CHAPTER - III

RESEARCH METHODOLOGY

STATEMENT OF THE PROBLEM
SIGNIFICANCE OF THE STUDY
CONCEPTUAL FRAMEWORK
OBJECTIVES
HYPOTHESES
DEFINITION OF CONCEPTS
PILOT STUDY
RESEARCH DESIGN
SCOPE OF THE STUDY AND LIMITATIONS
TOOLS OF DATA COLLECTION
RELIABILITY AND VALIDITY ESTIMATES OF TOOLS USED
PRE-TEST
SAMPLE SELECTION PROCEDURE
METHOD OF DATA COLLECTION
DATA ANALYSIS PROCEDURE
STATEMENT OF THE PROBLEM:

Alcoholism has often been described as a family illness. This implies that other family members particularly the spouse is caught up in the pathological processes of the alcoholic's illness in such a way as to develop parallel emotional and/or behavioural problems (Mueller, 1972). The alcoholic's spouse is considered to be a co-dependent i.e, being a partner in dependency, whose life is affected as a result of her involvement with an alcoholic.

The review of literature has indicated that disturbed personality traits are more often seen in the wives of alcoholics than of non-alcoholics. Higher scores in wives of alcoholics on dimensions such as depression, anxiety, social withdrawal, tendency for worry, hysteria, hypochondria and neuroticism have been reported (Kogan et.al., 1962; Corder et.al., 1963; Rae and Forbes 1966; Rao et.al., 1986; Kutty and Sharma, 1988). Thus it appears that an adverse consequence of co-existence with an alcoholic could be the manifestation of certain personality deficits in the spouse. It was seen from the review that aspects such as the self-esteem of the wife and the manifestation of pessimism have not been adequately investigated. It is felt that the nature of distress in which wives of alcoholics find themselves in, would have implications with regard to the manifestation of these two dimensions and so merits further investigation.

The role of personality in interpersonal adjustment cannot be underestimated and they are both complementary to one another. The personality traits of the wife of the alcoholic assume significance on par with that of her husband in determining the nature of their marital relationship. A disturbed marital relationship could be the cause, the effect or the aggravating factor leading to alcohol dependence. It thus becomes important to understand the nature of marital interaction and adjustment which wives of alcoholics have with their husbands. Further it would be a meaningful exercise to study both personality and marital factors in an integrated manner in order to study the relationship between the two.

The alcoholism literature is replete with bleak scenarios of high intensity conflict, inebriated tantrums, verbal aggression, domestic violence and wife battering. The alcoholism complicated marriage is most often portrayed as a highly dysfunctional system; as one which is turbulent and devoid of peace and
harmony. The picture of the wife which emerges is that of a victim of circumstantial distress, of one under tremendous emotional stress who finds herself unable to comprehend and come to terms with the devastating consequences of her husband's alcoholism. Several studies have highlighted the prevalence of violence and conflict in alcoholic families (e.g., Coleman and Straus, 1979; Reider et al., 1988; Horowitz and White, 1991). Hence it is important to enquire into the strategies used by wives of alcoholics to deal with conflict and to understand if these measures are the same or differ from those used by wives in the normal population. Communication anomalies have also been reported by researchers who have studied interpersonal transactions in alcoholic marriages (Hanson et al., 1967; Gorad, 1971). The review has indicated that the domain of communication apprehension has been largely ignored in the research on alcoholic marriages.

Further, the issue of marital conventionalisation has figured widely in the marital research literature in the west and needs investigation in the Indian context. It would be of interest to determine particularly if wives of alcoholics manifest this tendency to distort information pertaining to their marital life.

To sum up then, this investigation is based on the premise that personality and marital system deficits are more likely to be seen in wives of alcoholics. The central thrust of this study is to ascertain whether the manifestation of certain personality and marital dimensions is different in wives of alcoholics and those of non-alcoholics. Three personality dimensions namely, Neuroticism, Self-esteem and Pessimism and four marital dimensions namely, Dyadic Adjustment, Spouse Communication Apprehension, Conflict tactics and Marital Conventionalisation have been selected for this investigation.

CONCEPTUAL FRAMEWORK

The conceptual framework of this study is guided by the systems theory perspective on alcoholic families, its crisis theory orientation and the psychosocial perspective on wives of alcoholics. To elaborate, the alcoholic family unit is being viewed as a system of interactions between the marital partners. The influence of the husband's alcoholism generates a crisis for the family and disturbs its equilibrium. The husband's alcoholism may result in a change of
CONCEPTUAL FRAMEWORK

1. ALCOHOLISM

   WIFE'S PERSONALITY

   MARITAL DIMENSIONS

2. PRECIPITATING FACTORS
   SOCIAL
   ECONOMIC
   CULTURAL
   PERSONALITY
   WORK RELATED
   PSYCHOLOGICAL

   PERSONALITY DIMENSIONS
   NEUROTICISM
   SELF-ESTEEM
   PESSIMISM

   ALCOHOLISM

   MARITAL DIMENSIONS
   DYADIC ADJUSTMENT
   COMMUNICATION APPR.
   CONVENTONALISATION

   AREA OF PRESENT INVESTIGATION
spousal interaction patterns, and alter the complexion of the domestic environment by taxing the resources of the family and resulting in dysfunction in several areas. The immense psychological stress experienced by the wife in dealing with the pressures of his drinking behaviour is likely to influence her personality and marital life experience.

It is being hypothesised, that the pressures of a long standing relationship of co-existence with an alcoholic husband would generate adverse consequences for the wife and impact her personality and marital life.

Theoretically, the relationship between the three major components of this study viz. alcoholism, wife’s personality and marital life dimensions is perhaps triadic, with each having the potential of influencing the other (see Diagram 1).

Diagram 2, presents a more elaborate schematic representation of the conceptual framework of this study and the area of the present investigation. The left side of the dotted line in the diagram, contains a list of factors which by themselves or in combination may have resulted in the husband's alcoholism. These factors which were causally responsible or precipitated the husband’s alcoholism have not been included in this investigation.

This study is based on the simple premise that the husband’s alcoholism influences the personality and marital dimensions of his spouse. However the role of the wife's personality or the marital aspects in turn influencing the husband's alcoholism, are beyond the scope of this investigation, as indicated by the uni-directional arrows in diagram 2.

**SIGNIFICANCE OF THE STUDY:**

As observed earlier during the review of literature, the existing documentation based on empirical studies pertaining to wives of alcoholics in the Indian socio-cultural context is scant. Further, virtually none exist with regard to dimensions such as Pessimism, Communication Apprehension and Marital Conventionalisation. This study then, is a modest effort to add to the understanding of the personality and marital life of wives of alcoholics.

Social Work Practitioners, Counsellors and other professionals of
de-addiction centres may perhaps get a few indications from this study regarding aspects of the personality and marital lives of the wives of alcoholics which need to be focussed upon as part of a holistic intervention package.

An insight into neurotic tendencies, level of self-esteem and pessimism about the future, would enable professionals of alcoholism treatment programmes to take these dimensions into account while planning Individual Counselling and Psychotherapy sessions for the wives of their alcohol dependent patients. Similarly, an understanding of the marital adjustment, feelings of communication apprehension and of their usual response mode to marital conflict, it is hoped would facilitate the incorporation of these areas in efforts related to marital counselling and family therapy. A study of the tendency of marital conventionalisation would enable counsellors and researchers to be on guard while eliciting information from wives of alcoholics and to devise strategies to offset such tendencies if present.

The social worker today is an integral member of the multidisciplinary team functioning in any de-addiction centre. He not only conducts case work and group work with alcoholics but is involved in family therapy, marital counselling and makes collateral contacts and in general attempts to re-stabilise the disturbed family equilibrium. As such empirical information, regarding deficiencies in the personality and marital system of wives of alcoholics would go a long way in sharpening the focus of social work intervention in this area.

This study may also find use as background material by future researchers interested in studying the marital dynamics and personality traits in wives of alcoholics, by enabling them to identify related areas needing further investigation.

OBJECTIVES:

1. To study and compare wives of alcoholics with those of non-alcoholics with regard to the following personality correlates:
   a) Self-esteem
   b) Neuroticism
   c) Pessimism
2. To study and compare wives of alcoholics with those of non-alcoholics
with regard to the following correlates of marital life:

a) Dyadic Adjustment
b) Spouse Communication Apprehension
c) Use of Conflict Tactics
d) Marital Conventionalisation

3. To find out the association between socio-economic factors and the personality and marital correlates studied in wives of alcoholics.

4. To ascertain the influence of the wives' perception of her husbands' drinking habit on the personality and marital dimensions studied.

5. To examine the inter-relationship if any between the personality and marital correlates in the wives of alcoholics.

HYPOTHESES:

1. Wives of alcoholics have low Self-esteem than wives of non-alcoholics.
2. Wives of alcoholics have higher levels of Neuroticism than wives of non-alcoholics.
3. Wives of alcoholics have higher levels of Pessimism than wives of non-alcoholics.
4. Dyadic Adjustment will be low in wives of alcoholics than in the wives of non-alcoholics.
5. Spouse Communication Apprehension will be high in wives of alcoholics than in the wives of non-alcoholics.
6. Inter-spousal Conflict would be higher in the families of alcoholics than in those of non-alcoholics.
7. The tendency for Marital Conventionalisation is more in wives of alcoholics than the wives of non-alcoholics.

DEFINITION OF CONCEPTS:

★ALCOHOLICS: are those excessive drinkers whose dependence on alcohol has attained such a degree that it shows a noticeable mental disturbance or an interference in which their body and mental health are affected (WHO, 1952).

★ALCOHOLISM: or Alcohol dependence syndrome is defined as a state psychic and usually also physical resulting from taking alcohol, characterised by behavioural and other responses that always include a compulsion to take
alcohol on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence (International Classification of Diseases - 9th revision; WHO).

★NEUROTICISM : meaning neurotic trend (Schier and Cattell, 1961) is primarily physiological over reactivity to stressful environmental stimuli (Eysenck, 1967).

★SELF-ESTEEM : meaning hoplessness is defined in terms of a system of negative expectations a person has about himself and his future life (Stotland, 1969). It has been identified as one of the core characteristics of depression (Beck, 1967).

★DYADIC ADJUSTMENT : refers to the quality of adjustment in marital relationships. It is defined as a process, the outcome of which is determined by the degree of :

1. troublesome dyadic difference
2. interpersonal tensions and personal anxiety
3. dyadic satisfaction
4. dyadic cohesion and
5. consensus on matters of importance to dyadic functioning (Spanier, 1976).

★SPOUSE COMMUNICATION APPEHENSION : is conceptualised as an enduring syndrome in which one's fear of communicating with one's spouse outweighs the projected gain from interaction in a variety of situations (Powers and Hutchinson, 1979).

★CONFLICT TACTICS : refers to overt actions used by persons in response to a conflict of interest in the marital relationship. This includes the use of reasoning, verbal aggression and violence (Straus, 1979).

★MARITAL CONVENTIONALISATION : is defined as the extent to which a person distorts the appraisal of his marriage in the direction of social desirability (Edmonds, 1967).

Operational Definitions :

★ALCOHOLIC : In this study, the term refers to a person diagnosed
according to ICD - 9 by the Psychiatrist of the de-addiction centre of the Khajamalai Ladies Association and who is registered for in-patient de-addiction treatment.

⭐NON - ALCOHOLIC : In this study a non - alcoholic is one who abstains from the use of alcohol, has been identified as one according to a close associate (neighbour, friend or relative) and has a score below eight on the Alcohol use disorders identification test (Babor et.al, 1988).

⭐PERSONALITY CORRELATES: also referred to as personality aspects, factors or dimensions. In this study it refers only to Neuroticism, Self-esteem, Pessimism and their sub-dimensions.

⭐MARITAL CORRELATES : also referred to as marital aspects, factors or dimensions. In this study, it refers only to Dyadic Adjustment, Communication Apprehension, Conflict Tactics, Marital Conventionalisation and their sub-dimensions.

PILOT STUDY

In the preparatory stages of the study, the researcher visited other de-addiction centres in the city to first finalise the setting for the study. The de-addiction hospital of the Khajamalai Ladies Association was chosen since it received a large number of patients on a regular basis. Further, the staff of the centre convinced a keen interest in the study and assured all support to facilitate data collection. Once the centre was finalised, the researcher explained the nature of the study, the kind of information required and discussed the modality of identifying respondents with the counsellors and the psychiatrist of the centre. It was decided that on registration of a new patient and following his screening and diagnosis by the psychiatrist, his spouse would be evaluated for eligibility based on the inclusion criteria framed. The data collection set would then be administered to the spouse as part of the routine intake procedure of the agency. Moreover, since Wednesdays and Saturdays are exclusively earmarked for family therapy and it is mandatory for the spouses of all in-patients to turn up at the centre on these days, it was decided that a lot of respondents could be contacted on these days.
RESEARCH DESIGN:

This study attempts to compare two groups namely, wives of alcoholics and those of non-alcoholics with regard to certain dimensions of their personality and marital life. The wives of alcoholics (sample - I) constitute the study or experimental group and the wives of non-alcoholics (sample - II) are being used as a reference or control group to facilitate comparison. This study is so of a comparative nature.

Elements of descriptive-diagnostic research have also been incorporated in this investigation since the researcher has attempted to portray the marital and personality characteristics of both the groups studied, besides determining the frequencies of significant variables and to find out if the subject dimensions under focus are associated with other independent variables.

However, the design employed here is primarily experimental in nature since a study and a control group matched on key variables but differentiated on one major factor - "the husband's alcoholism", are being compared with the intention of obtaining an indication of whether the relative manifestation of certain personality and marital dimensions in both the groups could be attributed to the presence or absence of an alcoholic spouse.

In a study of this nature, it is not possible to manipulate the most important independent variable namely 'alcoholism' in the study group and then to assess its influence on the personality of the spouse and their marital life. Several phenomena investigated by social science research suffer from such a limitation.

It is therefore presumed that the effect if any, of living with an alcoholic (study group) or a non-alcoholic (control group) would have already manifested itself on the personality and marital life of both the groups and the researcher having matched them on certain important variables, is only attempting to study the similarities and differences between the two groups of wives in terms of the personality and marital dimensions, as manifested at the point of data collection.

Studies of this nature are categorised as Ex-post Facto designs. Kerlinger (1965) defines Ex-post facto research as "systematic empirical enquiry in which the scientist does not have direct control of important independent variables because their manifestations have already occurred or because they are inherently not manipulable."
Shavelson (1988), holds that such designs are termed as Ex-post Facto because when the researcher comes on the scene, nature has already manifested certain consequences either through differences in environments in which subjects find themselves or through differences in inheritance or a combination of both factors.

Chapin (1947) holds that the Ex-post Facto design attempts to trace out the prior cause from the present problem and is an analysis from the present to the past.

Thus, keeping in mind the nature of this study, the type of variables involved and the kind of inferences being drawn the researcher feels justified in basing this study on the Ex-post Facto research design.

**SCOPE OF THE STUDY AND ITS LIMITATIONS:**

This study was conducted in the de-addiction centre of the Khajamalai Ladies Welfare Association, Tiruchirappalli, a non-governmental organisation funded by the Ministry of Social Welfare. The wives of patients registered for treatment in this centre constituted the respondents of the study.

This study compares a group of wives of alcoholics with those of non-alcoholics with regard to the manifestation of three personality correlates namely, Neuroticism, Self-esteem and Pessimism and four marital dimensions namely Dyadic Adjustment, Communication Apprehension, Conflict Tactics and Marital Conventionalisation. The influence of socio-economic factors and the wives' perception of their husbands drinking on these personality and marital correlates have also been studied.

The picture which may emerge from this effort is neither a comprehensive nor a complete profile of the wife of an alcoholic vis-a-vis her personality or marital system. Moreover, the selection of these dimensions for investigation is not intended to emphasise their greater importance in relation to other dimensions of personality and marital life. Further, it is not the endeavour of this researcher to establish whether the manifestation of these dimensions ante-date the husband's alcoholism and were pre-disposing factors.

As discussed earlier in the conceptual framework of this study, though there is a possibility that the wife's personality and the marital situation may
influence the husband's alcoholism, investigation of this aspect has not been incorporated within the scope of this study.

Information related to the husband's drinking and the marital life of the couples has been exclusively obtained from a monadic perspective—that of the wife. The absence of corroborative information gathered from the husband, therefore only reflects the wife's perception on these issues.

Several factors influence the development of one's personality and determine adjustment in interpersonal relationships such as, early childhood experiences, family environment and the socio-cultural milieu to name a few. The study or control of these extraneous but important influences on the personality and marital life of the subjects is beyond the scope of this investigation.

The experimental sample is clinical in nature representing alcoholics and their spouses who having experienced the deleterious consequences of alcohol consumption were motivated to seek treatment. As such it may not be appropriate to generalise the findings to other non-clinical samples particularly to certain sections of the community and occupational groups where indulgence in alcohol is accepted as a routine part of daily life.

Further, the de-addiction centre where the study was conducted is run by a NGO with Government funding and so offers highly subsidised services. Thus it is inevitable that it would draw its clientele mostly from the lower economic strata. It would hence be appropriate to view the findings of this study in this socio-economic perspective.

Similarly, the majority of the respondents interviewed were housewives and it would be more apt to take the findings of this study to be representative of this category of women.

Other than these few limitations which emerge from the nature of the study sample, the large size of the experimental and control groups and the exhaustive matching procedure followed provide ample scope for drawing reliable inferences and for their generalisation.

TOOLS OF DATA COLLECTION:

The following tools were used to collect data pertaining to the objectives of the study.
1. Interview Schedules for socio-demographic information.
2. Self-Esteem Index
3. Neuroticism Scale Questionaire
4. The Hopelessness Scale
5. Dyadic Adjustment Scale
6. Personal Report of Spouse Communication Apprehension
7. Conflict Tactics Scale
8. Marital Conventionalisation Scale.

I. INTERVIEW SCHEDULES:

A common Interview schedule was used for both the groups to collect socio-demographic particulars such as age, occupation, income etc. It also collected data pertaining to marriage such as age at marriage, duration, type of marriage etc.

Another schedule was framed for the study group (wives of alcoholics) to collect information pertaining to the husband's drinking habit, problems because of drinking, attitude of neighbours and relatives etc.

II. SELF-ESTEEM INDEX

The Mac Kinnon's self-esteem index was developed in 1981 to assess an individual's perception of himself - his potential, worth and competence. According to the author a low self-esteem score indicates a feeling of unhappiness about oneself and feelings of not being competent. It reflects a feeling of failure, meaninglessness and a sense of alienation.

The scale has been used earlier by Sharada Rao et al. 1989, and has 25 items. It is a five point scale with responses ranging from "strongly agree" through "undecided" to "strongly disagree".

SCORING PROCEDURE

The scale has 17 items scored in the positive direction and these items are given a score of 5 for 'strongly agree' and 1 for 'strongly disagree'. For the remaining negative items the scores are reversed. The higher the total score, greater the self-esteem.
The NSQ was developed in 1961 by Dr. Ivan H. Schier of the Institute of Personality and Ability Testing, Illinois and Dr. Raymond B. Cattell of the University of Illinois.

According to the authors some degrees of neurosis exist throughout the population, affecting real life adjustment and effectiveness. The term "Neuroticism" has been used to mean degree of Neurosis or Neurotic trend. The scale has 40 items and can be self-administered in individual or group form.

COMPONENTS OF NSQ:

The scale measures 4 components of Neuroticism, discussed below.

1. Tender-minded, Overprotected, cultured, Protected Emotional Sensitivity (Component I)
   This dimension measures tender mindedness and tough mindedness and is also referred to as feminity v/s masculinity. People with high score on this dimension are tender minded and tend to be sentimental, kind, artistic, imaginative and intuitive. Low scorers are tough minded and tend to lack artistic interest and are sensitive, practical, no-nonsense type, responsible and logical.

2. Depressive, Serious, Inhibited Tendency (Component F)
   Persons with high scores are depressed, serious, subdued, withdraw from people, incommunicative, seclusive and introspective. Those scoring low on this dimension tend to be cheerful, happy-go-lucky, humourous, witty, enthusiastic and like excitement and social contact, and are talkative, energetic and impulsive.

3. Submissiveness, Dependence (Component E)
   High scorers are submissive, obedient, complaisant, dependent, lack will power and are non-assertive. Low scorers are dominant, assertive, aggressive, competitive, determined, independent minded, stubborn and self assured.

4. Anxiety
   This dimension measures three second order factors namely guilt proneness, frustration tension and emotional immaturity. High scorers have feelings of dread, guilt, inferiority and frustration. They are easily upset, tense, excitable, restless, irritable, emotionally immature and unstable with low
frustration tolerance. Low scorers show absence of anxiety, they are emotionally mature, secure, calm and composed, self confident, realistic, stable and resilient.

**RELIABILITY**

For each component scale the authors have reported split half reliability. For the total test the homogenity co-efficient is of the parallel split (herring bone) type.

The split half consistency co-efficients provided for the component scales by the authors are, Tendermindedness (+.55), Depression (+.57), Submissiveness (+.47), Anxiety (+.70), Total Neuroticism score (+.67).

**VALIDITY**

Two types of validity have been reported (a) Concept and (b) Concrete Validity.

(a) **Concept or construct validity** is the correlation of the items in a given scale with the factor they are designed to measure. Validity = Root of reliability, under the assumption that the items have no specifics in common / but only a common factor. The concept validity for the four NSQ components reported by the authors are:
- Tender - Mindedness = +.74, Depression = +.76, Submissiveness = +.69, Anxiety = +.84.

(b) **Concrete Validity** was estimated by the authors by administering the NSQ to 102 clinically diagnosed Neurotics (53 males, 49 females) and was found that the subscale scores and total NSQ score for this group was considerably high and statistically significant (beyond .0005 level) than the scores of 1,068 normal individuals.

**SCORING PROCEDURE**

Each item has three responses with scores assigned as 0,1 and 2. The score range for the total NSQ score is from 0-80 and for each component scale is 0-20. A raw score range of 42-48 is considered normal for women. The total NSQ score is the sum of all the component scores. The following is the raw score range for the component scales:
- Tender mindedness (11-13), Depression (9-11), Submissiveness (12 - 14) and Anxiety (9-11).
This instrument has earlier been used by Anand (1995) and is reported to be culture free.

IV. THE HOPELESSNESS SCALE (HS)

The scale was constructed by Aaron Beck and Arlene Wiseman of the University of Pennsylvania in 1974 to measure Hopelessness or Pessimism. The scale has 20 true-false items and measures the following three factors:

1. **Factor I** labelled *feelings about the future* and measured by items 1, 6, 13, 15, & 19 revolved around effectively toned associations such as hope and enthusiasm, happy, faith and good times.

2. **Factor II** labelled *loss of motivation* is defined by items 2, 3, 9, 1, 12, 16, 17 and 20. The items with the heaviest loadings, are concerned with giving up, deciding not to want anything and not trying to get something that is wanted.

3. **Factor III** labelled *future expectations* is defined by items 4, 7, 8, 14 and 18 and includes anticipations regarding what life will be like; a dark future, getting good things, things not working out and the future being vague and uncertain.

**CONSTRUCTION:**

Nine items were selected from a test of attitudes about the future structured in a semantic differential format (Heimberg, 1961). These items were revised to make them appropriate for this scale. The remaining 11 items were drawn by the authors from a pool of pessimistic statements made by psychiatric patients who were adjudged by clinicians to appear hopeless. The scale was administered to a random sample of depressed and non-depressed patients. It was then appraised by clinicians regarding the face validity and comprehensibility of the items.

**SCORING:** 9 Scale items were keyed false and 11 as true. Each response was assigned a 0 or 1 score and the total hopelessness score is the sum of the scores of individual items. The possible range of scores is from 0 - 20.

**RELIABILITY:** A population of 294 hospitalised patients who had made recent suicide attempts were administered the scale. Data was analysed by means of coefficient alpha (KR - 20) which yielded a reliability coefficient of 93.

**SCALE INTERCORRELATION:** All the 190 coefficients in the inter item
correlation matrix were significant ($N = 294$) and highly significant correlations were obtained between each item and the total score. The item-total correlation coefficient ranged from .39 to .76.

**CONCURRENT VALIDITY**: The authors determined concurrent validity by comparing HS scores with clinical ratings of hopelessness and with other tests measuring negative attitudes about the future.

The correlations of HS total scores with clinical ratings of hopelessness were compared in two samples; a) 23 outpatients in general medical practice and b) 62 hospitalized patients with recent suicidal attempts. The correlation with the clinical ratings of hopelessness in the general practice sample was .74 ($P < .001$); with the attempted suicide sample, .62 ($P < .001$). The inter rater reliability of the two judges was .86 ($P < .001$).

Further Beck et al., administered the scale to 59 depressed patients and compared the scores with those obtained for the Stuart future test and the Pessimism item of the Beck Depression Inventory (Beck, 1967). The correlations were .60 ($P < .001$) for the former and .63 ($P < .001$) for the latter, thus validating the HS.

★ **CONSTRUCT VALIDITY**: The HS was used in several studies to test various hypotheses relevant to the construct under investigation viz. Pessimism, thus establishing its construct validity.

V. **DYADIC ADJUSTMENT SCALE**:

This scale was developed by Graham Spanier of the Pennsylvania State University in 1976 to assess the quality of adjustment in marital relationships. It assesses the individuals perception of the adjustment of the marital relationship as a functioning group.

A very comprehensive empirical procedure was adopted to develop this instrument and it is a refinement of all previous tools developed for assessment of marital relationships published earlier.

**CONCEPTUAL RATIONALE**:

According to Spanier, marital dyadic adjustment may be viewed in two ways
- as a process or as a qualitative evaluation of a state. The implication of viewing dyadic adjustment as a process is that it should be studied over a period of time using a longitudinal design. The second view of viewing adjustment as a state acknowledges the existence of a continuum but simplifies the process by assessing the quality of marital relationship at the time of data collection in a cross-sectional manner.

The author has accepted the idea that dyadic adjustment is a process rather than an unchanging state, but that the most heuristic definition would allow for a measure which would meaningfully evaluate the relationship at a given point of time.

SCALE DESCRIPTION:

The scale has 32 items and can be administered either as a questionnaire or an interview schedule. Some items have been taken from other previous measures of marital adjustment, some are modifications and some developed specifically.

A few items have two responses but most have six responses ranging from 'Always agree' to 'Always disagree' and 'All the time' to 'Never'. The score for each item response has been provided and the scale has a theoretical range of 0 - 151. High score indicates high adjustment.

The DAS has 4 subscales which measure 4 dimensions of marital adjustment namely,

1. Dyadic Consensus
2. Dyadic Satisfaction
3. Dyadic Cohesion
4. Affectional expression.

SCALE DEVELOPMENT:

All previous instruments developed since 1929 to measure marital adjustment were reviewed by the author (e.g. Terman (1938); Locke, (1947); Locke and Karlsson, (1952); Locke and Williamson, (1958); Locke and Wallace, (1959); Nye and Mac Dougal, (1959); Orden and Bradburn, (1968); Burgess and Cottrell, (1939).

A pool of 300 items used in previous scales was created from which duplicate items were eliminated. Each item was assessed for content validity. Approximately 200 remaining items were administered as a questionnaire to 2
samples - 218 married persons and 400 persons divorced during the previous year (94 usable questionnaires were obtained from this group).

Items with low variance and high skewness were eliminated. Remaining items were analysed using t-test for both the groups. Items not significant at .001 level and those with low 't' values were eliminated. The remaining 40 variables were factor analysed and 8 were eliminated due to low factor loadings (below .30). Factor analysis identified 4 dimensions namely dyadic consensus, dyadic satisfaction, dyadic cohesion and affectional expression.

VALIDITY:

Three Validity measures have been reported by the author:

1. **Content Validity**: The DAS items were evaluated by three judges and incorporated based on two criteria.
   a) considered as relevant measures of dyadic adjustment
   b) consistent with the nominal definition of Spanier for adjustment and its components.

2. **Criterion-related Validity**: It is reported that each item showed a statistically significant difference (P < .001) using a t-test for the married and divorced samples. In addition the mean total scale scores for the married and divorced samples were 114.8 and 70.7 respectively and showed a significant difference at .001 level.

3. **Construct Validity**: The correlation between the DAS and Locke - Wallace Marital adjustment scale was .86 among married and .88 among divorced respondents (< .001). In addition factor analysis established the four interrelated components of the DAS.

RELIABILITY: Reliability estimates are reported by the author using Cronbach's co-efficient Alpha and the total scale reliability is .96. For scale components it was .90 for Dyadic Consensus, .94 for Dyadic Satisfaction, .86 for Dyadic Cohesion and .73 for Affectional Expression.

Spanier recommends that in order to reflect a broader conception of marital functioning besides marital adjustment such as adaptability, communication and interpersonal conflict. Accordingly the last two dimensions have been incorporated in the present study. The scale has been widely used in
marital research of alcoholic families (e.g., Perodeau and Kohn, 1988; Zweben et al., 1988.)

VI. PERSONAL REPORT OF SPOUSE COMMUNICATION APPREHENSION (PRSCA):

This instrument was developed in 1979 by William Powers of the North Texas State University and Kevin Hutchinson of the University of Missouri to measure the extent of communication apprehension felt towards one's spouse.

SCALE DESCRIPTION:

The instrument has 15 items and is a 5 point likert type scale with responses ranging from 'strongly agree' to 'strongly disagree'. 5 scale items are keyed positive and score ranges from 5 for 'strongly agree' to 1 for the other extreme. The remaining items are negative and the scoring procedure is reversed. Higher the score higher would be the Spouse Communication Apprehension.

SCALE DEVELOPMENT:

30 items were generated reflecting potential communication apprehension situations in the marital environment. Items were related only to spouse-spouse interaction with no mention of children or in-laws. Half of the items were positively worded and the remaining half negatively.

The 5 point instrument was administered as a questionnaire to a random sample of 210 married adults composing 105 marital units.

RELIABILITY:

The results were subjected to factor analysis by the authors and 15 items with highest loading were retained for the final instrument. Only items having a primary loading of at least 50 were included. These 15 items obtained comparable internal consistency rates (split half r = .88). Items total correlation exceeded the .001 level of significance.

VALIDITY:

The authors have established predictive validity of the PRSCA. Subjects were divided into 2 groups by treating total scores less than one standard deviation below the mean as low apprehensives and scores more than one standard deviation above the mean as high apprehensives. t - test established significant difference between the two groups at .05 level.
Subjects were asked to respond to a 5 item scale regarding feeling towards communication responsibility, role and influence in the marital environment. It was hypothesised that high apprehensives would score low on this scale. Data analysis confirmed the hypothesis thus establishing predictive validity.

Further, yet another scale to measure marital satisfaction was administered to the subjects and the results compared. It was hypothesised that high apprehensive subjects would indicate significantly lower marital satisfaction and the hypothesis was confirmed thus indicating predictive validity.

VII. CONFLICT TACTICS SCALE (CTS):

The CTS was developed in 1979 by Murray Straus of the University of New Hampshire to measure the use of reasoning, verbal aggression and violence in intra-familial conflicts between the spouses.

THEORITICAL RATIONALE:

Straus explains "Conflict of interest" by saying that no matter how small or intimate a social group is, each person seeks to live his life in accordance with a personal agenda which inevitably differs. The author holds that in understanding intrafamilial conflict it is important to assess the method used to advance one's own interest that is, the means or tactics used to resolve a conflict of interest and so has used the term "Conflict tactics" synonymously with "Conflict". The author has identified 3 common conflict tactics frequently used. The first is 'Reasoning' which refers to an intellectual approach to the dispute involving rational discussion and arguments. Secondly, 'Verbal Aggression' which refers to verbal and non-verbal acts which symbolically hurt the other or the use of threats. Thirdly, 'Violence' or the use of physical force as a means of dealing with the conflict.

SCALE DESCRIPTION:

The CTS besides providing information of conflict tactics used is also an indicator of the extent of prevalence of intra familial conflict. It consists of a list of actions which a family member might take in a conflict with another member. The items start with those low in coerciveness (such as discussing the issue) and gradually become more coercive and aggressive towards the end of the list (such
as slapping, hitting etc.) The response categories ask for the number of times each action occurred during the past year ranging from 'Never' to 'More than once a month'. The first four scale items pertain to the use of 'Reasoning', the next five to verbal aggression and the last five to 'violence'. The scale was administered as part of a national survey to a sample of 2143 couples and subjected to factor analysis and items with high factor loading have been incorporated.

**SCORING PROCEDURE:**

The scores for the responses are as follows:

- **Never** = 0;
- **Once the year** = 1;
- **2 or 3 times that year** = 2;
- **often but less than once a month** = 3;
- **About once a month** = 4;
- **More than once a month** = 5.

The scale has a range of 0 - 70.

The author has suggested that percentage standardisation of raw scores be done by dividing the score by the total score, multiplying by 100 and rounding the value to the nearest integer.

**RELIABILITY:** was established by the author through item analysis by correlating item scores with the total CTS score. Mean item co-relations obtained were Reasoning - .78, Verbal aggression - .79 and Violence - .85.

**VALIDITY:**

**Construct Validity:** The construct validity of the CTS has been reported by the author by providing meaningful results obtained by its use. Examples include the repeated findings (using the CTS with different samples) of a negative correlation between socio-economic status and violence (Straus, 1974., Straus et al., 1979); high violence when the conjugal power structure is either extremely husband or wife dominant (Straus 1973; Straus et al., 1979) and the finding that lower the husband's economic and prestige resources when compared to the wife greater his tendency to exert physical violence to maintain a male dominant power position (Allen and Straus, 1979).

**Concurrent Validity** of the CTS was established in a separate study by Bulcroft's and Straus (1975) by obtaining data separately from 121 parents and their children. Correlations obtained for the verbal aggression and violence scale were high.

The CTS has been used as a tool in several previous investigations of
alcoholic families (e.g., Leonard and Senchak, 1993; Gondolf and Foster, 1991; Leonard et al., 1985).

VIII. MARITAL CONVENTIONALISATION (MC) SCALE:

The MCS was developed by Vernon Edmonds in 1967 to measure the tendency of people to 'Conventionalize' their marriage. He defines marital conventionalization as the extent to which a person distorts the appraisal of his marriage in the direction of social desirability.

The author justifies the development of the MCS based on his contention that most studies using instruments to measure the quality of marital life are contaminated owing to the tendency of the respondents to provide good and socially desirable responses.

SCALE DESCRIPTION:

The scale has 15 items of the True / False type. Each item has been given weights in direct proportion to their contribution to the total variance and the total weight is 91. The MCS was administered to a random sample of 100 married students.

ITEM DISCRIMINATION AND VALIDITY:

All the 15 items correlated positively with the total MC score and thus showed positive validity. The first five scales items are reported to have the maximum discrimination.

Construct validity is established by the fact that the MCS scales correlate .63 with Lock-Wallace Scale of marital adjustment, the most widely used measure of adjustment used then. A few authors who have used the MCS earlier in alcoholism - marital research are Rychtarik et al (1989).

RELIABILITY ESTIMATES OF TOOLS USED FOR THE STUDY GROUP

Prior to administering the questionnaires, the scales proposed to be used were shown to psychiatrists and their opinion was obtained regarding individual items. It was opined that the items did not appear to be culture specific and could be employed for the study. All the original scales were administered in English to a group of 20 married women who were fluent in both Tamil and English and who were willing to cooperate with the researcher. The seven scales were then
given to a Tamil Professor for translation in Tamil. After a gap of few days the
tamil version was re-administered to the same group of women. Scores were
computed and correlated with the ones earlier obtained for the English version
and are presented in Table No. 1a.

The Tamil translation was then given to an English professor who is
fluent in Tamil and re-translated back to English. This version was then
administered to the same group of respondents and correlation obtained with the
scores of the original English version Table No. 1a.

The significant correlations obtained for the Tamil versus English scores
and the English original versus English translated versions indicate that in all
probability the translated tamil version has the same content validity and high
translation validity and so could be further employed for data collection.

**TABLE NO. 1 a.**

**DISTRIBUTION OF SCALES BY TRANSLATION CORRELATION COEFFICIENTS**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>SCALES</th>
<th>ENGLISH Vs TAMIL</th>
<th>ENGLISH (TRANS) Vs ENGLISH (ORIG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Self Esteem Index</td>
<td>0.86</td>
<td>0.82</td>
</tr>
<tr>
<td>2.</td>
<td>Neuroticism Scale Questionaire</td>
<td>0.77</td>
<td>0.79</td>
</tr>
<tr>
<td>3.</td>
<td>Hopelessness Scale</td>
<td>0.82</td>
<td>0.84</td>
</tr>
<tr>
<td>4.</td>
<td>Personal report of Spouse Communication Apprehension</td>
<td>0.88</td>
<td>0.92</td>
</tr>
<tr>
<td>5.</td>
<td>Conflict Tactics Scale</td>
<td>0.80</td>
<td>0.83</td>
</tr>
<tr>
<td>6.</td>
<td>Dyadic Adjustment Scale</td>
<td>0.83</td>
<td>0.87</td>
</tr>
<tr>
<td>7.</td>
<td>Marital Conventionalisation Scale</td>
<td>0.79</td>
<td>0.82</td>
</tr>
</tbody>
</table>
RELIABILITY ANALYSIS:

Though high translation validity was obtained prior to data collection, the researcher ascertained the reliability of the scales for the wives of alcoholics (n = 150) following data collection. The Cronbach Alpha was calculated after estimating the inter-item covariances and inter-item correlations for all the seven scales. The high reliability co-efficients obtained (as indicated in table No. 1b) further justify the choice of tools of data collection for the present study.

TABLE NO. 1 b.
RELIABILITY AND VALIDITY OF TOOLS ESTIMATED FOR WIVES OF ALCOHOLICS (n = 150)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>SCALE</th>
<th>ALPHA RELIABILITY</th>
<th>INTRINSIC VALIDITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Self esteem Index</td>
<td>0.8524</td>
<td>0.9233</td>
</tr>
<tr>
<td>2.</td>
<td>Neuroticism Scale Questionnaire</td>
<td>0.6925</td>
<td>0.8321</td>
</tr>
<tr>
<td>3.</td>
<td>Hopelessness Scale</td>
<td>0.8020</td>
<td>0.8955</td>
</tr>
<tr>
<td>4.</td>
<td>Personal report of Spouse Communication apprehension</td>
<td>0.6812</td>
<td>0.8253</td>
</tr>
<tr>
<td>5.</td>
<td>Conflict Tactics Scale</td>
<td>0.8429</td>
<td>0.9181</td>
</tr>
<tr>
<td>6.</td>
<td>Dyadic Adjustment Scale</td>
<td>0.8999</td>
<td>0.9486</td>
</tr>
<tr>
<td>7.</td>
<td>Marital Conventionalisation Scale</td>
<td>0.7659</td>
<td>0.8752</td>
</tr>
</tbody>
</table>

SAMPLE SELECTION PPROCEDURE:

SAMPLE - I (Experimental / Study Group) - Wives of alcoholics.

The universe for the selection of the study group respondents was defined as constituting of the wives of alcoholics diagnosed by the Psychiatrist of the de-addiction centre of the Khajamalai Ladies Welfare Association who were regis-
tered for treatment from September 1994 to April 1995 and fulfilled the following criteria:

(i) Husband should be registered for in-patient treatment.
(ii) Should be married for at least three years and living together.
(iii) Should not be the wife of a sober alcoholic coming for follow up services.

186 new patients were registered at the centre for de-addiction during the data collection period. 154 spouses of these patients fulfilled the criteria framed and were enlisted for data collection. Of these, four data sets could not be completed. No sampling procedure was used and the final number of respondents included in the study/experimental group stood at 150.

SAMPLE - II (Control Group) - Wives of non-alcoholics.

A vital concern of the researcher with regard to the methodology of this study was to identify control group respondents who could be matched on key background variables with their counterparts in the study group, maintaining as far as possible the "husbands' alcoholism" to be the major differentiating factor between the two groups.

Earlier studies which were methodologically similar to the present one, in that they involved comparison of the spouses of alcoholics and non-alcoholics were reviewed, prior to formulating the selection modality of the control group respondents for this investigation. In particular, the procedure followed by authors such as Ballard (1958), Kogan and Jackson (1962, 1964 a 1964 b) and Rao and Kuruvilla (1991, 1992) helped to identify important variables to be considered for matching and the mode of contacting prospective control group respondents.

The following variables were considered important and chosen for matching both the samples:

**QUANTITATIVE VARIABLES:**

1. Age of the respondent
2. Size of the family
3. Total family Income

**QUALITATIVE VARIABLES:**

4. Occupation of the respondent
5. Type of family

In addition, the following two mandatory inclusion criteria were framed
for selection of the control group respondents:

1. The husband should be a non-alcoholic.
2. The couple should be married for at least three years and living together.

An equal number (150) of control group respondents were identified with the assistance of the experimental group respondents. Each Sample - I respondent was provided with the seven points of reference (matching variables and inclusion criteria) and asked to provide the addresses of two people known to them (friend, neighbour or relative) who had an approximately similar background as themselves. Of the two people thus identified, the family whose profile more closely resembled the referer Sample-I respondent in terms of the matching variables was shortlisted and the wife included for data collection only if the husband registered a score below eight (indicating non-alcoholic status) on the AUDIT - Alcohol Use Disorders Identification Test (Babor et.al, 1988; see appendix)

Thus, a comparable control group was identified using frequency matching (mean score matching or group distribution matching) procedure.

The chi-square values obtained for the two pre-determined qualitative variables chosen for matching namely,

1. Occupation of the respondent
2. Type of family
indicate that there is no significant difference between the two samples at the 0.05 level.

Following data analysis it was observed that besides the three quantitative variables identified earlier for matching, the two groups were also incidentally matched with regard to:

1. Age of wife at marriage
2. Duration of marriage
3. Number of children

Table 1c profiles the mean values of both the samples on all the matched quantitative variables, and the 't' test reveals that the two samples are not significantly different in terms of these variables.
### TABLE NO. 1 c.
MEAN VALUE PROFILE OF THE RESPONDENTS ON MATCHED VARIABLES

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>SAMPLE - I (MEAN)</th>
<th>SAMPLE - II (MEAN)</th>
<th>'t' VALUE * (MEAN)</th>
<th>STATISTICAL SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Age</td>
<td>31.77 yrs</td>
<td>31.32 yrs</td>
<td>0.61</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td>No. of Family members</td>
<td>4.91</td>
<td>4.68</td>
<td>1.18</td>
<td>P &gt; 0.01</td>
</tr>
<tr>
<td>Family Income per month</td>
<td>1393.62 Rs</td>
<td>1433.97 Rs</td>
<td>0.30</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td>Age at marriage</td>
<td>19.77 yrs</td>
<td>21.27 yrs</td>
<td>4.56</td>
<td>P &gt; 0.001</td>
</tr>
<tr>
<td>Duration of Marriage</td>
<td>13.17 yrs</td>
<td>11.32 yrs</td>
<td>2.37</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td>No. of Children</td>
<td>2.19</td>
<td>1.99</td>
<td>1.46</td>
<td>P &gt; 0.05</td>
</tr>
</tbody>
</table>

* df = 298

### DATA COLLECTION PROCEDURE:

**SAMPLE - I:**

Data collection with the study group was carried out at the de-addiction centre. As soon as a patient was diagnosed by the Psychiatrist and registered as an in-patient, a preliminary screening was done to check if his spouse met the inclusion criteria of the study. Following this the questionnaire was incorporated as part of the regular intake procedure of the agency. Data was collected from the wife in the absence of the husband after assuring her that all information disclosed would be treated with confidentiality. Personal interviews were conducted with each respondent and the researcher clarified doubts regarding scale items and explained the modality of answering each scale. The exhaustive interview sessions took about an hour to one and half hour for some respondents. While mostly data was collected in a single session, for some it was collected over two or three sessions depending on their comfort and convenience.
SAMPLE - II

Each sample - I respondent provided two addresses of people known to them who had an approximately similar background as themselves. They were asked to identify people preferably from their own locality and it was emphasised that the husband should not be an alcohol user. Their concurrence was obtained for contacting these families for inclusion in the study and their assistance was sought to enable the initial contact.

Home visits were made to the addresses provided by each study group respondent. The initial contact in most cases was made with the husband. The couple was told that the study was about personality and marital life in general and their cooperation was sought after assuring them of absolute confidentiality. The comparative nature of the study was not disclosed. During the first contact the socio-economic and marital particulars were collected along with information pertaining to the matching variables. The Alcohol Use Disorders Identification Test was also administered to the husband of both the families contacted to rule out alcoholism in the husband. Of both the families, the one which was more closely matched with the referer sample-I respondent on the matching variable was visited subsequently for data collection. Information pertaining to the scales used was collected from the wife in the absence of the husband. The entire data collection procedure for the control group was a cumbersome and time consuming ordeal. The process which began in September 1994 could be completed only by the end of July 1995.

ANALYSIS OF DATA:

Data analysis was carried out by using basic and advanced statistical procedures in keeping with the nature of the data (involving both qualitative and quantitative variables) and the objectives of the study. The following statistical tests were used:

1. Chi-square Test:

If is a basic yet powerful non-parametric test widely used in social science research to study the degree of association between attributes of qualitatively defined variables. It also indicates any significant differences between two or more qualitative groups.
Chi-square is defined as the differences between the observed and expected frequencies. The degree of freedom for chi-square is \((R-1)(c-1)\) where \(r\) represents the number of rows and \(c\) the number of columns in a table.

\[
X^2 \text{ is estimated as } \frac{(O - E)^2}{E}
\]

where \(O\) and \(E\) represent the observed and expected frequencies.

2. 't' - Test:

This test often known as the student's - 't' test is also used to assess any statistical difference between two groups when the attributes of reference has been quantified for instance in terms of scores or weights.

It is based on comparison of mean scores and standard deviations and is calculated as

\[
t = \frac{X_1 - X_2}{\sqrt{SD_1/n_1 + SD_2/n_2}}
\]

\(X_1\) and \(X_2\) are the group means
\(SD_1\) and \(SD_2\) are the standard deviations
\(n_1\) and \(n_2\) represent the number of cases
\(n_1 + n_2 - 2\) is the degrees of freedom

The difference in the mean is usually estimated at 95% level of confidence (ie. 5% of error) and indicates significant difference between the groups. It may also be estimated at higher levels of confidence such as 99% (ie. 1% error) or 99.99% (ie. 0.001% error).

3. Analysis of Variance (Anova):

Whereas the 't' test is reliable for assessing significant differences between two groups, it does not find use when the number of groups to be compared increases. In such cases the analysis of variance or 'F' ratio is estimated.

\[
F = \frac{\text{Variance between the samples}}{\text{Variance within the samples}}
\]

One way analysis of variance is used when there is one nominal and one qualitative variable and we wish to observe significant differences between several groups.
4. Scheffe Procedure:

The 'F' ratio would indicate if there is a significant difference between several groups. In order to find out which two groups have significantly different means the Scheffe test is used.

For this procedure the 'S' value is computed as follows:

\[ S = \sqrt{(r-1)(f-1)N - r \cdot (MSE)} \]

Where:
- \( r \) = the number of experimental treatments
- \( f \) = a tabled value
- \( d \) = probability of making one or more false conclusions about the means
- \( N \) = total number of experimental observations
- MSE = error mean square
- \( n_1, n_2 \) = size of the two samples

Two groups means would be said to be significantly different from one another if the difference of means is greater than the computed and compared between the various groups before concluding which group pairs are significantly different from one another if the difference of means is greater than the computed S value. All possible S values are computed and compared between the various groups before concluding which group pairs are significantly different.

5. Product Moment Coefficient of Correlation:

This index of correlation of two variables was formulated by Karl Pearson and is based on the assumption that there is a linear association between two variables.

It is calculated as:

\[ r = \frac{N \Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N \Sigma X^2 - (\Sigma X)^2][N \Sigma Y^2 - (\Sigma Y)^2]}} \]

where \( X \) and \( Y \) represent the individual values of two variables and \( N \) the number of cases.

It is ideal for large samples and a coefficient of 0.70 to 1.00 (plus or minus) indicates a high degree of association (Positive or Negative) between the series.

6. Multiple Regression Analysis:
When there are several independent variables and one wishes to ascertain the magnitude of their effects on one particular dependent variable then stepwise regression is employed.

The independent variables may be introduced one at a time for acceptance or alternatively by beginning with the whole set of variables and rejecting them one at a time. Acceptance or rejection of a variable depends on the extent to which it affects the multiple correlation coefficient or equivalently the residual variance.

7. Discriminant Analysis:

Multiple discriminant analysis is used to predict membership of two or more variables into separate categories or groups. It enables one to understand that when several variables are taken together which of these discriminate significantly between groups and the extent to which each variable contributes to the difference between groups. Thus it becomes possible to hierarchically state the extent to which each variable discriminates between two groups.

8. Factor Analysis:

This procedure enables one to know that, when several variables are taken together and studied in a population, whether there is a tendency for some of these variables to cluster together on the basis of certain similarities into mutually distinguishable factors.