CHAPTER IV

SURVEY OF RELATED STUDIES

In order to explain those aspects of the concept of creativity which are selected for the present study, a review of the following empirical researches seems necessary:

(i) Relationship between intelligence and creativity.
(ii) Factors of creativity
(iii) Relationship between intelligence and divergent thinking.
(iv) Creativity and socio-economic status, and
(v) Creativity and personality dimensions.

(i) Relationship between intelligence and creativity

The relationship between the measures of creativity and the measures of intelligence has been found
to vary, though within a narrow range. The variations in the relationship seem to be due to variations in the nature of creativity measures, intelligence tests and samples employed by the investigators. It is particularly true with respect to subjects of differing I.Q. and Socio-Economic Status.

In a study, Getzels and Jackson (1962) utilized five measures of creativity and one measure of intelligence. The five measures of creativity correlated significantly \( (p \leq 0.05) \) for boys \((N = 292)\) as well as for girls \((N = 241)\) separately. The correlations among the tests of creativity were also significant. The average correlation for boys was 0.26 between the creativity tests and I.Q., and 0.28 among the creativity tests themselves. For girls, these correlations were found to be 0.27 and 0.32 respectively.

1 J.W. Getzels and P.W. Jackson (eds.) Creativity and Intelligence: Explorations with Gifted Students. New York: John Wiley and Sons, Inc. 1962, p. 20.

2 For detailed information, see Chapter II.
These relationships indicate that creativity and intelligence have common variance, i.e., they measure common domain of human intelligence. Therefore the validity of the hypothesis that creativity is a dimension distinct from intelligence may be doubted.

In another study of the relationship between intelligence and creativity, Cline, Richards and Needham (1963 b) utilized California Mental Maturity I.Q. scores as the index of general intelligence and seven creativity measures from Guilford's battery. The data was collected from male (N = 79) and female (N = 40) high school students. It was found that the average of the coefficients of correlation between creativity and I.Q. for boys was .21 only. In case of girls, correlation between Creativity and I.Q. was found to be .33 whereas between tests of creativity themselves, it was .24.


4 For details, see Chapter II.
This study reveals that the creativity tests correlated more strongly with intelligence index than with each other. And, it holds with regard to the results of both the sexes. These results too negate the hypothesis that creativity and intelligence are independent dimensions of individual differences.

Torrance and Gowan (1963) on utilizing Torrance battery of tests of creativity and indices of intelligence (such as Wechsler Intelligence Scale for children - 1949) found that the correlations between the sum of five verbal subtests and the sum of five performance subtests for 100 boys and 100 girls at ages: 7.5, 10.5 and 13.5 were .60, .68 and .56 respectively. Thus verbal and performance indices of intelligence are found to be substantially related. In contrast, the Torrance group reports that verbal and performance indices of creativity are independent. Thus evidence is available that the

creativity domain as defined by the Torrance group of researchers does not possess the kind of generality characterized by the domain of intelligence tests.

Wallach and Kogan (1965) utilized another distinct battery of creativity and the Wechsler Intelligence Scale for Children as test of intelligence in order to study the relationship. The ten indices of creative thinking were found to be strongly correlative; the median correlation being .41 and the range (.07 -.74). The indices of general intelligence also strongly correlated with .56 as median and (.12 -.80) as range. When measures of creativity are correlated with measures of intelligence for the whole group, the coefficients are quite low (no correlation exceeds .23).

When the data of this sample were divided sex-wise, and the same relationships studied for separate groups, the following statistics were obtained. The average intercorrelations among

creativity measures, for total, boys, and girls were of the order .41, .34, and .50 respectively and were almost as strong as the average correlations .51, 50 and .55 respectively among indices of intelligence. On the other hand, average correlation between creativity and intelligence indices were .09, .05 and .13 respectively, i.e., of the order of .10.

This is the only study so far conducted, in which creativity is evolved as a dimension of individual differences, distinct from intelligence. Though the concept of creativity seems very sound from statistical point of view yet it is not inclusive of all the factors that involve in creative operation. Raine (1968)7 utilizing Jalota’s test of mental ability and Minnesota tests of creative thinking studied the relationship by collecting data from Higher Secondary School students of Rajasthan. His recorded correlation between intelligence and creativity (.182) supports the earlier findings.

All the studies reported above utilize the holistic view of creativity. In order to understand

the relationship between intelligence and creativity when the latter is considered as a composite of ability factors, it seems proper to review the constituents of creative ability.

(11) FACTORS OF CREATIVITY

The effort to identify observable factors in the creative process extends from relatively simple analyses to the more recent work of Guilford and his associates where 14 factors were identified and 53 tests employed to measure different factors. 8

French et al. (1963) 9 discovered that the dimensions most directly concerned with creative abilities are "originality" factor; "Semantic Redefinition" factor, "Figural Adaptive Flexibility" factor, and "Semantic spontaneous Flexibility" factor.

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8 For details, see, J.P. Guilford and R. Wilson's studies, Chapter II.

The various factors of creativity reviewed in these researches can hardly be comprehended in the absence of the S.I. model of intellect put forth by Guilford in 1960. The model (Fig. I) represents operations, productions and contents as three facets of intellect. The greatest potential value of this model is that it offers a unified general theory of intelligence.

The divergent thinking abilities that are the major and distinct constituents of creative ability can well be perceived with the help of the S.I. model and the empirical researches. These ability factor provide the bases to devise pure test of the selected ability in a medium of expression.

(iii) RELATIONSHIP BETWEEN INTELLIGENCE AND DIVERGENT THINKING:

It is worthwhile to review a few important studies that have a bearing on the relationship between intelligence and factors of divergent thinking/creative ability. Thorndike, on utilizing the Guilfords group's data (1959) about "three faces

of intellect" finds that the average correlation among the ten divergent thinking raters was .27. The average of the 60 correlations between the general intelligence and the divergent thinking test, in turn, was .24. These relative magnitudes suggest that most of what the divergent thinking measures have in common is the variance they also share with the measures of general intelligence.

Thorndike analysed another set of materials gathered by Wilson, Guilford, Christensen and Lewis (1954). In this analysis too, he finds that the average of correlations among the twelve general intelligence measures was .23; the average correlation among the sixteen divergent thinking indicators was .41; and the average of 198 correlations between the general intelligence and the divergent thinking measures was .12. Here again, we have a picture similar to the one obtained in the study quoted earlier.


12 For details see Chapter II.
Prime and Bell (1959)\textsuperscript{13} in investigating the relationship with chronological age, mental age, I.Q. and sex to divergent thinking tests found that the students with an I.Q. of less than 130 tend not to score well on tests of creativity. When the students score above 130 I.Q., an increase in I.Q. is not necessarily related to an increase in creativity score. The relationship seems to be curvilinear. The implications of this relationship is that the person within an I.Q. of less than 130 may not be able to express his creativity in a meaningful way.

The study does not explain how the curvilinear relationship hinders the manifestation of creativity fully at the level lower than I.Q. 130. Cropley (1965)\textsuperscript{14} utilized the children of Edmonton school to study the relationship between divergent thinking and convergent thinking. He found the following coefficients of correlations.

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The data do not support the notion that convergent thinking and divergent thinking are completely independent aspects of intellect.

In the studies of Getzels and Jackson; cline, Richards and Needham; Torrance and Gowan; and Raina Creativity is not evolved as a distinct dimension to measure the individual difference of gifted persons. All the measures of creativity in the above studies cover a domain common to general intelligence. Therefore, it would be difficult to devise a test of creativity which identifies high creative individuals only. A study of personality dimensions, of creative individuals will also be a problems in such a situation. Wallack and Kogan realized the complexity of the problem. They developed the tests of creativity which correlate highly among themselves but poorly with measures of
general intelligence. But the concept of creativity includes fluency and originality factors only. Wallach and Kogan seem to be of the opinion that individuals who perform well on originality factors can do so on flexibility and elaboration factors as well. Perhaps they would also have sensitivity to problems. Researches conducted by Guilford and his group do not confirm this Corollary of Wallack and Kogan's concept of creativity.

Guilford's hypotheses put forth in 1950 provides the basis for his factor-analytic studies at later stages. Creativity defined in terms of factors provides a more sound basis to measure the factors in pure form. The factor-constituents of creativity seem to indicate that creativity can well be explained in terms of these factors. But it is not so. There may be individuals who can perform well on tests of divergent thinking, cognitive abilities and evaluative factors but they may remain still unproductive. Hence, the need to understand the roles of these ability factors in the background likely to be produced by concomitant personality dimensions or of understanding the interaction between the ability factors and the personality dimensions seems essential. It is due to the multiple facets
of creativity that some psychologists view creativity as a personality dimensions rather than an ability.

However, in the present study, the divergent thinking ability has been assumed as the major dimension of creative ability at the expressional level. For Guilford, Divergent thinking ability, when it operates, seems totally opposite to convergent thinking. But the two sub-dimensions correlate positively. Price and Bell's study shows that the degree of relationship depends upon the nature of samples particularly with respect to I.Q. and socio-economic status. In homogenous samples, the two sub-domains may be obtained distinct from each other.

(iv) CREATIVITY AND SOCIO-ECONOMIC STATUS

Theoretically, it was found that actualization of creative potentialities depends partly on the environment provided to the gifted child. But empirical researches provide conflicting views about the relationship between creativity and socio-economic status.
Getzels and Jackson (1962)\textsuperscript{15} studied the type of family environment with which creative children are associated. It was observed that the parents of the high I.Q students were more diligent with respect to the behaviour of their children \((p \leq .05)\), were critical of the children and the school \((p \leq .01)\), and were desirous of proper external behaviour from the friends of their children. In addition, the parents of the high I.Q group had higher occupational goals for their children and purchased more mass-media magazines and less controversial type of literature than the high creative groups' parents. The authors interpreted this to imply that parents from the high I.Q. homes stress greater conformity and exert greater pressure on the child to do well scholastically than parents from the homes of the high creative group. The parents of the high creative group focused mainly on other qualities like independence in thinking, and the child interest and enthusiasm and breadth of experience.

\textsuperscript{15} J.W. Getzels and P.W. Jackson, op. cit. \(\text{pp. 61 - 76}\).
Klatskin (1952)\textsuperscript{16} while studying the shifts in child care practices in different classes, found that the differences in child-rearing practices between the middle social class and the lower social class relate in certain ways to the differences in philosophy of child rearing held by the parents of the high creative and low creative children. The differences relate to the fostering of independence and dependence in behaviour and thought. Middle class parents are generally conceived as more permissive of the child's behaviour early in life and of his behaviour within the family situation. They are less severe in toilet training and in wearing practices. Middle class parents are characterized as permitting their children to communicate openly with them, to select their own occupations, to exhibit instances of developmentally immature behaviour in interacting with parents more often than do lower class parents.

Raina (1967 a)\textsuperscript{17} Torrance and Aliotti (1967)\textsuperscript{18} pointed out the differences in child-rearing


practices of boys and girls. These differences are related primarily to the distinctive cultural norms for boys and girls. Boys are expected to be more aggressive, rebellious, competitive, non-conforming and uncooperative. Girls are expected to be sensitive and obedient to social controls, cooperative, and accepting of authority. They observed the contrasting punishment techniques used for boys and girls of the different socio-economic groups.

A study undertaken by Skager et al. (1960) with the purpose to determine whether the quality and quantity measures of accomplishment showed a differential pattern of correlation with scholastic aptitude and socio-economic status. The measures of socio-economic status did not relate to either of the measures of creativity. They concluded on the basis of their data that income, position and even education of parents are less relevant to creative accomplishment of children than an intellectualized home atmosphere. But the researchers suggest still other replication of the study with

the secondary school children, before concluding that socio-economic status is not related to either the quality or the quantity of creative accomplishment.

In his Ph.D. Thesis, Raina (1968) while studying the socio-economic status of creative and non-creative students of higher secondary schools, found that higher creative group came from parents who were comparatively better in education than the parents of the lower creative students. Nearly 40 percent of the high creative students came from the homes where the parents had received an education at the Post-graduate and graduate levels, while the percentage of the parents of low creative students was 20 only. A large number of low creative students came from homes where parents were illiterate or primary school pass.

47.77 per cent of the high creative students came from homes where the parents income per month was between Rs. 500 and Rs. 1000 and above, but the percentage of low creative in this case was 17.65. In lower income groups the correlation was low.

20 Raina, Loc. Cit.
The socio-economic status determined, primarily, by factors like education, income and occupation of parents seems to provide rich environment to foster creativity. It is quite obvious from the studies of Getzels and Jackson, Raina, Torrance and Aliotte show that the parents of high I.Q. students encourage conformity in the behaviours of their off-springs. They encourage their children to work for the well-established occupations and ways of living simply to avoid risks and failures in life. Not only this, they expect a similar behaviour from the friends of their wards. In contrast, the parents of creative children seem liberal in providing open and permissive atmosphere in the family. Getzels and Jackson pointed out that the parents of creative children encourage qualities like independence in thinking and judgment. They provide opportunities to the children to behave according to their own interests and enthusiasm. Such environment is more conducive for gifted children to respond to the demands of inner life independently. Klatkin's observation that the differences in child rearing-practices in middle social class and low social class are due to the difference in the philosophies of life of the two families.
It is just possible that the educated parents just go beyond the traditions and prevailing practices of the society. Since the middle class families are more permissive they provide opportunities to children to communicate their feelings to parents and also to select occupation of their choice at a later stage. They donot adopt punishment techniques to get their wards conform to their own thinking and occupations.

Raina, Torrance and Aliotte point out to the different norms set for boys and girls. For them, it is the social climate that encourages boys to react independently to stimuli. Girls donot get that much of independence. It is probably this reason that creative boys are produced more in number than creative girls in every society. Skager etal's study indicates no relation between socio-economic status and creativity. This may be true in case of gifted children born with high degree of creative ability. The expression of creative potentiality in case of such children cannot be inhibited by social restrictions. This seems quite natural as is evident from the lives of Tagore, Ramanujan and other born - creatives.
(v) CREATIVITY AND PERSONALITY DIMENSIONS/TRAILS

Wallach and Kogan (1965)\textsuperscript{21} in a bid to study the effect of modes of thinking on personality traits selected a sample of 151 fifth grade children (70 boys and 87 girls) from middle class families with respect to socio-economic status.

They found that the highly creative and intelligent girls behaved in ways indicative of high levels of "ego-strength". The girls high in creativity but low in intelligence appeared to be having the greatest difficulty in coping with the achievement and the social demands of the school situation. Their academic motivation was low, and they were the most withdrawn and hesitant pupils in the class-room. For girls with high intelligence and low creativity, in turn, school apparently presents few problems despite evidence of some constriction in intellectual functioning and in interpersonal relationship. Finally, the girls low in both creativity and intelligence appeared to be compensating for poor academic performance by seeking,

\textsuperscript{21} Wallach and Kogan, op. cit., pp. 66-94.
with qualified success, for satisfactory inter-
personal outlets. In the case of the boys, only
intelligence effects were noted. The less
intelligent boys manifested significantly lower
levels of concentration than their highly intelligent
peers. Such intrapunitiveness might be considered
a typical outcome of poor academic performance in a
middle class elementary school.

This study indicates that creativity in
girls when accompanied by high intelligence is no
problem. But in case, it is associated with low
intelligence, the girls face problems in adjusting
their inner life to the demands of the society. The
girls low in intelligence and creativity both have
to submit to social norms and restrictions simply
to get social recognition because they cannot
achieve it by productive work.

Getzels and Jackson (1962)\(^{22}\) conducted a study
to find out concomitants of high creativity and high
intelligence separately. An intensive study of each
group was carried out with respect to the nature of

\(^{22}\) Getzels and Jackson, op. cit. pp. 15 - 76.
behaviour in school, value orientations and family environment. It was observed that differences in modes of thinking could not affect level of achievement in school subjects. Creativity accounted for a large portion of variance in school subject marks in the same way as intelligence did.

Further, the high creative individuals seem to be guided more by the needs of their own life instead of the external incentives and pressures. A little relationship was found between what the creative individuals considered suitable for success in life and what actually they did. They did not care even for the approval of teachers. On the other-hand, the high I.Q. individuals are guided by external needs and therefore there is high relationship between what they think essential for success in life and what they actually do. Teachers like such individuals.

Another dimensions where the differences were found was fantasy. The high creative adolescents were significantly higher than the high I.Q. adolescents in stimulus free themes, unexpected endings, humour, incogruities, and playfulness, and showed a marked tendency toward more violence in their stories. The high creative adolescents have experimental
attitude toward conventional ideas, objects, and qualities. Rather than dealing only in predetermined categories, as the high I.Q. adolescent likely to do; he tends to use categories that he himself originates. Another point of difference was that high I.Q. adolescents tended to favour the anxieties and delights of "safety", whereas the high creative adolescent tend to favour the anxieties and delights of "growth". Further the number of choices for unusual occupations in the latter category of adolescents was much larger than the number of such choices in high I.Q. adolescents. The latter preferred conventional occupations.

✓ This study indicates that creative adolescent performs an action with vigour and imagination provided it suits his temperament. He looks at every thing with an experiential outlook since such an attitude provides outlets to his creative energies. He never accepts things as given by others. He favours anxieties because they motivate his energies to manifest in problematic situations and, in turn, he feels grown up and better equipped to tackle the problems of life. In contrast a high I.Q. adolescent tends to adopt the verified and tested
ways of life simply to avoid risks and failure. Therefore the latter is guided more by external forces than the inner ones.

In two of her pioneering investigations Roe (1946a), (1946b) studied clinically twenty top-ranking American painters. She reports that creative activity is satisfying to the basic autonomous drive and also to the extent that the subject submerged himself in his work and lose consciousness of his identity of the harmonious drive.

In a number of studies of motivation for scientific creativity, Stein (1962, 1963) and Stein et al. (1958) found that creative subjects were more autonomous, more devoted to their goals and


made greater sacrifices to achieve them in comparison to non-creative subjects. The creative subjects were more dynamic and more integrative in their approach to complex situations.

Barron (1956) in an attempt to study the personality concomitants of originality, found that originality was related to independence of judgment, to personal complexity, to self-assertion and dominance, and to the rejection of suppression as a mechanism of the control of impulse.

Using the same one hundred subjects, Barron (1957) in a later study concerned with originality in relation to Personality and Intellect, compared the relation between selected personality characteristics and creativeness. The high scorers on originality were discovered to be "intelligent, widely informed, concerned with basic problems, clever and imaginative, socially effective and personally dominant, verbally fluent, and possessor of initiative."


The low scorers were described as conforming, rigid, stereotyped, uninsightful, apathetic and dull. Barron then partialled out the effects of the intelligence test scores from the relationship found between the originality tests and other measures. There remained the following significant relationship; (a) disposition towards integration of diverse stimuli; (b) energy, fluent output, involvement; (c) personal dominance and self-assertion; (d) responsiveness to impulses and emotions; (e) expressed feminity of interest and general effectiveness of performance.

Drewehl (1956) conducted a study to explore relationships between creativity and certain objectively measured personality and intellectual factors. The creative and non-creative groups were discriminated by objective criteria.

The intellectual factors which were found to a better degree among creative individuals are

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verbal facility, fluency, flexibility and originality. They are also found to be more withdrawn, quiescent and nonconforming. They exhibited more individuality.

Raina (1968) found that high creative subjects exhibit the need of greater achievement, autonomy, dominance, change and endurance than the low creative subjects.

The high creative females were high in change and endurance than the high creative males, but the latter were high on the heterosexuality than the high creative female. The high creative male showed the need of greater achievement, autonomy, dominance, change, endurance, and aggression than the low creative male. The low creative males exhibited greater deference, affiliation, succorance, abasement and heterosexuality. The high creative females were significantly higher than the low creative females on achievement, while the low creative females were characterized as higher on deference, order, affiliation, succorance and heterosexuality traits.

There are certain dimensions which differentiate creative person from non-creative one. The differences seem due to differences in the organisational pattern of personality traits because the organization is to provide outlets to the inflowing creative energies. It is perhaps due to this reason that Getzels and Jackson, Roe, Stein, Barron and Raina's creative individuals act according to the demands of their personality growth rather than under external pressures. It is this reason that the creative individuals feel the need of autonomy, achievement and self-assertion as recorded by Raina, Roe, and Stein. They enjoy activities like humour which involve their imagination (Getzel and Jackson). Sometimes when creativity is not concomitted by sufficient degree of intelligence, the creative individual fails to manifest the bubbling energies and it was observed by Wallach and Kogan that the creative girls had to withdraw from real situations. The creative individuals rebel against the irrational authority or object which blocks the manifestation of immature and growing creative energy. It is in this context that Barron's high original thinking individuals reject suppression as a mechanism of control of impulses. Since the
creative person tends to act as a whole as demanded by a situation, he behaves in a flexible manner. His thinking tends to be complex because it involves all possible aspects of the situation and therefore all possible psychic functions. The non-creatives, on the other hand show rigidity and less imagination.