skybus. If you did use a discount fare, you would have had to meet certain conditions in order to buy your ticket. You might have had to buy your ticket 30 days in advance or stay at your destination at least 7 days.

We are interested in how you view airlines and airfares and at how you finally decide which airline or which airfare you purchase.

Now, I want you to think for a moment about your last trip. Was the purpose of the trip primarily business or was it a pleasure or vacation trip? Raise your hands:

1. Business?
2. Pleasure or Vacation?

Would the business travellers please move to the left side of the room and the pleasure or vacation travellers to the right side.

We are going to ask you to take a hypothetical or imaginary trip to Toronto or Vancouver. On the table in front of you are 20 cards. Each card has 6 airline trip characteristics.

1. Price
2. Airline
3. Minimum Stay
4. Advance Booking Requirements
5. Departure Times
6. Enroute Stops

You will note that each card differs in either the benefits or restrictions offered, or in price.

Now, I mentioned that we wanted you to take a hypothetical trip. Those of you on the left hand side of the room are going to take another business trip - those of you on the right, another pleasure or vacation trip.

Assume that you want to choose those cards representing your preferences, in light of your last trip, whether it was business or pleasure. First of all, sort the 20 cards into 3 piles:

1. Most Preferred.
2. Less Preferred.
3. Least Preferred.

To do this you will have to consider all 6 points on each card. Your needs, preferences, and priorities may be different on a business trip than on a pleasure trip. This is why we have divided you into two groups and why we want you to sort the cards into three piles based on your last trip experience.

Please work carefully and sort the cards into the 3 piles. There is no need to have an equal number of cards in each pile, and you can switch from pile to pile until you have decided on a final grouping.

Are there any questions?

Now that this has been done, let's look at the "Most Preferred" pile. Of all the cards you placed in the pile, which one represents the very best combination of features, i.e. the most "Most Preferred" card. Go through the pile and rank the cards within your most preferred pile from best to worst.

Now, do the same thing with each of the other two piles. Ultimately, what we want you to do is to rank each of the 20 cards from Most Preferred to Least Preferred. Don't hesitate to switch cards from pile to pile since our objective is to ensure that your final ranking reflects your preferences from best to worst.

Everyone should now have one pile of 20 cards ranked in order from best to worst.

Now let's move on to the easy part. The first two pages of the questionnaire will provide us with some information about you that we can use to statistically classify our data. Please remember that we do not need your name or address so there should be no difficulty with confidentiality. It is important that you answer each of the questions.

1. How many round trips have you taken by air during the last 12 months?

2. Was your last air trip made for primarily pleasure or primarily business purposes?
1. Vacation/Pleasure _____
 2. Business _____
3. Which of the following best describes your occupation?
- Executive/Managerial/ _____ Housewife _____
Professional Officer Worker _____
Craftsman/Tradesman _____ Civil Servant _____
Military/Protective _____ Student _____
Salesman _____ Other _____
(Please Specify) _____
4. Are you:
Male _____ Female _____
5. Which age group are you in:
- Under 18 Years _____ 40 - 49 Years _____
18 - 21 Years _____ 50 - 64 Years _____
22 - 29 Years _____ 65 and Over _____
30 - 39 Years _____

6. On which Canadian Carriers have you flown during the last 12 months?

- Air Canada _____
- C.P. Air _____
- Pacific Western _____
- Wardair _____
- Other, Please Specify _____

THANK YOU FOR YOUR ASSISTANCE.

We would like to get your opinions about your extent of agreement or disagreement with various statements pertaining to your lifestyle and about air travel in general. That is, we would like your frank opinion about how completely each of the statements describes you. This description can range in degree from "Describes Me Completely" to "Does Not Describe Me At All".

Just circle the number that best reflects your judgement.

	Describes Me Completely						Does Not Describe Me At All
1. I like to look for sales where I shop.	6	5	4	3	2	1	
2. I like to send away for premiums offered with products.	6	5	4	3	2	1	
3. I like to try new products when they come out.	6	5	4	3	2	1	

4.	I usually compare prices when I shop.	6	5	4	3	2	1
5.	I read the daily newspaper most days.	6	5	4	3	2	1
6.	I feel one major airline is as safe as another.	6	5	4	3	2	1
7.	Inflight service is important to me.	6	5	4	3	2	1
8.	Good Service at the Airport is important to me.	6	5	4	3	2	1
9.	I read the travel section of the newspaper.	6	5	4	3	2	1
10.	All airline prices are the same.	6	5	4	3	2	1
11.	I watch at least some television every day.	6	5	4	3	2	1
12.	I listen to the radio in the morning.	6	5	4	3	2	1
13.	I read the weekly community newspaper.	6	5	4	3	2	1

APPENDIX B

ATTRIBUTES MEASURED IN STUDY

APPENDIX B

ATTRIBUTES MEASURED IN STUDY

A total of 6 attributes were considered in the study, the levels of which are given below:

<u>ATTRIBUTE NUMBER</u>	<u>LEVEL</u>	<u>ATTRIBUTE</u>
1 PRICE (Long Haul Calgary - Toronto)	0	Your return ticket would cost \$402.00.
	1	Your return ticket would cost \$252.00.
	2	Your return ticket would cost \$202.00.
	3	Your return ticket would cost \$186.00.
1 PRICE (Short Haul Calgary - Vancouver)	0	Your return ticket would cost \$162.00.
	1	Your return ticket would cost \$101.00.
	2	Your return ticket would cost \$88.00.
	3	Your return ticket would cost \$78.00.
2 AIRLINE	0	Air Canada
	1	C.P. Air
	2	Pacific Western
	3	Wardair
3 MINIMUM STAY	0	There would be no minimum stay required.
	1	You would have to remain at your destination at least one Saturday night.
	2	You would have to remain at your destination at least 7 days.
	3	You would have to remain at your destination at least 14 days.
4 ADVANCE BOOKING	0	You could reserve and pay for your seat any time prior to departure.
	1	You would have to reserve and pay for your seat at least 7 days to departure.
	2	You would have to reserve and pay for your seat at least 30 days to departure.
5 DEPARTURE FREQUENCY	0	Your flight would leave within 2 hours of your most preferred departure time.
	1	Your flight would leave within 4 hours of your most preferred departure time.
	2	Your flight would leave within 12 hours of your most preferred departure time.
6 ENROUTE STOPS	0	Your flight would be nonstop.
	1	Your flight would make one enroute stop.

APPENDIX C

ORTHOGONAL ARRAY
ATTRIBUTE LEVELS TESTED IN SURVEY

APPENDIX C

ORTHOGONAL ARRAY (ADDELMAN; 1961)
 ATTRIBUTE LEVELS (CONCEPT STATEMENTS) USED IN SURVEY

<u>CELL</u> (of 1152)	<u>PRICE</u> <u>LEVEL</u>	<u>AIRLINE</u> <u>LEVEL</u>	<u>MINIMUM</u> <u>STAY</u> <u>LEVEL</u>	<u>ADVANCE</u> <u>BOOKING</u> <u>LEVEL</u>	<u>DEPARTURE</u> <u>FREQUENCY</u> <u>LEVEL</u>	<u>ENROUTE</u> <u>STOPS</u> <u>LEVEL</u>
001	0	0	0	0	0	0
018	0	0	0	2	2	1
107	0	1	1	2	2	0
184	0	2	2	0	1	1
278	0	3	3	1	0	1
294	1	0	0	0	2	1
316	1	0	1	1	1	1
409	1	1	2	2	0	0
491	1	2	3	0	2	0
518	1	3	0	2	0	1
596	2	0	1	0	0	1
630	2	0	2	2	2	1
704	2	1	3	0	0	1
731	2	2	0	1	2	0
807	2	3	0	2	1	0
907	3	0	2	1	0	0
936	3	0	3	2	2	1
940	3	1	0	0	1	1
1022	3	2	0	2	0	1
1103	3	3	1	0	2	0