CHAPTER III

RESEARCH METHODOLOGY

Several topics concerning the methods utilised in gathering research data and analyses are discussed in this chapter. This research methodology chapter is presented in six sections.

Section 3.1 presents the various hypotheses of this study.

Section 3.2 briefly traces the profile of automobile and automobile component manufacturing organisations in Tamil Nadu. It also gives an account of the profile of the respondents' organisation of this study.

Section 3.3 narrates the designing of the questionnaire for this research study which includes, the definition of purchasing problem situations, characteristics to be measured and the rating scale.

Section 3.4 gives a brief account of data collection of this study.

Section 3.5 outlines the testing of the group homogeneity of the respondents.

Section 3.6 states the specific statistical tools applied to validate the hypotheses of this research study.
3.1 HYPOTHESES OF THIS STUDY

Theoretically the organisational buying behaviour models dealt in the earlier chapter reflect the fact that these models are highly descriptive and explicates the relevant variables that influence organisational buying. Their focus was upon description, definition and categorisation. They have clearly influenced the ways in which problems have to be structured and operationalised by the researchers in the field.

The purpose of this study is to determine the choice criteria used by the chief purchasing executives to select suppliers in the three types of buying problems. To test whether the differences in choice criteria are consistent between purchasing situations, and to examine the importance of the different information sources used by them to evaluate alternative suppliers.

Four hypotheses regarding vendor selection process are stated below. These hypotheses stem from the research questions that were presented in Chapter I.
The hypotheses of this study are stated in null form.

H.1 : "In a given purchasing decision situation in which a vendor is to be chosen from among a number of alternative vendors, there will be no differences in the importance of
a) vendor characteristics, and
b) buyer information sources
that are used by the purchasing decision maker".

H.2 : "Given different purchasing decision situations in which a vendor is to be chosen from among a number of alternative vendors, the importance of each
a) vendor characteristic, and
b) buyer information source
will not differ between purchasing decision situations".

H.3 : "For a given vendor selection situation the decision maker's
a) vendor characteristic ratings will not be related in a manner such that the number of characteristics could be reduced to a smaller set representing dimensions or factors that were latent in the original larger set of characteristic ratings, and
b) buyer information source ratings will not be related in a manner such that the number of ratings could be reduced to a smaller set representing dimensions or factors that were latent in the original larger set of buyer information source ratings".

H.4 : "Given any two purchasing decision situations in which a vendor is to be chosen from among a number of alternative vendors there will be no difference in the discriminating power of
a) vendor characteristics, and
b) buyer information sources
that are used by the purchasing decision maker".

3.2 AUTOMOBILE INDUSTRY IN TAMIL NADU

Automobile and Automobile component manufacturing industries in Tamil Nadu, India, were judgmentally chosen as the population for the study of this research project because of their large size, importance in Indian economy and diversity. This industry has many sectors of component manufacturing which differ in competitive composition and sell products of different technology. In spite of its variety the industry has a common vocabulary and powerful association which facilitated data collection. A growth
rate of over 125% is predicted for this industry in 1990's. Tamil Nadu is one of the states in which the contribution to the overall growth rate in automobiles and components is highly significant compared to many other states in India. The organisations considered for this study provide a wide range of products covering most of the components needed for the automobiles right from the manufacturer of engines, fuel pumps, drives, and other components to finished commercial vehicles.

Tamil Nadu is also a dominant market for automobiles. The sales figures of different automobile classes reveal that among the states in India, Tamil Nadu is ranked 3rd in the sale of passenger cars, 2nd in the sale of truck chassis, and 1st in the sale of bus chassis. Thus the contribution of Tamil Nadu both as a producer of parts and products and a dominant consumer of the finished products is highly significant for the overall development of automobile industry in India.

The small scale units unlike the medium and large scale sector predominantly do not confine only to the manufacture of automobile components. Hence the study is directed towards the medium and large scale automobile and automobile component manufacturing industries in Tamil Nadu.

3.2.1 Respondents profile

The sales turnover of the organisations to which the respondents belonged was less than 25 crores in 23 percent, Rs. 25 to 50 crores in 29 percent, Rs. 50 to 75 crores in 25 percent, Rs. 75 to 100 crores in 17 percent and over 100 crores of rupees in 6 percent of the cases. The overall average sales turnover of the organisations surveyed was Rs. 58.73 crores.

In 11.5 percent of them the total company purchases formed less than 40 percent of the sales turnover. In 7.5 percent of them the total company purchases formed over 70 percent of the sales turnover. In 29 percent of them it was between 40 to 50 percent, in 35 percent of them the purchases formed between 50 to 60 percent of sales turnover and in 17 percent of them the purchases formed between 60 to 70 percent of the sales turnover. The overall average expenditure on purchase as a ratio of sales turnover was 52.11 percent.

Most of the organisations conduct operations at one location. 18.5 percent of them have operations in multi locations. The number of vendors considered while purchasing varied from 3-9. The average size of the vendor considered for new capital equipment was 6; for modified rebuy was 4; and for the straight rebuy was 4. The profile of the organisations with details are provided from Table 3.1 to 3.4.
## TABLE 3.1

**SALES TURNOVER OF THE ORGANISATIONS STUDIED**

<table>
<thead>
<tr>
<th>Sales Turnover in Crores of Rs.</th>
<th>No. of Organisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25</td>
<td>12</td>
</tr>
<tr>
<td>25 - 50</td>
<td>15</td>
</tr>
<tr>
<td>50 - 75</td>
<td>13</td>
</tr>
<tr>
<td>75 - 100</td>
<td>9</td>
</tr>
<tr>
<td>Over 100</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>
### TABLE 3.2

PURCHASE TO SALES RATIO OF THE RESPONDING ORGANISATIONS

<table>
<thead>
<tr>
<th>PURCHASE TO SALES RATIO</th>
<th>NO. OF ORGANISATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.4</td>
<td>6</td>
</tr>
<tr>
<td>0.4 to 0.5</td>
<td>15</td>
</tr>
<tr>
<td>0.5 to 0.6</td>
<td>18</td>
</tr>
<tr>
<td>0.6 to 0.7</td>
<td>9</td>
</tr>
<tr>
<td>Over 0.7</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>
### TABLE 3.3

**OTHER FUNCTIONS PERFORMED BY PURCHASING DEPARTMENT**

<table>
<thead>
<tr>
<th>FUNCTIONS</th>
<th>PERCENTAGE OF ORGANISATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inventory control</td>
<td>78.85</td>
</tr>
<tr>
<td>2. Traffic</td>
<td>67.30</td>
</tr>
<tr>
<td>3. Receiving</td>
<td>51.92</td>
</tr>
<tr>
<td>4. Inspection</td>
<td>50.00</td>
</tr>
<tr>
<td>5. Salvage</td>
<td>40.38</td>
</tr>
<tr>
<td>6. Scrap Disposal</td>
<td>21.15</td>
</tr>
<tr>
<td>7. Stores</td>
<td>13.50</td>
</tr>
</tbody>
</table>
## TABLE 3.4

### ORGANISATIONS' USE OF PROFESSIONAL TOOLS

<table>
<thead>
<tr>
<th>PURCHASE DEPARTMENT USES</th>
<th>PERCENTAGE OF ORGANISATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vendor development</td>
<td>86.53</td>
</tr>
<tr>
<td>2. Vendor analysis</td>
<td>78.85</td>
</tr>
<tr>
<td>3. Computers</td>
<td>71.15</td>
</tr>
<tr>
<td>4. Studies on market trends</td>
<td>67.30</td>
</tr>
<tr>
<td>5. Reports on purchase savings</td>
<td>63.46</td>
</tr>
<tr>
<td>6. Regular search for new suppliers</td>
<td>59.61</td>
</tr>
<tr>
<td>7. Value analysis/value engineering</td>
<td>51.92</td>
</tr>
</tbody>
</table>
3.3 DESIGN OF QUESTIONNAIRE

3.3.1 Prelude

Several personal interviews with the chief purchase executives of the industries located in Madras city were conducted. A few of the interviews were conducted for the purpose of acquiring an initial familiarity with purchasing. Several personal interviews were carried out in connection with the questionnaire design. The interviewees were queried on important parts of the questionnaire which included the problems or cases, the instructions, the vendor characteristics, the information sources and the rating scale.

The characteristics that were discussed included the list of all the items considered by the earlier researchers. Banville and Dornoff (1973) considered twelve vendor characteristics and the products considered range from laundry appliances to concrete. Dempsey (1973) listed twenty vendor characteristics and fifteen information sources for his study on two buy situations, namely new task capital buy and modified rebuy. Dickson (1965) used 22 vendor characteristics for evaluation. The purchase situation varied in complexity from a simple problem involving the procurement of desks to a complex problem involving the procurement of computer to be used in orbital laboratories.
Lehmann and O'Shaughnessy (1974) investigated the relative importance of seventeen attributes in four purchasing situations among a section of US and UK purchasing agents. The four product types were:

1) **Routine** order products: They were frequently ordered; no problem in learning how to use; no question whether the product will do the job.

2) **Procedural** problem products: The product will do to the job; but training may be required.

3) **Performance** problem products: There is doubt as to whether the product will perform satisfactorily in the application for which it is being considered.

4) **Political** problem products: These give rise to political problems and there is likely to be difficulty in reaching agreement among those affected if the product is adopted.

Mehta, Khurana, Chhabra, Rao and Kiser, (1981) considered 65 characteristics for their study of organisational buying of 'off the shelf' items which are readily available. Wind, Green and Robinson (1968) considered 11 characteristics for the study of a simulation model of the vendor selection process. The characteristics considered by the above researchers formed the basis for the listing of vendor characteristics.
The work done by Dempsey (1973) and Moriarty and Spekman (1984) formed the basis for listing out the different information sources encountered in the industrial buying process. The list of characteristics provided by the above researchers formed the basis for discussion in the construction and determination of vendor characteristics and information sources necessary for this study. As a result of the interviews, some items were added, some were revised and others were deleted.

3.3.2 Methods considered in defining the cases

Four possible methods were considered for defining the three problems. First the problem could have been considered in general terminology emphasizing characteristics of the problem that could be applied to different industries. i.e. the generalisation of the problem as suggested in the 'Buy Grid Framework'. Second, the problems could have been defined by including specific mention of items that are commonly bought by most industries e.g., office machinery, specific materials etc. Third the specific industry related items could be appropriately described for each respondent group wherein the items chosen would have common underlying characteristics. Fourth, the problems could have been defined without regard to their relevance to the respondents. The first method for defining the problem was
used. It was considered to be more flexible than the second method since (1) actual items did not have to be defined and checked for similarity in application in different industries and (2) the number of such items would be limited. The first method was deemed superior to the third method because it avoided difficulties that would have been encountered in identifying different items in different industries that would have common underlying characteristics. The first method was considered superior to the fourth because under the first method the respondents can visualise actual problems from their own experience rather than having to project themselves into what may be a totally unfamiliar purchase situation. Also, the first method was better than the other methods, in an overall sense, because, it would be easier to extend to additional industrial class in possible future research.

3.3.3 Definition of the buying problem

A traditional definition of buying problem was merged with the concepts that were developed by Rabinson, Faris and Wind (1967). According to these researches there are three fundamentally distinct buying situations: the new task, the modified rebuy, and the straight rebuy. In order to make the problems meaningful to the respondents, traditional means of describing buying problems were also embodied in the
problem description. The traditional means of describing buying problems referred involve the product classification system including the categories of: 1) installation 2) accessory equipment 3) raw materials 4) component parts and materials 5) supplies and 6) services (McCarthy 1971). Consequently, the first problem was described in terms of a new task-capital equipment problem; and the second problem was stated in terms of modified rebuy --- component material procurement problem; and the third a straight rebuy ---- materials procurement problem.

In the above buying problems, statements were made concerning the relative rupee commitment that would be required, the design simplicity or complexity of the product and the critical or non critical application of the product. Thus, these dimensions were fixed in each problem.

The problems were stated so that the respondents would know something about the newness of the problem, information requirements, and consideration of new alternatives which are the characteristics of the new task, modified rebuy and straight rebuy situations (Robinson, Faris and Wind, 1967).

With the above, a questionnaire to be administered to the chief purchase managers/executives was developed in
accordance with the procedure recommended by Churchill (1979). Accordingly the proposed questionnaire was pretested sequentially with one purchase executive at a time for clarity, interpretation and ease of answering. After each pretest the questionnaire was revised. The opinions of the experts were also obtained for content validity. Now another manager was selected for another pretest. Pretesting and content validation continued until no more objections were raised and questionnaire framed in a manner easy to answer, phrased in their vocabulary, clear and valid. The process lasted several weeks, involved a dozen purchase executives and several sittings with experts.

3.3.4 The purchasing situations

The three problems (or cases as they were called in the questionnaire) were stated as follows:

Case I - AN ENTIRELY NEW CAPITAL EQUIPMENT PURCHASING SITUATION

Your organisation needs to procure a new piece of capital equipment. The equipment called for will incorporate significant technological advancement in design that will lead to very efficient operations. At present, you have
little information concerning the equipment, however you know that:

1) The total required investment will be substantial.
2) The design of the equipment is complex.
3) The equipment will be very important in your organisation's future operations.

Case II - A COMPONENT MATERIAL MODIFIED REBUY PURCHASING SITUATION
You have heard that an improvement has been made in one of the component materials your organisation uses in its operations. It may be possible to use the improved material and obtain lower manufacturing cost while maintaining quality standards. The improved materials design is simple and several vendors will be able to provide the materials.

Case III - AN ENTIRELY FAMILIAR STRAIGHT COMPONENT MATERIAL REBUY PURCHASING SITUATION
Your organisation needs to procure a component for which the buying alternatives are known and no new suppliers are to be considered. A great deal of buying experience for the product type exists and little new information about the product is needed. There is no problem in using it.
3.3.5 Variables that were measured

A set of twenty vendor characteristics and fifteen buyer information sources were finally arrived at based on the design, pretesting and validation. They are listed in the questionnaire as follows:

Vendor characteristics:

1. Each vendor's likely repair service capability and warranties
2. Each vendor's ability to provide progress data on orders or projects
3. The labour relations record of each vendor
4. Each vendor's technical capability (including research and development)
5. The production facilities and capacity of each vendor
6. Each vendor's ability to meet with your bidding procedures
7. The management and organisation of each vendor
8. Each vendor's net price
9. The financial position and credit rating of each vendor
10. Financing and credit terms of each vendor
11. The ability of each vendor to meet specified delivery schedules
12. The geographic location of each vendor
13. Each vendor's ability to provide problem solving advice and aid
14. The reputation and product leadership of each vendor
15. Each vendor's ability to provide required training and instructions
16. Each vendor's attitude towards your organisation
17. The ability to meet your packaging requirements by vendor
18. The amount of satisfactory past experience with each vendor
19. Each vendor's ability to meet quality specifications consistently
20. Moral/Legal considerations

Information sources:

1. Interview with vendor's salesmen
2. Telephone conversations with vendor's salesmen
3. Credit and financial reports on vendors
4. Vendor's catalogs
5. Articles in trade or industry publications
6. Mail advertisements from vendors
7. Other departments within your organisation
8. Local chapters of purchasing organisation
9. Trade shows and conventions
10. Purchasing personnel in other organisations
11. Purchasing directories, guides and registers (eg. DGTD handbook)

12. Your own purchasing records

13. Visits to vendor's plants and facilities

14. Classified telephone directories

15. Advertisement in trade or industry publications

3.3.6 Organisational variables

The survey members were asked to respond to several organisational characteristics. General organisational characteristics that were measured included: the number of operating locations, the type of product or service produced, number of employees at their location, annual purchasing volume, annual sales turnover and capital outlay of their organisation. Data were also obtained that dealt with the operation of the purchasing function.

3.3.7 Rating scale

The Likert type seven point rating scale was used to measure the importance that each respondent would be assigning to the vendor characteristics and information sources while selecting a vendor for the case mentioned in the questionnaire. The respondents were asked to circle the number which would represent the degree of importance they would attach to each vendor characteristic and information
source. The two extreme points of the scale were represented by the numbers one and seven. The numbers one and seven were described as 'of no importance' and 'of extreme importance' respectively. The remaining numbers 2, 3, 4, 5 and 6 represented various degrees of importance.

It was assumed that constant or biased error due to halo effect, error of severity, error of leniency and error of central tendency would not significantly affect or interfere with validity of the measurements and data analyses (Kerlinger, 1964). This assumption is based upon the care taken in designing the questionnaire, the pretesting, and the census survey conducted.

A basic assumption is that the numerical points on the scale did represent equal measurement intervals in the minds of the respondents. In otherwords it was assumed that the seven point rating scale in each instant actually represented an underlying continuous variable and that each interval between the discrete numbers from one to seven was an equal interval in the minds of the respondents.

3.4 DATA COLLECTION

The chief purchase executives of medium and large scale industries of 'Automobile and automobile components manufacturing organisations in Tamil Nadu were the
respondents of the study. The number of such medium and large scale industries in Tamil Nadu is limited to 54 industries which are geographically distributed apart. It was decided to undertake a census survey of all the industries. Questionnaires were sent by mail to the chief purchase managers/executives of all the organisations as listed by 'A profile of the Indian Automobile Industry'\textsuperscript{1}. The initial response to the mail survey was as low as 30 percent. A reminder was mailed which prompted the responses to increase to 44 percent. The apathy displayed by the respondents to mailed questionnaire required the researcher to undertake a follow up in person. As a result responses could be gathered from fifty two out of the listed fifty four industries. It could not be gathered from the remaining two organisations since one was under prolonged strike and the other had seized operations. The number of industries and their locations are listed in Table 3.5.

3.5 TEST OF GROUP HOMOGENEITY

The respondents group homogeneity was tested using two samples from the same population. This was done by making a random division of the questionnaires into two

\textit{A profile of the Indian Automobile Industry' Automotive buyers guide, ACMA, 1985.}
### TABLE 3.5

**LOCATION OF AUTOMOBILE AND AUTOMOBILE COMPONENT INDUSTRIES IN TAMIL NADU**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>PLACE</th>
<th>NUMBER OF ORGANISATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anaikkarapatti</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Aviyoor</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Chengalpattu (Maraimalai Nagar)</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Coimbatore</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Hosur</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Karur</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Madras</td>
<td>44</td>
</tr>
<tr>
<td>8</td>
<td>Madurai</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Ranipet</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Sholingar</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total** 64*  

* Multi operation locations are also included.
groups. The two sets of the questionnaires were then scored and the results compared by means of two-way analysis of variance with 'n' observations in each cell. The results are presented in Table 3.6. The null hypothesis that there is no significant difference in the mean scores of the two sets of questionnaires is found to be true in all the three purchase situations both for vendor characteristics and buyer information sources establishing the group homogeneity.

3.6 DATA ANALYSES

The data collected from the respondents were analysed by using various statistical tools. The appropriate multivariate statistical techniques used in testing each of the hypothesis are briefly presented below.

3.6.1 Testing hypothesis one

In hypothesis one the questions are: in a given purchasing situation whether or not a) the twenty vendor characteristics are equally important and b) the fifteen information sources are equally important. Hypothesis one has been stated in null form indicating that all the vendor characteristics and information sources are equally important in the vendor selection decision.

The statistical test involves the comparison of several means of the vendor characteristics and several means
### TABLE 3.6
## HOMOGENEITY TEST OF RESPONDENTS

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>TOPIC</th>
<th>F RATIO (BETWEEN TWO SETS OF RESPONDENTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>New Task - Vendor</td>
<td>0.27&lt;sup&gt;a&lt;/sup&gt; n.s.</td>
</tr>
<tr>
<td></td>
<td>characteristics</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>New Task - Information</td>
<td>0.23&lt;sup&gt;b&lt;/sup&gt; n.s.</td>
</tr>
<tr>
<td></td>
<td>sources</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Modified rebuy - Vendor</td>
<td>0.79&lt;sup&gt;a&lt;/sup&gt; n.s.</td>
</tr>
<tr>
<td></td>
<td>characteristics</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Modified rebuy - Information</td>
<td>0.10&lt;sup&gt;b&lt;/sup&gt; n.s.</td>
</tr>
<tr>
<td>5.</td>
<td>Straight rebuy - Vendor</td>
<td>0.14&lt;sup&gt;a&lt;/sup&gt; n.s.</td>
</tr>
<tr>
<td></td>
<td>characteristics</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Straight rebuy - Information</td>
<td>0.63&lt;sup&gt;b&lt;/sup&gt; n.s.</td>
</tr>
</tbody>
</table>

n.s. - not significant  

a df 1, 1000  
b df 1, 750
of information sources. There will be several overlapping sets of means when a number of means are being compared. Numerous procedures for multiple comparisons have been developed. In many situations it may not matter which method is chosen, all methods leading to identical conclusions. But infrequently some methods may detect more differences than others. In routine situations, 'least significant difference (LSD)' method should be satisfactory (Kerlinger and Pedhazur, 1973; and Nambudiri, Carter and Blalock, 1975).

The statistical test that was applied to the data is the least significant difference - LSD method. This test may be described as a sequential test because the testing follows a prescribed order for testing groups of two, three, four etc. means for statistically significant differences. In using this test the researcher arranges a number of different variable means from arithmetically largest one to the arithmetically smallest. The researcher can make decisions concerning which means are significantly greater than or less than other means on the basis of computed required difference LSD.
3.6.2 Testing hypothesis two

In hypothesis two, given three different purchase situations whether or not the twenty vendor characteristics and the fifteen information sources will have the same importance between purchase situations. One would expect that the importance of some vendor characteristics and information sources are likely to differ according to the purchase situations and some characteristics are not likely to have any difference in the importance irrespective of the purchase situations.

The one way analysis of variance procedure can be used to test whether the means of two or more groups of data are equal. If the group means are equal, then the total variation around the grand mean will be due to chance or sampling error. The error variance is to be estimated. One estimate can be based upon pooling within group variation, while a second estimate can be made based upon the variation between the group means. If the group means are the same, then the two estimates of error variance will be equal. If the estimate of the error variance based on between groups variation is significantly greater, then the means are not equal. The ratio 'F' of the two variances i.e. between estimate of variance to within estimate of variance, serves
as the criterion concerning whether or not the means are equal.

3.6.3 Testing hypothesis three

Hypothesis three concerns whether the twenty vendor characteristics could be actually represented by a lesser number of vendor qualities to the purchase decision makers. Similarly the fifteen information sources could be represented by a lesser number of information inputs to the purchase decision makers. Factor analysis is used to redefine large number of variables as a smaller number of factors while preserving the essential nature of the variables. Factor analysis also aims to explain observed relations among numerous variables in terms of similar relations. The simplification may consist of producing a set of classificatory categories or creating a smaller number of hypothetical variables (Cattel, 1965). Therefore factor analysis was used to reduce the number of variables in each of the original sets to smaller sets of underlying factors.

According to Wells and Sheth: (1971)

"Factor analysis is a multivariate technique that addresses itself to the study of inter relationships among a total set of variables ...." They further state that "Factor
analysis, in a sense, does consider each of the observed variables as a dependent variable which is a function of some underlying, latent, and hypothetical factors. Conversely, one can look at each factor as the dependent variable which is a function of the observed variables" (p. 23).

The basic approach of the factor analysis in this study can be simply stated. The simple correlation coefficients of all the combinations of the variables were computed. The simple correlation coefficient matrix was used as input to the factor analysis. The correlation matrix was manipulated to derive a factor matrix showing each variable's degree of relationship with each of a number of factors. The number of factors will be less than the number of variables. The degree of relationship is represented in the factor matrix by fractions entitled "factor loadings". These loadings are analogous to simple correlation coefficients. They may range from minus one to plus one. Any loading near zero indicates no relationship between the particular factor and the particular variable involved. Variables that are heavily loaded on the same factor may be presumed to be closely related to each other and to the common underlying factor. The variable is
assigned to a particular factor based on the highest loading it has among the factors (Hunter, 1988).

The factors that were derived for each subsample were reviewed. First, an attempt was made to see if the variables loaded on each factor could be used to logically develop or construct a name for the factor. Then the factors of each case were compared with factors of other cases for similarity or lack of it. A brief note concerning the factor analysis used in this study is presented next.

There are number of factor analysis techniques that are used in research. The specific technique used in this study was powered vector factor analysis. Orthogonal powered vector method tends to position factors meaningfully without rotation. In comparison with the principal axis method, powered vector analysis places less emphasis on parsimony and more emphasis on psychologically meaningful definition of factors. The powered vector method requires much less computation than is required for principal-axis analysis (Overall and Kleft, 1972).

3.6.4 Testing hypothesis four

In hypothesis four, the discriminating power of the twenty vendor characteristics and fifteen information sources
under paired comparisons of purchasing situations are to be established. The discriminant analysis is the statistical tool which will satisfy the purpose.

**Discriminant analysis** is a useful tool of differentiation and classification. It helps to statistically distinguish between two or more groups of cases. A collection of discriminating variables also known as discriminating characteristics is selected in the first stage. The groups are expected to differ on these characteristics. These variables are weighted and linearly combined in some fashion so that the groups are forced to be as statistically different as possible. Statistical theory assumes that discriminating variables have a multivariate normal distribution and an equal variance - covariance matrix within each group (Mardia, 1979; Overall and Kleft, 1972). Discriminant functions are formed in such a way that separation of groups is maximised. These functions are utilised for the computation of classification scores which would form the basis for classifying cases with unknown group memberships.

The above statistical analyses were carried out in personal computer using standard software packages.