CHAPTER – IV

METHODS AND PROCEDURE
CHAPTER - IV
METHODS AND PROCEDURE

4 DESIGN OF THE STUDY

4.1 INTRODUCTION

The present study entitled, “The study of Intelligence, locus-of-control and well-being of adolescents in Addis Ababa Ethiopia”. can be described as an exploratory descriptive survey. “Descriptive survey method helps in describing, studying and interpreting what exists to day and is concerned with conditions, relationships that exist, practices that prevail, beliefs, points of view, attitudes that are held, processes that are going on, effects that are being felt and trends that are developing” (Best, 1978). The descriptive survey method has been employed in the present investigation in view of the above characteristics of this method.

4.2 Population and Sample

The population of this study covers all adolescents in urban and suburb area government school going high school adolescents and out of school adolescents from sector area in Addis Ababa, Ethiopia.

The population was very large in number and covers a large geographical area. Thus, it seemed unnecessary to carry on the study, with the whole population. Therefore, a representative sample could fulfil the necessary information. Further more to delimit the geographical area it was decided to select from urban and suburb government school going adolescents and out of school adolescents from sector area by using purposive randomized technique of sampling.

The investigator has tried his best to ensure the sample of the research study becomes a true representative of the population under survey.
The procedure adopted for the selection of the adolescent sample in each school and sector area is as follows:

1. Survey of the adolescent boys and girls who were in the age range of 13 to 18 years.
2. Administering intelligence test, locus of control and well-being measure to those adolescent girls and boys who were in the age range of 13 to 18 years.
3. The total number of the sample was 600 (300 boys and 300 girls).

A total picture of the number of students surveyed and selected from each school and sector area has been presented in the following tables:

Table 4.1
Showing sample of adolescents from urban area

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the high school</th>
<th>No. of boys</th>
<th>No. of girls</th>
<th>Type of the school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Minilik</td>
<td>25</td>
<td>25</td>
<td>Co-education</td>
</tr>
<tr>
<td>2.</td>
<td>Yekatit 12</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Ethiopia Tikedom</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Medhane alem</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Kokeb Tsebah</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Miserake Atekaly</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2
Showing sample of adolescents from suburb area

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the high school</th>
<th>No. of boys</th>
<th>No. of girls</th>
<th>Type of the school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Keffetegan 12</td>
<td>15</td>
<td>15</td>
<td>Co-education</td>
</tr>
<tr>
<td>2.</td>
<td>Nefas Silk</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Akaki</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Ayere Tena</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Wonderad</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.3

Showing sample of adolescents from Sector Area

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Number of the Sector Area</th>
<th>No. of boys</th>
<th>No. of girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Two</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Seventeen</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Twenty three</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Twenty Six</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>5.</td>
<td>Twenty eight</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>75</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

4.3 Tools Used

The reliability and validity of the research data depends largely upon the selection of appropriate tools.

Thus, in the present investigation the data was collected with the help of the following tools.

1. Intelligence
   Standard progressive Matrices (Raven, 1996)

2. Locus of control
   Rotter’s Internal External scale (1966)

3. PGI general well-being scale
   (Verma 1989).

4.4 ADMINISTRATION OF THE TOOLS

All the three namely the standard progressive Matrices, Rotter’s Locus of control scale and well-being scale were administered personally (in a group of 30 and 50 adolescents) by the investigator, to 600 school going adolescents (Urban and suburb) and out of school adolescents (sector area) the tests were administered in the following manner. Firstly the intelligence test was administered, followed by the Internal-External locus of control scale, and finally the well-being scale. The regional education officers and senior high school teachers of Addis Ababa...
education officers and senior high school teachers of Addis Ababa assisted the investigator in the selection of the schools. All possible efforts were made to make the adolescents feel at ease and respond to the various tests with full concentration. All queries were answered so as to satisfy their curiosity to answer the questionnaires carefully. They were informed that the results would be kept strictly confidential and their cooperation was important as the findings of the research would be beneficial to all present and future adolescents.

4.5 DESCRIPTION OF THE TOOLS

4.5.1 Standard Progressive Matrices (Raven 1996)

There are several reasons why the Raven test provides an appropriate test to study analytic intelligence. First, the size and stability of the individual differences that the test elicits, even among college students, suggest that the underlying differences in cognitive processes are susceptible to cognitive analysis. Second, the relatively large number of items on the test (36 problem) permits an adequate data base for the theoretical and experimental analyses of the problems solving behavior. Third the visual format of the problems makes it possible to exploit the fine-grained, process-tracing methodology afforded by eye-fixation.

Studies (Just and Carpenter, 1976). Finally, the correlation between Raven test scores and measures of intellectual achievement suggests that the underlying processes may be general rather than specific to this one test (Court and Raven 1982).

The Raven test, including the simpler standard progressive matrices test and the colored progressive matrices test, is also widely used in both research and clinical settings. The test is used extensively by the military in several western countries. Also, because of its non-verbal format, the test is a common research tool used with children, the elderly and patient populations for whom the processing of language may need to be
minimized. The wide usage means that there is a great deal of information about the performance profiles of various population several different research approaches have converged on the conclusion that the Raven test measures processes that are central to analytic intelligence.

Individual differences in the Raven test correlate highly with those found in other complex, cognitive tests (Jensen, 1987). The centrality of the Raven test among psychometric tests is graphically illustrated in several non-metric scaling studies that examined the interrelations among ability test scores obtained from archival sources and from more recently collected data (Snow, Kyllonen, and Marshalek, 1984). The scaling solutions for the different data bases showed remarkably similar patterns. The Raven test and other complex reasoning tests were at the center of the solution.

Simpler tests were located toward the periphery, and they clustered according to their content, in the following figures.

Figure 1 analysis is based on the results from various cognitive tests given to 241 high school students (Marshalek, Lohman, and Snow, 1983). Snow et.al. (1984) constructed an idealized space to summarize the results of their numerous scaling solutions, in which they placed the Raven test at the center.
Figure 2 shows an idealized solution task complexity is maximal near the center and decreases outword, toward the periphery. The tests in the annulus surrounding the Raven test involve abstract reasoning, induction of relations and deduction. For tests of intermediate or low complexity only, there is clustering as a function of the test content, with separate clusters for verbal, numerical and spatial tests. By contrast, the more complex tests of reasoning at the center of the space were highly inter-correlated in spite of differences in specific content (Carpenter, et.al.1990).

One of the sources of the Raven test’s centrality, according to Marshalek et.al. (1983) is that “more involvement of executive assembly and control processes that structure and analyze the problem, assemble a strategy of attack on it, monitor the performance process, and adapt these strategies as performance proceeds”.

Raven’s standard progressive matrices (SPM) sets A, B, C, D and E was used as a measure of intelligence. The test as a tool in the present study was selected for its being culture-fair, for ease of administration, and for its popularity and wide use in different cultural and environmental settings.

The SPM is a non-verbal (non-linguistic) test to apprehend meaningfulness of figures presented for observation, to see the relationships between them, conceive the nature of the figure completing each system of relation presented and by doing so, develop a systematic method of reasoning (Ravens, 1964).

The test consists of sixty problems divided into five sets called, A, B, C, D and E. The problems in each set provide five opportunities for grasping five methods of meeting the problems and five progressive assessments of a person’s capacity for intellectual activity. The test is intended to cover the whole range of intellectual development from the time a child is able to grasp the idea of finding a missing piece to complete a pattern. The test is sufficiently long to assess a person’s capacity to form comparisons and reason of analogy. The initial series of problems require accuracy of discrimination, and at the later stage, more difficult series involve analogies, permutation and alteration of pattern and other logical relations. This test can be administered individually or in a group situation.

RELIABILITY OF THE TEST

The original studies of SPM Raven (1948) found a retest reliabilities ranging from .83 to .93 with the higher value being associated with younger subjects. It correlates .86 with the Terman Merill scale and has been found to have a ‘g’ contribution of .82.
Scoring of the Test

Scoring was done with the help of the scoring key prepared from the manual in a quick and economic manner. The total number of right answers were the total scores of the individual. The maximum score for the test was 60.

4.5.2 Locus of Control Scale (Rotter, 1966)

The locus of control scale was originally conceived as a unidimensional measure of internal versus external control of reinforcement (Rotter 1966). In his introduction of the scale, Rotter, reports two factor analysis of the scale which yielded a strong general factor.

One study of 400 college students was conducted by Rotter. This study yield a general factor which accounted for much of the variance and several small factors, Rotter also reported a factor analysis done by Franklin (1963) in which there was a total variance. Both studies were cited as evidence for the unidimensionality of the scale. A re-analysis of Franklin’s data by Prociuk (1977) indicated that Franklins general factor accounted for only 6.4% of the total variance and few of the 23 times of the scale had loadings on .35 of greater on the factor, Prociuk concluded that Franklin’s factor accounted for 53% of the common variance.

A number of factor analysis of the items on Rotter I.E. scale have been conducted since 1966 and all have supported the notion of the multidimensionality of the scale based on finding two or more factors. Watson (1981) summarized 16 factors analytic studies of the I.E. scale in which 18.8% to 44.5% of the variance was accounted for by two to five factors.
In addition to reviewing other studies, Watson (1981) analyzed the I.E. scale, using three methods of factor extraction. She concluded that the two-factor solution was adequate and probably the best representation of the scale.

Mcinish and Srivastava (1982) made the most serious attempt to determine the actual number of factors in the I.E. scale. They were concerned with total variance, using principal components analysis followed by Varimax rotations. They found that both the screen test and the minimum eigen value 1.00 indicated a nine-factor solution.

In a more recent article, Barley and Wiesle (1987) studied the number of makeup of the factors of Rotter’s I.E. scale with a sample of college students and reported that there were 10 components with eigen value greater than 1.00 and the screen test also indicated that there were 10 factors. This finding supports the statement of Rotter (1975) that factor analysis of the I.E. scale with different subjects and situations “do not reveal the true structure of the construct, they only reveal the kinds of similarities perceived by a particular group of subjects”. Like most other factor analysis of the I.E. scale, these results support the notion that the scale is multidimensional.

The locus of control has been operationalized many times in terms of causal attributions, psychological and personality dimensions. Ganellen and Blaney (1985) stressed the need for assessment of the different dimensions of locus of control rather than treating it as a unidimensional construct.

Various authors developed scales to measure locus of control. For example, Crandall’s intellectual Achievement responsibility questionnaire (1965), Stephens Delys reinforcement contingency interview (1973),

The Rotter I.E. scale (1966) has been the most widely used measure of internality versus externality.

Rotter (1975) says that to view the question as unidimensional versus multidimensional is inappropriate. He claims that a broad concept of internal versus external locus of control is appropriate for most samples and that there are likely to be different subscales within the concept that will vary from sample to sample.

The Rotter I.E. locus of control scale which has a unidimensional and multidimensional components was adopted for the present investigation. This scale measures Internal-external dimension of personality, that is internal and external control of the person.

It is a 29 item scale with 6 filler items. Items are scored towards externality so that a higher score on the scale indicates a more external direction and a lower score on the scale indicates a more internal direction.

Each item has two statements one representing the internal direction and the other representing the external direction. The subject is required to check one of the two statements according to his own belief. One mark is given for each of the Keyed choice. There is no time limit.

**Scoring of the scale**

Scores range from 0-1 for each item. The filler items 1, 8, 14, 19, 24 and 27 are not scored. The possible range of scores in the scale is 0-23.
Responses on items at serial numbers:

2(a), 3(b), 4(b), 5(b), 6(b), 7(a), 9(a), 10(b), 11(b), 12(b), 13(b), 15(b), 16(b), 17(a), 18(a), 20(a), 21(a), 22(b), 23(a), 25(a), 26(b), 28(b), 29(a) are directed towards externality and carry a score of one point each.

2(b), 3(a), 4(a), 5(a), 6(a), 7(b), 9(b), 10(a), 11(a), 12(a), 13(a), 15(a), 16(a), 17(b), 18(b), 20(b), 21(b), 22(a), 23(b), 25(b), 26(a), 28(a), 29(b) are directed towards internality and carry a score of zero each. Total score obtained by an individual on 23 significant items in this scale represents his locus of control orientation.

Reliability

The reliability and validity of the internal-external scale is well established. The reliabilities as estimated by three methods, Kunder - Richardson, split-half and the test retest method were respectively found to be .69 to .73, .65 to .79 and .55 to .83 in different samples (Hasan, 1974).

Concerning the overall validity of the internal-external scale, Rotter (1966) states, a series of studies provide strong support for the hypothesis that the individual who has strong belief that he can control his own destiny is likely to:

a) be more alert to those aspects of the environment which provide useful information for his future behavior

b) place greater value on skill or achievement, reinforcement and to be generally more concerned with his ability, particularly his failures

c) be resistive to subtle attempt to influence him.
The internal consistencies and test-retest reliabilities of the Rotter internal-external scale have been found to be ‘good’ by Rotter (1966) also correlations with social desirability are moderate and construct validation extensive both in laboratory and field situation (Rotter, 1975, Lefcourt, 1976; Strickland, 1977).

4.5.3 Well-being Scale (Verma, 1989)

It may be defined as the subjective feeling of contentment, happiness and of one’s role in the world of work, sense of achievement, utility, belongingness, and no distress, dissatisfaction or worry etc. These things are difficult to evaluate objectively. However, the emphasis on the term “Subjective Well-Being”, it may well be maintained in adverse circumstances and conversely may be last in favorable situation. Thus, defined and conceptualized the general well-being may show some degree of positive correlation with quality of life, job satisfaction, general satisfaction level, sense of achievement etc. and negatively related with neuroticism, psychoticism, and other such variables.

However, the degree of overlap with such variables should not be high if this concept as a separate independent entity is to be considered as a valid one. Also, it should show relative stability over time (reasonable time gap without any significant life events intervening). Its utility will depend upon these relationships a net work of relationship with other variables.

This scale was considered likely to be useful in a variety of research and applied setting such as a quality of life index a mental health status appraisal, a measure of psychotherapy out-come evaluation and a social indicator of measuring population changes in sense of well-being over time (Fazio 1977).
Scoring of the Scale

Number of ticks are counted and constitute the well-being score of that particular individual. A high score indicates a high level of well-being and a low score indicates a low level of well-being. It took very little time to administer. The maximum total score was 20.

Reliability of the Scale

It was found to be .98 (P< .01) Verma, Dube, and Gupta 1983) while test-retest reliability was .91 (P< .01) (Moudgil et.al. 1986). It correlates (i) positive score +.53 (ii) negative score -.15 (iii) modified score +.56 with Bradburn well-being scale (Verma, 1989).

4.6. STATISTICAL TECHNIQUES EMPLOYED

The obtained raw scores with the above mentioned tools were treated statistically to analyze the results and interpret them meaningfully and scientifically. The following statistical techniques were employed for the analysis of the data.

4.6.1 Descriptive statistics

4.6.1.1 Mean and standard deviations
4.6.1.2 Skewness and Kurtosis
4.6.1.3 Graphic presentation.

The values of means, standard deviations, were computed to study the descriptive nature of all variables in the investigation – Skewness and Kurtosis were calculated to find the tendency of deviation from the normal probability curve.
4.6.2 Differential Statistics

The differential analysis was employed to study the significant differences between urban, suburb and sector area adolescents in respect of all the variables and to study the significance of difference between boys and girls and between internally controlled and externally controlled adolescents in respect of all the variables.

4.6.3 Correlational Statistics

To study the inter-relationship in respect of intelligence, locus of control and well-being. Person’s co-efficient of correlation was worked out.