CHAPTER 3
RESEARCH METHODOLOGY

INTRODUCTION

The purpose of this chapter is to address the research methods used in this study. Items that will be addressed include the research design, population and sample, instrumentation, reliability and validity of the instrumentation, data-gathering procedures, and the method of statistical analysis and the development of the model for the purchasing decision of bikes in Tamil Nadu. The chapter also dwells at length the role played by the mediator, referral, on the purchase decisions of motorcycles consumers.

3.1 RESEARCH FOUNDATION

3.1.1 DIMENSIONS OF CONSUMER PURCHASE DECISION

Convenience was found to be the main factor affecting the choice of a particular product. Other important reason for choosing a particular product is the requirement of the company that they are working with. various models providing comfortable, flexibility, return potential, professional management, low cost, transparency, convenience and
affordability to large number of customers. (Amat Taap Manshor, Mukesh Kumar, Fong Tat Kee and Ali Khatibi 2007). Information technology and Internet revolution have broadened avenues of training and education that combine economy flexibility and convenience (Anjali Ganesh 2007). A satisfaction dimension corresponds to a number of product attributes or features that together generate particular aspects of performance, such as price, perceived quality, ease of service, convenience in availability, variety of features, attractiveness of the product, and advertising of the product. The most important factors that will cause them to change are the perceived quality of the product and attractiveness of the product, while convenience in availability is not found to be of a great influence in brand switching. (Paurav Shukla, 2004).

Consumers can more easily find merchants, products, and product information by browsing the web, reducing search costs, and eliminating the need to travel. Thus, consumers may prefer the convenience of online stores compared to traditional stores. Consumers may prefer the convenience of online stores compared to traditional stores. In 2001, however, conventional stores rang up 96.6% of all retail sales compared to 1.1% online and 2.5% from mail order houses, so
certainly convenience is not the only factor influencing US consumers’ decisions of whether to buy online or at a traditional store. (Jacqueline J. Kacen, 2002).

In an earlier issue of Management Science, Keeney (1999) interviewed consumers about the pros and cons of Internet commerce and qualitatively categorized their responses into objectives (attributes) such as maximize product quality, minimize cost, minimize time to receive the product, maximize convenience, and maximize shopping enjoyment. Szymanski and Hise (2000) investigated consumers’ satisfaction with Internet shopping. They found that greater satisfaction with online shopping is positively correlated with consumer perceptions of the convenience, product offerings, product information, site design, and financial security of an online store relative to traditional stores. Das (1986) states that the consumer response for a given type and nature of the product can be expected if the typology of the village is known. This assumes that all the consumers in a given village type would behave similarly. There could, however, be other important factors, economic, convenience and attitudinal, which could influence the individual consumer’s response even within the village.
The online buying environment offers several goal-oriented attributes that facilitate the benefits of freedom and control frequently mentioned by our participants. Specifically, goal-oriented buyers value the following online attributes:

- Product selection
- Accessibility and convenience
- Ease of use/website design
- Price and price comparison
- Lack of sociality
- Appropriate Personalization.

For many consumers, the relationship between convenience and freedom is implicit rather than explicit (Mary C. Gilly and Mary Wolfinbarger, 2000). Cowan (1985) suggests that advertisers were a primary force driving the mechanization of households and the perceived need to buy appliances to increase convenience. Many Web based companies have taken large steps to increase the convenience to their customers by providing features like express checkouts and recommender systems. Many e-commerce researches indicate that convenience is a prime motivator for Web customers to stop and interact with online vendors. Customers associate convenience with easy and fast information browsing, shopping and settling of the online transaction.
In his research on customer’s opinion on bikes, Sreeramulu (2000) has concluded that more than a purchase, it is the maintenance factor, which is given considerable importance. Most of the respondents are worried about high maintenance cost. So, the company should take a serious note of this issue. Ford and Warnes (1993) state that the residential strategies of older people need to embrace how people anticipate changes in the health, physical abilities, extra-house mobility and the survival of themselves and other members of their household. This study, however, established that anticipation seems to be limited to the size and maintenance of the house and garden, rather than future care needs.

Some consumers might avoid buying from an online retailer because of concerns about uncertainties such as Examination Cost: cost perceived in relation to examining the products to get the right product or fit, such as shoes that fit the feet, and Post-service cost: cost perceived incurred after receiving a product, such as maintenance, repair of broken products, and customer support (Jacqueline J. Kacen 2002). Corporate branding is not the extent of the change; the fundamental nature of the brand is being reconceived. No longer to managers think of only the physical product; rather they think of products plus services (e.g. not
just a car brand, but a car brand with regular maintenance servicing occurring because of a series of communications directed from the company to individual consumers) (McEnally and de Chernatony 1999). Both ‘dealers provide good service’ and ‘easy to source accessories for’ are key components to ongoing motorcycle maintenance. Motorcycles are most commonly serviced by dealers at least once a year and motorcyclists consistently purchase accessories, as evidenced by the amount of floor space dedicated to motorcycle accessories in most motorcycle dealerships (Hair et al., 1998). Liking, a personal and emotional factor, has long been recognized as a strong human motivator for relationship development and maintenance. Nicholson et al. (2001, p. 3) suggest, “Liking creates a personal attachment, thus reinforcing economic bonds”.

Chinese consumers take “after-sale maintenance” and “exterior design/size” as the forth most important factors when making the purchase decision. For “after-sale maintenance”, base segment customers usually prefer to choose a car with less maintenance cost and more service shops. For “exterior design/size”, it indicates that Chinese people prefer to choose a bigger car with a good looking to show off. Volkswagen’s Santana and Jetta which have been phased off in Europe
are still very hot models because they have a bigger size, and have more service shop due to the big sales, so a lot of Chinese people choose to buy Santana and Jetta (Carlos Gomes 2008).

External search involves going outside sources to acquire information such as personal sources, marketer controlled sources, public sources, or through personal experiences such as examining or handling a product (Michael R Solomon 2003). Lowering price is attractive because the seller “kills two birds with one stone”: a lower price increases the probability of an initial purchase and the likelihood of referral. Unfortunately, a low price also creates a “free riding” problem because some customers benefit from the low price but do not refer other customers (Francisco Veloso 2000).

3.1.2 CONSUMER PURCHASE DECISION-MAKING OF AN AUTOMOBILE PRODUCT IN INDIA

Davis and Rigaux in 1974 examined data collected at each of three decision phases – problem recognition, information search, and purchase decision – for 25 common household purchase decisions. (They elected to omit the phase concerning alternative evaluation given that it is so closely tied to information search.) Using these data
collected from a sample of 73 couples, they concluded that the dominant marital role in family purchase decision making varied both with the phase of the decision process and the product/consumption category under consideration. Following closely on the heels of this study and drawing from a comprehensive review of the family decision-making literature, Davis has also forwarded three generalized conclusions regarding family decision making:

(1) Marital role influence will vary by product class
(2) Marital role involvement within product classes will vary by the stage of the decision process and
(3) Marital role influence for any decision will vary among families.

Marketing efforts can be initiated to change these consumer perceptions of store attributes without damaging the perception of other equally important aspects of product image. Potential customers are attracted to one store or another form of retail outlet for several reasons. The most important reason in this regard is the image of the store related to the image preference of consumers. This has been emphasized by Kunkel and Berry who reduce the number of attributes in this regard into twelve categories comprising of almost fifty dimensions of department store image. These include: Price of merchandise, quality of merchandise,
assortment of merchandise, fashion of merchandise, sales personnel, locational convenience, other convenience factors, services, sales promotions, advertising, stores atmosphere and reputation on adjustments. (Murray and O’Driscoll 1996).

In the area of automobile purchase decisions, Fred Reynolds and William D. Wells have identified over sixty attributes that can be ascribed to the purchase of automobile makes. They make their evaluations on the basis of a limited number of attributes selected from a total possible set (Aaker, Biel 1992). Psychological needs also influence perception in a similar manner. For instance, the consumers’ mental state of affairs may play a role purchase decisions. Thirdly, the sociological needs such as status, dominance and love affiliation also contribute to purchase choices (Gerald L. Lohse, Steven Bellman and Eric J. Johnson 2000).

Promotion of brands in rural markets requires the special measures and opinion leaders play an important role in promoting the product in rural India. The word of mouth is an important message carriage in Rural Areas. It travels fast. A bad mouth carries many a persons while a good one few. The impact of WOM is at strongest when it originates from social contacts because of their greater perceived reliability. The
strength of WOM is influenced by perceived communicator characteristics and is moderated by perceived risk. (Siby Zacharias, Jose M C, Afsal Salam, Binu Kruvilla, Denny Anand 2008).

In India, USA and South Korea, the consumer ethnocentrism provokes negative attitudes toward both foreign advertisements and foreign products. The authors identify a set of consumer variables (i.e., consumers’ global mind-set) that may mediate consumers’ unfavorable attitudes toward foreign advertisements and products derived by consumer ethnocentrism (Hyokjin Kwak, Anupam Jaju, and Trina Larsen 2006). Product familiarity had a significant impact on Indian consumers’ attitudes, subjective norms, intention to buy, and, ultimately, purchase behavior of the low innovator and high innovator groups (HoJung Choo, Jae-Eun Chung, and Dawn Thorndike Pysarchik 2004).

Large size might be also used to signal that the store is able to assume the risk of product failure and to compensate buyers accordingly. In addition, large sellers should be able to control their suppliers, again increasing the perception of product or service reliability and credibility (Sirkka L. Jarvenpaa, Noam Tractinsky and Michael Vitale 2000). Mitra (1995) argues that consideration sets can be affected by advertising as
advertising was found to have a stabilizing effect on consideration set composition. Advertisings effect on consideration set size was researched by (Mitra, 1995) who found that reminder-type advertising increased consideration set size in India.

3.1.3 AUTOMOBILE PURCHASE OF INDIAN CONSUMERS – AN OVERVIEW

Piplai (2001) examines the effects of liberalization on the Indian vehicle industry, in terms of production, marketing, export, technology tie-up, product up gradation and profitability. Till the 1940s, the Indian auto industry was non-existent, since automobile were imported from General Motors and Ford. In early 1940s, the Hindustan Motors and Premier Auto company’s were started, by importing know-how from General Motors and Fiat respectively. Since the 1950s, a few other companies entered the market for two-wheelers and commercial vehicles. However, most of them either imported or indigenously produced auto-components, till the mid-1950s, when India had launched import substitution programme, thereby resulting in a distinctly separate auto-component sector.
Till early 1980s, there were very few players in the Indian auto sector, which was suffering from low volumes of production, obsolete and substandard technologies. With de-licensing in the 1980s and opening up of this sector to FDI in 1993, the sector has grown rapidly due to the entry of global players. In India, mopeds, scooters and motorcycles constitute the two-wheeler industry, in the increasing order of market share. India is a global major in the two-wheeler industry producing motorcycles, scooters and mopeds principally of engine capacities below 200 cc. It is the second largest producer of two-wheelers and 13th largest producer of passenger cars in the world (Badri Narayanan G. Pankaj Vashisht 2008).

As far as mileage per litre of petrol is concerned, Hero Honda (a popular motorcycle brand in India) is ruling the market and finding favour with the consumers. Yamaha and TVS are far below the expectations of the consumers based on mileage per litre of petrol. This is also due to constant advertisements through newspapers, TV, Cable TV, hoardings, road shows, etc. Hero Honda attained supremacy due to mileage factor. In these hard days of price increases and poor incomes, everyone is concerned with economic use of vehicles. Naturally Hero Honda has become the favorite of the masses. Hero Honda is a leader by its
design, fuel efficiency and price. The advertising strategy adopted by the Indian Automakers is quite informative and the consumers are able to gain information about the product from friends, colleagues, and brochures of the automakers (Reddy Mallikarjuna, 2000).

The two-wheeler industry in India has grown at a compounded annual growth rate of more than 10 per cent (in number) during the last five years and has also witnessed a shift in the demand mix, with sales of motorcycles showing an increasing trend. Indian two wheelers comply with some of the most stringent emission and fuel efficiency standards worldwide (Badri Narayanan G. Pankaj Vashisht 2008). McKinsey (2005) predicts the growth potential of India-based automotive component manufacturing at around 500 per cent, from 2005 to 2015. This report describes the initiatives required from industry players, the Government and the ACMA to capture this potential. This study was based on interviews and workshops with 20 suppliers and 7 OEMs and survey with ACMA members.

The motorbike production is dominated by the major industrial groups through following popular brands (listed in terms of market share) in India.

1. Hero Honda – Motorbikes, Scooter
2. TVS Suzuki – Motorbikes, Mini Scooters, Mopeds

3. Bajaj – Scooters, Motorbikes

4. Yamaha – Motorbikes

5. Honda Industries – Scooters, Motorbikes

6. Kinetic Honda – Mini Scooters, Motorbikes

7. Vespa – Scooters

8. Enfield – Motorbike

Table 3.1 Automobile Domestic Sales Trends in India (in No of Units)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>707,198</td>
<td>902,096</td>
<td>1,061,572</td>
<td>1,143,076</td>
<td>1,379,979</td>
<td>1,547,985</td>
</tr>
<tr>
<td>Commercial</td>
<td>190,682</td>
<td>260,114</td>
<td>318,430</td>
<td>351,041</td>
<td>467,765</td>
<td>486,817</td>
</tr>
<tr>
<td>3 Wheelers</td>
<td>231,529</td>
<td>284,078</td>
<td>307,862</td>
<td>359,920</td>
<td>403,910</td>
<td>364,703</td>
</tr>
<tr>
<td>2 Wheelers</td>
<td>4,812,126</td>
<td>5,364,249</td>
<td>6,209,765</td>
<td>7,052,391</td>
<td>7,872,334</td>
<td>7,248,589</td>
</tr>
<tr>
<td>Grand Total</td>
<td>5,941,535</td>
<td>6,810,537</td>
<td>7,897,629</td>
<td>8,906,428</td>
<td>10,123,988</td>
<td>9,648,094</td>
</tr>
</tbody>
</table>
The table 3.1 and fig.3.1 shows that two wheelers are the most preferred mode of transport among the growing Indian middle class population and the cars are the most preferred mode of transport among the upper middle class and rich people. Growth in sales of Commercial vehicles is in line with the macroeconomic conditions prevailing in India.

(Source: Society for Indian Automobile Manufacturers, www.siamindia.com)
3.2 RESEARCH DESIGN

The research employed a cross-sectional methodological approach. Cross-sectional data “is one used to collect data on all variables at one point of time” (O’Sullivan & Rassel 1999). This approach is adopted in most econometric data collection. The survey design is regarded as the most appropriate research design to measure the perceptions of the respondents in this study. A survey is the most appropriate research design as it can enable the researcher to collect information from a large population. The information obtained from the sample can then be generalized to an entire population. Survey research is usually a quantitative method that requires standardized information in order to define or describe variables or to study the relationships between variables.

Surveys generally fall into one of two categories, descriptive or relational. Descriptive surveys are designed to provide a snapshot of the current state of affairs while relational surveys are designed to empirically examine relationships among two or more constructs either in an exploratory or in a confirmatory manner. The current study is a relational survey that seeks to explore the relationship between Affordability, Attributes of the product, Sales Support, External Factors
as the mediating factor and the outcome as the Purchase Decision.

3.3 PILOT STUDY

Prior to beginning actual data collection with the procedure described above, the researcher utilized similar procedures to conduct a pilot study to ensure that the survey materials and procedure were clear and did not provoke any confusion or problems for participants. The draft questionnaire was eventually subjected to pilot testing with a total of 50 visitors to the retail outlet of motorcycles spread across the entire Kancheepuram district in Tamil Nadu, and they were asked to comment on any perceived ambiguities, omissions or errors concerning the draft questionnaire.

The feedback received was rather ambiguous, thus only minor changes were made. For instance, technical jargon was rephrased to ensure clarity and simplicity. The revised questionnaire was subsequently submitted to three experts (an academician, a researcher and a motorcycle sales dealer) for feedback before being administered for a full-scale survey. These experts indicated that the draft questionnaire was rather lengthy, which in fact coincided with the preliminary feedback from visitors-who were either potential buyers or customers of
the sales outlet. Nevertheless, in terms of number of items in the questionnaire, the current study conforms broadly with similar research works conducted in market research area.

3.4 DATA COLLECTION

Data were collected by means of a structured questionnaire comprising nine sections namely A, B, C, D, E, F, G, H & I (see Appendix I). Section A consists of eleven questions pertaining to Needs, Section F consists of four questions pertaining to Credit Availability, which are the sub dimensions of Study Factor Affordability. Section B consists of ten questions relating to Features, Section E consists of four questions relating to Price and Section G consists of four questions pertaining to Infrastructure and Maintenance, which are the sub dimensions of Study Factor Attributes. Section C consists of six questions related to the After Sales and Service & Spares, a Study Factor. Section D has six questions to the choice of Media of Advertising, Section I has one question pertaining to referring (referral) intentions, which are the dimensions of the Study Factor, External Factors.

In Section H, five questions relating to the overall reasons for possessing bikes, which is kept as dummy for Purchase Decision in this
study. Finally in the part on personal information, five questions pertaining to consumer/respondent’s demographic profile information were given.

All the items in Sections A to I were presented as statements on the questionnaire, with the same rating scale used throughout, and measured on a seven-point, Likert-type scale that varied from 1 strongly disagree to 7 strongly agree. In addition to the main scale addressing individual items, respondents were asked in Section H to provide overall reasons for possession of motorcycles/bikes.

For conducting an empirical study, data were collected from existing customers, potential customers, and casual visitor to the various motorcycle manufacturer retail outlets spread across Kancheepuram district in Tamilnadu. Assurance was given to the respondents that the information collected from them will be kept confidential and will be used only for academic research purposes.

Data had been collected using the “personal-contact” approach as suggested by Sureshchandar etal. (2002) whereby “contact persons” (Managers of Retail Outlets) have been approached personally, and the survey was explained in detail. The final questionnaire was then handed personally to the customers. A total of 1000 nos. of questionnaire were
handed over to the potential population of the sample. Of these 705 were collected. Out of the questionnaires that were collected 33 were not usable due to insufficient and/or incomplete data. As a result, a total of 672 valid questionnaires were used for the analysis, leading to a response rate of 95 per cent. So, the sample size for the analysis is 672.

3.4.1 SAMPLING PLAN:

An integral component of a research design is the sampling plan. Specifically, it address three questions: Whom to survey (The sample unit), How many to survey (The sample size), and How to select them (The sampling procedure).

3.4.2 SAMPLE UNIT:

The sample unit selected for the is the users of 100 cc bikes in kancheepuram District of Taml Nadu. The size of the population is found out from the RTO offices of the Kancheepuram District. The district having four offices situated at Chengalpatu, Kancheepuram, Tambaram and Meenambakkam. For the study purpose the researcher collected the vehicle population according to the various taluks of kancheepuram district. There are eight taluks namely Sriperumbudur, Tambaram, Chengalpattu, Kancheepuram, Uthiramerur,
Thirukkalukundram, Madurandakam and Cheyyur. There are about 232756 nos of 100cc motorbikes in Kancheepuram district. The number of vehicle according to taluks is given below.

3.4.3 THE SAMPLE SIZE

The researcher given below the vehicle population based on the taluks of Kancheepuram District. The populations of the motorcycles are in eight taluks: as follows

1. Sriperumbudur = 33550
2. Tambaram = 38465
3. Chengalpattu = 28620
4. Kancheepuram = 29750
5. Uthiramerur = 28112
6. Thirukkalukundram = 25025
7. Madurantakam = 28055
8. Cheyyur = 21179

After considering the population of bikes on taluk basis, the researcher further selected a particular taluk of Tambaram in which there are 38465 numbers of 100 cc bikes. The researcher selected 1000 samples for survey. After data collection it is found only 672 samples are usable for analysis. So the researcher used 672 samples for the study.
3.4.4 THE SAMPLING PROCEDURE

It is a procedure involved in selecting the sampling. There are various methods in selecting samples. In order to select the sample the researcher used the several stages. As the selection is based on several stages the researcher used the multi stage sampling method for this study.

3.4.5 RESPONDENT’S CHARACTERISTICS

The demographical characteristics of the sample of respondents are presented in order to get a clear picture of the sample. Demographic variables that were measured from the respondents were as follows:

- Age
- Occupation
- Annual Income
- Family Size
- Educational Qualifications

The following tables (tables 3.2 to 3.5) give the breakup of the sample size across the different demographic variables.

**Table 3.2: Respondents based on Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Respondent</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
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</thead>
<tbody>
<tr>
<td>21-25</td>
<td>250</td>
<td>37.2 %</td>
<td>37.2 %</td>
</tr>
<tr>
<td>26-35</td>
<td>199</td>
<td>29.6 %</td>
<td>66.8 %</td>
</tr>
<tr>
<td>36-45</td>
<td>88</td>
<td>13.1 %</td>
<td>79.9 %</td>
</tr>
<tr>
<td>45-50</td>
<td>58</td>
<td>8.6 %</td>
<td>88.5 %</td>
</tr>
<tr>
<td>50 and above</td>
<td>77</td>
<td>11.5 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
</tr>
</tbody>
</table>

Source: Primary data computed in SPSS 16.0
### Table 3.3: Respondents based on Occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Respondent</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govt/ Public Sector</td>
<td>53</td>
<td>7.9 %</td>
<td>7.9 %</td>
</tr>
<tr>
<td>Employees- Pvt Sector</td>
<td>183</td>
<td>27.2 %</td>
<td>35.1 %</td>
</tr>
<tr>
<td>Professionals</td>
<td>249</td>
<td>37.1 %</td>
<td>72.2 %</td>
</tr>
<tr>
<td>Self/Businessmen</td>
<td>77</td>
<td>11.5 %</td>
<td>83.7 %</td>
</tr>
<tr>
<td>Others</td>
<td>110</td>
<td>16.3 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
</tr>
</tbody>
</table>

### Table 3.4: Respondents based on Annual Income

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Total Respondent</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Rs.50000</td>
<td>76</td>
<td>11.3 %</td>
<td>11.3 %</td>
</tr>
<tr>
<td>50001-100000</td>
<td>127</td>
<td>18.9 %</td>
<td>30.2 %</td>
</tr>
<tr>
<td>100000-150000</td>
<td>149</td>
<td>22.2 %</td>
<td>52.4 %</td>
</tr>
<tr>
<td>150000-200000</td>
<td>91</td>
<td>13.5 %</td>
<td>65.9 %</td>
</tr>
<tr>
<td>&lt;2000000</td>
<td>229</td>
<td>34.1 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
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### Table 3.5: Respondents based on Family Size

<table>
<thead>
<tr>
<th>Family Size</th>
<th>Total Respondent</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>204</td>
<td>30.4 %</td>
<td>30.4 %</td>
</tr>
<tr>
<td>4-5</td>
<td>340</td>
<td>50.6 %</td>
<td>81.0 %</td>
</tr>
<tr>
<td>6-7</td>
<td>82</td>
<td>12.2 %</td>
<td>93.2 %</td>
</tr>
<tr>
<td>8-9</td>
<td>27</td>
<td>4.0 %</td>
<td>97.2 %</td>
</tr>
<tr>
<td>&lt;9</td>
<td>19</td>
<td>2.8 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
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</table>

### Table 3.6: Respondents based on Qualifications

<table>
<thead>
<tr>
<th>Educational Qualification</th>
<th>Total Respondent</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schooling</td>
<td>35</td>
<td>5.2 %</td>
<td>5.2 %</td>
</tr>
<tr>
<td>Graduate – UG</td>
<td>176</td>
<td>26.2 %</td>
<td>31.4 %</td>
</tr>
<tr>
<td>Graduate – PG</td>
<td>289</td>
<td>43.0 %</td>
<td>74.4 %</td>
</tr>
<tr>
<td>Professionals</td>
<td>172</td>
<td>25.6 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
</tr>
</tbody>
</table>
3.4.6 PROCEDURE FOR DATA ANALYSIS

The data collected were analyzed for the entire sample. Data analyses were performed with Statistical Package for Social Sciences (SPSS) using techniques that included descriptive statistics, correlation analysis and AMOS Package for Structural Equation Modeling and Bayesian Estimation and testing.

3.4.7 STRUCTURAL EQUATION MODELLING

The main study used structural equation modeling (SEM) because of two advantages: “(1) estimation of multiple and interrelated dependence relationships, and (2) the ability to represent unobserved concepts in these relationships and account for measurement error in the estimation process” (Hair et al., 1998, p.584). In other words, a series of split but independent multiple regressions were simultaneously estimated by SEM. Therefore, the direct and indirect effects were identified (Tate, 1998).

However, a series of separate multiple regressions had to be established based on “theory, a priori experience, and the research objectives to
distinguish which independent variables predict each dependent variable” (Hair et al, 1998, p.584). In addition, because SEM considers a measurement error, the reliability of the predictor variable was improved. Structural Equation Modeling was conducted with **AMOS 16.0** (an upgraded version of **AMOS 7.0**). **AMOS 7.0** (Arbuckle and Wothke, 2006), a computer program for formulating, fitting and testing structural equation models to observed data was used for SEM and the data preparation was conducted with **SPSS 15.0**.

Linear structural equation models (SEMs) are widely used in sociology, econometrics, management, biology, and other sciences. A SEM (without free parameters has two parts: a probability distribution (in the Normal case specified by a set of linear structural equations and a covariance matrix among the “error” or “disturbance” terms), and an associated path diagram corresponding to the casual relations among variables specified by the structural equations and the correlations among the error terms. It is often thought that the path diagram is nothing more than a heuristic device for illustrating the assumptions of the model. However, in this research, the researcher will show how path diagrams can be used to solve a number of complex problems in structural equation modeling.
Structural equation models with latent variables (SEM) are more and more often used to analyze relationships among variables in marketing and consumer research (refer Bollen 1989, Schumacker & Lomax 1996, or Batista-Foguet & Coenders 2000, for an introduction and Bagozzi 1994 for applications to marketing research). Some reasons for the widespread use of these models are their parsimony (they belong to the family of linear models), their ability to model complex systems (where simultaneous and reciprocal relationships may be present, such as relationship between profitability and economic growth), and their ability to model relationships among non-observable variables (such as the economic downtrend in the SEM-CPD model) while taking measurement errors into account (which are usually sizeable in small sample and can result in biased estimates if ignored).

As is usually recommended, a confirmatory factor analysis (CFA) model is first specified to account for the measurement of relationships from latent to observable variables. In our case, the latent variables are the four perception dimensions and the observed variables the 8 perception items. The relationships among latent variables cannot be tested until a well-fitting CFA model has been reached. In our case, the relationships among overall quality of education, the mediating impact
of external factors with the Affordability, Attributes, and Sales Support dimensions are of interest. This modeling sequence stresses the importance of the goodness of fit assessment. As a combination of regression, path and factor analyses, in SEM, each predictor is used with its associated uncontrolled error and; unlike regression analyses; predictor multi-collinearity does not affect the model results.

3.4.8 EVALUATION OF MODEL FIT

According to the usual procedures, checking the statistical and substantive validity of estimates, the convergence of the estimation procedure, the empirical identification of the model, the statistical significance of the parameters, and the goodness of fit to the covariance matrix assess the goodness of fit. Since complex models are inevitably mis-specified to a certain extent, the standard \( \chi^2 \) test of the hypothesis of perfect fit to the population covariance matrix is given less importance than measures of the degree of approximation between the model and the population covariance matrix. The roots mean squared error of approximation (RMSEA) is selected as such a measure. Values equal to 0.05 or lower are generally considered to be acceptable (Brown &Cudeck 1993). The sampling distribution for the RMSEA can be
derived, which makes it possible to compute confidence intervals. These intervals allow researchers to test for close fit and not only for exact fit, as the $\chi^2$ statistic does. If both extremes of the confidence interval are below 0.05, then the hypothesis of close fit is rejected in favor of the hypothesis of better than close fit. If both extremes of the confidence interval are above 0.05, then the hypothesis of close is rejected in favor of the hypothesis of bad fit.

Several well-known goodness of fit indices were used to evaluate model fit: the chi-square $\chi^2$, the comparative fit index (CFI), the unadjusted goodness-of-fit indices (GFI), the normal fit index (NFI), the Tucker-Lewis Index (TLI), the root mean square error of approximation (RMSEA) and the standardized root mean square error residual (SRMR).

### 3.4.9 BAYESIAN ESTIMATION AND TESTING IN SEM

With modern computers and software, a Bayesian approach to structural equation modeling (SEM) is now possible. Posterior distributions over the parameters of a structural equation model can be approximated to arbitrary precision with AMOS, even for small samples. Being able to compute the posterior over the parameters allows us to address several
issues of academic and practical issues. First, prior knowledge about the parameters may be incorporated into the modeling process in AMOS. Second, we need not rely on asymptotic theory when the sample size is too small, a practice which has been shown to be misleading for inference and goodness-of-fit tests in SEM (Boomsma 1983). Third, the class of models that can be handled is no longer restricted to just-identified or over-identified models. Finally, the SEM estimates the cause-effect between the variables. Whereas each identifying assumption must be taken as given in the classical approach, in a Bayesian approach some of these assumptions can be specified with perhaps more realistic uncertainty.

3.5 HYPOTHESIS DEVELOPMENT

Mediation refers to a process or mechanism through which one variable (i.e., exogenous) causes variation in another variable (i.e., endogenous). Studies designed to test for moderation may provide stronger tests for mediation than the partial and whole covariance approaches typically used (e.g., Baron & Kenny 1986; Bing, Davison, LeBreton, & LeBreton 2002, James & Bren 1984). It is useful to distinguish between moderation and mediation. Moderation carries with it no connotation of
causality, unlike mediation, which implies causal order. Based on the arguments discussed in the previous chapters and this chapter the researcher formulated the following hypotheses for dimensions of purchase decisions for motorbikes in succeeding sections.

- The dimensions of affordability influence the external factors as the mediating factor.
- The dimensions of attributes influence the external factors as the mediating factor.
- The dimensions of sales support influence the external factors as the mediating factor.
- The dimensions of external factors positively influence the purchasing decisions.

The mediator hypothesis is supported if the interaction path (Affordability, Attributes and Sales Support X External Factors) are significant. There may also be significant main effects for the predictors (Affordability, Attributes and Sales Support) and mediator (External Factors). Therefore, this research seeks to explore whether the relationship between Purchase Decision and Affordability, Attributes and Sales Support are fully or partially Mediated by External Factors. The hypothesized mediated model is given in the figure 3.2.
3.5.1 Hypotheses formulated for SEM-CPD (EF) Mediated Model (Fig. 3.2)

**Hypothesis 1:** The purchase decision-making dimension ATTRIBUTES is mediated by External Factors towards motivating the purchase decisions.

**Hypothesis 2:** The purchase decision-making dimension AFFORDABILITY is mediated by External Factors towards motivating the purchase decisions.
**Hypothesis 3:** The purchase decision-making dimension SALES SUPPORT is mediated by External Factors towards motivating the purchase decisions.

**Hypothesis 4:** The purchase decision-making dimension ATTRIBUTES positively influences the purchase decisions.

**Hypothesis 5:** The purchase decision-making dimension AFFORDABILITY positively influences the purchase decisions.

**Hypothesis 6:** The purchase decision-making dimension SALES SUPPORT positively influences the purchase decisions.

**Hypothesis 7:** The purchase decision-making mediating dimension External Factors, positively influence the purchase decisions.

**Hypothesis 8:** The purchase decision-making dimension ATTRIBUTES is positively correlated to the purchase decision dimensions SALES SUPPORT.

**Hypothesis 9:** The purchase decision-making dimension SALES SUPPORT is positively correlated to the purchase decision dimensions AFFORDABILITY.

**Hypothesis 10:** The purchase decision-making dimension ATTRIBUTES is positively correlated to the purchase decision dimensions AFFORDABILITY.
Hypothesis 11: Including the interaction between dimensions of the purchase decision-making and external factors will explain more of the variance in overall purchase decision-making than the direct influence of dimensions of purchase decision-making or external factors on their own.

3.6 CONCLUSION

In this chapter the research methodology adopted for this research was explained with the research design followed by the explanation on the population and the sample, respondents’ characteristics, survey instruments and scoring procedures, data collection procedure and data analysis were briefed respectively. In the following chapter the developed hypotheses will be empirically tested.