CHAPTER 3

PLAN OF THE PRESENT STUDY
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The methodology to be adopted for the present investigation needs to be decided upon beforehand so that the objectives of the research are fulfilled, the sample is drawn in an organized fashion from the population, the data are collected as accurately and systematically as possible as well as the precision of data analysis is ensured. The salient features of the methodology are mentioned in the sections 3.1 to 3.8.

3.1 Objectives of the study:
To find out –

i) the relationship between human – figure drawings and cognitive style (field – dependence – independence) of ten to fifteen year old girls and boys.

ii) the relationship between human – figure drawings and self esteem of ten to fifteen year olds.

iii) the relationship between cognitive style and self esteem of ten to fifteen year olds.

iv) to predict the human – figure drawing scores of ten to fifteen year old girls and boys on the basis of their cognitive style and self esteem.

v) the impact of age – level and gender, if any, on human – figure drawing, cognitive style and self esteem scores.

vi) the age related differences, if any, on the nature of relationships among human – figure drawings, cognitive style and self esteem of ten to fifteen year old girls and boys.
3.2 Variables Selected:

On the basis of the survey of research literature (as already presented in Chapter 2) and in keeping with the goal of fulfilling the objectives of the investigation as mentioned in the preceding section 3.1, the following variables were selected for study:

i) human-figure drawing (developmental characteristics depicted through human-figure drawing)

ii) cognitive style (field-dependence-independence)

iii) self-esteem

iv) age of the subjects

v) gender of the subjects

Besides, the variables of parental occupations of the subjects, habitat of the subjects, type of schooling, language of instruction at school and private lessons in art taken by the subjects were identified on the basis of previous research findings (as cited later in section 3.7.2) for the purpose of control as these might affect the scores of the variables under investigation.

3.3 Operational Definitions of the Variables:

i) Human-Figure Drawing

It refers to the drawing of pictures of a man, a woman and of the person (who is drawing) himself/herself (Harris, 1963). It is, thus, a performance variable. According to Koppitz (1983) drawing is a natural mode of expression for boys and girls. It is a nonverbal language and a form of communication. She also proposed that like any other language, it can be analysed for structure, quality and content. Kitahara and Matsuishi (2007) opine that children tend to
communicate far more information by their drawings than they can do using language because they do not yet have sufficient capabilities for abstract linguistic expression. So children (as also anyone beyond the childhood years) communicate about their own existence, experience and inner self through drawings.

Human figure drawings are essentially portrait drawings. Drawing a person not only gives expression to a subject of drawing that belongs to the category of people but also expresses the kind of person (who is drawing) himself/herself is. Portrait drawings, therefore, are fusions of images of the others and images of the self. The human figure drawings are based on various perceptive information such as visual information, knowledge acquired by learning, experientially acquired information (Kitahara and Matsuishi, 2007). According to Goodenough (1926) and Harris (1963) superiority in the drawing of human figures is quantitatively manifested through the inclusions of more details like more and correct numbers of body parts, more articles of clothing and accessories, detailing of clothing and accessories, better representation of gender, movements and presence of facial expressions.

But Harris (1963) and more particularly Machover (1949) suggest the qualitative evaluation of human figure drawings. According to Machover (1949) drawing is a symbolic expression of the unconscious part of the psyche of the person who is drawing. She opines that the person who is drawing tends to project his/her own self onto the subject(s) of the drawing.

In the present context, however, the conceptualizations of Goodenough (1926) and Harris (1963) regarding the quantitative aspect of human figure drawing will be adhered to.
ii) Cognitive Style (Field – Dependence – Independence)

Goldstein and Blackman (1978) define cognitive style as the hypothetical construct which refers to characteristic ways in which individuals conceptually organize the environment. They add that cognitive style is an information transformation process whereby objective stimuli are interpreted into meaningful schema. Morgan et al. (1987) have explained the concept of cognitive style more simply by stating that people differ in the ways they typically and characteristically process information. The general processing strategies that characterize different people are termed as cognitive style. Ridding and Cheema (1991) suggest that cognitive style is a bridge between cognition/intelligence measures and personality measures. They also point out that cognitive style is unique in its polar nature, having an "either or" quality, where the absence of one characteristic implies the presence of its extreme form. This distinguishes cognitive style from the majority of personality measures which are more multifaceted (Ridding and Cheema, 1991).

There are several measures of cognitive style – the most researched on being Field – Dependence – Independence (Witkin and Goodenough, 1981). This bipolar dimension of cognitive style was initially proposed by Herman Witkin in the 1950’s. Morgan et al. (1987) have clarified Witkin’s conceptualization in this regard and have stated that among the many dimensions that people differ in their cognitive style are their field – dependence and field-independence. A field-dependent person tends to unify and organize sensory inputs so that it is difficult to break down what is perceived into its parts. Such people face difficulty in disembedding tasks. Field–independent people who emphasize the parts is perception, do well on embedded figures tests (Morgan et al., 1987). Witkin et al. (1977) have proposed the field – dependence – independence dimension not so much as an absolutely "either or" measure as understood by Ridding and Cheema (1991) but more so as a continuum with most people falling somewhere in between being completely field-dependent and field-independent. So
persons can at best be categorized as relatively field-dependent or relatively field-independent (Witkin et al., 1977).

For the present investigation, the definitions of cognitive style by Goldstein and Blackman (1978) and Morgan et al. (1987) will be followed. Besides, the definition of field – dependence – independence stated by Morgan et al. (1987) which is based on Witkin’s conceptualization will be accepted.

iii) Self Esteem

According to Coopersmith (1981; 1990) self esteem is a set of attitudes and beliefs that a person brings with him or herself when facing the world. It includes beliefs as to whether he or she can expect success or failure, how much effort should be put forth, whether failure will “hurt” or whether he / she will become more capable as a result of different experiences. In psychological terms self esteem provides a mental set that prepares the person to respond according to expectations of success, acceptance and personal strength. He also mentioned that the term self esteem refers to the evaluation a person makes and customarily maintains, of him – or herself; that is, overall self esteem is expression of approval or dis approval, indicating the extent to which a person believes him –or herself competent, successful, significant and worthy. Self esteem is , therefore, a personal judgement of worthiness expressed in the attitudes a person holds towards the self (Coopersmith, 1981; 1990). Similarly, Smith et al. (2003) regard self esteem as the appreciation of a person’s own worth and the person’s feeling of being accepted by others around him or her. Persons having higher self esteem tend to be well – adjusted and comfortable with other people. They are able to react spontaneously in social situations. But they do not feel obligated to completely subjugate their opinions to those of the group (Smith et al., 2003).
For the present study, Coopersmith’s (1981; 1990) views on self esteem will be accepted.

iv) Age

In general, it refers to the chronological age of a person. Age is an important demographic variable. It exerts powerful influence on the development of characteristics of individuals. Generally, age and the stages of development attained by individuals are closely associated (Smith et al., 2003). This closeness of association has given rise to the normative model of the life course (Marini, 1984) exemplified by the concepts of developmental milestones and sensitive periods (Papalia et al., 2005). Sociologists construe aging over the life course as a social process and they also view societies and groups as stratified by age (Riley, 1987). Thus, the variable of age occupies a prominent place in social science research.

In the present context, the ideas of Marini (1984), Riley (1987) and Smith et al. (2003) will be conformed to.

v) Gender

It refers to the differences between men (male, masculine) and women (female, feminine). Gender has come to be associated with sex so much so that the two terms are used interchangeably. But actually, sex is a biological fact – one is usually born with either male or female genitalia. However, gender is conceptually different from sex. It is regarded as a social construction – it gives meaning to the fact of sex. In other words, only after specific meanings came to be attached to the sexes, did the sex differences become relevant. When social scientists examine masculinity and femininity and the systems that are associated with
them, they actually study and use gender as a category of both description and analysis (Geetha, 2006).

The foregoing conceptualization of gender will be followed in the present investigation.

The operational definitions of the control variables are also presented:

a) Occupations of parents

The socioeconomic status of children and adolescents are determined by that of their parents (Kuppuswamy, 1962; 1984). Occupations of the parents have important roles to play in their socioeconomic status. According to Kuppuswamy (1962; 1984), there are three determinants of socioeconomic status viz., education, occupation and income. Obviously, occupation mediates in the relationship between education and income. It thus seems to be the most important determinant of socioeconomic status. Earlier , only the father’s occupation was taken into consideration. But nowadays, women’s employment has become quite common. So the occupations of both parents need to be taken into account. For this piece of research, occupations of both the mother and the father of the subjects will be considered for inferring their socioeconomic status for the purpose of control.

b) Habitat

It is an ecological or environmental area that is inhabited by a particular species. It is the natural environment in which an organism lives or the physical environment that surrounds (influences and is utilized by) a species population (Abercrombie et al., 1966). The places where people live are therefore called the human habitat. This includes the environment where they sleep, eat and work.
People do not generally live wild in nature, they make their own environment adapted to their needs. So they can control the quality of their environment. Most people live together with other people, whether as an isolated family in a rural area, in a village or tribe, or a larger town or city. A human habitat can range in size from a farm with a single family to a city of millions (Dahl, 1998). Human habitats vary not only in size but also in availability of resources; natural, man-made and socio-cultural. The extents of complexities and associated problems are different for different types of human habitats. So human habitats can be categorized as urban, semi-urban, rural etc. This definition of habitat will be accepted for the present study.

c) Type Of School And Language Of Instruction At School

Schools may differ with respect to their underlying philosophies, goals of education, modes of teaching–learning, methods of evaluation, classroom organization, degrees of discipline, funding pattern, physical setting and facilities. Therefore, types of schools include formal vs. non-formal schools; traditional vs. open schools; government–funded vs. private schools; schools with competitive classroom organizations vs. schools with cooperative classrooms; special schools vs. integrated schools etc. (Mussen et al., 1990). In India there are three major types of boards of school education:- i) the Central Board of Secondary Education (C.B.S.E.), ii) the Council for the Indian School Certificate Examination (I.C.S.E.) and iii) the boards of school education of the different states of the country. The C.B.S.E. has its headquarters at Delhi. It has a network of affiliated schools, located all over India, following the same syllabus, textbooks, teaching and examination patterns. The C.B.S.E. conducts both the secondary and the higher secondary examinations for the pupils studying in its affiliated schools. The Council for the Indian School Certificate Examination is headquartered at New Delhi. It also has a network of affiliated schools spread throughout the country following the same syllabus, textbooks, teaching and examination patterns. It's affiliated schools are mainly the Christian Missionary
Schools and several public schools. It conducts the Indian Council of Secondary Education (I.C.S.E.) examination at the secondary stage and the Indian School Certificate (I.S.C.) examination at the higher secondary level.

Besides other characteristics, the language of instruction of these types of school boards may differ. The language of instruction refers to the language in which the textbooks are written, the lessons are taught and the students write their answers. The medium of instruction in the schools affiliated with C.B.S.E. is either English or Hindi (i.e., the national language). The language of instruction at the I.C.S.E. schools is English. The Medium of instruction of the schools affiliated with the boards of the respective states of the country is generally the regional language of that particular state. Very few schools under the state boards have English as the language of instruction. So in India, the medium of instruction is linked with the type of board of school education.

This conceptualization of type of school and language of instruction will be adopted.

d) Private Lessons In Art

It refers to the special training in drawing and painting that the parents of some children and adolescents arrange for their offspring by engaging a tutor or by enrolling their wards in art schools. This training takes place alongside the compulsory training in art that children and adolescents receive as a part of their regular schooling. The variable of private lessons in art will be controlled in this study.
3.4 Design of the Study:

According to Kothari(2001) design of research is defined as the conceptual structure within which research is conducted. It is the blueprint for the collection, measurement and analysis of data.

The first step in the formulation of the design was to categorize the selected variables into independent and dependent variables and also to decide upon the variables to be controlled to minimise extraneous sources of variation. It was decided to consider the variables of age and gender as independent variables and to regard the subjects’ human – figure drawings, cognitive style and self esteem as the dependent variables.

It was planned to control the variable of parental occupations of the subjects to indirectly ensure that only subjects of middle socio – economic status families are included in the sample. The variable of habitat was decided to be controlled by planning to include only residents of urban localities of Kolkata in the sample. To control the variable of type of schooling and language of instruction, it was planned to include only children and adolescents studying in reputed English - medium schools of Kolkata affiliated with Central Board of Secondary Education (C. B. S. E) and Indian Council of Secondary Education (I. C. S. E) in the sample. To keep the variable of training in drawing and painting under control, only those children and adolescents who do not take private lessons in art will be selected. These variables were planned to be controlled to ensure as much homogeneity as possible within the sample with regard to these variables so that error variance is reduced.

Then, in view of the objectives of studying the relationships among the variables of human – figure drawing, cognitive style and self esteem, the correlational design was envisaged for the present study. Since these three variables are continuous and normally distributed, at least theoretically, so the correlational
design was deemed appropriate. Table 3.1 outlines the classification of variables according to the design of the study.

**TABLE 3.1**

CLASSIFICATION OF VARIABLES OF THE INVESTIGATION

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>DEPENDENT VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Age</td>
<td>i) Human – figure drawing</td>
</tr>
<tr>
<td>ii) Gender</td>
<td>ii) Cognitive style</td>
</tr>
<tr>
<td></td>
<td>iii) Self esteem</td>
</tr>
</tbody>
</table>

**CONTROL VARIABLES**

| i) Parental occupation of the subjects |
| ii) Habitat of the subjects           |
| iii) Type of schooling and language of instruction at school |
| iv) Private lessons in art            |

**PREDICTORS DEPENDENT VARIABLE**

| i) Cognitive style | Human - figure drawing |
|                   |                       |
| ii) Self esteem   |                       |
3.5 Hypotheses of the Study:

3.5.1 Null Hypotheses

i) There is no difference in the human – figure drawing scores of ten to fifteen year old girls and boys due to differences in their ages.

ii) There is no difference in the human – figure drawing scores of ten to fifteen year old girls and boys due to their gender.

iii) There is no difference in cognitive style (field – dependence – independence) scores of ten to fifteen year olds due to differences in age.

iv) There is no difference in the cognitive style scores of ten to fifteen year olds due to their gender.

v) There is no difference in self esteem scores of ten to fifteen year olds due to variation in age.

vi) There is no difference in the self esteem scores of ten to fifteen year olds of two separate genders.

vii) There is no relationship between the human – figure drawing and cognitive style scores of ten to fifteen year old girls and boys.

viii) There is no relationship between the human – figure drawing and self esteem scores of ten to fifteen year olds.

ix) There is no relationship between cognitive style and self esteem of ten to fifteen year olds.
x) Human – figure drawing scores of ten to fifteen year old girls and boys cannot be predicted on the basis of their cognitive style and self esteem.

### 3.5.2 Alternative Hypotheses

i) There is significant difference in the human – figure drawing scores of ten to fifteen year old girls and boys due to differences in their ages.

ii) There is significant difference in the human – figure drawing scores of ten to fifteen year old girls and boys due to their gender.

iii) There is significant difference in cognitive style (field – dependence – independence) scores of ten to fifteen year olds due to differences in age.

iv) There is significant difference in the cognitive style scores of ten to fifteen year olds due to their gender.

v) There is significant difference in self esteem scores of ten to fifteen year olds due to variation in age.

vi) There is significant difference in the self esteem scores of ten to fifteen year olds of two separate genders.

vii) Human – figure drawing scores of ten to fifteen year olds are significantly related to their cognitive style.

viii) Human – figure drawing scores of ten to fifteen year olds are significantly related to their self esteem.
ix) Cognitive style of ten to fifteen year olds are significantly related to their self-esteem.

x) Human-figure drawing scores of ten to fifteen year old girls and boys can be significantly predicted on the basis of their cognitive style and self-esteem.

3.6 Selection of Tools:

For the purpose of assessing the variables mentioned in section 3.2, the following tools were selected to serve the purpose of data collection. The general reasons for selecting these tools are stated below:

i) The tools conformed to the operational definition of the selected variables, as already presented in section 3.3

ii) The tools are suitable for administration on the relevant age-group of the subjects i.e., ten to fifteen years.

iii) The tools can be administered on groups of subjects.

iv) The tools have adequate reliability, validity and appropriate norms.

The tools to be used are:

A. Goodenough–Harris Drawing Test devised by Florence L. Goodenough and Dale B. Harris (1963) for assessment of human-figure drawings of subjects. It is presented in Appendix A.
B. Group Embedded Figures Test developed by Philip K. Oltman, Evelyn Raskin and Herman K. Witkin (1971) for the assessment of Cognitive Style (field – dependence – independence). It appears in Appendix B.

C. Coopersmith Inventory, School Form by Stanley Coopersmith (1967;1981), which is presented in Appendix C, for the measurement of self esteem.

The identifying information printed at the top of the tools will be useful in gathering the background information regarding the subjects. Besides, additional information like home address, mother’s occupation, the board of affiliation of the school the subject is studying in, the language of instruction at school and whether the subject takes private lessons in art will be recorded using the interview technique.

Brief accounts of the details of the selected standardized tools follow:

A. Goodenough – Harris Drawing Test

This test was devised by Florence L. Goodenough and Dale B. Harris (1963). It is a standardized psychological test which helps in the assessment of human – figures drawn by children and adolescents. It is suitable for use with individuals aged 3 through 15 years. It is a nonverbal, performance test and can be used either as a group or an individual test. The test requires the subject to draw a picture of a man, draw a picture of a woman and draw a picture of himself / herself. The subject is asked to make the very best pictures he/ she can draw and also to draw pictures of whole figures – not just pictures of heads and shoulders. There is no time limit for the test. Although the subjects generally take 10 – 15 minutes to finish their tasks.
(1963) is an extension and revision of the original Draw-a-Man Test (Goodenough, 1926).

The pictures drawn are scored separately by consulting the manual. In scoring the Test, emphasis is placed on the child's accuracy of observation and on the development of conceptual thinking, rather than on artistic skills. It can provide an estimate of intellectual maturity (Harris, 1963; 1991). In the Point scales, which are quantitative, credits are given for the inclusion of individual body parts, clothing details, proportion, perspective and similar features (Anastasi, 1988). One score is earned for inclusion of each detail as mentioned in the manual. The maximum scores obtainable for the pictures of the man, woman and self are 73, 71 and 73 respectively. The raw scores obtained for the pictures of the man and woman are averaged. So the scores range from 0 – 72. The picture of self can be scored to roughly confirm the finding. The self-figure has not been standardized so it can only be considered as a tentative measure (Harris, 1963; 1991).

An alternative, simplified scoring procedure is provided by the Quality scales for both the man and woman drawings. These scales utilize a global, qualitative assessment of the entire drawing obtained by matching the child's drawing with the one it resembles most closely in a graded series of 12 samples (Anastasi, 1988). Quality scale has not been constructed for the self drawing as it seemed inappropriate to use the samples of man and woman drawings to judge it (Harris, 1963; 1991). The Quality scales will not be used in the present context because the Point scales are more reliable and valid.

**Reliability:**

Most of the reliability data reported for 1963 version apply to the original 1926 test. Within homogeneous age groups, the correlations reported between the 1926 version and the 1963 revision range from .91 to .98. For the 1926 scale,
test – retest reliabilities range from .60 to .70; interscorer reliabilities are on the order of .80 to .96 (Thorndike and Hagen, 1977).

The reliability of the Goodenough – Harris Drawing Test has been repeatedly investigated by a variety of procedures. In one carefully controlled study of the 1926 form administered to 386 third and fourth graders, the retest correlation after a one week interval was .68, and split – half reliability was .89. Rescoring of the identical drawings by a different scorer yielded a scorer reliability of .90, and rescorings by the same scorer correlated .94. Studies with the 1963 form have yielded similar results. Readministration of the test to groups of kindergarten children on consecutive days revealed no significant difference in performance on different days. Examiner effect was found to be negligible, as was the effect of art training in school. The correlation of the Man and Woman scales is about as high as the split – half reliability of the Man scale found in comparable samples. On this basis Harris (1963) recommended that the two scales be regarded as alternate forms and that the mean of their standard scores be used for greater reliability. The Quality scales, representing a quicker but cruder scoring method, yield interscorer reliabilities clustering in the .80s. Correlations about the same magnitude have been found between Quality scale ratings and point scores obtained for the same drawings (Anastasi, 1988).

Validity:

Most of the validity data reported for 1963 version apply to the original 1926 test. The correlations of the 1926 test with the Stanford – Binet range from .36 to .65 (Thorndike and Hagen, 1977). Apart from the item – analysis data gathered in the development of the scales, information regarding the construct validity of the test is provided by correlations with other intelligence tests. These correlations vary widely, but the majority are over .50. In a study with 100 fourth graders, correlations were found between the Draw – a – Man Test and a number of tests
of known factorial composition. Such correlations indicated that, within the ages covered, the Draw-a-Man Test correlates highest with tests of reasoning, spatial aptitude, and perceptual accuracy. Motor coordination plays a negligible role in the test at these ages. For kindergarten children, Draw-a-Man Test correlates higher with numerical aptitude and lower with perceptual speed and accuracy than it did for fourth graders (Harris, 1963). Such findings suggest that the test may measure somewhat different functions at different ages (Anastasi, 1988).

Norms:

The test was standardized on 2975 children representative of the occupational distribution of the United States in 1950. Raw scores are converted to standard scores with a mean of 100 and a standard deviation of 15. A table is provided in the manual for converting standard scores into percentiles (Thorndike and Hagen, 1977).

*The specific reasons for selecting the Goodenough – Harris Drawing Test are:*

i) The children and adolescents would be interested in taking the test as it involves drawing. They would find the task enjoyable.

ii) The test is non-verbal so it can be administered irrespective of the language spoken and the culture. Although it was developed in the U. S. A., it has been widely used in different parts of the world e.g. among the Hopi (Dennis, 1942), among the Mexicans and Americans (Laosa et al., 1974), in Nigeria (Bakare, 1972), in Turkey (Ucman, 1972), in India (Seshadri and Gopaldas, 1989) etc.
iii) The Goodenough – Harris Drawing Test was preferred over the Draw – a – Person Test (Machover, 1949) because firstly, the latter test was of projective type but the present investigation required quantitative rather than projective analysis of drawings and secondly, the latter test lacked adequate psychometric properties (Anastasi, 1988).

iv) An Indian test could have been selected for the present purpose but the investigator was not aware of any Indian test of human-figure drawing which was as well standardized as the Goodenough – Harris Drawing Test.

v) The test is easy to administer and score.

B. Group Embedded Figures Test (GEFT)

GEFT has been developed by Philip K. Oltman, Evelyn Raskin and Herman A. Witkin (1971). It is used to assess the cognitive style (field–dependence–independence) of individuals. It is an adaptation of the original individually administered Embedded Figures Test (EFT) so that group testing can take place. The GEFT is appropriate for use with individuals of ten years of age and over. It contains three sections - the first section includes seven very simple items basically for practice; the second and the third section each have nine relatively difficult items. For each item, the subject’s task is to find and trace a simple figure embedded within a complex one. The time limit for the first section is two minutes. The time limits for the second and third sections are five minutes each. The scoring is done using a scoring key in which for each item the simple form(s) are traced over each complex figure. The subject’s score is the total number of simple forms correctly traced by him/her in the second and third sections combined. The items in the first section are not included in the total score. Omitted items are scored as incorrect. The scores range from 0 to 18. Higher score indicates greater field–independence (Witkin et al., 1971).
Reliability

Since the GEFT is a speed test, an appropriate method of estimating reliability is the correlation between parallel forms with identical time limits. Correlations between the 9-item Second Section scores and the 9-item Third Section scores were computed and corrected by the Spearman–Brown prophecy formula, producing a reliability estimate .82 for both males (N = 80) and females (N = 97). These reliability estimates compare favourably with those of the EFT (Witkin et al., 1971).

Validity

There are several ways of assessing the validity of the GEFT. Since the test is intended as a group form of the EFT, the most direct criterion measure is the "parent" form of the test, namely the EFT. In one study, subjects were administered the Second Section in its group form and the Third Section as an individually–administered test using the items in their original colored form. Another group was given the Second Section individually and the Third Section as the group test. The correlations, corrected for reduced test length and combined for the two groups, as reported by Witkin et al. (1971), are presented in table 3.2.
### TABLE: 3.2
VALIDITY COEFFICIENTS OF GEFT

<table>
<thead>
<tr>
<th>Population</th>
<th>N</th>
<th>Criterion Variable</th>
<th>r with GEFT Score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male undergraduates</td>
<td>73</td>
<td>Individual EFT, solution time</td>
<td>-0.82</td>
</tr>
<tr>
<td>Female undergraduates</td>
<td>68</td>
<td>Individual EFT, solution time</td>
<td>-0.63</td>
</tr>
<tr>
<td>Male undergraduates</td>
<td>55</td>
<td>PRFT, error</td>
<td>-0.39</td>
</tr>
<tr>
<td>Female undergraduates</td>
<td>68</td>
<td>PRFT, error</td>
<td>-0.34</td>
</tr>
<tr>
<td>Male undergraduates</td>
<td>55</td>
<td>ABC, degree of body articulation</td>
<td>0.71</td>
</tr>
<tr>
<td>Female undergraduates</td>
<td>68</td>
<td>ABC, degree of body articulation</td>
<td>0.55</td>
</tr>
</tbody>
</table>

* r's with the EFT or the PRFT should be negative because the tests are scored in reverse fashion.

### NORMS
The norms reported by Witkin et al. (1971) are based on men and women college students from an eastern liberal arts college in the U.S.A., and are given in the Table 3.3. Men performed slightly better than women (p < .005). This finding is consistent with the sex differences usually obtained with the EFT.
TABLE : 3.3

QUARTILE NORMS OF GEFT

<table>
<thead>
<tr>
<th>Quartiles</th>
<th>SCORES ON GEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>1</td>
<td>0 - 9</td>
</tr>
<tr>
<td>2</td>
<td>10 -12</td>
</tr>
<tr>
<td>3</td>
<td>13 - 15</td>
</tr>
<tr>
<td>4</td>
<td>16 - 18</td>
</tr>
<tr>
<td>N</td>
<td>155</td>
</tr>
<tr>
<td>Mean</td>
<td>12</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.1</td>
</tr>
</tbody>
</table>

*The GEFT has the following specific advantages:*

i) The subject's task is very simple.

ii) The methods of administration and scoring are simple.

iii) The test takes very little time to administer.

iv) Though the test has been standardized on American subjects yet it can be administered on individuals belonging to other cultures. This is because it is a non-verbal, performance test. Many Indian researchers for example Dani (1984) have used the GEFT to assess field–dependence–independence.
C. Coopersmith Inventory, School Form

It was devised by Stanley Coopersmith (1967, 1981). It is a standardized test used to measure self esteem. There are three forms of the Coopersmith Inventories – the School Form, the School Short Form and the Adult Form. The term "self esteem" does not appear on the top of any of the forms to disguise the intent and reduce faking of the responses by the subjects.

The School Form can be used with 8 to 15 year old individuals. It consists of 58 self-descriptive statements to be marked either ‘Like Me’ or ‘Unlike Me’. Among these 58 items – 50 are self esteem items and there are 8 items that constitute the Lie scale, which is a measure of a subject’s defensiveness or test wise- ness. Scoring is done by using the scoring key. The items of the Lie scale are scored separately and not included in the self – esteem score. The self – esteem items yield a total score and, if desired, separate scores for four subscales; General Self, Social Self – Peers, Home – Parents and School – Academic. The subscales allow for variations in perceptions of self – esteem in different areas of experience. The items are listed by subscales in Table 3.4. The Total Self score is obtained by summing the scores attained on the four subscales and multiplying it by two. Multiplication by two is done so that the results of the different forms of the Coopersmith Inventory are readily comparable. The Total scores range from 0 to 100. There is no time limit. Higher scores indicate higher self esteem (Coopersmith, 1981; 1990).
### TABLE 3.4

**ITEMS CORRESPONDING TO THE SUBSCALES OF COOPERSMITH INVENTORY, SCHOOL FORM.**

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Items</th>
<th>Total Possible Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Self</td>
<td>1, 3, 4, 7, 10, 12, 13, 15, 18, 19, 24, 25, 27, 30, 31, 34, 35, 38, 39, 43, 47, 48, 51, 55, 56, 57</td>
<td>26</td>
</tr>
<tr>
<td>Social Self - Peers</td>
<td>5, 8, 14, 21, 28, 40, 49, 52</td>
<td>8</td>
</tr>
<tr>
<td>Home Parents</td>
<td>6, 9, 11, 16, 20, 22, 29, 44</td>
<td>8</td>
</tr>
<tr>
<td>School Academic</td>
<td>2, 17, 23, 33, 37, 42, 46, 54</td>
<td>8</td>
</tr>
</tbody>
</table>

### Reliability

Coopersmith Self Esteem Inventory was administered to over 600 students in grades 5, 9, and 12 in a rural school district of U.S.A. From each grade, 100 inventories were selected, and Kuder – Richardson reliability estimates were calculated. Obtained coefficients were 0.81 for grade five, 0.86 for grade nine, and 0.80 for grade twelve. The coefficients indicate adequate internal consistency for students in all three grades. The test was administered to approximately 7600 American public school children in grades 4 through 8. The sample included students of all socio-economic ranges and Black and Spanish – surnamed students. Kuder – Richardson reliability estimates were generated for each grade level. Obtained coefficients range from 0.87 to 0.92. Other studies...
reported a split – half reliability coefficient of 0.87 for 104 students in grades 5 and 6 (Coopersmith, 1981; 1990).

Validity

Construct Validity

Studies on 7600 American school children in grades 4 through 8 to observe the comparative importance of the home, peers and school to the global self – esteem of the children confirmed the construct validity of the subscales proposed by Coopersmith as measuring sources of self – esteem (Coopersmith, 1981; 1990).

Concurrent Validity

The Coopersmith Self – Esteem Inventory and SRA Achievement Series scores of 87 children in grade 4 were correlated. A coefficient of 0.33(p<.01) was obtained. The children’s self – esteem inventory scores were also correlated with their scores on the Lorge – Thorndike Intelligence Test. The obtained coefficient was 0.30. It was suggested that this data may be reasonably interpreted as providing the concurrent validity for the Coopersmith Inventory (Coopersmith, 1981; 1990).

Factor Analysis

The Coopersmith Self – Esteem Inventory responses of 7600 children (grades 4 through 8) were factor analysed. Four pairs of bipolar factors emerged; each pair seemed to be highly congruent with the subscales of the inventory (Coopersmith, 1981; 1990). There were factors related to School – Academic subscale (Success and Failure); factors related to the Social Self – Peers subscale (Success and Failure); factors related to the Home – Parents subscale (Good – Poor); and factors related to the General Self subscale (Perceived Adequacy of Self, Perceived Inadequacy of Self, and Rejection of Self).
**Norms**

Several studies have been carried out for establishment of the norms for the Coopersmith Self – Esteem Inventory, School Form. The Normative data include boys and girls studying in grades 2 through 8 and also grades 9 and 11. These children and adolescents were American belonging to different socio – economic statuses and rural, suburban and urban habitats. The normative data included Blacks, Hispanics, Caucasians and Asians. The norms are expressed in terms of mean, S.D. and percentiles (Coopersmith, 1981; 1990).

The specific reasons for selecting the Coopersmith Inventory, School Form are:

i) It is suitable for use with school students.

ii) It takes into consideration different aspects of self – esteem viz., general self, social self – peers, home – parents and school – academic in arriving at the total self – esteem score.

iii) It has a lie scale to detect defensiveness of respondents.

iv) Although, it is an American test, it was preferred over the Indian tests of self – esteem because of it’s sound psychometric properties. Several Indian investigators for example Dawn (2005) have used this test.

v) The test is in English. The statements of the test are framed in simple language. So the test is suitable for administration on the subjects of the present investigation who study in English – medium schools and are well – versed in English.

vi) The test is easy to administer and score. It does not take much time to complete.
3.7 Plan of Sampling:

3.7.1 Population of the Study

In the present context, the research population will comprise of ten to fifteen year old girls and boys residing and studying in Kolkata. The population will confine itself to the age group: ten to fifteen years because of the following reasons:

a. This age-range embodies the transition from later childhood to adolescence. This is specially significant because it generally marks the qualitative change from Piagetian concrete operational to formal operational stage of cognitive development (Morgan et al., 1987) among individuals. Such transition from concrete to formal operational cognition naturally has powerful impacts on the key variables of the present study – human figure drawing (Cox et al., 2001; Chemey et al., 2006), cognitive style (Pascual-Leone, 1969; Makkan et al., 1999) and self-esteem (Holmbeck et al., 1994). Therefore, this particular age-group (ten to fifteen years) may not only depict important changes in human figure drawing, cognitive style and self-esteem but also in the relationships among these variables.

b. All the three tools to be used in the present investigation (described in section 3.6) are suitable for administration on the ten to fifteen years old age-group.

The population will comprise of both girls and boys to ensure representation of the two genders so that the findings of the investigation can be generalized irrespective of gender.

The population will be restricted to the residents of the city of Kolkata to control, as far as possible, the influence of the differences in geographical area (viz.,
urban, semi – urban, rural, tribal etc.) and the associated cultural influences on the data.

3.7.2 Technique of Sampling

The technique of drawing a sample from such a population will conform to a combination of area sampling, stratified random sampling and multi - stage random sampling. These are types of probability sampling which ensures the selection of samples for which the probability of inclusion in the sample of each element of the population is known. Obviously one kind of probability sample is the random sample which is so drawn that every element in the population has an equal probability of being selected and each possible sample of the same size has equal probability of being selected. Probability sampling under restricted sampling technique result in complex random sampling design (Kothari, 2001).

Area sampling, stratified sampling and multi - stage random sampling are actually different types of complex random sampling. Area sampling refers to drawing of sample from the population where the primary sampling unit represents a cluster of units based on geographical area. Stratified random sampling is a type of complex random sampling design which is adopted if the population is not homogeneous. It is used to obtain a representative sampling which would not be possible in case pure random sampling technique is used. For stratified random sampling, the population is divided into several subpopulations (strata) that are individually more homogeneous than the population and then individuals from each stratum are selected to constitute a sample. Multi - stage random sampling occurs when the population consists of numerous clusters. In this, a sampling of clusters at the first stage and then sampling within each cluster in subsequent stages occurs. If random selection takes place at all the stages, a multi – stage random sampling design results (Kothari, 2001).
In this investigation, at first, an area sample will be drawn from the city of Kolkata. For this, the city will be divided into regions viz., north, south, east, west and central. Each of these regions is clusters of localities. Some of these localities from each region will be randomly selected for inclusion in the area sample. Thus, greater representativeness of the area sample will be ensured.

The population will be restricted to children and adolescents residing and studying within the urban limits of Kolkata to ensure as much homogeneity as possible in respect of cultural influences. This is because previous researches have revealed the impact of culture on the variables of human—figure drawing (Dennis, 1942; 1966; Laosa et al., 1974), cognitive style of field—dependence—dependence (Berry, 1967; 1976; Dawson 1967a; 1967b) and self esteem (Cress and O’Donnell, 1975; Martin, 1976; Howell, 1979).

Then a stratified sample will be drawn from the restricted geographical area.

Since the age—range of the population of the present study is quite wide (ten to fifteen years) so it will be divided into age—based strata. Equal number of subjects will be selected from each age—based stratum to form a representative sample.

From then on, it was planned to conform to the technique of multi—stage random sampling to draw a sample of girls and boys belonging to the middle socio—economic status families (as ascertained from their parental occupations), studying in reputed English—medium schools of Kolkata affiliated with C.B.S.E. and I.C.S.E. and not taking private lessons in art. The method of elimination will be followed at each stage, however, keeping in mind the constraints of ensuring equal representation of all the age—based strata and equal representation of either gender—group within each stratum.
The subjects will be students of reputed schools affiliated with C.B. S. E. and I. C. S. E. and will belong to middle socio-economic status families (as inferred from their parental occupations) to ensure substantial uniformity in their socialization experiences. In fact, the socio-economic status of the families of the subjects strongly influence the types of parenting (Giovannoni and Billingsley, 1971; Hoffman, 1984; Bacon and Ashmore, 1986) and schooling (Pohlman, 1956; Mukherjee, 1999) that they receive. Previous investigations indicate that socio-economic status may exert influences on the variables of human-figure drawing (Bakare, 1972; Ucman, 1972), cognitive style (Zhang and Postiglione, 2001) and self-esteem (Rubin et al., 1976; Rasmussen et al., 1997; Caffery and McCubbins, 1999) hence the need for uniformity in socio-economic status.

The sample will consist of girls and boys studying only in English-medium schools because one of the tools i.e. Coopersmith Self-Esteem Inventory, School Form is in English language and requires reasonably good knowledge of English to comprehend the statements and to respond to them.

The sample will comprise only of girls and boys who do not take private lessons in art. This is because training in art may influence the human-figure drawing scores as revealed by the findings of Dennis (1942; 1966), Money and Nurcombe (1974).

It was aimed to draw a sample of 500 subjects comprising of equal numbers of girls and boys belonging to each age based stratum.
3.8 Plan of Statistical Analysis:

In order to fulfil the objectives of the investigation (stated in section 3.1) and to verify the hypotheses (presented in section 3.5) the following methods of statistical analysis of the data will be adopted:

Computation of

i) Mean, Standard Deviation and Correlation Coefficients

ii) Two-Way Analysis of Variance (ANOVA)

iii) Multiple Regression Analysis

i) Mean, Standard Deviation and Correlation Coefficients

At the outset, the above descriptive statistics will be calculated to bring out the features of the data. Mean and standard deviation values will be computed separately for each of the three age groups and for the two gender groups within each age group. The mean and standard deviation values will indicate the central tendency and variability respectively in each case.

To ascertain the magnitude and nature of relationships among the variables of human figure drawing, cognitive style and self esteem, Pearsonian Product-Moment Correlation Coefficients will be computed for each pair of the above variables separately for the whole sample as well as the separate age groups and the gender groups within each age group. All the correlation coefficients will be tested for significance at 0.05 and 0.01 levels of significance. The Product Moment Correlation is the most widely used method of measuring the degree of relationship between two variables. It was suggested by Karl Pearson. It is based on the following assumptions: a) there is linear relationship between the two variables, b) the two variables are causally related which means that one of the variables is independent and the other one is dependent, c) a large number of
independent causes are operating in both variables so as to produce a normal distribution. Product Moment Correlation Coefficient (r) lies between ±1. Positive values of r indicate positive correlation between the two variables (i.e., changes in both variables take place in the same direction), whereas negative values of r indicate negative correlation i.e., changes in the two variables taking place in opposite directions. A zero value of r indicates that there is no association between the two variables. The value of r nearer to +1 or –1 indicates high degree of correlation between the two variables (Kothari, 2001).

The descriptive statistics will help in the comparison among the three age groups and between the gender groups within each age group.

ii) Two Way Analysis of Variance (ANOVA)

It was decided to carry out the Two-Way Analysis of Variance to simultaneously study the main effects of the two independent variables viz., age and gender of the subjects and the effects of the interaction of these two variables on the dependent variables viz., human figure drawing, cognitive style and self esteem.

The analysis of variance was originally developed by the late Sir. Ronald A. Fisher. This technique is used when multiple sample cases are involved. Through ANOVA technique one can investigate any number of factors which are hypothesised or said to influence the dependent variable. One may as well investigate the differences among various categories within each of these factors which may have a large number of possible values. So the ANOVA technique is utilized to investigate the differences among the means of all the populations simultaneously (Kothari, 2001). The assumptions of ANOVA are: a) the subgroup populations are normally distributed, b) the samples are drawn at random, c) the selection of elements comprising any subgroup is independent of the selection of elements of any other subgroup, iv) the variance of the several subgroup
populations are the same for all subgroups i.e., homogeneity of variance (Minium, 1978).

ANOVA may be One - Way, Two - Way and Multivariate etc.

The ANOVA yields the F ratio. It is the ratio of the variance occurring between the sample means to the variance of the scores within the sample groups. A large F occurs when the variance between the sample means is greater than the variance within the sample groups. Large F values may indicate significant impacts of the independent variables on the dependent variable.

In the present context the Two – Way ANOVA will be used because the data are classified on the basis of two factors – age and gender. Besides, the Two – Way ANOVA will permit the evaluation of the effect of interaction between age and gender on the dependent variables.

iii) Multiple Regression Analysis

It was selected as a method of analysis to evaluate whether the human – figure drawing scores of the subjects could be predicted on the basis of their cognitive style and self esteem scores. It was decided to consider human – figure drawing as the dependent variable because it is a performance variable and to regard cognitive style and self esteem as the predictors because these are psychological variables.

Multiple Regression Analysis helps in the prediction of the scores of the dependent variable on the basis of the scores of more than one predictors. This technique is based on multiple correlations. The technique of multiple correlation combines the predictor variables and thus enables a better prediction than any one of the predictors could do alone. In finding the coefficient of multiple correlation (R), the weights to apply to each predictor variable are determined so
that the weighted total of these variables has the highest possible correlation with the variable to be predicted. R gives the Pearsonian correlation between the variable to be predicted and the best weighted composite of several predictors. To compute it, the Pearsonian correlation coefficients (r) between each variable and all the others must be known (Minium, 1978). Test of significance is carried out on R to examine whether the prediction is significant. ANOVA is also carried out to assess whether the regression is statistically significant. For carrying out the ANOVA, the coefficient of multiple determination (R²) is computed. R² gives the proportion of the variance in the variable to be predicted which is associated with changes in the predictors.

The methodology to be followed in the present investigation has thus been described in this chapter. The next chapter will discuss the procedural details involved in the actual conduct of the study.