Chapter 3

RESEARCH METHODOLOGY

Research methodology deals with the methods adopted to carry out any study. Research methodology gives a planned path of carrying out a project work. A study without a research methodology will not culminate into desired results. This chapter explains the research methodology adopted in this study in detail. It explains objectives of the study, area of the study, sampling technique adopted, sample size, data collection instrument used, data collection method, statistical techniques used, limitation and organisation of study.

Objectives of the study

The main aim of this study is to check the applicability of Aaker’s scale of brand personality in India in case of motor bike consumers and to identify relationship between human personality and brand personality for motor bikes. The following sub objectives have been framed to achieve this task:

- To check the validity of Aaker’s brand personality dimensions/scale for major brands of motor bikes in India;
- to find out the dimensions of brand personality of motor bike’s brands;
- to find out the brand personalities of major motor bike brands;
- to examine the relationship between brand personality and human personality for various brands of motor bikes; and
- to check the contribution of brand personality and human personality on purchase behaviour and satisfaction of consumer.

Area of Study and Sampling

This research is carried out in state of Haryana, India. First question for defining the area of study is to define the universe of the study. The universe comprises of all those individual, who are of interest for any particular study and about whom the research is
being carried out (Lavrakas, 2008). The current research is addressed to the entire state of Haryana. Hence, population of Haryana state is considered as universe of the study.

There are two methods of finding results for population or universe in any study. Either researcher collects the data from each and every sample unit of the universe (this is called census) and results are drawn or researcher may decide to opt the technique of sampling in which a subgroup from entire population or universe is selected in such a way that the maximum variation in the universe can be explained by this subgroup. Despite the entire population, this subgroup is studied and results about the population or universe are estimated from the results of the sample because of some obvious reasons like: the census studies are usually not recommended due to time and budget constraints, it is not realistic to do census for research studies (Malhotra N. K., 2007). Hence, sampling technique is adopted in this study over census. Adopting sampling technique in current study means that the sample is to be chosen in such a way so that the entire Haryana state can be represented well and the variation in the thinking pattern of residents of Haryana for the motor bikes which they possess, is covered properly with minimum possible error.

Multistage cluster cum convenience sampling was adopted to select the samples in this study. In first stage, process of sampling is started with administrative setup of Haryana state. Government of Haryana has divided the state into four administrative divisions or clusters (Hisar, Rohtak, Ambala and Gurgaon). Each administrative division has following districts in it:

i. Hisar – Hisar, Bhiwani, Sirsa, Fatehabad, Jind;
ii. Rohtak – Rohtak, Jhajjhar, Sonepat, Panipat, Karnal;
iii. Ambala – Ambala, Panchkula, Kaithal, Yamunanagar, Kurukshetra; and
iv. Gurgaon – Gurgaon, Faridabad, Rewari, Mahendergarh, Mewat, Palwal

This administrative setup is taken as sample frame in current study. In second stage, random sampling was adopted to select two districts from each division. The randomly selected districts were: Hisar, Bhiwani, Rohtak, Karnal, Faridabad, Mahendergarh, Yamunanagar and Panchkula. In third stage, convenience sampling was adopted to record the responses of respondents from each of the selected district.
Data Collection Instrument

Data collection instrument refers to the tool used to collect data. Primary data for any research study can be collected using various data collection instruments like questionnaire, focus groups, interviews, observational checklists etc. All the tools of data collection except questionnaire takes the data collection exercise into qualitative instruments which requires a trained psychologist to collect data. Keeping in mind the budget and time constraints of the current study, the questionnaire as a tool of data collection is adopted. Data on questionnaire can be recorded in multiple ways like – questionnaire given to the respondent and respondent fills up the questionnaire (Self-reporting method), researcher asks the questions of questionnaire from respondent orally, respondent replies back and researcher on the behalf of respondent fills the answer in the questionnaire (Schedule). Although, self-reporting is advocated as the better and reliable method (Heeler, Okechuku, & Reid, 1979) to gather data but considering the subject matter of study (concept of brand personality and responses for it rests on the ability of respondent to assume a non-living entity (motor bike in this study) as a living being and then replying to the questions), which is relatively new, might requires the researcher involvement in explaining a question to respondent. Hence, a mixed approach of self-reporting-cum-scheduling was adopted for data collection. Moreover, the subject matter was properly briefed to respondents before of the questions in questionnaire (questionnaire can be seen in Appendix I).

There are two ways to prepare a questionnaire for a study. One way is to develop a measure on our own as was strongly suggested by Kassarjian (1971) and another one is to use an established scale measuring any construct. Kassarjian (1971) highlighted reasons for not using established scale like: condition, situation in which the scale is being used etc. Abiding by Kassarjian (1971), new measure should be developed for every study. Developing a new measure is very cumbersome process and in itself is a separate research. As the objective of this study is not to develop a measure but to check the applicability of Aaker’s brand personality scale in India, the existing scale of Aaker (1997) is used. Developing a measure would have exposed the researcher beyond the objectives of this study.

(Note: Just to understand what does developing a construct involves, consider the validation issue for a newly developed questionnaire. Operationalizing a construct
without validity problems for a multidimensional concept is an important part of a construct measurement (Ferber, 1979). Ensuring validity is a comprehensive, important and complex (McGrath & Brinberg, 1983) exercise ranging from internal to face to convergent to discriminant to external to predictive validity and establishing it requires a separate research work (Bagozzi, Tybout, Craig, & Sternthal, 1979). Researchers have even been arguing to go beyond the external validity and advised to go for theory and intervention testing (Calder, Phillips, & Tybout, 1983). Therefore, it was not considered as it was out of the preview of this study.

In view of the above discussion, the established scale was used to measure human personality (Big Five Inventory) and brand personality (Brand Personality Scale). These scales were used without any change as it is strongly objected by Kassarjian (1971). The author writes in the paper:

“Much too often, in order to adjust test items to fit specific demands, changes are made in the instrument. Items are taken out of context of the total instrument, words are changed, items are arbitrarily discarded, and the test is often shortened drastically. This adjustment would undoubtedly horrify the original developer of the instrument, and the disregard for the validity of the modified instrument should horrify the rest of us.” (In Original) (Kassarjian, 1971)

Molding the items of scale to fit in the conditions is a debatable issue with many advocating in favor of it and many against it. Argument of Kassarjian (1971) was adhered to as far as this study is concerned as author specifically advocated it for the constructs of personality in relation to consumer behaviour. This study is emphasizing on personality (brand and human) in context to consumer behaviour (do individuals buy motor bikes in accordance with their personality?) and hence his view was adopted.

Human Personality was operationalized using big five inventory (BFI) (big five inventory is the most accepted measure of human personality). Big five inventory has 44 items in it. Each of the item is measuring responses on five point Likert scale. All the instructions suggested by developers (John, Donahue, & Kentle, 1991) were followed strictly during data collection. The 44 items in the scale contains positively and negatively worded traits. Score on five personality dimensions were calculated using the formula suggested by the original authors.
Brand personality was operationalized using brand personality scale (BPS) developed by Aaker (1997). Scale has 42 items in it. All items were measured using five point Likert scale. Scale was used in full compliance with the instructions suggested by Aaker (1997). Brand personality scale is considered as the largest (Harris & Fleming, 2005) and most widely accepted (Wang, Yang, & Liu, 2009) effort to measure brand personality.

The final structured questionnaire was divided into four parts. First part contains the items measuring brand personality using brand personality scale. Second part of questionnaire contains 44 items measuring human personality using Big Five Inventory. Third part of questionnaire contains items relating to satisfaction of respondents for their motor bike. Fourth part contains items measuring demographics of respondents (copy of questionnaire is attached in Appendix I).

**Sample Size**

To determine the sample size for the study, a pilot study was carried out with 150 respondents. 150 respondents were approached with structured questionnaire. Preliminary analysis of questionnaire revealed that only 111 questionnaires are good enough to be analyzed. That means about 74 percent of the totally planned questionnaire are properly filled up stating that response rate is 74 percent. Responses from these 111 respondents on the structured questionnaire were analyzed for the standard deviation. Average standard deviation for the pilot study was observed as 0.7. Taking the value of z as 1.96 for 95 percent confidence interval, and 5 percent as precision level, formula suggested by Malhotra & Dash (2011), \( n = \frac{SD^2 * Z^2}{D^2} \) (n – Sample Size, SD – Standard deviation of population, D – precision level) is applied to determine the sample size. Putting 0.7 as standard deviation value, 1.96 as Z value, 5 percent (0.05) as precision value, the sample size is calculated as 752.95 (753). This depicts that around 750 questionnaire need to be filled up to cover the deviation in the population.

Considering the response rate or return rate of 74 percent (as is found in pilot study), it is considered that the final study would also have response rate around 74 percent. Assuming that about 26 percent of responses would not be used fully, it was decided to approach 126 percent respondents of the desired sample size. Sample size required is 750. 126 percent of 750 is calculated as 945. 945 is taken as the number of
respondents to be approached for current study. This sample size is to be distributed among the eight districts of Haryana which are already selected (See section 3.2). Hence, it was decided that 125 questionnaires to be filled up from each of the eight districts. This culminates the sample size to 1000.

**Statistical Techniques**

Objectives of the study are addressed by estimating the brand personality, human personality, and relationship between them for motor bikes. Results for the constructs of interest can only be achieved by subjecting the data to various statistical techniques. There are many statistical techniques available in literature. Thus, it is important to select only relevant statistical technique which gives the desired results. This study has incorporated the statistical techniques of descriptives, t-test, correlation, item-to-total correlation, cronbach alpha, exploratory factor analysis, confirmatory factor analysis and regression analysis to achieve desired results. Use of too complex and sophisticated techniques are avoided in present study as was suggested by Feber (1979).

**Descriptives**

Statistical techniques like frequency, percentile, mean, standard deviation, skewness etc. are called as descriptives in research methodology. These statistics provide important information about the data. These statistics are very common for any study. These statistics help in interpreting the results of analytical tools applied to data.

**t-test**

$t$-test is a difference of mean test. $t$-test is used to decide whether the difference between the two groups is significant or not. Although, the difference between two groups for any construct can be judged by its numeric value, yet this difference which is numerically observed across groups should be treated as a real difference or not can only be judged by the results of student’s $t$-test. It can check the difference of significance against any fixed numeric value (one sample $t$-test), against any group (independent sample $t$-test) or against the value of the same group (paired sample $t$-test).
Correlation Analysis

Correlation analysis is a technique which measures the relationship between two continuous variables. Correlation also informs about the gravity of the relationship along with the direction (negative – if one variable value is increasing, value of other variable is decreasing; or positive – if value of one variable is increasing, the other variable value is also increasing). Although correlation yields results about relationship but it does not signify a causal relationship (one is reason of existence of other variable) between the two variables.

Item-to-Total Correlation

Item-to-total correlation is used to find out misfit item in a scale. It measures the correlation between one item and the scale consisting all other items except this item. Greater value of item to total correlation depicts item is not a misfit and vice versa (Nunnally & Bernstein, 1994). Benchmark value of item to total correlation in the current study is taken as 0.4.

Cronbach Alpha

Good inter-item correlation would result into good value of reliability (which is a measure of internal consistency; and a necessary condition of a scale which checks whether all the items are measuring one construct only or not). Another widely used measure of reliability of scale is cronbach alpha (Churchill, 1979). Value of cronbach alpha greater than 0.60 signifies that the scale could be treated as reliable. Greater the value of cronbach alpha, better the reliability of the scale is. Current study checked the importance of various items of Aaker scale by using the value of cronbach alpha. Value of cronbach alpha was checked by deleting the items in scale one by one. If the value of cronbach alpha for scale is decreasing by deleting an item, it depicts that the item which is deleted is an important item and it should not be deleted. This check is called as ‘cronbach alpha if item deleted’.

Factor Analysis

Factor analysis is a data reduction technique which is used to reduce the number of variables to be analyzed in a research for making estimates about deliverables. Factor analysis is an interdependence technique as no dependent and independent variables
required for its application. Application of factor analysis results into factors. Each factor represents certain items. As more than one items are being replaced by a factor as a result of factor analysis, the data reduction is called to have taken place. Factor analysis is generally used for two purposes – data reduction and identification of latent dimension for any construct. Before applying factor analysis, the data should have necessary correlation required for factor analysis as on the basis of correlation the various items are clubbed together under a factor and hence data reduction is achieved. Two tests which checks the data for this requirement of factor analysis are – Bartlett’s test of sphericity (checks whether the correlation matrix of items is an identity matrix or not), significant values of this test depicts that data has necessary correlation and vice versa; and Kaiser-Meyer-Olkin (KMO) which is the measure of sampling adequacy (checks the appropriateness of factor analysis). Larger the value of KMO, better it is (Malhotra N. K., 2007).

Factor analysis uses various extraction methods (principal components analysis, principal axis factoring, unweighted least squares, generalized least squares, maximum likelihood, alpha method and image factoring) to extract the factors. All these methods use different calculations to generate or extract factors. Principal component analysis is the most widely and popularly used extraction method in factor analysis (Malhotra N. K., 2007).

A very important decision which a researcher has to take is to decide how many factors to retain as result of factor analysis. Literature has suggested multiple ways of deciding the number of factors (a priori determination, eigenvalues, scree plot, percentage of variance method). Researcher has to choose any one of these methods depending on the research condition and requirement. After deciding the number of factors, various items are to be assigned to the factors. This decision is taken on the basis of factor loading (correlation between items and factors). An item will be assigned to that factor for which the factor loading is maximum. It also might occur that one item is having equivalent factor loading for more than one factor. This is called as cross loading issue in factor analysis. One possible solution in factor analysis to get rid of cross loadings is to rotate the factors. Rotation means that various factors are rotated, which results into recalculation of factor loading. Factors are rotated in such a way that items can be clearly assigned to factor without cross loading issues. Factors can be rotated either by orthogonal rotation (factors are allowed to rotate by keeping angle
between them 90 degree) or by oblique rotation (condition of angle between factor to be 90 degrees is relaxed, free rotation takes place). For orthogonal rotation, varimax is the most popular method; and for oblique rotation, promax is the most popular method. This will result into a factor solution, which will be explaining a specific variance (how much change in original items is explained by the factor solution). Larger the value of variance explained better it is. But in social sciences, where parsimony is required, the variance explained can be as low as 50 percent (Adaileh & Abu-alganam, 2010).

After assigning items to various factors, factors need to be profiled (name are given to factors). Last stage of factor application is to calculate factor scores (a value of a specific factor) for each respondent. Post factor analysis application, these factor scores are used in further analysis (Malhotra N. K., 2007).

**Confirmatory Factor Analysis**

Confirmatory Factor Analysis (CFA) is a Structure Equation Modelling (SEM) technique used to confirm the already established structure for a specific set of data. Factor analysis generates factor, CFA confirms the factor structure. Hence, it is advisable to apply CFA in conjunction with factor analysis so that the results of factor analysis can be confirmed.

CFA application requires a measurement theory on priori which states how the variables under study are linked or correlated to each other is a specific way to represent a latent construct. CFA tests the data for this measurement theory. Like measurement theory, literature also has structural theories. The results of combination of measurement theory and structural theories can be confirmed using Structural Equation Modelling (SEM) (Hair, Black, Babin, & Anderson, 2010).

Application of CFA starts with observed variables which are considered to be correlated with latent factors based on a measurement theory. Observed variables are represented by rectangular boxes and latent factors are represented by ovals. Following the measurement theory, associations between observed and unobserved variables are formulated and graphically depicted by arrows in CFA model (AMOS is used in this study). These arrows represents the path in CFA model. One of the path’s variance for each latent variable is to be constrained to 1. Each observed variables are attached an error term with them which represents the error variance. This error is also called
unique factor (Arbuckle, 2006). All the latent variables are also co-varied with each other or as the theory suggests. This model of CFA is run for its results (Hair, Black, Babin, & Anderson, 2010).

CFA is a variance based technique which accepts or rejects the pre-established structure or theory on the basis of the amount of variance explained by the structure or theory proposed. More the variance explained by the model, better will be the acceptance. More the interrelation between variables in model, more variance the model will explain. When a model explains good amount of variance out of the total possible variance, the model fit is achieved. However, the maximum variance that variables can explain will be achieved when each and every variable is interrelated with every other. Though, the maximum value of variance explained is achieved here but every variable correlating with each other is a-theoretical with zero degrees of freedom. Such a model is called as a saturated model. Pertaining to this, only theoretically relevant interrelations are depicted in CFA model. CFA produces regression weights, variances, covariance and correlation in multiple iterations to estimate the model fit (Holmes-Smith, Coote, & Cunningham, 2004). Larger values of regression weights depicts the internal consistency of the latent variable, better variance explained and better model fit. Covariance and correlation is estimated among the latent variables. Higher values of covariance and correlation suggests latent variables to be correlated to each other. A very high value of correlation between variables may lead to discriminant validity issue.

Results of CFA are generated in the form of regression weights and fit indices. Regression weights produced could be seen as equivalent to factor loading in factor analysis. Value of regression weights depicts whether the observed variable has loaded clearly on the latent variable or not. A lower value of regression weights signifies a problem. Current study has taken 0.4 as bench mark value for regression weights in CFA. CFA uses chi- square ($\chi^2$) to generate results. Typically, the chi-square ($\chi^2$) should not be significant for a model to fit according to measurement theory but chi-square ($\chi^2$) by nature is a very sensitive statistic as it is highly impacted by larger sample size, large number of observed variables. It is found that chi-square ($\chi^2$) never yields a non-significant value in CFA for larger sample size. This stats that value of chi-square ($\chi^2$) alone cannot be taken as deciding factor in deriving results of CFA. This is why, other fit indices plays important role in determining a model fit in CFA.
These fit indices are: comparative fit index (CFI), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), chi-square/degrees of freedom (CMIN/DF). Among these indices, CMIN/DF, CFI and RMSEA are sufficient to establish a model fit. PCLOSE, SRMR are additional measures for supporting the argument of model fit (Hair, Black, Babin, Ralph, & Ronald, 2006). AIC is a comparative measure used to compare two models of CFA. Lower value of AIC signifies improvement in the model. Among two models of CFA for same observed and unobserved variables, the one with lower value of AIC will be considered as a better model. For a model to be fit, value of CFI should be greater than 0.95, SRMR should be less than 0.08, RMSEA should be less than 0.07, CMIN/DF should be between 1 and 3 (Hair, Black, Babin, & Anderson, 2010).

A poor model fit signifies that the data does not fit well into the measurement theory for which it is being tested. But a CFA result of poor model fit should not be straight taken as measurement theory failure. There might be some observed variables which might be creating problems. Hence, in case of poor model fits, modification indices should be first analyzed. Modification indices, states that there are certain co-variances in the model which are not considered in the model. If these co-variances are considered the model might improve. As first attempt of improving model fit, the error terms should be co-varied if suggested by modification indices. Co-varying error terms in between factors should be avoided. Even if that does not improve the model fit, then standardized residuals for various observed variables should be analyzed. If any observed variable is having a standardized residual value above $|2|$ with more than two other observed variables, this states a problem. This observed variable should be considered for deletion (Hair, Black, Babin, & Anderson, 2010).

After achieving the model fit, the model should be tested for reliability and validity. Statistic for checking the reliability of CFA model is composite reliability (reliability of latent factor after taking error into account). Validity of latent factor can be checked by analyzing the value of co-variance between latent factors. Very high value of co-variances between latent factors signifies a validity problem. Values of co-variances greater 0.85 between latent factors needs additional statistical testing to establish validity. One such test is chi-square test. Value of chi-square should be calculated by constraining the variance of the highly co-varying factors and this value of chi-square should be checked with chi-square value of model without constraining
the variance. A difference of 14.6 in the value of chi-square between constrained and unconstrained models validates the latent factors (Mulyanegara, Tsarenko, & Anderson, 2009).

**Regression Analysis**

Regression analysis checks the relationship between dependent variable and independent variables. Along with this, regression analysis is also capable of estimating the strength of relationship. There can be one or more than one independent variables in regression analysis. For the data to be adequate for regression analysis, the dependent and independent variables both should have been measured on continuous scale. Independent variables (if more than one) should individually be having significant non zero correlation with dependent variable. At the same time the independent variables should not have strong correlation between themselves as it may give rise to the problem of multicollinearity (Malhotra & Dash, 2011).

Data can be subjected to regression analysis using multiple methods (enter, stepwise, remove and backward) available in SPSS. Out of these four methods, two methods (enter and stepwise) are usually adopted. Enter method takes all the independent variables at one time and delivers the results whereas stepwise regression method takes the independent variables one by one by giving weightage to the most contributing variable in model and next highest contributor independent variables to follow. In output, stepwise method will only display those independent variables which are accepted by the model in terms of their significant contribution. Those independent variables which are either not contributing significantly to the model or those which are suffering from the problems of multicollinearity are excluded. In Enter method, independent variables are to be manually identified for problems of multicollinearity using statistics like part to partial correlation, condition index and variation inflation factor (VIF) etc. To get rid of the manual identification of problematic independent variables, the stepwise method of linear regression is adopted in this study.

Before accepting the result of regression analysis, significance of the model should be checked. A significant regression model states that a significant proportion of variation in dependent variable is explained by independent variables. Application of regression analysis gives statistics like R square (explains how much variation in dependent variable can be explained by independent variables), unstandardized β value
(these are regression coefficients stating the gravity of change which will be brought in dependent variable when the independent variable (whose regression coefficient is being discussed) is changed by unity). However, statistics like R square should be judged cautiously and it alone (in isolation) should not be taken as single most important indicator of regression results. For example, when the aim is to identify relationship between independent and dependent variables (which is case in this study), value of R square is not that important whereas when aim is to predict value of dependent variable, value of R square is important (Frost, 2013).

These unstandardized $\beta$ value along with value of constant can be used to generate a regression equation, using which the strength of relationship between dependent and independent variables can be judged.

**Hypothesis**

To achieve the objectives of the study, following hypothesis are formulated from literature review:

- **H1:** There exists relationship between human personality and brand personality for motor bikes in India.
- **H2:** Aaker scale is not absolutely generalizable for motor bikes in India
- **H2a:** There are culture specific dimensions of brand personality for motor bikes in India.
- **H2b:** There are more than five dimensions of brand personality for motor bikes in India.

**Statistical Techniques for Objectives under Study**

**Objective 1: To check the validity of Aaker’s brand personality dimensions/scale for major brands of motor bikes in India**

Validity of Aaker brand personality scale was tested by first identifying items (question) if any, which were not applicable for motor bikes. This was achieved by using correlation analysis. Ideology of using correlation analysis (to identify those items which are not applicable while measuring any construct – brand personality in this study) has come from the literature of questionnaire and scale formulation which suggests that for any scale to deliver good results, the items in that scale should be
highly correlated with each other (Churchill, 1979). Poor correlation signifies that the item is not applicable to the construct or do not belong to the domain of the construct being measured. Current study has used correlation coefficients to understand the relationships between various items in brand personality scale. Items were checked for the maximum correlation which each item was having with any other item in scale. Maximum correlation was taken as it signifies that no value of correlation coefficients for a specific item with any other item can be greater than this correlation (as this is maximum correlation). Hence, the maximum correlation can be taken to understand the gravity of relationship between the items in study. Items having low value of maximum correlation can potentially be inapplicable in Indian context. Another use of correlation coefficient for achieving the first objective was in the form of inter-item correlation. For an item to be a part of a specific construct (brand personality in this study), value of inter item correlation should be good. Inter item correlation analysis was applied in current study to find out those items from 42 items proposed by Aaker which were not correlating with other items.

Factor analysis is also used to highlight the problem items or those items which are not applicable (if any) for brand personality measurement of motor bikes. Concept of factor loading is used to identify the appropriateness of an item in brand personality measurement. If any item which is not loading on any factor with a factor loading equivalent to 0.4 and above is highlighted as problem item. Confirmatory factor analysis is used in current study for first objective to find out if the theory proposed by Aaker in form of brand personality scales fits the data of this study well or not. If any item is not loading properly and causing problems in model fit, then such item is highlighted as an item which is not applicable in measuring brand personality in India and hence checking applicability of 42 items and measurement theory of Aaker for brand personality.

**Objective 2: To find out the dimensions of brand personality of motor bike’s brands**

Factor analysis with principal component analysis as extraction method and varimax as rotation method was used to find out the dimensions of brand personality. Cronbach alpha was used to establish the reliability of various dimensions of brand personality which has come up as result of factor analysis application. Confirmatory
factor analysis was used to confirm the structure of dimensions of brand personality as was found out in factor analysis.

**Objective 3: To find out the brand personalities of major motor bike brands**

Brand personality of major brands of motor bikes were identified by analyzing the mean scores of major motor bike brands for all dimensions of brand personality. If any motor bike brand has a mean score equal to or more than 80 percent (value of 4 on five point likert scale) for any specific brand personality dimensions, then that brand of motor bike is called to have this brand personality.

**Objective 4: To examine the relationship between brand personality and human personality for various brands of motor bikes**

Regression analysis was used to find out relationship between brand personality and human personality. Regression models are run by taking dimensions of brand personality as dependent variables and dimensions of human personality as independent variables. Number of regression models corresponds to the number of brand personality dimensions found out in second objective of this study. Models revealed the relationship and strength of relationship between human and brand personality.

**Objective 5: To check the contribution of brand personality and human personality on satisfaction of consumer.**

Regression analysis was used to check the contribution of brand personality and human personality on satisfaction of consumer. Satisfaction of consumer was taken as dependent variable in regression model and dimensions of human and brand personality were taken as independent variables in two separate models of regression.

**Limitations**

This study is empirically carried out in practical situation, which may be different from ideal situation. Usually, the accuracy of results demand ideal situation from research methodology and the way research is carried out; which many a times is not feasible. Hence, studies suffer from certain limitations within which they are executed. This study also has some limitations which are as follows:
Study is based on the results derived from primary data. Data was collected using mix of self-reporting and schedule. Data collected from self-reporting questionnaire may not be free from biasness of one or another form. Moreover, the subject matter of brand personality is relatively newer construct in marketing. It involves lot of imagination on respondent part (human traits are to be transferred to non-human elements – motor bikes in this study). The process of imagination and recording responses on the basis of this capability of respondent might have given rise to sampling errors.

Study has drawn results for relationship between brand personality and human personality in general and for three major motor bikes brands in particular (Splendor, Discover and Pulsar). Extension of these results across all present brands of motor bikes should be exercised with caution. Generalizability of results across Haryana based on the findings generated from a sample size of 717 can also be treated as a limitation. This sample size might not be sufficient to cover the variation of the entire state.

Organization of Study

The study is divided into 5 chapters. The arrangement of these chapters are mentioned below:

Chapter I introduces the topic of research study. It introduces the concept of human personality, brand personality and relationship between these two. Human personality and brand personality are introduced right from their evolution to the current state of their understanding.

Chapter II reviews the studies carried out in the same context. This chapter highlights, how the literature has evolved for relationship between human personality and brand personality. Usage, acceptability of Aaker’s brand personality scale by researches across the globe are highlighted. Chapters deals with the explanation of researchers experiences when they tried to found out relationship between human and brand personality.

Chapter III deals with the research methodology. This chapter lists the objectives of the study and also discusses the tools and techniques adopted to carry out the study. Chapter explains what are the tools (used in study) meant for and why those are
specifically used in this study. Chapter also depicts which area does the study refer to, which sampling technique is adopted.

Chapter IV encompasses the analysis of the study. Application of various tools and techniques are projected in detail along with their results. Results of data are interpreted and discussed at length in this chapter. This chapter provides results for all the 5 objectives of study along with their interpretations.

Chapter V is based on the results of chapter IV and include findings drawn from analysis and interpretation. The researcher also tried to give suggestions applicable to marketers on the basis of findings of the study.