CHAPTER III

RESEARCH METHODOLOGY

The extensive review of the literature on work stress research provided a base to examine the concept of empowerment as a moderator and also threw up many unresolved research problems. The review of literature was the basis for formulating several hypotheses and the research methodology was finalised to answer the research questions raised in this study.

This chapter is divided into the following sections:

Section 3.1 Lists the specific research hypotheses to be tested in the proposed study.

Section 3.2 Describes the research sites from which data were collected.

Section 3.3 Explains the research instruments selected to measure independent, dependent and moderator variables.

Section 3.4 Presents the steps taken for pretesting the research tools.

Section 3.5 Presents the mode of data collection and sample characteristics.

Section 3.6 Discusses the types of statistical techniques adopted to test the hypotheses.
3.1 RESEARCH HYPOTHESES

Based on the review of literature, the following main and supportive hypotheses were formulated to meet the research questions:

H1 : Empowerment will have a factor structure comprising of four independent dimensions.

H1.1 : Meaning will form an independent factor of empowerment.

H1.2 : Competence will form an independent factor of empowerment.

H1.3 : Self-Determination will form an independent factor of empowerment.

H1.4 : Impact will form an independent factor of empowerment.

H2 : Work stress will be adversely related to individually and organisationally valued states in both manufacturing and process industries.

H2.1 : Work stress will be adversely related to job satisfaction in both manufacturing and process industries.

H2.2 : Work stress will be adversely related to organisational commitment in both manufacturing and process industries.
H2.3 : Work stress will be positively related to the psychosomatic symptoms of fatigue and tension in both manufacturing and process industries.

H2.4 : Work stress will be negatively related to performance in both manufacturing and process industries.

H3 : The extent of work stress experienced by employees will differ between manufacturing and process industries.

H4 : Empowerment as a composite, as well as its dimensions individually will have an interaction effect with work stress in its relationship to individually and organisationally valued states.

H4.1 : Individuals perceiving a higher level of Meaning will have a less negative relationship between work stress and individually and organisationally valued states.

H4.2 : Individuals perceiving a higher level of Competence will have a less negative relationship between work stress and individually and organisationally valued states.

H4.3 : Individuals perceiving a higher level of self-determination will have a less negative relationship between work stress and individually and organisationally valued states.
H4.4 : Individuals perceiving a higher level of impact will have a less negative relationship between work stress and individually and organisationally valued states.

H4.5 : Individuals perceiving a higher level of empowerment will have a less negative relationship between work stress and individually and organisationally valued states.

H5 : Empowerment as a composite, as well as its dimension individually will have a main effect with work stress in its relationship to individually and organisationally valued states.

H5.1 : The addition of Meaning as an independent variable to work stress will improve prediction of individually and organisationally valued states.

H5.2 : The addition of Competence as an independent variable to work stress will improve prediction of individually and organisationally valued states.

H5.3 : The addition of Self-determination as an independent variable to work stress will improve prediction of individually and organisationally valued states.

H5.4 : The addition of Impact as an independent variable to work stress will improve prediction of individually and organisationally valued states.
H5.5 : The addition of the empowerment composite as an independent variable to work stress will improve prediction of individually and organisationally valued states.

H6 : Empowerment from supervisor will have an interaction effect with work stress in its relationship to individually and organisationally valued states.

H7 : Empowerment from supervisor will have a main effect with work stress in its relationship to individually and organisationally valued states.

H8 : Support for hypothesis 4 & 5 will differ between manufacturing and process industries.

H8.1 : The frequency of observed interaction effect of empowerment, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.

H8.2 : The nature of observed interaction effect of empowerment, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.
H8.3 : The frequency of observed main effect of empowerment, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.

H9 : Similarly support for hypothesis 6 & 7 will differ between manufacturing and process industries.

H9.1 : The frequency of observed interaction effect of empowerment from supervisor, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.

H9.2 : The nature of observed interaction effect of empowerment from supervisor, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.

H9.3 : The frequency of observed main effect of empowerment from supervisor, on work stress relationship with individually and organisationally valued states will differ between manufacturing and process industries.

3.2 DATA SOURCES

A survey type of questionnaire approach was adopted to accommodate the wide ranging hypotheses formulated.
Hypotheses relating to production set up differences required selection of employee samples from manufacturing and process industries.

The test for moderator hypothesis requires the influence of inter-organisational extraneous variables to be controlled. Thereby, a consolidated sample for each production setup (manufacturing vs process industry), by cross sectional sampling of organisations within each production set-up category, is precluded.

The study was confined to one organisation from each production set-up category because of time and resource constraints. Both the organisations selected are located in the state of Tamil Nadu.

Lack of organisational co-operation which is so common in the Indian industry has in the past frustrated many researchers. This study was fortunately accepted and encouraged by the top management and the participants of both the organisations.

The manufacturing organisation chosen is a giant public sector undertaking. It has been identified as a 'Nav Ratna' - a rare distinction given in recognition of its past record as a consistent profit making organisation and also for its potential to sustain and increase its growth in its particular area of operation. The organisation is mainly involved in the manufacturing of boiler plants for state owned and private power generation units. It is almost a monopoly in this sector. In addition it is also specializing, of late, in the production of high pressure valves especially the Christmas tree valves which
has an international market. It also manufactures some defence vehicles and spares, and it also manufactures seamless steel tube products. Many of its products have been accepted all around the world and its order book is full for the next few years. Its turnover and profits have touched record heights.

The processing organisation chosen is another public sector undertaking. It is a giant oil refinery with a throughput of many million tonnes of crude, accounting for more than 15% of India's total refining capacity. This organisation's operations yield products like petrol, kerosene, diesel, LPG, lubricants, asphalt etc. This organisation is also a profit making public sector undertaking and can be termed as a 'healthy' organisation. The well being of the organisation is reflected in and outside the balance sheet.

The manufacturing organisation is located in Tiruchirapalli with another sister unit at Ranipet and administrative offices at the above places in addition to Madras. The processing organisation is located, along with its administrative office in Chennai. Both the organisations are located within the state of Tamilnadu.

Both these organisations fall under the large scale public sector undertakings. The similarities of the organisations are in terms of huge capital investments, large work force, high turnover and good profits etc.

But the basic difference between the two organisations is in their production set-ups. While one organisation is a processing unit the other organisation is a manufacturing unit.
The similar and dissimilar organisational characteristics enumerated above were instrumental in their selection for this study, as they meet a set criteria for broadening the frame work of its generalisation.

3.3 RESEARCH INSTRUMENT

The nature of this research necessitated the study to focus on white collar ‘executives’ in the managerial cadre as this class of employees form the prime target of organisational work stress. The following tools were identified, keeping in view the objectives and the respondents, to tap the independent, moderator and dependent variables (Ref Appendix A).

3.3.1 Stress Diagnostic Survey

For the purpose of this research the instrument chosen for measuring the work stress as perceived by individuals was developed by Ivancevich and Matteson (1980). It aims to measure work stress as made up of six categories of stressors namely, role ambiguity, role conflict, role overload (quantitative), role overload (qualitative), career development and responsibility for people.

The instrument contains 30 items which can be classified into the above mentioned 6 groups of 5 items each. The responses were noted on a seven point scale where 1 stood for ‘never a source of stress’ and 7 stood for ‘always a source of stress’. The responses were added to arrive at the stress level under each category. Overall work stress was measured by summing the totals of the six individual dimensions of stress namely role ambiguity, role conflict, role
overload - quantitative and qualitative, career development and responsibility for people.

A review of literature finds that in stress research the instrument by Rizzo et al. (1970) measuring role conflict and role ambiguity has been used extensively. This instrument is limited to only two dimensions of stress. The instruments by Ivancevich and Matteson (1980) is preferred because it measures six dimensions of stress.

3.3.2.a Empowerment

Empowerment has been looked upon from two angles. One looks at Empowerment as perceived to be received from the supervisor while the other looks at empowerment as a psychological concept made of Meaning, Competence, Self-determination and Impact factors. Because of the divergent ways of viewing empowerment two separate instruments to measure these two ideas were adopted.

3.3.2.b Empowerment from Supervisor

The instrument adopted to study empowerment from supervisor was developed by Das (1992). He argues that because of the increased competitive environment managers are eager to know about alternative ways for managing people at work and he advocates the use of empowerment as a tool to help attain the goals.
The instrument is made up of 16 items and the respondents were required to mark their responses on a 7 point scale depending on the degree of agreement with the statements given. The responses are scored from 1 (strongly disagree) to 7 (strongly agree). Negatively worded items were reverse scored. The author in a study of 186 executives finds that the items included in the scale have a high order of homogeneity and co-efficient alpha is also at a high level, which is .8670. The factor analysis of this study (Das, 1992) identifies three factors which between them explain 55.5 per cent of variance. The author however is guarded on the robustness of the structural dimensions of this scale.

3.3.3 Psychological Empowerment in the Work Place

This instrument was developed by Spreitzer (1995) and aims to study empowerment as a psychological concept comprising of a set of four cognitions reflecting an individual's orientation to his or her work role: Meaning, Competence, Self-determination and Impact. That empowerment was not a single concept was first proposed by Thomas and Velthouse (1990). In sum, psychological empowerment is defined as a motivational construct manifested in four cognitions (meaning, competence, self-determination and impact).

The instrument claims construct validity of a nomological network of empowerment in the work place. The author has also presented that there is evidence of internal consistency and test - retest reliability of the dimensions of psychological empowerment in a work context.
The instrument consists of 12 items divided into 4 sets of 3 statements each. The respondents were required to agree or disagree with the given statements on a 7 point scale with the traditional scoring from 1 for strongly disagree to 7 for strongly agree.

3.3.4 Overall Job Satisfaction Questionnaire

This particular instrument was developed by Seashore, Lawler, Mirvis and Camman (1982). It is a 3 item scale with one item being reverse scored. The respondents were required to record their overall job satisfaction on a 7 point scale with scoring being from 1 for strongly disagree to 7 for strongly agree. The negatively worded items were reverse scored.

This instrument has been well tested and used repeatedly over the years.

3.3.5 Organisational Commitment Instrument

This instrument developed by Balaji (1986) contains 5 items aimed at measuring the individual's Organisational Commitment. The Cronbach's alpha coefficient was found in the reported study as 0.72.

The respondents were asked to mark their responses on a 7 point scale for the 5 items in the instrument with the responses scored from 1 for strongly disagree to 7 for strongly agree.
3.3.6 Measures of Individually Valued States

The individually valued states referred to in this research are fatigue and tension perceived by individuals. A 5 items instrument developed by Quinn and Shepard (1974) was adopted. It has 3 items measuring fatigue and 2 items measuring tension. A study by Beehr, Walsh & Taber (1976) of white collared workers reports reliability of this scale is 0.66 and 0.73 respectively.

The respondents were required to respond to these 5 items on a 7 point agree - disagree scale and scored 7 to 1 respectively. The negatively worded items were reverse scored.

3.3.7 Performance Appraisal Scale

This three item instrument was developed by Hackman and Lawler (1971). The three items measured quantity, quality and overall performance as reported by the individual himself. This self-appraisal was required to be done on a 7 point scale by the individual as compared with his or her perceived performance of other workers. Each item was scored 7 for strong agreement to 1 for strong disagreement. A study by Tharenou (1986) of 160 electrical apprentices gives the reliability of this scale as 0.93.

3.4 PILOT STUDY

The selected tools were pretested in the following manner prior to it being used in the main study.
The tool of empowerment (12 items) was administrated on 107 executives, of various organisations, registered for part-time management course in three different academic institutions in Chennai. The data collected were analysed with the limited view to examine if this measure was a multidimensional construct. Factor analysis using the SPSS (Nie et al., 1975) indicated the existence of four orthogonal factors for this tool.

The measures of work stress, psychological empowerment, overall job satisfaction, individually valued states and performance, being tools of foreign origin, were subjected for scrutiny by a panel of five experts to identify any cultural barriers for their use in India and establishing content validity. After careful consideration no change was recommended and the instruments were administrated unaltered.

Finally the completed questionnaire was administered on a sample of 20 executives drawn from both the organisations chosen for the study. The primary aim was to ascertain the respondents' comprehension of the questionnaire and the meaningfulness attributable to their responses. This pretest demonstrated little difficulty on the part of the executives in understanding and responding to the questionnaire. A semi-structured interview was also conducted individually with the 20 respondents and it was ascertained that their responses to the questionnaire adequately reflected their feelings and perceptions. The average time taken by the executives to complete the questionnaire was about twenty-five minutes.
3.5 DATA COLLECTION PROCEDURE

The subjects for this study were drawn for each production set up by stratified random sampling. In each organisation the executive population was stratified on a functional area basis and within each strata, samples were selected on a random basis. This method of sampling was adopted to ensure that various types of organisational role positions are adequately represented and to avoid sampling bias. The sample profile is given in Appendix B.

Each questionnaire was provided with a covering letter by the researcher. The letter stated the purpose of the sought data and assured the anonymity and confidentiality of the responses (See Appendix A-1).

Questionnaires were distributed through the organisational communication network with an additional note issued by the administrative head of the respective organisations requesting the executives to co-operate in this study. Completed questionnaires were directed to be returned to the respective heads in sealed covers.

The organisational requirements dictated that the self administration of the questionnaires by the executives was done at their leisure. The apathy towards such questionnaires prompted a follow-up in person by the researcher, to remind the respondents and offer clarification, if necessary.

The questionnaires distributed in the manufacturing and process organisations were 190 and 175 respectively. Of these, duly completed usable
responses obtained total to 306 with 155 (81.5%) from the manufacturing 
organisation and 151 (86.2%) from the process organisation.

The entire field data collection involved nearly four months. The top 
management in both the organisations proved difficult to access, and as such 
this executive sample may be typified as 'lower and middle managerial'. The 
two organisations had a negligible number of female executives and the study 
resulted in an all male sample.

3.6 ANALYTICAL PROCEDURE

The data collected were computer analysed using 'Statistical Package for 
the Social Sciences' (Nie et al., 1975).

The first hypothesis relates to structural properties and was tested on 
aggregated data of the two samples.

To test the empowerment structure hypothesis (H1) principal component 
factoring with varimax rotation was initially performed prior and following the 
Scree Test (Cattell, 1966) for determining the number of factors. Varimax 
rotation for orthogonality was effected.

The structural nature of Empowerment from Supervisor was also 
examined using factor analysis with varimax rotation.
Internal consistency of all the variables was examined by computing Cronbach's alpha coefficient of reliability for each production set up sample (Bohrnstedt, 1969).

Hypothesis 2 stating relationship between work stress and individually and organisationally valued states, was tested using Pearson's product moment correlation coefficient for each pair of independent and dependent variables for both the organisations separately.

Hypothesis 3, positing difference between the two organisations for work stress, was tested using t-test.

Hypothesis 4, Hypothesis 5, Hypothesis 6 and Hypothesis 7 were tested using linear Moderator Multiple Regression (MMR) analysis (Zedeck, 1971). The MMR technique was preferred to the sub group correlation method as it enabled retention and use of information that would otherwise be lost in sub group analysis and the fact that its use resulted in more detailed information about both main and interaction effects (Cohen & Cohen, 1975).

Using the MMR technique, for each work stress - individually and organisationally valued states relationship pair, the increment in the percentage of variance explained due to the addition of (a) the purported moderator as a second independent variable and subsequently (b) the interaction term, a cross-product of work stress and the purported moderator, were tested with the F ratio described by Cohen (1968).
The direction of significant interaction was determined by the sign of the regression weight 'b' for the interaction term. The significant interactions were also analysed graphically using the beta weights in the moderated regression models. Hunt et al (1975) hold that the 'absolute values in the interaction diagram are not as important as the general directions indicated'. As suggested by Hunt et al (1975), lines within one standard deviation from the independent and moderator variables were plotted.

Hypothesis 8 and Hypothesis 9 related to the replication of moderator research results across organisational samples. Supporting hypotheses seek quantitative assessment of test results of Hypotheses 4, 5, 6 & 7 for the purpose of generalization.
Chapter IV

Structural and Functional Analysis