CHAPTER II
REVIEW OF LITERATURE

The related literature available on the proposed study is presented in this chapter under the following sections, namely:

1. Curiosity and Intelligence
2. Curiosity and Creativity
3. Curiosity and Personality
4. Sex Differences in Curiosity
5. Curiosity and Socio-Economic Status.
Curiosity and Intelligence

Though intelligence is innate cognitive ability, its development depends on various biological and environmental factors which provide the necessary stimulus. One such factor is curiosity.

Penney and McCann (1964) in their study report the description of and the normative data obtained with a scale of reactive curiosity (RC Scale) for use with children of grades 4, 5 and 6. The California Test of Mental Maturity was included for the purpose of measuring IQ. Intercorrelations between scores on the RC Scale and the IQ's, although low and positive were not significant.

Maw and Maw (1965) conducted a comprehensive programme in which they identified curious children from among grade 5 pupils, on the basis of teachers' ratings, peers' ratings and self ratings. They then compared these criterion groups on a series of tests including intelligence. Among their findings were indications that curiosity was not related to intelligence.

Day (1968) studied the relationship between curiosity and intelligence in children of grades 6, 7 and 8 in a number of schools in Toronto. Results
varied from school to school, but generally showed that curiosity was unrelated to scores on the usual standard school group intelligence tests. In one sample of subjects, curiosity was found to be negatively correlated to verbal and total Wechsler's Intelligence Scale for Children (WISC) scores for grade 6 pupils but not for grades 7 and 8.

Day (1968b) examined the role of specific curiosity in school achievement for pupils of grades 7 to 9 using a test of specific curiosity. The results show that while school grades correlated significantly with I.Q. scores, they almost invariably failed to be related with the measure of specific curiosity.

In order to test the hypothesis whether any relationship exists between curiosity and intelligence, Langevin (1971) conducted an investigation where representative curiosity measures and two intelligence measures, the Otis and Raven tests, were included in the study. Results failed to indicate any relationship between curiosity and intelligence.

Munichin (1971b) in a study of curiosity and exploratory behaviour in disadvantaged children found that curiosity was correlated with intelligence
using the Draw-a-Man Test.

Inagaki and Hatano (1974) carried out a study where 143, 5th graders were encouraged to write 2 questions for each of 8 stories involving incongruity (novelty, surprise, contradiction or perplexity). Questions were scored 1-5 according to use of information in the story and relating it to prior knowledge. Combined scores of 2 questions were positively correlated with each other among stories. The sum of combined scores was significantly correlated with school grades and achievement test score in language, intelligence, performance in science and in social studies, sensitivity to mismatch, verbal report of felt incongruity and plot comprehension.

In a study on the curiosity and intelligence of school children by Maw and Maw (1975), the Primary Mental Abilities Test was administered to 67 white children in grade 5, who also rated themselves as to level of curiosity. Significant Pearson Product Moment Correlations were observed for both boys and girls, supporting the notion that the relationship between curiosity and intelligence was positive and moderate.
Kakkar (1977) conducted a study to find the relationship between intelligence, achievement and curiosity in school children, using Maw and Maw's (1968) 41-item self-rating instrument of curiosity, Thorndike's intelligence test and, for measurement of achievement, the students' aggregate marks in the school examination. Results revealed that differences in intelligence between the means of high, medium and low curiosity students were significant at the .01 level. Significant relationship ($p < .05$) was revealed between intelligence and curiosity and intelligence, achievement and curiosity.

Kauser (1978) studied the relationship between curiosity and intelligence in a sample of 30, 5-year-old boys. Curiosity was assessed on an adaptation of Medinnus and Love's (1965) tests of curiosity which consisted of three sub-tests. Intelligence was assessed using The Coloured Progressive Matrices (Raven 1947). Intelligence was found to be correlated with curiosity.

**Evaluation**

The available literature on curiosity and intelligence as cited has indicated a positive and
moderate relationship between these two variables. With the exception of two studies (Kakkar 1977 and Kauser 1978) the rest of them were carried out in Western countries. As far as the Investigator's knowledge goes, there has not been any study dealing with boys and girls of the age groups of 7 to 10 years all taken at the same time. Further, the studies cited so far have made no attempt to investigate the influence of socio-economic status on curiosity and intelligence of boys and girls of any age or grade. This is an important area which needs further study.

2. Curiosity and Creativity

Creativity is an important ability of a well developed individual and a number of studies relating it to curiosity have appeared in the literature, as shown below.

Patrick (1937) had shown that without curiosity or exploratory behaviour, creativity in the arts was impossible, since there were more changes in the thinking process during the first quarter of creativity than at any other period.

However, Getzels and Jackson (1962) in research
with children, did not find significant relationships among creativity, curiosity and intelligence.

Some studies which were designed to explore the personality of creative individuals, found that the creative personality contained an element of curiosity. Houston and Mednick (1963) have indicated that the creative individuals in a University student sample tended to seek out novel stimulation in that they preferred remote associations more than common associations in a free choice situation.

Studying University students and subjects from the armed forces Barron (1963; 1965) found, that creative individuals preferred the more complex and asymmetrical figures on the Barron Welsh Art Scale (1952) more than their less creative peers.

In a series of studies a group of investigators, (McClelland 1963; Torrance 1960; and Mooney 1954) have demonstrated that creative individuals working in various fields were persistently curious, thus indicating a relationship between curiosity and creativity.

Taylor (1964) has shown that the creative individual is curious, high in energy, enjoys
manipulating or toying with ideas, is intellectually persistent, has a need for recognition, achievement, variety and autonomy, shows a preference for complex order, is tolerant of ambiguity and resistant to closure and shows a need for mastery.

Penney and McCann (1964) reported the use of a 100-item self description scale to identify level of curiosity in children of grades 4, 5 and 6. The results indicated a significant correlation between curiosity and creativity measured by the Unusual Uses Test for grade 6 pupils but not for grade 4 and 5.

Maw and Maw (1965) found in an extensive study of curiosity in fifth grade children, that high curious individuals, as rated by peers, teachers and self had significantly higher scores on the Word Association Tests, but, however, did not find any relationship on the Unusual Uses Test or Total Uses Tests of Creativity.

Anderson (1967) indicated that the biographies of some eminent creative individuals show that they were, among other things, sensitive, high in energy and highly curious.

Cummings (1967) conducted an investigation of
curiosity and creativity in grades 4 through 8 and in the first two years of university, where the Torrance Creativity Tests and question-asking were used for measuring creativity and curiosity respectively. A positive correlation was found between these two tests, indicating a significant relationship between creativity and curiosity.

Eisenman and Robinson (1967) found in grade 10, 11 and 12 that creativity, I.Q. and interest in complexity were interrelated. They found that a creativity test, the Personal Opinion Survey, was related to interest in complexity as measured by preference for random polygons varying in number of sides.

In an investigation by Day (1967, 1968a) verbal expressions of interest in complexity were found to be related to curiosity. Measuring interest in complexity by verbal ratings of interest in random polygons varying in number of sides, he found a consistent positive correlation between his test and the Barron Welsh Art Scale for children in grades 7 and 8.

Day (1968b) reports significant correlations of the Unusual Uses Test and the Barron Welsh Art Scale
with the Test of Specific Curiosity for a sample of subjects belonging to grade six, seven and eight. However, the Specific Curiosity Questionnaire did not correlate with the Barron Welsh Art Scale, but did correlate with the Unusual Uses Test.

In a study using a sample of first year nursing students, Day and Langevin (1969) obtained a significant correlation between the Specific Curiosity Questionnaire and the Remote Associations Test of Creativity.

On the nature of creativity in high and low curiosity boys, Maw and Maw (1970) have conducted an investigation, where on the basis of a definition of curiosity, 224 white V grade boys were separated into high and low groups. They were administered 38 instruments including the Word Association Test of Creativity. It was found that high curiosity boys showed significant positive loadings for creativity on the General factor, Restrained Creativity factor and the Impulsive Creativity factor. Low curiosity boys showed negative loading for a factor named Concrete Creativity.

Hutt and Bhavnani (1972) re-examined 48, 7 to 10-year-old subjects (from an original sample of 100
nursery schoolers) to determine the present manifestations of earlier-observed characteristics of curiosity and exploration. The earlier study showed that failure to explore was related to lack of adventure in boys and to difficulties in personality and social adjustment in girls. Results indicated that failure to explore novelty was not necessarily associated with convergent thinking in girls, and that inventive play was positively associated with the propensity for divergent and creative thinking, particularly in boys.

An investigation was conducted by Towell (1973) to test performance of high and low curiosity subjects on timed and untimed verbal tests of creativity, where the hypothesis that high curiosity subjects would produce more creative responses in the area of fluency, flexibility and originality on the Torrance Tests of Creative Thinking (TTCT) Verbal Form, than will low curiosity subjects. It was found that more high curiosity subjects took the untimed test than did middle and low curiosity subjects and that high curiosity subjects made significantly higher scores on the timed tests of creative thinking than did middle and low curiosity subjects; however, there was no significant
difference between the three groups on the untimed test. It was also found that more females took the untimed test than males but there was no significant difference between the two groups on the timed tests of creative thinking.

Cohen (1974) investigated the association between exploratory task performance and creativity in 129 kindergartners and 2nd graders. Exploratory behaviour was assessed with a series of embedded figures tests, and creativity was assessed using the Instances Test. Among kindergartners of both sexes, exploratory and creativity measures were positively correlated. However, a different pattern of correlation was observed among 2nd graders; particularly among males, correlations were sharply lower than for the kindergartners. Data indicate that the early established exploration-creativity relationship may not hold over time.

Voss and Keller (1977) conducted an investigation into a critical evaluation of the Obscure Figures Test as an instrument for measuring cognitive innovation which refers to an integration of different kinds of behavioural systems (e.g. creativity and exploratory behaviour). It was hypothesized that this is an instrument
for measuring creativity rather than curiosity. 41 boys and 41 girls, ages 7 to 10 years, were given a battery of tests of curiosity and creativity (e.g. self-appraisal inventory of curiosity and the Incomplete Figures Subtests of the Torrance Tests of Creative Thinking). Significant correlations were found between Obscure Figures Test and creativity measures. No such relationships were found between Obscure Figures and curiosity measures.

Glover (1979) conducted two experiments, in order to examine the kinds of questions, asked by under-graduates identified as relatively creative and relatively non-creative by scores on the Torrance Thinking Creativity With Words Test. In Experiment I, with 260 subjects, creative subjects asked significantly higher numbers of application, synthesis and evaluation level questions in interview settings, while relatively non-creative subjects asked significantly higher number of knowledge and comprehension level questions. In Experiment II, with 96 subjects, creative subjects wrote significantly greater numbers of higher order questions in the margins of reading materials than did relatively non-creative students. The relatively non-creative subjects wrote significantly higher
numbers of factual level questions.

Evaluation

Studying the literature on the relationship between curiosity and creativity for the past fifteen years or more, it is found that many of the studies have indicated a positive relationship between them. It is observed that so far there has not been any study with respect to the relationship between curiosity and creativity in Indian children. Further, it is also evident that no attempt was made to find out the influence of socio-economic status on curiosity and creativity in the literature cited. The present study attempts to investigate this aspect as well.

3. Curiosity and Personality

The results of the few available studies, though not directly connected to the relationship between curiosity and extraversion and neuroticism, but which were conducted in the area of curiosity and other personality factors in children and adults are summarized below:

In a study, Eysenck (1941; 1947) found that the aesthetic tastes of extraverts lean towards simple,
regular polygons with few sides and simple brightly coloured, modern paintings, whereas introverts tend to like complex, irregular, many-sided polygons and paintings in the academic manner with abundant detail and less vivid colouring.

Whiting and Mowrer (1943) and Berlyne (1950) in a study have found a relation between fear and curiosity—that is, a tendency to seek stimulation from fear-provoking objects, though at a safe distance. Woodworth (1921) and Valentine (1930) have reported this in children and Woodworth and Marquiss (1947) have also emphasized its importance in adults. It appears that up to a certain point, threat and puzzle have positive value, beyond that point show negative value.

According to Foulds (1951) dysthymics (introverted neurotics) spend more time than hysterics examining a pencil maze before attacking it, which according to him, points to a propensity for resolving conflicts by exploratory behaviour.

McReynolds (1958) found some evidence for a negative relation between anxiety and curiosity in a group of psychiatric patients.
Berlyne (1960) observes that the obsessive-compulsive patient is given to brooding, to wondering and doubting to pettyfogging distinctions and classificatory schemes—all of which according to Berlyne (1960) amount to a morbid travesty of epistemic (knowledge seeking) behaviour or curiosity.

McReynolds, Archer and Pietila (1961) reported a significant negative correlation between a measure of curiosity and teacher's rating of psychological maladjustment in a group of VI grade children.

A negative relationship between curiosity and anxiety which has frequently been cited (Hebb 1955; and Levitt 1967) has also been substantiated by research (Zuckerman, Kolin, Price and Zoob 1964; and Leherissey 1972).

Maw and Maw (1965) in their study on differences between children with high and low curiosity have identified some of the personal and social variables differentiating children who were high in curiosity from those who were low. Among the instruments used in their study were included the California Test of Personality, The Children's Personality Questionnaire, Children's Manifest Anxiety Scale and The General
Anxiety Scale for Children, and instruments used to determine criterion groups. The findings were reported in terms of characteristics differentiating children high and low in curiosity. Part of the findings of the above tests and scales revealed that high-curiosity boys differ from high-curiosity girls on many personal and social variables; high-curiosity children had a higher level of self-acceptance, were more self-sufficient and showed better overall social adjustment than low curiosity children, and high-curiosity boys showed a higher level of emotional maturity than low-curiosity boys. Their findings indicated that curiosity was not related to general anxiety level.

Penney (1965) in a study reports consistently negative correlations between curiosity and manifest anxiety in several groups of elementary-school children. Mendel (1965) also finds the same results in a study using pre-school children.

Evaluation

From a perusal of the above literature it was observed that of the few studies that have been carried out, most of them relate to curiosity and anxiety or fear, based on other variables like extraversion,
emotion, high and low curiosity levels, etc. Since there has been practically no study on the relationship between curiosity and the personality dimensions of extraversion and neuroticism in children, nor on the influence of socio-economic status, it becomes important to explore the relationship between curiosity in children and these varied factors.

4. Sex Differences in Curiosity

The following studies reveal that male and female children differ in curiosity levels, because of their inherent sex characteristics and their upbringing within their culture matrix.

Maw and Maw (1964) conducted an exploratory investigation to measure curiosity in elementary school children. In general, the findings of the investigation revealed that boys selected outgoing adventurous activities significantly more frequently than did girls; when required to seek answers to questions, boys tended to do better than girls; boys tended to have more general information than did girls, but in general, the differences were not significant. Boys and girls did not differ on the delayed recall of unusual and new information; boys had more positive attitude
than did girls, but the differences were significant in one test and not significant in another; and sex differences were not consistent on three of the curiosity measures.

A study relating to differences in preference for investigatory activities by school children who differ in their level of curiosity was conducted by Maw and Maw (1965). They hypothesized that high curiosity children differ from low curiosity children and that boys differ from girls in that they have a greater preference for investigatory activities. Results supported both the hypotheses.

Hutt (1970) investigated curiosity of children using a novel toy, which provided several incentive conditions and found that boys were more interested in exploring and playing than girls.

Peterson (1970) in a study attempted to identify and analyze some aspects of exploratory behaviour (curiosity) in elementary school children, where one of the purposes of the study was to examine the relationship of curiosity to age and sex. Results showed that boys and girls appeared to be equally curious over all age groups although differences between
sexes appeared within age groups.

In an investigation Coie (1974) tested the cross-situational consistency of curiosity as a trait in a sample of I and III grade children across 4 curiosity evoking situations, varying in stimulus content and the presence of adult positive sanction to explore. The presence or absence of adult sanction to explore did seem to account for some consistency of response within individuals and between groups. Boys were far more actively curious than girls, when sanction had not been explicitly given; however, no sex differences were found when sanction had been given.

Freidenbergs (1975) examined three aspects of nonverbal curiosity namely, reactivity to novelty, preference for novelty and exploratory behaviour towards novel objects. His findings revealed boys to have more curiosity than girls.

Rabinowitz, Moely, Finckel and McClinton (1975) investigated children's exploration of a large colourful, novel toy and familiar toys. Children who played in the presence of a same-sex peer spent more time with the novel toy and less with the familiar toys than
did children in two other conditions, who played alone. Children who played with same-sex peers also gained more information about the novel toy than did subjects in the other two conditions. Although there were no sex differences in information gained about the novel toy, boys spent more time playing with the novel toy and less time playing with the familiar toy than did girls.

Kauser (1976) studied the effect of sex on curiosity in two groups of kindergarten children using toys as the stimuli for measuring curiosity, where three tests of curiosity were administered to the subjects. Results failed to reveal any differences due to sex in the sample studied.

Evaluation

The few studies available in the literature on the influence of sex characteristics on curiosity cited so far, have indicated contradictory findings. So far, as the Investigator's knowledge goes, there has been an acute dearth of studies, in the area of the influence of sex on curiosity with respect to Indian children. This is an important area which needs further study.
5. **Curiosity and Socio-Economic Status**

Socio-economic conditions have been found to have a bearing on the curiosity of children.

McCarthy (1929) as cited by Hurlock (1942) found that in the case of children from 36 to 54 months of age, who belong to the upper socio-economic classes, 14.41% of their conversations is made up of questions, compared to 7% in the case of children in the lower socio-economic classes.

Collard (1971) investigated the effects of exploratory and play behaviours of infants reared in an institution and compared it to that of infants from lower and middle class homes. The number of exploratory and play responses and varieties of schemas shown to a toy and performance on the Gesell Cubes and Cups and Cubes subtests were compared in institutional infants (8.5 to 13 months old) and lower-class and middle-class home-reared infants matched in age and sex to the institutional subjects. Institutional babies were found to explore less and to show fewer schemas and less social play than did home-reared babies. The subjects from lower-class homes explored as much as those from middle-class homes, but middle-class
home babies showed more schemas and more social play than did the former. The babies level of performance on the Gessell subtests appeared to depend on their experience with similar objects and on the extent to which some one had played with them.

Munichin (1971) presented a study on the correlates of curiosity and exploratory behaviour in pre-school disadvantaged children. The study had two objectives; to develop measures of curiosity and exploration applicable to pre-school children and to assess the relationship between curiosity and other aspects of functioning. Subjects were eighteen 4-year-old Negroes in Head Start Programmes. Data were obtained from pre-school children's observations, teacher rankings and individual sessions. Measures of curiosity inter-correlated and suggested consistent reaction patterns among children. Exploratory behaviour was related to differentiation of self-image, expectations of coherence and support in the environment, and concept formation. The data point to a "developmental high risk" group within the disadvantaged pre-school children.
Kauser (1976) studied the effect of economic status on curiosity using two groups of pre-school boys and girls as subjects, belonging to the high and low economic status levels. Three tests of curiosity were administered to the sample. Results revealed economic status as an influencing factor in the degree of curiosity manifested by the subjects studied.

Evaluation

From the limited number of studies available in the literature on the influence of socio-economic status on curiosity, it has been observed that economic conditions have been found to have a bearing on curiosity in children. Except for one study (Kauser 1976) all the others have been carried out mainly in the West. As far as the Investigator's knowledge goes, there has been no study in the Indian context in the area of socio-economic background and its influence on curiosity in elementary school children.