CHAPTER III

REVIEW OF RESEARCH
Creativity for long time was treated as a kind of rare exception, so there was an attitude of inevitability and fatefulness towards creativity, which offered little hope either of understanding it or of being able to do anything about it (Guilford, 1965). The studies conducted were in peripheral areas, which creative people themselves felt really had next to nothing to do with creativity (May, 1959). Before the landmark ovation, there was only what Taylor and Barron (1963) call a 'trickle' of scientific research devoted to creativity. Studies which were made were sporadic, exiguous and involved the use of fairly unsophisticated research techniques (Raina, 1970). It was only after 1950 with the presidential address of Guilford (1950) to the American Psychological Association that the psychological educational researchers started to make serious and sophisticated studies on creativity. Guilford (1950) after a search of literature revealed that few studies on imagination, creativity and closely related topics had been attempted. He pointed out that only 196 out of 121,000 articles dealt with these subjects and declared that divergent thinking was one of the most neglected areas in psychology and education. Furthermore, he stressed the importance of research in this area and the necessity for the establishment of adequate criteria measures,
following which creative research trend in education geometrically progressed. This acceleration is reflected in the rising tide of research reports and other publications concerning the nature and nurture of creative behaviour (Osborn, 1965). Recent literature reveals that serious research in the field of creativity has been undertaken in spite of the difficulty involved in casting the construct into a rigorous empirical mould. A review of literature in India by Raina (1976, 1981) records that majority of research has been done in the areas of cognitive and personality types as related to creativity; while cognitive styles and emotive variables among other important areas remain to be investigated.

The following research investigations gleaned from a survey of literature were selected on the basis of their scientific prominence, historical educational importance, and for being noteworthy contributions of knowledge in the field of creativity as related to cognitive styles, needs and values. With a view to directing the efforts in an appropriate direction, as also to capitalising on the research conducted by the previous researchers for the formulation of hypotheses, a review of research literature related to problem under study has been grouped under three sub-headings. Creativity and cognitive styles, creativity and needs, and creativity and values.

CREATIVITY AND COGNITIVE STYLES

The studies of cognitive styles of field independence-field dependence as related to creativity have been found to be
correlational as well as experimental in nature. Some studies also show field independence as a mode of thinking in creative subjects and vice-versa.

McFee (1961) was the first art educator to point to the utility of the work of Witkin (1954) for research and theory in art education in the area of perceptual style with its field independence - field dependence continuum. In the context of art education, he maintained that the only promising direction for exploration in artistic creativity would be to investigate its relationship with cognitive/perceptual style.

Bloomberg (1966) investigated possible relationship between perceptual field-independence and creativity. His study was conceptualized as an exploration within the developmental frame of reference of Heinzwarner (1957) and results indicate that the field independent person's greater range of differentiation may make him more mature in some ways than field dependent person, but his lack of hierarchic integration may also hinder him and place him at a less mature level in terms of that characteristic, thereby conceptualizing field independence as a necessary but not sufficient condition for creativity. In another study too, Bloomberg (1967) concluded that creative individuals are likely to be field independent, but not all field independent subjects are creative.

By using Witkin's Embedded Figures Test (1954) and the Torrance Test of Creative Thinking (TTCT, 1966) and by employing
simple correlations, Stevens (1970) found that field dependence correlated significantly with figural elaboration (-.31), verbal flexibility (-.31) and verbal originality (-.30) indicating that creatives are independent in their thinking style.

The relationship of the cognitive style of field independence with creativity across sex was examined by Bottenbenger, Finster and Werner (1974). By administering eighty six males and eighty nine females of third and fourth grades the TTCT (Torrance, 1966), they found sex differences in the creative ability which related positively to cognitive style of field independence. Taking field dependence - independence as a measure of grouping, Jeanette and Lloyd (1977) studied relationship between creative thinking and field dependence-independence. Sixty two education majors enrolled in two sections of introductory education psychology urban university comprised the data. The findings of this study that field independent subjects attained significantly higher RAT scores as compared to field dependent subjects, supported the contention of Bloomberg (1967) that analytic perceptual ability is essential for creativity.

In order to gather support for a theory of creative problem solving Lloyd (1978) proposed another study based upon Pascual Leone's neo-piagetian concepts (1969) and Werner's (1957) differentiation framework creative problem solving
variables were hypothesized to explain cognitive styles/development group differences. Data was obtained from a sample of twenty nine males and eighty three female college students. The Hidden Figures Test, a measure of field dependence-independence, was used and Lloyd summed up that neo-plaguetian cognitive style was validated with mobile field independent formal thought considered to be the hallmark of creative problem solving.

Ross (1978) on a sample of 167 community college students determined the degree of interrelationships among five cognitive constructs i.e. moral development, three components of internal external locus of control, creative behaviour, field dependence-field independence, and general intelligence. He concluded that field dependence field-independence may be subject to experimental modification because of their high degree of relationship to creative behaviour, field independence and flexibility may be aspects of the same cognitive factor. By taking thirteen undergraduate architecture majors and twenty five business majors as the sample of study Morris and Bruce (1978) too examined the relationship between creativity and cognitive style of field independence and administered group embedded figures test. The hypothesis that architecture majors would be significantly more field independent than business majors was supported by the data.

Probing further beyond the realm of correlational analysis Spotts and Mackler (1967) employed factor analysis alongwith
analysis of variance and predicted that field independent subjects would obtain higher scores on tests of creative ability than would field dependents. 138 undergraduate males were administered individual and group measures of perceptual field independence. As predicted individuals with field independent cognitive styles were consistently more creative on the tasks used in this study than individuals with field dependent orientations. Significant relationships were also found between individual and group measures of field independence.

Besides correlational studies, researchers have also attempted to seek creativity-cognitive style relationship by employing experimental design. Mendelsohn and Griswald (1964) divided 108 college students to their scores on the Remote Associates Test (RAT) into high, medium, and low groups. The subjects were instructed to memorize 25 words (Focal stimuli) while 25 other words (peripheral stimuli) were presented individually. Results indicated that the three groups did not differ significantly in the number of new anagrams. However, highly creative subjects more than low or medium groups solved significantly more anagrams that is creative subjects utilized both focal and peripheral cues.

Eliminating the medium group Komlosi (1974,1975) presented her high and low creative subjects, previously selected on verbal tests, a series of simple schematic figures
against a coloured figural background suboptimally at a constant time of exposure. The necessary number of subsequent exposures for the subjects to safely recognize figures was studied. Results indicated that highly creative persons need significantly smaller number of repetitions to recognize the figures. This piece of evidence can be paralleled with that of Bloomberg (1967): as field independents who are more creative took less time in locating a simple figure hidden within a larger embedded design as compared to field dependents.

In the year 1976 Morgan studied convergent and divergent thinkers and reported that divergers appear to be more likely to prefer open student teaching and convergers utilize primary process or synthetic as opposed to analytic modes of thought. Instead of convergent and divergent thinkers McCarthy (1977) compared the cognitive styles of high achieving gifted pupils with low achieving gifted pupils. Sample consisted of ninety six fourth, fifth, and sixth graders mentally gifted children. He reported that high achieving in comparison with low achieving gifted pupils tended to be field independent and more creative in divergent production tasks.

Apart from studies of simple analysis involving high and low creatives, and high and low achieving gifted pupils, interactional studies with experimental design have also been attempted. Rao (1976) investigated the relation of three cognitive variables namely category width, field independence,
and integrative complexity with creative abilities on a sample of 182 boys of tenth class from five municipal high schools of Vijaywada in Andhra Pradesh. The data were analysed with the help of analysis of variance followed by t-test. Groups for analysis were made on the basis of scores on the Hidden Figures Test, as field independent group and field dependent groups. Boys with field independence generally did better in their performance on creativity tests by displaying more originality, more adaptive flexibility, more ideational fluency, more associational fluency, more sensitivity to problems and more redefinition, but the two groups did not differ significantly in their spontaneous flexibility, word fluency, expressional fluency and elaboration.

Following the same pattern of grouping of field dependents and field independents as that in the preceding study, Saleh (1979) examined the effects of creativity training, classroom atmosphere, and cognitive style on the creative thinking abilities of Egyptian elementary school children. Interactions observed for the different measures of creativity showed that field independent group performed significantly better on originality than did all other groups, under the permissive type of classroom atmosphere. Whereas field dependent group showed significantly better performance on fluency and flexibility measures. The findings suggest that originality might not be
related more to the developmental stage of field independence. High and low creatives selected on the basis of median scores on Torrance tests of creative thinking (TTCT, 1966) were compared by Kumar (1981) in respect of the field independence-field dependence style as assessed by Witkin's (1954) embedded figures test. 2x2 analysis of variance revealed that significant differences existed between high and low creative groups. High creatives were more field independent than low creatives.

There are instances in the research literature when low correlations have also been demonstrated between creativity and field independence. Artley et al. (1980) took the sample of eighty-four college students, i.e. nineteen males and sixty-four females. No significant correlations were found among the variables of problem finding, creativity and cognitive style. Likewise in the study conducted by Schilling (1981) the overall multivariate analysis of the cognitive style variable failed to produce significant results among creativity variables, the personality variables, or the fluency variables. Sample of the study comprised of 156 persons at the university of Kentucky. His study suggested that cognitive style of analytic information may not play a crucial role in creativity as it was conceptualized in the study. Bates (1981) hypothesized positive correlation between field dependence and creativity.
Sample of the study consisted of twenty one learned disabled children in the age group of seven to ten years. Statistically non-significant correlations were found between field dependence and creative abilities, though they were in the hypothesized direction. The few earlier explorations led by Bieri et al. (1958), Getzels and Jackson (1962) and Rouse (1963) too yielded essentially inconclusive results, although some tendencies of higher creativity in field dependent persons as compared to field independent were noted by Bieri et al. (1962) and Rouse (1963).

To explore the relationship among field independence, dogmatism, and creativity Ohnmacht and McMorris (1971) administered The Hidden Figures Test, The Dogmatic Scale and The Remote Associates Test to seventy four subjects. Male and female data were subjected to separate 2x2 analysis of variance. This study provides weak support for the notion that field independence and dogmatism when considered in concept provide some information concerning creativity. Likewise, while investigating theoretically proposed relationship between field independent cognitive style, flexibility and creativity with a sample of high and average ability sixth and seventh graders, Sarno (1980) too found non-significant effect of flexibility and field independence on the creativity. Analysis of variance was run to consider the effects of sex, intelligence, field dependence and flexibility upon the seven creativity variables. It was concluded that creativity is an area of
personality not measured by perceptual cognitive styles. Result did not support the view that students possessing high degree of field independence would have significantly higher creative scores.

Review of studies of creativity as related to cognitive styles lead to infer that creative individuals are likely to be field independent but not all field independent individuals are creative. Putting it in another way field independence seems to be a necessary but not a sufficient condition for creativity. Weak tendencies for cognitive style of field independence in case of creative subjects have also been observed.

CREATIVITY AND NEEDS

By now psychologists have conducted an impressive number of investigations into the personality characteristics of the creative people, though the methods employed by the researchers are highly varied ranging from clinical interviews and projective techniques through empirically developed biographical inventories to factor based tests. Investigators seem to have used slightly different terms depending upon their theoretical preferences or biases but so consistent is the common core of observation that as far as personality characteristics are concerned little is needed in the way of translation from one terminology to another (Taylor and Barron, 1963). It is a general belief that motivation is a vital component of creativity (Taylor, 1964). The great need is for better measuring
instruments (for all ages) although in the Utah Study of Air Force scientists (Smith et al., 1961) motivation was found to be only a small component of creative performance and very few studies have been conducted on motivational aspect of personality in relation to creativity.

Most of the studies with regard to creativity and needs have been conducted on professionals, i.e. mathematicians, scientists, artists, architects, teachers etc. In one of her pioneering investigations on clinically top ranking American painters, Roe (1946a, 1946b) reports that creative activity is satisfying to the basic autonomous drive, and also, to the extent that the subject submerges himself in his work and loses consciousness of his identity, of the harmonious drive. Somewhat similar is a report by Peck (1958) to whom creativity is largely a result of drive to be unique and desire to prove superiority of the drives. There is also autonomous motivating urge in the form of persistence.

In order to explore the relationship between creativity and achievement motivation McClelland (1956) found that the successful scientists, like the successful salesman or business entrepreneur had a higher need for achievement, because high motivation predisposes them to take moderate calculated risks in which the success or failure of the enterprise depends upon their own efforts. Eminent mathematicians in Nelson and Crutchfield (1970) study scored more
on achievement motivation than average mathematicians.

Earlier, Helson (1966) found 135 women nominated as creative by the faculty to have greater need for autonomy, a lesser need for acting on impulsive and stronger motivation to take the creative role.

Seventeen Ph.D. industrial research chemists were divided by Blatt and Stein (1957) into two groups of eight 'more' and nine 'less' creative men based on ratings on creativity as obtained from superior colleagues. The more creatives were found to be autonomous, striving and devoted than their less creative colleagues.

In a number of studies of motivation for scientific creativity Heinz et al. (1958) and Stein (1962,1963) concluded that, creative subjects were more autonomous, more devoted to their goals and were also more dynamic and integrative in their approach to complex situations and made greater sacrifices to achieve them than their non-creative counterparts. The need for autonomy in addition to high degree of self-respect and low degree of dependence and anxiety for honour, prestige and reward in creatives was also pointed out by Maslow (1959). In a study of personality dynamics of high school seniors, Parloff and Datta (1965) of the National Institute of Mental Health, studied the males who competed in 1963 Westinghouse Science Talents Search. High creatives were more
ambitious and driving, more independent, autonomous, self-reliant, more efficient and perceptive, more rebellious towards rules and constraints, and more imaginative.

Apart from studies conducted on recognised fields of creativity some attempts have been made to study the personality needs of high and low creative groups as identified on the basis of various creativity tests. Gumerson (1964) indicated significant differences between high and low creatives on autonomy — high creative males were reported to be more autonomous, dominant and aesthetically oriented. High creative females were evidenced as more autonomous than low creative females. Surveying a large number of studies and compiling characteristics found in one or more studies to differentiate highly creative persons from less creative ones, Torrance (1964) found that creative people in common had desire to excel.

In India, Raina (1968) compared high creative and low creative groups of students on certain measures of cognitive abilities, personality, manifest anxiety, academic achievement, and socio-economic status. By administering The Minnesota Tests of Creative Thinking on 500 students of classes eighth, ninth and tenth of seventeen schools from three educational zones of Rajasthan, high and low creative groups were selected. Analysis through F test, t-test and correlational techniques revealed that high creative subjects exhibited greater autonomy, achievement, dominance, change and endurance than the low creative subjects.
In a study on female college students aged between 18-21 years, Jawa (1971) obtained significant association between creativity and need achievement. High creative girls as compared to low creatives were found to have more need for achievement. Similarly Aaron and Malestha (1972) reported strong relationship between creativity and achievement motivation. Sample of his study consisted of fifty high school boys from two schools of Dharvar. Motivation was assessed in terms of achievement through a standardized TAT instrument and a test of creativity developed by investigators was used for measuring fluency and flexibility. To study relationship between need for achievement and creative potential, Lett (1967) took a sample of 359 ninth grade high school students from a school in the Bay area. A central prediction that a high degree of need achievement and creative potential would not be typical of their relationship within individuals was attested, and the typical pattern of combination of these two measures was far less than high need achievement to accompany high creative potential.

In contrast to the findings of high need achievement in high creatives, Lal and Chilana (1977) reported that creativity scores were negatively related with achievement motivation of eighty three students of Class XI. Saxena (1981) too reported that there was no significant relationship between need achievement and creativity of 300 boys and 300 girls studying in class ninth and tenth of Agra city.
Using Barron-Welsh figure preference tests on the criterion of creativity Cashdon and Welsh (1966) found high creative adolescents to be independent and seeking change in the environment. Apart from need for autonomy, achievement, dominance, change and endurance as characteristics of high creatives, drive to be creative, drive to be different from others and desire to prove that their ideas were superior to others were reported by Peck (1958) as characteristic of creative men. He carried out a number of studies at the University of Texas and the University of Chicago, with a number of engineers who had already demonstrated inventiveness of a high order. In their childhood and youth the subjects felt unwelcomingly dominated and had to fight hard to be themselves, manifested a drive to achieve a successful personal identity which was distinctly different from that of their parents or other authority figures. Need for quality or excellence is a vital ingredient in high level creativity, as pointed by Maddi (1965). The creative person seeks to do things in certain ways and considers himself to be excellent.

The research trends for creativity and needs are by and large consistent in revealing that high creatives exhibit a greater need for achievement, autonomy, dominance, change, order and endurance than low creative subjects, and that in general, significant differences are found in the needs of high creatives and low creatives.
CREATIVITY AND VALUES

One of the major interests in creativity-personality relationship has centred around value orientation of the creative individuals. Creative persons differ in their value preferences from non-creative persons and moreover, value preferences may differ among the creative person of one area from the creative person of another area.

Hudson (1957; 1958) in a study on creative artists found them to be different from non-artists, primarily in their ways of thinking and perceiving. He has adduced evidence to show that creative individuals have more theoretical and abstract interests. In another study, the same investigator (1962) revealed that the creative scientists possessed a deep-seated involvement in intellectual things and an experience of wide emotional response with intellectual framework. Myden (1959) too reflected creatives to be intellectually oriented towards the outward world and Reid et al. (1959) found that creative individuals tend to value intellectual attainment.

A series of studies conducted at the Institute of Personality Assessment and Research, University of California concentrated on the personality structure of the creative person in a variety of professional fields. One of the many variables which received prominence in Mackinon's studies was...
value orientation (Mackinnon, 1961; 1962a; 1962b). The results of these studies revealed that architects exhibited the highest value in aesthetics and were equally high on theoretical values (Mackinnon, 1962). Mathematicians and writers were also subjected to similar investigation in 1962, by the same researcher. The creative mathematicians were found high on both theoretical and aesthetic values. For the creative writers, the results are similar to those obtained on architects and mathematicians. Findings of Mackinnon (1962a) have been attested by Drevdahl (1964), who found scientists to have greater interest in scientific investigation as compared to more socially oriented activity. Barron (1965) found the creatives to have concern for philosophical problems. Barron (1953a, 1953b) in another study reported the creative groups identified by peer ratings to be characterised by aesthetic disposition. In Windholz's (1968) view the creatives are characterized by a higher level of literary interest.

Taft (1961) selected actors as the sample of his study and found them to be characterized by idealism and aesthetic qualities. Blatt and Stein (1957) revealed that creative industrial research chemists too possessed higher aesthetic and economic, but lower social and religious as well as authoritative values. A study of innovative physics teachers by Walberg and Welch (1967) showed the innovations to be higher in aesthetic and theoretical values but lower in economic, religious
and political values. Yamamotto (1963) also studied creative teachers and found them to score high on theoretical orientation but no significant differences were, however, found between the high and low creative teachers on aestheticism scale.

Gumeson (1964) found significant differences on measures of values between high and low creative groups differentiated on the basis of The Guilford's Test of Creativity. High creatives possessed high aesthetic and lower economic values in comparison to low creatives. Lois (1965) found that creative or gifted individuals tend to have higher relative preferences for both the theoretical and aesthetic scales of the Allport Vernon Lindsey study of values than do less eminent comparison groups.

In order to investigate creative and non-creative individuals with respect to value orientations Paramesh (1970) included 107 senior high school American Whites of both sexes of the State of North Carolina, U.S.A. in the sample of the study. Fifty three boys and fifty four girls were administered Barron Welsh Art Scale and The Study of Values by Allport et al. for measuring the creativity and value orientations of the subjects. By using analysis of variance data were analysed and high, moderate, and low creative groups were found to differ among themselves with reference to theoretical, aesthetic and economic values. The high creative group was significantly high on theoretical and aesthetic values and low on economic
value as compared with the low as well as moderate creative groups.

Cooke (1975) studied the behaviour, values and personality measures of academically superior adolescents in a creativity oriented curriculum. The results reflect that high creatives gained in theoretical and aesthetic and lost in economic and religious values. Sharpest differences in profiles were found in male female choices but all were within average limits.

Singh (1977) administered creativity test by Chauhan and Tiwari and study of values scale by Bhatnagar and Tondon to 1000 male and female students studying in arts classes from ninth to twelfth and coming from urban as well as rural background. Co-efficient of correlation values were computed in order to analyse the data. Theoretical values were significantly and positively related to creativity.

High creative students were compared with low creative students with regard to values by Kumar (1978). 968 science students differentiated on the basis of The Torrance Tests of Creativity as high and low creatives were administered The Scale of Values by Bhatnagar. High creative students scored significantly high on theoretical and aesthetic values as compared to low creative students. Singh's (1977) study revealed that high creativity among student teachers (H*Mf2)
tended to go with higher economic value and low creativity on the other hand, seemed to be associated with higher theoretical value.

In the year 1978, Mishra explored differences in the perception of a set of values by sixty randomly selected high and low creative student-teachers. Four values - social service, independent, variety and surroundings were found to be more prominent for highly creative teachers while power and economic return were more prominent in the perception of low creative teachers.

By conducting a study on 298 students from four schools located in the Mid-West, Lindseth (1981) took fifty nine high creatives and fifty nine low creatives as the final sample of the study. High creative students value preferences were the aesthetic over the social and religious, the theoretical over the religious. Low creative students preferred the economic and political over all others. The findings support earlier research in the relationship of the aesthetic and the theoretical values to creativity.

Theodore (1964) used correlational analysis to investigate the traits of intelligence, personality and values as they are associated with creativity in adolescents. 300 eighth grade students enrolled at two public Junior High schools in Jefferson county Colorado comprised the sample creative thinking abilities were measured by six of Guilfords Creativity
Tests and Levy's Modified Study of Values was used as a measure of values in this study. Positive correlations were found between religious values and creativity in female group and negative correlations between economic values and creativity in both male and female group. Doherty and Corsini (1976) investigated the relationship between creativity and moral reasoning in college women. Creativity was significantly and positively associated with moral maturity. Similarly Wragg (1981) investigated relationship between dimensions of moral character, creativity and ideology. Flexibility and originality were positively related to empathy, autonomy and ethics of personal conscience. There was a positive correlation between the value of religious efforts and socialization.

Pandey (1980) found creative and non-creative pupil teachers to be alike with respect to their values. The data consisting of 200 pupil teachers differentiated into creative and non-creative groups through Mehdi's Verbal Test of Creative Thinking were analysed by t-test. No significant differences between creative and non-creative pupil-teachers were found with respect to their social, religious, democratic, aesthetic, economic, knowledge, hedonistic, power, family, prestige and health values. Singh and Gupta (1977) found no relationship between traditional values and creativity. It may thus be concluded that high creatives are characterised by high theoretical and aesthetic values and low economic,
religious and political values.

The research on values in relation to creativity is not expected to yield consistent pattern over a long spectrum of time, evidently because of a continuously changing nature of values. Accordingly, values of the individual are likely to undergo a drastic change from time to time. As such, constant and persistent efforts are needed in this direction so as to identify up-to-date trends for the purpose of proper guidance.

HYPOTHESES

The study was advanced on the undermentioned hypotheses as emanating from the review of related literature with regard to creativity and cognitive styles, creativity and needs, and creativity and values:

1. High creatives are field independent as compared to low creatives who are field-independent in their cognitive style.

2. High creative group differs significantly from low creative group on the measures of needs.

3. High creative group differs significantly on values from the low creative group.

4. (a) Creativity accounts for significant variations on measures of cognitive styles, needs, and values.
Intelligence accounts for significant variations on measures of cognitive styles, needs, and values.

The interactional effect of creativity and intelligence is significant on measures of cognitive styles, needs, and values.