Addendum

(Corrections as suggested by the Examiners)

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<table>
<thead>
<tr>
<th>CONTENT</th>
<th>PAGE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Introduction</td>
<td>1-36</td>
</tr>
<tr>
<td>Discussion</td>
<td>37-60</td>
</tr>
<tr>
<td>Bibliography</td>
<td>61-69</td>
</tr>
<tr>
<td>TABLE NO</td>
<td>LIST OF TABLES</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>50B.</td>
<td>T statistics showing the mean difference of Creativity among Rank achievers and High achievers.</td>
</tr>
<tr>
<td>50C.</td>
<td>T statistics showing the mean difference of Achievement-Motivation among Rank achievers and High achievers.</td>
</tr>
<tr>
<td>50D.</td>
<td>T statistics showing the mean difference of Personality among Rank achievers and High achievers.</td>
</tr>
</tbody>
</table>
GENERAL INTRODUCTION

It is reasonable to assume that the progress of a nation does not depend so much upon the natural resources it possesses as it depends upon the persons of high calibre, or whose shoulders ultimately live the task of exploration of natural, physical and human resources. All over the globe and specially in India, till recent times, it is quite unfortunate in our educational system, we fail to distinguish between the divergent and convergent talent. Herbert Spencer has remarked that the great aim of education is not knowledge but action (Spencer in Osborn, 1966). Modern education should develop to provide children relevant and new meaning to their classroom experience.

Student who secure very high marks at examination, often may not be revealing any new ideas, to do so in writing a story or essay. Getzels and Jackson (1958, 1959, 1961) in their studies have differentiated highly creative students from highly Intelligent ones. They suggested that, the high IQ students is rated as a more desirable students by their teachers, more ambitious, and more hardworking or studious. On the otherhand, the creative children of their fantasy productions, usually made significantly greater use of stimulus-free themes, unexpected endings, humour and playfulness. They have excellent ideas but these unique and unusual ideas simply do not confirm to the standardized dimensions, the behavioral norms on which these responses are judged. Their teachers also agree in this point (weisberg & Springer, 1961; Torrance, 1959).

In the present study an attempt has been made to explore the
influence of Intelligence and Creativity on a student to perform high or low academic achievement.

Achievement motivation is concerned with the arousal of interest in learning and, to that extent, is basic for academic achievement. Student must be so motivated that their interests will be directed toward definite goal and help them to prove their academic performance. Ryan (1985, p.142) presented data indicating that "strong and stable self-esteem seems to emanate from strong sense of self, which motivationally means intrinsic motivation and more integrated internalization of extrinsic motivation". Ambile(1983) has pointed that the impact of an event on motivational processes is determined not by the objective characteristics of the event but rather by "its psychological meaning for the children".

Personality characteristics also are important for achievement. Personality characteristics such as intellectual and artistic values, breadth of interests, attraction to complexity, high energy, concern with work and achievement, independence of judgement, autonomy, intuition, self-confidence, ability to tolerate and resolve conflict and creative self-image are related to creative achievement in the sciences (Albaum, 1976; Albaum & Baker, 1977; Chambers, 1964; Gough, 1979; Owens, 1969; Roe, 1953). Guilford, Christensen, Frick and Merrifield (1957) found that ideational fluency a prominent characteristics of creativeness appears to be related to confidence, asendence, greater aspitation of originality. They found in their study that students having higher originality score tend to be more interested in aesthetic
expression, tolerant of ambiguity and feel less need for discipline and orderlines.

"underachievement" and "overachievement" refer to the fact that a group of pupils all of same age, the same IQ, the same type of home background, will still vary in the scores that they obtain on academic achievement (Thorndike, 1963; P.2-3).

The high achieving students have a greater inborn desire for mastery, achievement, recognition, popularity or superiority. The results of Benbow and Arjmand (1990), Phy and Benbow (1991), and Sanders, Benbow & Albright (1991) revealed that among those in the top 1% in ability, educational opportunity, family background and attitudes have stronger relationships with subsequent academic achievement than does ability. Though high achievers have been considered, studies on rank achievers have possibly not yet been attempted.

The term "average" is a statistical concept indicating the central tendency of a group. The analogy implies that any educational system based on average requirements fall short of being adequate because no actual child has average needs and average abilities. On the contrary, children differ from one another so greatly in abilities and interests that no curriculum based on a concept of the average child can possibly be adequate.

Underachievement is a function of such variables as - the discrepancy among grade-point average, self- perception of effort and student's perception of teacher feedback regarding effort (Ford, 1992). This definition is in line with that described in
Chaplin's Dictionary of Psychology (1975, p.5-6). In fact most definition of achievement incorporate the notion of effort. Mandel & Marcus (1988) stated that most definitions of underachievement embrace the idea of energy expanded to accomplish task and of effort made to attain a desired goal. By adolescence, the pattern of behavior characterized by underachievement in activities are involved, has usually become well developed from the foundations laid during the childhood years (Doherty & Culver, 1976). Incase of average and low achieving students educational problems arise out of difficulties with studies, examinations and handicaps in expressions.

The underachievement is characterised by such attributes as disorganization, lack of concentration, perfectionism, low self-esteem, unwillingness to confirm, anxiety, Vulnerability to peer pressure and a sense of external locus of control (Colman, et al. 1966).

In this perspective, academic achievement of the student is predominantly influenced by a number of factors which can be broadly classified as: (a) Intelligence (b) Creativity (c) Achievement motivation (d) Personality characteristics. Academic achievement may be the result of interactions among these factors.

We have proposed to consider in the present study how these factors influencing academic achievement of the rank achievers and high, average & low achievers.

INTELLIGENCE

To what extent human qualities are innately given or determined by
upbringing and environment has long been a source of dissension between radical reformers and the conservative establishment. In England, during the nineteenth century, it was taken for granted that the upper classes inherit abilities superior to those of the lower classes and required a better education to fit them for their position in life. Conversely in the United States all people were believed to be created equal, and to deserve equal educational opportunities (though this did not apply to the black slaves and their descendants). Such a polarity of ideologies does not necessarily coincide with political attitudes, though it is true that extreme hereditarian and racist views were held in Nazi Germany and extreme environmentalism prevailed in Soviet Russia.

HERIDITY-ENVIRONMENT DETERMINATES

The early pioneers of mental testing, particularly Terman in America and Burt in the United Kingdom, were measuring inborn ability, conceived as almost wholly determined by the genes. Hence the Intelligence Quotient (IQ) measured quite early in life, showed the level of education and occupation each child would be able to achieve. However, even in the 1920s, critics argued that the Army Alpha test results of different national groups of recruits reflected the economic and educational environment of these groups, not innate ability. Several studies showed that children reared in deprived environments obtained low IQs and that, if adopted by well-educated foster parents, the scores tended to improve. It is found from the studies of Shimberg (1958), Shepard (1942), Devis (1946), Piaget (1952), Anastasi (1958), Leehman (1959), Bloom
(1964), Wiseman (1967), Gruber (1975), Chatterjee (1975), and Sinha (1978) and many others that the increase of decrease in the level of intelligence of a subject depends to a considerable extent on the nature of environmental stimulation. Shockly (1972) and Jensen (1969) are among the foremost supporters of the so-called genetic theory of Intelligence. Theirs conclusions are based mostly on the analysis of data from .62 to .85, in otherwords, the average difference in IQ of these separated twins runs about 3 or 4 points of those who were never separated. The average IQ difference in fraternal twins living together as well as siblings runs about 12 points. Based on these findings Shockley has concluded that heridity is responsible for 80% of Intelligence, or 4 times as important as environment.

There was a violent reaction by radical students groups, blacks activists and many social scientists against his suggestion that black-white differences in Intelligence in the United Stated might be largely genetic in origin. This increased the distrust of Intelligence testing amongst the general public. Also, in several legal contests the application of such tests for assigning dull children to special education programmes of restricting entry to college or to various employments were challenged, often successfully. However the majority of Psychologists rejected both extreme views, and admitted that both genetic and environmental factors are necessary for human intellectual growth and that these interact with one another from conception onwards. Yet views still differ widely on the relative importance of these factors, with
estimates of "heritability" of intelligence ranging from 40 percent of less to 70 percent or more. These figures represent genetic variance, that is, the extent to which genetic differ between people account for high or low intelligence scores. They do not imply that 40 percent of any other percentage of a person's intelligence is of genetic origin, for genetic potential is only realized in combination with appropriate environmental conditions. It is possible to use the statistical technique of analysis of variance to estimate the major underlying factors in intelligence and it is found that very little distortion occurs in assuming an additive model, where the total genetic and environmental components add up to 1.0 or 100 percent. Several sub components have also been investigated - (dominance, assortative mating, genetic-environment covariance)- but there is little consensers among genetic statisticans regarding their relative importance. Boderman (1972)says,"intelligence is, however, a composite and complex character, the expression or which must be dependent on a combination of the effects of environmental factors and products of many different genes, each genes probably only having a small effect on measured IQ characters determined by the joint action of many genes like height and IQ are often called quantitative characters because, they are measured on a contineous scale. They are much more suseptible to environmental influences than are polymorphisms such as blood groups which seem to be pretty well independent of environmental factors".
Evidence of Genetic Determinates

The bulk of evidence for genetic factor in intelligence derives from kinship studies, where correlations are found between parents and offspring, or between siblings and particularly between twins. Monozygotic or identical twins are known to carry the same genes, whereas dizygotic or nonidentical twins have only half their genes in common. First cousins share one eighth, and so on. The obtained correlation coefficients (r) between IQs of monozygotic twins do approximate 1.0 as would be expected if intelligence was wholly genetic. Similarly the correlation coefficients for siblings, or for a child with one of his or her parents, approximates .50, but some correlations do not fit closely, and different studies of the same kinship often give widely varying results. Bauchard and McGue (1981) have collated 3 studies, and the following are some of their average correlations: (a) for monozygotic twins reared together, obtained figure of .86 falls below 1.0 partly because the twins of environments (including prenatal conditions) are more dissimilar, as with such twins reared apart, the correlation coefficient drops to .72; (b) dizygotic twins give a lower average of .60, as expected, but it is higher than the .47 for siblings, probably because they are brought up more alike; (c) pairs of unrelated children should give zero correlations, but two in the same home show .29 and an adopted child with one foster parent averages .19.

Adoption studies and other evidence

Adopted children obviously carry genes different from those of their foster parents, but are likely to be affected by the foster
home upbringing. Several studies have found a tendency for foster children's IQs to rise above the level expected in their biological parents' home, though the maximum gain seems to be about 10 IQ points. Alternatively, correlations are calculated between children and foster parents, and these tend to be lower than the correlations with true parents' ability (if known). However, different studies vary, and the data are often unsatisfactory for various reasons, including selective placement, where the adoption agency tries to place the child with foster parents of education and socioeconomic status similar to those of true parents. This tends to boost child-foster parent correlations, and would partly account for the unexpectedly high correlation of .29 between unrelated children in the same home.

Apparently, then, all intelligence tests are affected by cultural background and all these cognitive tests are dependent on past experience, language, training or motivation.

**Ethnic and Racial Group Differences**

The claim for genetic differences in intelligence between radical or ethnic groups is highly unpopular since, throughout history, supposedly inferior groups have been the victims of discrimination, hostility, repression and even genocide. Though there is evidence both for and against the notion of genetic differences, there are no satisfactory methods of separating genetic from cultural influences. A very thorough survey of black-white differences, by Lohlin et.al.(1975) concluded that they are partly attributable to "inadequacies and biases in the tests themselves", partly to a
"differences in environmental conditions", and partly genetic. But it is not possible to tell "the relative weight to be given to these three factors".

Constitutional Factors

There are numerous physiological conditions which affect intellectual growth adversely. These are usually present at birth, but they are constitutional, not genetic in origin. They occur much more frequently in low social class and ethnic minority families. Dull and poorly educated parents often live in poverty. The mother's health is weakened and she is likely to incur "reproductive causality". Infant mortality is high and surviving children may be unhealthy, inadequately cared for, or malnourished. They achieve poorly at school and are fit only for unskilled jobs. So the cycle repeated itself and it is difficult to say which features of this syndrome are causes and which effects.

Mothers who take drugs or alcohol or undergo physical or emotional stress during pregnancy are especially apt to produce premature or unhealthy babies. Premature children and those with a difficult delivery tend to be below average in intelligence, though this adverse efficacy seems to decrease as they grow older.

Early Stimulation and Deprivation

Remarkable advances in knowledge of early child development, made in the 1970s, have shown that young children are active in their own mental growth, and not merely shaped by the environment. They appear to have inborn dispositions to be selectively alternative to human visual and auditory and to react particularly to any novel
experiences. Quite early in the first year, children and their mother engage in what might be called prelinguistic conversations, that is activities in which each stimulates the other in turn. The mother's taking encourages the infants vocalizations and later speech.

It is generally agreed that the formation of close mother-child bonds in the early months is crucial to normal cognitive growth. The father is also important in providing a male model to children. If he is absent for prolonged periods during early childhood, whether, because of job demands, marital disharmony, or other reasons, the sons tend not to show self-esteem and are more given to antisocial activities to peers. Their abilities come to resemble the female with fewer mathematical and visuospatial scores.

Effect of School and Socioeconomic State

The National Survey of Health & Development reports (Dauglas, 1964; Dauglas et.al. 1968) makes it clear that the children from economically and culturally deprived homes are burdened with a cumulative series of hindrances to achievement and educational progress. The children from deprived home not only suffer due to education have hardly valued in their homes, but also they were disadvantaged at school itself. The poor achievement of many slow learners is due as much to the limitations of their cultural background as to the limitations of ability. Moreover, deprivation influences not only attainment but also the development of abilities. Various kinds of social disadvantages, particularly unstable and broken family circumstances and marked deviations from
acceptable child care, affect progress of more children than we realize (Guilford, 1969).

**Extremes of Intelligence**

**Mentally Gifted**

With the development of Intelligence tests it has become possible to select for study large groups of superior children and then to follow their careers. The gifted children were better than average physical specimens. They averaged more than an inch taller than others of the same age in elementary school. Their birth weights were above normal. They talked early and walked early. They read an unusually large number and variety of books, but reading did not interfere with their superiority in leadership and social adaptability.

**CREATIVITY**

Creativity is one of the most highly valued qualities of human beings because creative acts influence all spheres of life. Inspite of the enormous amount of psychological research done on creativity in recent years, there is still little conceptual agreement as to what creativity is. It is often conceived as an ability to bring something new into existence. Yet others think of as an ability, rather as the psychological process or processes by which novel and valuable products are created.

**NATURE**

There are four major psychological aspects of creativity upon which attention is focused: (1) the creative product, (2) creative process, (3) the creative person, (4) the creative
situation.

The Creative Product

In each field of creative endeavour there are several dimensions peculiar to the product of the field to which they satisfy. The five criteria of originality, adaptiveness, elegance, transcendence and realization are the several traditionally recognized demands of architecture. A similar extension of the criteria of creativity could be undertaken in all fields of endeavour.

The Creative Process

The first phase of the creative process involves a period of preparation, during which one acquires the skill and techniques and the elements of experience that make it possible for one to pose a problem to oneself. Next, a period of concentrated attention in an attempt to solve the problem. This may involve a relatively brief period of times, during which attention is focused solely upon the problem until it is solved, but perhaps more often and especially when the highest levels of creativity are ultimately reached, there is a blocking of one's effort to solve the problem and the experiencing of so much frustration, tension and discomfort that one is led, out of sheer self-protection, to the third phase, a period of withdrawal from the problem, a psychological "going out of the field", a period of renunciation of the problem of recession from it. This phase is referred to as a period of incubation. This may be of quite variable length. The fourth phase may be another brief one a moment of period of insight, accompanied by exhilaration, glow and elation at the moment of insight. The fifth
and final phase is a period of verification, evaluation, elaboration, realization & communication of the insight that has been experienced.

Factor analysis and quality of thinking

A gross analysis of the creative process reveals that the creative process is a complex set of cognitive & motivational process involving perceiving, remembering, thinking, imagining, deciding. It has divergent thinking which places a premium of richness and novelty of ideas. There is now a general recognition that both divergent thinking and convergent thinking are required in all creative thought although their relative properties will vary widely from one creative task to another.

The Creative person

The determination of the characteristics of creative persons requires first that such individuals be accurately identified and the level of creativity measures. The creative person appears to be intelligent, yet there is a far from perfect correlation between intelligence as measured by intelligence tests and creativity. Within several professional groups the correlation is essentially zero. Certain degree of intelligence is required for a person to be creative and this level of intelligence varies from field to field and in some is sometimes surprisingly low.

Psychological health & cognitive style

As to the relationship between a person's creativeness and his
psychological health - a relationship widely studied and widely disputed - the situation is again not a simple one. One of the prominent characteristics of the test performance of male creative group is a tendency to score high on scales that measure feminity. Creativeman reveal an openness to their feelings and emotions, a sensitive intellect and an understanding self awareness and their wide range interests include many that in Western culture are thought of an feminine. They give fuller expression to the feminine side of their nature than do their less creative peers. The creative person is not only open to experience; he is intuitive about it.

The Creative Situation

while speaking of creative situations one should recognize that creativity is not a fixed trait of personality but something that changes over time, waxing and wanling, facilitated by some life circumstances and situations while inhibited by others. Creative situations allow child to act independently but reasonably and responsibly, which is improved when there is closeness between parents and child so that neither our dependence is fostered nor a feeling of rejention is experienced by the child. Creativity also depends upon the development of an individual ethical code. It cannot be said conclusively that creative thoughts and actions are stimulation more by solitariness and separateness, the individual working alone or by interactions with others in group activity. The evidence also shows that individual differences play an important
DEFINITIONS

There is no clear and concise definition of creativity inspite of the tremendous amount of research done and various definitions put forth by different scholars working in the area of creativity.

Torrance (1965) conceives creative behavior in a multidimensional fashion. In its global definition he maintains that creativity is composed of constellation of general abilites, personality variables and problem solving traits. Torrance defined creativity "as a process of becoming sensitive to problems deficiencies, gaps in knowledge, missing elements, disharmonies and so on identifying the difficulty; searching for solutions, making guesses or formulating hypothesis about the deficiencies; testing and retesting these hypothesis and possibly modifying and retesting them and finally communicating the results" (p.19).

Torrance's definition is useful as it makes it possible to define operationally the kinds of abilities, mental functioning and personality characteristics that facilitate or inhibit with awkward historical usage and equally applicable in scientific, literary, dramatic & interpersonal creativity.

Guilford (1956, 1959, 1960, 1986) has conceptualized creativity in terms of the mental abilities involved in creative achievement. In his well known structure of intellect, he sees creative thinking as clearly involving what he categories as divergent production as the generation of information from given information, where the emphasis is on variety of output from the same source (innovation,
originality, usual synthesis of perspective). Included in the divergent thinking category are the factors of fluency, flexibility, originality and elaboration. He concludes however, that creative thinking cannot be equated with divergent thinking category. He believes that sensitivity to problems and redefinition abilities are also important in creativity. The redefinition abilities involve transformations of thought, reinterpretation and freedom from functional fixedness in deriving unique solutions. Sensitivity to problems seem to be essential in getting the creative thinking process in motion. According to Guilford(1967) "Creativity is the key to education in its fullest sense and to the solutions of mankind's serious problems"(p.35).

The definitions of creativity as considered by these 2 thinkers been discussed. Creativity as considered in this study, is described as a capacity which can express itself in all areas of life. It is not only artistic but is a specific way of handing information, observing things, behaving, and reacting.

In the Indian context, Rasool(1977) has described that researcher gave us an idea that all of us are born with creative potential and, if given proper environments and techniques, this potential can be recognized, nurtured and measured. Mathur (1977) states that creativity is not a monopoly of a few, if opportunities are provided, everyone has the potential to be creative in his own way. It can be stated that a variety of factors rather than a unitary talent accounts for the observed achievement of creativity. For the purpose of the present study, creativity has been considered as
being referred by Guilford and Torrance and the test used to measure creativity is based on Guilford's distinction made on two types of thinking abilities, namely convergent and divergent thinking. The unique feature of divergent thinking is that a variety of responses are produced, and Guilford relates this divergent production to creativity.

THEORIES

Many theories have been proposed to describe the process of creativity. These theories try to explain the inner working of the creative process. The psychological and philosophical theories are presented here to have sound theoretical understanding of the concept of creativity.

Psychological Theories

a) Psychoanalytic theory

Psihchoanalytic theorists, such as Kris (1952) and Kubie (1958), emphasize the importance of preconscious processes. These processes are believed to occur when the ego, with its emphasis on logical rational thought, temporarily loses its control of the thinking process, so that an unorganized, drive oriented type of thinking can occur. This preconscious level of thinking facilitates associations between ideas related to the immediate problem and other, apparently unrelated but potentially useful ideas. The ideas produced in this way be evalutaed in a logical, regorous way. To engage in preconscious thinking, one must allow oneself to daydream and fantasize.

Freud (1958) believed that sublimation of repressed unconscious
wishes, pregenital and libidinal urages determine creativity. Creativity originates in a conflict with the unconscious mind, the id. Sooner or later the unconscious produces a solution to this conflict. If the solution is "ego-syntonic" it reinforces an activity by the ego or conscious part of the personality and will result in creative behavior, if it is at odds with ego it either will be repressed altogether or will emerge as neurosis.

From very different points of view, Kubie (1958) emphasized the preconscious system, and Wolman (1967) access to unconscious processes. Creativity may mean the ability to use preconscious and unconscious processes effectively. Such an ability implies that a creative individual is not bound by reality, conformity, logical processes, or repetitive unconscious difficulties. If the creative act is associated with neurotic processes, it is apt to become stereotyped, as in the artist who repeats the same picture, or the novelists, who repeats the same book. According to Wolman, creative artists, capable of developing into their unconscious, have more in common with psychoanalysts than with clinical patients.

Followers of psychoanalytic view generally explain the production of poets, artists, and writers based on sublimation. Philips (1957) e.g. told that artist is a successful neurotic person who seeks through socially acceptable channel, the outlet of his unconscious conflicts. On the other hand Kubie (1958) has rejected this view point. He stated that neurosis corrupts, mars, distorts and blocks creativeness. If the neurotic succeeds in producing art objects his unconscious dominates and the objects are expressions
of neurosis, then creativity is not possible.

b) Gestalt theory

Gestalt psychologists (e.g. Kohler, 1969, Wertheimer, 1959) use the terms "productive thinking" and "problem solving" to refer to what others might call creative thinking. Wertheimer describes productive thinking as a process of successive restructurings of a problem. The structural features of the problem set up stresses and tensions in the thinker. By following up these stresses and tensions, the thinker is led to a restructuring of the problem. Successive restructurings occur until a solution emerges. This theory also defines creative thinking primarily as a reconstruction of "Gestalt" patterns that are structurally deficient. Creative thinking usually begins with a problematic situation which is incomplete in some way. The thinker grasps this problem as a whole and after grasping the dynamics of the problem, the forces and tensions within the problem situation, which is structurally incomplete and thus restores the harmony of the whole. In the words of Gestalt theorist, Wertheimer (1945) "Productive thinking does not proceed by either the piecemeal operation of logic, or piecemeal connection of association, but through the cognitive reorganization of gestalten".

c) Associative theory

Associationist theories involve the common assumption that creativity results from novel or unusual associations. Mednick (1962) defines the creative process as "the forming of associative elements into new combinations which either meet specified
specified requirements or are in someway useful" (p.221). The degree of creativity depends on the relative remoteness of the elements used to form the new combination. When asked to respond to a stimulus word, creative people are likely to give some remote or uncommon responses, whereas less creative people tend to give only common, stereotyped responses. The RAT has been standardized on this definition. The test items consists of three words drawn from mutually remote associative cluster and the subject is required to find fourth word which serve as an associative link between them, for example frog, toad, shoe will have horn as the associative word. To attempt an item successfully on the test, the examiner must give associative responses that are likely to be at a low probability in almost anybody's hierarchy. The test is reported to have good predicitive value as Mednick found high correlations between RAT and associative productivity, but it is not known what factor or factors it represent, and it does not cover all divergent production abilities.

For all associationist, thought is a chain of stimulus response connection. A problem initiates a succession of previously learnt responses to try out in the new situation. There is no fundamental differences between the higher and lower mental functions, between trial and error, logical or creative thoughts. The creative thinking process consists simply of the forming of associative elements into new combinations that are in someway useful; the more mutually remote the combinatory elements, the more creative the process or solution.
d) **Factor analytic theory**

For factor analysts like Guilford (1950) the aspect of intellect represented by the IQ metric is only one of numerous factors, and not necessarily the most important. He disaggregated the factors of intellect, distinguishing especially between convergent and divergent thinking. Before 1950 there had been few precedents for believing in the hypothesis of multivariate nature of creative potential. As early as 1927, Hargreaves had found tests of fluency and originality to reflect a group factor. Thurstone (1952) and his students, and Taylor (1959) had distinguished four factors in various kinds of tests of verbal fluency. Guilford in 1950 proved by his factor analytic studies that there is not only one factor or primary ability of creativity that functions equally in all areas but there are surprisingly a large number of creative abilities, each limited in scope and properties and undoubtedly in its application. In his model of the structure of intellect which first presented in his presidential address to the American Psychological Association (1950), Guilford lists nine factors of creativity, viz. (1) word fluency (2) ideational fluency (3) semantic spontaneous flexibility (4) figural spontaneous flexibility (5) expressional fluency (6) symbolic adaptive flexibility (7) associational fluency (8) originality and (9) elaboration.

e) **Motivational theory**

This theory tries to explain the various sources that motivate a person to be creative. Various motivational forces have been
the drive for intellectual competence and development indicated to
be a natural source of motivation for creativity (Thorndike, 1931;
Role, 1952). Rossman (1931) in his study of 710 inventors, concluded
that inventing carries its own intrinsic rewards. Exhilaration and
feeling of mastery and superiority on the successful solution of
problem motivates the inventor to look for new problems. Roe found
this to be true in case of scientists (1952). White (1961) asserts
that individual have a natural drive to achieve competence by
developing knowledge and skills. Related to this motive is the
finding that creative people have a strong desire to realise their
potentialities i.e. self-actualization which means becoming
everything one is capable of becoming. Maslow has asserted "what a
man can be, he must be" (1970, p. 41). Golann (1962) is of the
opinion that motivation for creative performance is in the form of
a desire to make the most one's own perceptual, cognitive and
expressive potentials. Rogers (1959) joins Golann in this
contention. Creative people also have shown preference for
complexity (Barron, 1958), may be because it provides challenges to
their comprehension abilities and to the facility for establishing
order out of disorder.

Another drive for creative behavior has been indicated as an urge
to do something different just because it is different
(Hadamard, 1945; Houston & Mednick, 1963). It coincides with the
personality traits of creatives and preference for unusual.
Interest for divergent thinking is yet another motive for
creativity. Originality tests correlated positively with liking for
divergent thinking, tolerance of ambiguity and reflective thinking (Merrifield et. al. 1961). Krop (1969) showed that both intrinsic and extrinsic motivations were associated with higher levels of creativity and higher proportions of creative responses. Psychoanalysts point to sublimation of repressed unconscious wishes and pregenital and libidinous urges as a source of creativity (Frued, 1949; Kubie 1958). Frued stated that, when freely rising a thought process becomes ego-syntonic, the occasion exists for creativity. This school of thought attributes a dominant role to preconscious processes in creativity. A general consensus then is that both conscious and unconscious motives keep him with the act of creation.

INTERRELATED THEORIES
A number of theories are composites in the sense that they combine principles from psychoanalytic, Gestalt and associationist theories. Hadamard (1945), focusing on mathematical creativity, developed a theory with psychoanalytic as well as associationist ideas. Hadamard proposed a sequence of four steps in the creative process: preparation, incubation, illumination and verification. The initial preparation period is conscious systematic and logical, but sets in motion some unconscious thinking processes that are essential to the incubation and illumination phases. The unconscious mind produces a vast number of associations. The potentially fruitful ideas selected by the unconsciousness in the phase of illumination. The last step of the creative process, verification of the values of the idea and establishing its
implication is entirely conscious. Some theories combine psychoanalytic and associative elements. For example, Kiestler (1964, 1978) developed a bisociation theory of creativity. In bisociation, two independent matrices of ideas come into contact but this occurs only subconsciously, through a regression to the preconscious thinking processes stressed by psychoanalytic theorists. Rothenberg (1979) has proposed a psychoanalytic based theory that highlights two thinking processes that, like bisociation, facilitate association of independent ideas. Gruber's theory (1974) draws on the associationist and Gestalt positions, as well as on Piaget's theory of cognitive development. In Gruber's view, creative accomplishments are failed by conscious, purposeful action and unconscious processes are not critical rather, when people direct all their efforts toward some goal, the problems occupying their conscious thoughts also will spill over into imagery and dreams.

Mansfield & Busse (1982) proposed a somewhat similar model of the creative process in scientific fields, involving five steps (1) selection of a problem that is both important and potentially soluble (2) extended effort to solve the problem (3) setting constraints on the solution of the problems (4) changing the constraints through a restructuring process and (5) verification and elaboration of results.

**ACHIEVEMENT MOTIVATION**

All of the comprehensive theories which dominates psychology until the 1970s had motivational concepts as a central component.
The achievement motive has been described by Hackhausen (1967) as "the striving to increase, or keep as high as possible one's capability in all activities in which a standard of excellence is thought to apply and where the execution of such activities can be therefore, either success or fail". Achievement motivation thus be considered as extended person intrinsic motivation because its reinforcement is delayed and arises from an interaction within a person. This motivation is "a pattern of planning, of actions, and of feelings connected with striving to achieve some internalized standard of excellence, as contrasted with power of friendship"(Vidler,1977,p.67). Achievement motivation in terms of school performance has been found to play an important role in the academic achievement of the students. Academic achievement is the outcome of the training imparted by the teacher to a student in the school as measured by his performance on standardized tests. It is valuable to distinguish between behavioral, dynamic and cognitive approaches all of which have shaped ideas in this field.

Theories belonging to behavioral approach describe academic motivation in terms of behavior modification. They emphasize the role of learning experiences, contingencies of reinforcement and situational variables in determining the direction and intensity of behavior. The academic motivation broadly comes under the head of achievement motivation.

Dynamic approaches based on psychoanalysis argue that behavior is determined by internal, largely unconscious, conflicts between drives, internalized demands of culture, and the reality
orientation of the ego. Psychoanalysis has contributed to the study of academic motivation by placing it within the context of personality in general, and by suggesting a framework for the analysis and treatment of motivational difficulties such as work inhibition and neurotic anxiety.

Cognitive approaches view motivation as determined by a process of decision making, in which an active individual seeking meaning and control of his or her environment considers and selects from among alternative ways of a single school of thought and of a handful of theorist and researchers who have work closely under the general leadership of D.C. McClelland.

McClelland's Model of Achievement Motivation

Early interest by McClelland in the 1950s was directed towards broad questions such as how need for achievement is reflected in societies and how as a societal value, it affects the economic and political growth of a nation. His work had its source in that of Murray who had listed the need to achieve as one of 27 acquired human motives. The need to achieve appears to be a need that becomes part of an individual's personality and affects the person's behavior in every facet of life including education. Individuals with a high need for achievement are people interested in excellence for its own sake rather than for the extrinsic rewards it can bring such as money or prestige. They prefer situations in which their personal responsibility affects the outcome. They tend to prefer to control their destinies and to make independent judgements based on their own evaluations and experience. They
choose challenging goals (McClelland 1958) and prefer delayed larger rewards to immediate smaller rewards. Under some circumstances high need for achievement people will persist longer at a challenging task (unless alternative tasks become more challenging), challenge, especially to be an intrinsic motivator and independent of external reinforcers such as grades & prizes, it cannot be expected that there should be a high correlation between it and school achievement, yet a number of studies have found some support for this position (McClelland; 1958).

According to McClelland, general theory of motivation states that there should be two kinds of achievement motives, one characterized primarily by fear of failure and the other by hope of success, depending on whether achievement cues in the past history of an individual have been primarily associated with negative and positive changes in affective level. Thus, the behavioral sequence originated when an individual experiences a state of need or a motive (n). He may anticipate successful attainment of his goal (Ga+) or anticipate frustration and failure (Ga-). He may engage in activble instrumental (I) to the attainment of his goal (I+) or to failure (I-).

Sometimes his goal directed activity will be blocked. The obstacle or block (B) to his progress may be located in the world at large (BW) or it may be some personal deficiency in himself (BP). He may experience strong positive and negative affective states which engaging in solving his problem. He is likely to experience a state or positive affect (G+) in goal attainment or a state of negative
affect (G-) when his goal directed activity is thwarted or he fails. Often someone will help or sympathize with him [Nurturant-Press (NUP)] ailing him in his goal-directed behavior. This adjusive behavior sequence is presented schematically in the figure 1.

The five states an individual may experience—Need, Positive or Negative Anticipatory Goal States, Positive or Negative Anticipatory Affective state are located within the person in this diagram. Instrumental activity is denoted by the arrows suggestive of trails and errors in the problem-solving attempt. A block which also may be located in the person is denoted as a barrier in must be overcome if the goal is to be attained. The symbol for NUP is another person with an arrow in the direction of the goal indicating that he may help to attain the goal. Finally, the goal is indicated by plus sign. The goal defines whether the various anticipations, affective states, instrumental acts and so forth of the person are achievement related or are related to some other motive. Presumably these categories may be used to describe the behavioral sequence independent of an individual.

Origin of Achievement motivation

The study of Achievement motivation would be incomplete without some attempt to understand its origins. How is it that some students score high and some low? Are they simply born that way? One can accept neither of these views if the theoretical analysis of motivation previously stated is correct. The argue that all motives are learned, that they develop out of repeated affective
Figure presenting the adjusitive behavior sequence
affective experiences connected with certain types of situations and types of behavior by the parents as representatives of the culture, and the behavior should involve either competition with those standards of excellence to meet the, which if successful, produce positive effect or, if unsuccessful, negative effect. It follows that those cultures or families which stress competition with standards of excellence or which insist that the child be able to perform certain tasks well by himself, should produce children with high achievement motivation. To state the same issue negatively, if a family does not set high standards of excellence, or if it does not permit the child to compete or strive to do them on his own, then he could not be expected to have had the affective experiences connected with meeting or failing to achievement standards which cumulatively produce an achievement motive.

The research problem then boils down to an attempt to discover whether individuals with high and low achievement scores have in fact been treated differently by their families as they were growing up. Winterbottom (cited on McClelland et. al. 1955) studied the parents of 30 middle class boys ages 8 to 10. She determined the strength of their need for achievement using the Thematic Apperception Test and examined the child-rearing practices of the parents through an interview and questionnaire procedure. She found that the mothers of boys with high achievement motivation differed from those whose sons had low achievement motivation in three significant ways: They tended to set higher standards for their sons; they expected independence and master behavior to occur at an
early age, and they more often rewarded their sons affectively. In the typical administration of the TAT as modified by McClelland, a subject is shown a picture and given about 5 minutes in which to writh a story about the picture. The picture is deliberately vague so as to allow for a wide range of variation in interpretation and production.

Subjects are often told that they are taking a test of their creative imagination and are invited to make up a vivid & dramatic story. In the complete procedure four pictures are presented, stories are written for each of them & subsequently analysed for content reflecting achievement motivation. The hypothesis has been tested in three main ways: (1) by asking students of known differences in motivation to describe their parents and their upbringing (2) by relating objective measures of parent behavior to achievement motivation and (3) studying intensively a few individuals with high and low achievement scores.

Perception of parents and achievement motivation

1) Child - rearing practices attributed to parents by sons with varying n-achievement:

As part of the extensive case study of 30 college students, McClelland (1953) found that sons who felt their fathers had rejected them had higher n-achievement scores than those who felt their father had loved and accepted them.

2) Traits attributed to parents by sons with varying n-achievement:

In another study by McClelland (1953) high school male students and college students were asked to rate each parent on a seven-
points scale on the following personality traits: self confident, helpful, domineering, friendly, selfish, clever, successful (vacationally). The rating of traits were grouped into three clusters: one dealing with nurturance characteristics, one with authoritarian characteristics and one with success characteristics. The results confirm that students who rank low in n-achievement tend to perceive their fathers (and their mother to a lesser extent) as more friendly and helpful. Students with high n-achievement tend to perceive their father as unfriendly and helpful.

3) Parent-son relations suggested by the sons' views on morality:
On another part of the questionnaire the subjects were asked to rate themselves on six vices- disrespect, general dishonesty, lack of courage, rebellion, narrow-mindedness and over indulgence. The low n-achievement subjects feel more guilt over disrespect to their parents than the high n-achievement subjects who characterized their parents as unsuccessful and rejecting. The high n-achievement group should place much greater stock on independence, the ability to stand alone of courage.

From the above findings a conclusion can be made that students with high n-achievement perceive their patents as distant rather than close and themselves as independent of all types of pressure toward conformity, parental or otherwise. The students with low n-achievement are just the opposite. They admire their parents, whom they described as friendly and nurturant, and tend to behave in a more dependent manner towards all types of authority. Such an
analysis had added greatly to our understanding of how the achievement motive fits into or modifies a person's conception of his relation to the world. It also strongly suggests that the origins of achievement motivation will lie in the stress placed on independence training by family in which the child is brought. In short, the more the child is forced to master the greater his n-achievement, the more independent he becomes of his parents, and the more rejectant they are likely to appear to him. The theoretical analysis joins with the results reported earlier in supporting the hypothesis that training for early independent mastery of skills should be associated with high achievement motivation.

ATKINSON'S SYSTEM

Expectancy-value theory

The concept of achievement motive, defined as a stable personality characteristic, was incorporated into a larger theory of achievement motivation proposed by Atkinson (1957). This theory which has come to be known as expectancy-value theory, specifies that the strength of the achievement motive actually aroused in any achievement-oriented situation is determined by the sum of two tendencies with opposing signs.

1. The tendency to approach success (Ts), which is manifested by engaging in achievement-oriented activities.
2. The tendency to avoid failure (Taf), which is manifested by not engaging in these activities.

The strength of each of these opposing tendencies is determined by
three components: 1) The motive to approach success (Ms) or the motive to avoid failure (Maf). 2) The expectancy (probability) that an achievement-oriented act will result in success (Ps) or the probability that it will result in failure (Pf). 3) The incentive value of success (Is) or the incentive value of failure (If). It is the latter two variables that give Atkinson's theory its expectancy-value level.

The motive to approach success (Ms) is an individual difference variable, typically measured by the TAT. The motive to avoid failure (Maf), also called Fear of failure, is proposed as a separate dispositional tendency that like the motive to approach success, is a stable personality characteristic that has been acquired as a result of past experience. Individual difference in the motive to avoid failure have usually been measured by objective self-report instruments, most often the Mandler-Sarason Test Anxiety Questionnaire (Mandler and Sarason, 1952) or the Alpert-Haber Debilitating Anxiety Scale (Alpert & Haber, 1963). Heckhausen (1963) has attempted to bring more symmetry into the measurement of the two motivational constructs by extending the TAT projective technique to include a measure of the motive to avoid failure, but the measure has not been widely adopted.

The second component determining the tendency to approach success or the tendency to avoid failure is expectancy, defined as the probability that engaging in an achievement-oriented activity will result in success (Ps) or in failure (Pf). Since success and failure exhaust all possibility, their probabilities add up to
unity \(Ps + Pf = 1\). The probability of failure, \(Pf\), can therefore be expressed as \((1 - Ps)\). In experimental situations designed to test the implications of expectancy-value theory, the expectancy variable either has been subjectively defined by having subjects give their estimate prior to undertaking the task, or the probability that they will succeed has been experimentally manipulated by such methods as supplying subjects with performance norms which the task's level of difficulty can be inferred or first giving them similar tasks on which they succeed or fail.

The third component, incentive value of success or failure, has been described by Atkinson as the degree of anticipated satisfaction or pride in succeeding at a task or the degree of anticipated shame in failing. In practice, Atkinson's operationalization of the incentive factor has usually been reduced to a property of probability of success. Based on the contention of Lewin, Dembo, Festinger, and Sears (1944) that the attractiveness of incentive value of success increases with task difficulty, the incentive value of failure \(If\) are \((I-Pfa)\) or \([1-(1-Ps)\].

The three components associated with the tendency to approach success \(Ts\) and with the tendency to avoid failure \(Tf\) - motive, expectancy and incentive - are assumed to combine multiplicatively to determine the strength of each of these tendencies.

These two tendencies sum algebraically to determine the strength of the resultant achievement motivation, or the tendency to achieve \((Ta = Ts - Taf)\). When the complete set of assumptions about each component is considered and the formula is algebraically simplified
the tendency to achieve is defined as $T_a = (M_s - M_{af}) [P_s \times (1 - P_s)]$.

Perhaps the most intriguing aspect of the theory involves predictions about an individual's preferred level of task difficulty. The equation for determining the tendency to achieve ($T_a$) implies that for individuals in whom the motive to approach success is stronger than the motive to avoid failure ($M_s > M_{af}$), the tendency to achieve is strongest in the situations in which the probability of success is half. These success-oriented individuals are therefore more likely to choose tasks of intermediate difficulty and to persist at them longer than at tasks that are either higher or lower in difficulty. Those persons on whom the motive to avoid failure dominates ($M_s < M_{af}$) are least likely to choose or to persist at tasks of intermediate difficulty. For these failure-avoidant individuals, the tendency to achieve is predicted to be highest when task difficulty is either high or low. The bulk of evidence suggests that individuals tend to prefer tasks of intermediate difficulty, whatever the strength of their motive to achieve (Weiner, 1972).
DISCUSSION

In the present study academic achievement has been studied in relation to Intelligence, Creativity, Achievement motivation and Personality variables. The purpose here is to consider how far the results, as a whole throw light on the objectives that were examined and what could be the implication of the study. In the discussion, an attempt has been made to interpret the results of the present study. However, correlational studies have given some important information.

INTELLIGENCE AND ACADEMIC ACHIEVEMENT

High achiever - In order to verify the relationship between Intelligence and academic achievement a non-null hypothesis has been formulated. It stated that there exist relation between Intelligence and academic achievement of the high achievers. The result showed that, in case of high achievers Intelligence has significant relation with academic achievement, so the non-null hypothesis is retained here.

Average achiever - Here the non-null hypothesis states that, there exist relation between Intelligence and academic achievement of the average achievers. The result showed there exist no significant relation between Intelligence and academic achievement of the average achievers. So non-null hypothesis is not retained here.

Low achiever - Here the non-null hypothesis states that there exist relation between Intelligence and academic achievement of the low achievers. From the, result it has been observed that significant relation has found between Intelligence and academic achievement of the low achievers. So non-null hypothesis is retained here.
Three groups as a whole - The non-null hypothesis stated that there exist relation between Intelligence & academic achievement. When the three groups namely the high, the average and the low achievers were considered as a whole. The result also verify the hypothesis that significant relation has been found between these two variables when the three groups considered as a whole. So the non-null hypothesis is retained here.

So it can be stated that Intelligence has a significant relation with academic achievement, in case of the high and low achievers and the three groups as a whole. Fernando (1993) also found significant relation between Intelligence and achievement. The data revealed that average achievers showed no significant relation between Intelligence and academic achievement. So it can be stated that family relationship, career interest may play important role other than intelligence in their achievement.

CREATIVITY AND ACADEMIC ACHIEVEMENT

High achievers - Incase of high achievers a non-null hypothesis have been formulated to verify the relation between Creativity and academic achievement, that is, there exist relation between Creativity & its component factors and academic achievement.

Another hypothesis have been formulated inorder to determine the interitem correlation of the Creativity and its component factors of the high achievers. The result revealed that Creativity and its component factors have significant relation with academic achievement in case of high achievers.

Among the interitem correlation of the Creativity and its
component factors, all the factors are found to be significant except between verbal elaboration and nonverbal flexibility.

**Average achievers** - Here the non-null hypothesis states that there exist relation between creativity and academic achievement of the average achievers.

Another hypothesis states that there is significant relation among the interitem correlations of the Creativity and its component factors of the average achievers.

It has been observed that, in case of average achievers negative correlation has been found between academic achievement and some of the Creativity component factors namely verbal fluency, v.flexibility, v.originality, v.elaboration, v.creativity, fig.elaboration, fig.creativity & composite creativity. Only fig.fluency, fig.flexibility and fig.originality have significant relation with academic achievement of the average achievers.

Among the intercorrelations of the creativity component factors all the subfactors have significant interitem correlation except between fig.flexibility and v.flexibility as well as between fig.fluency and fig.flexibility.

**Low achiever** - Here the non-null hypothesis states that there exist a relation between Creativity and academic achievement of the low achievers.

Another hypothesis states that there is significant relation among the interitem correlations of the Creativity and its component factors.

The result revealed that Creativity and its component factors
have no relation with academic achievement of the low achievers. So the non-null hypothesis is not retained here.

All the interitem correlations of the Creativity and its component factors are found to be significant. So the non-null or alternative hypothesis is retained here.

**Three groups as a whole** - The non-null hypothesis states that there exists relation between Creativity and its component factors and academic achievement when the three groups considered as a whole.

When the interitem correlations among the Creativity and its component factors have been considered, the non-null hypothesis states that there is interitem correlations among the Creativity and its component factors of the three groups as a whole.

The result showed that significant relation exists between Creativity and its component factor and academic achievement. So the non-null hypothesis has retained here.

It has also been found that all the interitem correlations among the Creativity and its component factors are significant, So the non-null hypothesis is retained.

The relationship between Creativity and academic achievement is always a controversial issue. In the present study, high achievers and average achievers showed significant relation with some of the Creativity and its component factors. But incase of low achievers no relationship has been found between these two variables. Riaz (1989) also in his investigation found that the correlation between scores on Creativity and science achievements were significant for the academically superior group but not for the below average
ACHIEVEMENT MOTIVATION AND ACADEMIC ACHIEVEMENT

High achievers - A non-null hypothesis has been formulated inorder to determine the relationship between Achievement motivation and academic achievement of the high achievers. It states that there is a relation between achievement motivation & its subfactors and academic achievement.

The hypothesis also states that there exists interitem correlations among the Achievement motivation and its subfactors of the high achievers.

From the result, it has been observed that, achievement motivation and its subfactor Fear of failure and Hope of success have no significant relation with academic achievement. So the non-null hypothesis is not retained here.

Among the interitem correlations Hope of success and Fear of failure have significant relation with Achievement motivation. So the null hypothesis is retained here. The interitem correlation between Hope of success and Fear of failure did not turn out to be significant.

Average achievers - The non-null hypothesis here is, there exists relation between achievement motivation and academic achievement of the average achievers.

Another hypothesis states that there exist interitem correlations among the subfactors of Achievement motivation.

The result revealed that Achievement motivation and its subfactors Hope of success and Fear of failure have no significant
relation with academic achievement. So the non-null hypothesis is not retained here.

Among the interitem correlation Hope of success and Fear of failure have significant relation with Achievement motivation. Here the non-null hypothesis is retained. As expected Fear of failure have no relation with Hope of success in case of average achievers. **Low achievers** - The non-null hypothesis stated that there exist relation between achievement motivation and its subfactors and academic achievement in case of low achievers.

Another hypothesis stated that there is interitem correlations among the Achievement motivation and its subfactors.

In case of low achievers significant correlation has found between qach+(hope of success) and low academic achievement. But the relationship between achievement motivation qach-(fear of failure) and academic achievement is not found to be significant.

Among the interitem correlations Hope of success and fear of failure have significant correlation with Achievement motivation. Fear of failure also found to be significantly correlated with Hope of success. So non-null hypothesis is retained here.

**Three groups as a whole** - The non-null hypothesis states that there exist relation between achievement motivation and academic achievement when we consider the three group high, average and low achievers as a whole.

Another hypothesis states that there is interitem correlation among the achievement motivation and its subfactors.

But the result shows that Achievement motivation and its subfactors
have no relation with academic achievement. So the non-null hypothesis is not retained here.

Among the interitem correlations, Hope of success and Fear of failure have significant relation with Achievement motivation. Fear of failure also found to be significantly related to Hope of success. So the non-null hypothesis is retained here.

Overall, it has been observed from the present study the Achievement motivation and its subfactors are not found to be significantly related to academic achievement. Ford(1992) in her study suggested that psychological factors played greatest role for underachievement and poor achievement motivation. Much recent research emphasize the fact that academic self concept, perceived competence and self efficacy are the critical factors in student's academic motivation, self-regulation of learning and academic achievement.(Gonzalez & Carmen, 1993).

PERSONALITY AND ACADEMIC ACHIEVEMENT

High achiever - The non-null hypothesis stated that there is relation among Personality and academic achievement.

Another hypothesis states that there is interitem correlations among the personality variables.

The result revealed that among the Personality variables only Empathy has significant relation with academic achievement. All the other variable namely Ego ideal, Pessimism, Introversion, Need-achievement, Neurotism, Selfconfidence, have no relation with academic achievement. So the non-null hypothesis is not retained here.
Among the interitem correlation of the Personality variables, Introversion has significant relation with Empathy and Pessimism. Neurotism has relation with Pessimism & Introversion. Self confidence has relation with need achievement and Dogmatism has relation with Introversion. All the other interitem correlations among the Personality variables are not found to be significant.

**Average achiever** - Here also the non-null hypothesis states that there exist significant relation between Personality and academic achievement.

Another hypothesis states that there is significant relation among the interitem correlations of the Personality variables. From the result it has been observed that none of the Personality variables have significant relation with academic achievement of the average achievers. So the non-null hypothesis is not retained here.

When the interitem correlations among the Personality variables were considered it has been found that Need achievement has significant relation with Ego ideal. Introversion, Neurotism and Dogmatism has relation Pessimism. Neurotism has significant relation with Introversion.

All the other interitem correlations of the Personality variables are not found to be significant in case of average achievers.

**Low achiever** - Here the non-null hypothesis states that there is significant relation among the Personality and academic achievement in case of low achievers.

Another hypothesis states that there is significant relation
the interitem correlations of the Personality variables of the low achievers.

From the result, it has been found that Empathy, Selfconfidence and Dominance have significant relation with academic achievement. Other Personality variables are not related to academic achievement. Among the interitem correlations introversion and Neurotism have significant relation with Pessimism. Self confidence has relation with Need achievement. Dominance has relation with self confidence.

Three groups as a whole - When the three groups considered as a whole Empathy, Self confidence, Dominance have significant relation with academic achievement. So the non-null hypothesis is retained here.

Overall it can be stated that incase of high achievers and low achievers Empathy, Selfconfidence and Dominance show significant relation with academic achievement. Knowles (1993) in his study found that confidence help the students to achieve his goal which generally associated with academic achievement.

INTELLIGENCE AND CREATIVITY

High achiever - In case of high achiever, the non-null hypothesis states that there exist a relation between Creativity and Intelligence. The result also revealed that Intelligence has significant relation with Creativity and component factors, so the non-null hypothesis is retained here.

Average achiever - Here the non-null hypothesis states, Intelligence has significant relation with Creativity and Component
factors. But, from the result it has been observed that none of the Creativity and its component factors are found to be related to Intelligence. So the non-null hypothesis is not retained here.

**Low achiever** - In case of low achievers the non-null hypothesis states that Intelligence has relation with Creativity & its component factors. From analysis it has been found that Intelligence has relation with Verbal Flexibility and Verbal Creativity. None of the other factors are found to be related to Intelligence.

**Three groups as a whole** - Here non-null hypothesis states that Intelligence has significant relation with Creativity and its component factors.

The result also support the notion, Intelligence show significant relation with Creativity & component factors. So the non-null hypothesis is retained here.

Overall it can be stated that in case of high achievers and when the three groups considered as a whole Intelligence has significant relation with Creativity and component factors. The present study also revealed that Intelligence does not have significant relation with Creativity and component factors in case of average and low achievers. Mehdi (1974), discussed the nature of divergent thinking and convergent thinking in relation to Intelligence and school achievement. A review of literature examining this relationship indicates that in real life situations those individuals who make creative contributions to society are not necessarily those who are highly Intelligence.
INTELLIGENCE AND CREATIVITY

High achiever - Here the non-null hypothesis states that there exist relation between Intelligence and Achievement motivation. But the result does not confirm the non-null hypothesis. It shows that Intelligence and Achievement motivation & its subfactors are not significantly related.

Average achiever - Here the non-null hypothesis states that there exist relation between Intelligence and Achievement motivation of the average achievers. Here also the non-null hypothesis is not retained. No significant relation has been found between these two variables.

Low achievers - Here the non-null hypothesis states that there exist relation between Intelligence & Achievement motivation of the low achievers. Here it has been observed that motivational subfactor Hope of success (qach+) is significantly related to Intelligence.

Three groups as a whole - The non-null hypothesis states that there exist relation between Intelligence & Achievement motivation. But here also, the result does not confirm the hypothesis. No significant relation has been found between Intelligence and Achievement motivation, when the three groups considered as a whole.

INTELLIGENCE AND PERSONALITY

High achiever - Here the non-null hypothesis states that Intelligence has significant relation with Personality variables. From the result it has been observed that, among the personality
variables Empathy has significant relation with Intelligence. None of the other Personality factors are found to be related to Intelligence.

**Average achiever** - Here the non-null hypothesis also states that there exist relation between Intelligence & Personality variables. But the result does not confirm the non-null hypothesis. None of the Personality variables are found to be significantly related to Intelligence.

**Low achiever** - Here the non-null hypothesis states that Intelligence has significant relation with Personality variables. The result shows that, in case of low achievers Empathy, Self-confidence, Dominance have significant relation with Intelligence. So the non-null hypothesis is retained.

**Three groups as a whole** - Here the non-null hypothesis states that Personality variables have significant relation with Intelligence. It has been observed that Empathy has relation with Intelligence.

**CREATIVITY AND ACHIEVEMENT MOTIVATION**

**High achiever** - Here the non-null hypothesis states that there exists relation between Creativity and Achievement motivation of the high achiever. It has been observed from the result that no significant relation has been found between Creativity and Achievement motivation of the high achievers. So the non-null hypothesis is not retained here.

**Average achiever** - The non-null hypothesis states that there exist relation between Creativity and Achievement motivation of the average achievers. The result shows, none of the Creativity and its
component factors have significant relation with Achievement motivation. So here also the non-null hypothesis is not retained.

Low achiever - The non-null hypothesis states that there exist relation between Creativity and Achievement motivation of the low achievers. The result revealed that none of the Creativity and its component factors have significant relation with Achievement motivation. So the non-null hypothesis is not retained here.

Three groups as a whole - When the three groups considered as a whole, the non-null hypothesis states that there exists relation between Creativity and Achievement motivation. But the result did not confirm the hypothesis. No significant relation has been found between these two variables.

Overall it can be stated that, in the present study no significant relation has been found between Creativity and Achievement motivation of the high achievers, average achievers low achievers or when the three groups consider as a whole.

CREATIVITY AND PERSONALITY VARIABLES

High achiever - The non-null hypothesis states that there exist relation between Creativity and Personality variables. It has appeared from the result that, among the Creativity component factors verbal flexibility has significant relation with need achievement. Figural originality has significant relation with need achievement. So non-null hypothesis is retained here.

Average achiever - The non-null hypothesis states that there exist relation between Creativity and Personality variables of the average achievers. It has been observed from the table that some of
the Creativity component factors are found to be significantly related to Personality variables. It has been observed that Fig-fluency, Fig-flexibility, Fig-originality, Fig-elaboration, Fig-creativity and Composite creativity have significant relation with Ego ideal. Again F-fluency, has significant relation with Pessimism. None of the other Creativity factors are found to be related to Personality variables. So the non-null hypothesis is retained here.

**Low achiever** - The non-null hypothesis states that there exist relation between Creativity & Personality variables of the low achievers. In case of low achievers Fig-creativity & its Com-creativity exhibits significant relation with Need achievement. So non-null hypothesis is retained.

**Three groups as a whole** - Here the non-null hypothesis states that there exists relation between Creativity and Personality. It has been appeared from the result that Fig-creativity & its component factors and composite Creativity have significant relation with Need achievement. So non-null hypothesis is retained.

So overall it has been observed that Creativity has significant relation with Personality.

**Achievement Motivation and Personality Variable**

**High achiever** - The non-null hypothesis states that there exists relation between Achievement motivation and its subfactors and Personality variables. Incase of high achievers Achievement motivation has significant relation with need achievement. Among the motivational subfactors qach+ (hope of success) is positively
related to Need achievement, self Confidence and Dogmatism. qach- (Fear of failure) is positively related to Need achievement. So the non-null hypothesis is retained here.

**Average achiever** - Here the non-null hypothesis states that there exists relation between Achievement motivation and Personality variables. But result shows that none of the Personality variables are significantly related to achievement motivation. So the non-null hypothesis is not retained here. Only qach- (Fear of failure) has significant relation with Need achievement.

**Low achiever** - Here the non-null hypothesis states that there exists relation between Achievement motivation and Personality variables. The result revealed that Achievement motivation has significant relation with Self confidence and Dominance. None of the other Personality variables are found to be related to Achievement motivation. Among the motivational subfactors, no significant relation has found with Personality variables.

**Three groups as a whole** - Here the non-null hypothesis states that when the three groups high, average & low achievers considered as a whole, there exists relation between Achievement motivation and Personality variables. It has been observed from the result that Ego ideal, Need achievement, Self confidence, Dominance are found to have significant relation with Achievement Motivation. Among the motivational subfactors, qach- (Fear of failure) has significant relation with Need achievement and Self confidence. Overall it has been observed that Achievement motivation has significant relation with Personality variables incase of high and
low achiever. The high achieving students have a greater inborn desire for mastery, achievement, recognition, popularity and superiority. The relationship between selfconcept of ability and intrinsic motivation was supported by Munson & Kamphaus (1993). They syggestd that those students who felt positive about their school performance tended to persist on tasks and enjoyed challenging activities. Ryan & Grolnick (1984) found strong positive correlations between intrinsic motivation and self esteem in these children.

RESULTS OF UNIVARIATE ANALYSIS

Intelligence - When we consider Intelligence the non-null hypothesis states that the rank achievers and high,average & low achievers will differ with respect to Intelligence. The result shows that the four groups differ significantly. So the non-null hypothesis is retained here.

Intelligence as major determinant of academic achievement has been studied by Super(1949). From a study in Indian context Sinha (1966) revealed the general superiority of high achievers in Intelligence.

Creativity - The non-null hypothesis states that the rank achievers and high, average and low academic achievers will differ with respect to their Creativity and its component factor. The result revealed that in case of Creativity and its component factors the four groups differ with respect Verbal-fluency, V-flexibility, V-originality, V-elaboration, V-creativity, Fig-fluency, f-flexibility, F-originality, F-elaboration, F-creativity and composite creativity. so the non-null hypothesis is retained here.
Ball (1988) studied the relationship between Creativity, Cognitive style and academic achievement on 150 freshman of Delhi University. The sample had high, middle and low academic achievers in equal number. He found that the three groups differ with respect to Creativity.

**Achievement motivation** - The non-null hypothesis states that the rank achievers and high, average, and low academic achievers will differ with respect to their Achievement motivation and its subfactors. But it has been observed from the result that the four groups do not differ with respect to Achievement motivation and its subfactors qach+ (Hope of Success) and qach-(Fear of failure). So the non-null hypothesis is not retained here.

**Personality variables** - The non-null hypothesis states that the rank achievers and high, average and low academic achievers will differ with respect to Personality variables. The result also confirms the hypothesis. The four groups differ with respect to certain Personality characteristics namely Empathy, Pessimism, Dogmatism, and Dominance. But the four groups do not differ with respect to Ego ideal, Neurotism, Introversion, Need achievement and Self confidence. Haynes (1990) stated that one of the main reasons for students academic failure rests in their self perception and belief about their own abilities to effect given outcomes. This lack of Self confidence often finds expression in academic failure.

**RESULT OF MULTIVARIATE ANALYSIS**

The non-null hypothesis states that the four groups namely the rank achievers, high, average and the low achievers as a whole will
will differ with respect to all the 24 variables of the 4 tests namely Intelligence, Creativity, Achievement motivation and Personality. The result shows that the four groups differ when we have taken together all the 24 variables of the 4 tests.

**RESULT OF SIMPLE REGRESSION ANALYSIS**

**Intelligence** - Here the non-null hypothesis states that Intelligence has relative degree of contribution on academic achievement of the high, average, low achievers and the three groups as a whole.

The findings show that, in case of high achievers Intelligence has found to be significant predictor of academic achievement. Same result has found in case of average and low achievers. When we consider the three groups as a whole, Intelligence has significant impact on academic achievement. So the non-null hypothesis is retained here. The use of Intelligence test to predict academic achievement levels is a common practice among the school psychologists (Philip & Jane, 1990). Some studies also use successful uses of non-verbal measures of Intelligence as an additional sources of information in a comprehensive battery of testing and assessment (Baska, 1986; Nasca, 1988).

**Creativity and its component factors** - Here the non-null hypothesis states that Creativity and its component factors have relative degree of contribution on the academic achievement of the high, average, low achievers as well as when the three groups considered as a whole.

In case of high achievers Creativity is found to be significant
predictor of academic achievement. So the non-null hypothesis is retained here.
Same result has been found when we consider the three groups as a whole. Here also the non-null hypothesis is retained. But Creativity has found to have minimum impact on academic achievement of the average and low achiever.

In case of scholastic achievement and Creativity a number of studies show that there is positive but low correlation of Creativity and achievement (Yamamote, 1964; Passo, 1972). An equally good number of studies are available with contradictory results which show that Creativity and achievement are not related (Flecher, 1967; Sandhu, 1979).

**Achievement motivation and its subfactor** - The non-null hypothesis here states that Achievement motivation has significant degree of contributaion on the academic achievement of the high, average, and low achievers as well as the three groups as a whole.

The findings show that incase of high achievers and three groups as a whole achievement motivation has significant contributaion on academic achievement. So the non-null hypothesis is retained here. But incase of average & low achievers minimum contribution has been found of Achievement motivation and it is not significant. So the non-null hypothesis is not retained.

**PERSONALITY VARIABLES** - Here the non-null hypothesis states that Personality variables have relative degree of contributaion on academic achievement of the high, average, low achievers and the three groups as a whole. The findings show that, incase of high
achievers, Personality variables have minimum contribution on academic achievement.

Same result has been found in case of average and low achiever. So the non-null hypothesis is not retained either in high or in average and low achievers.

But when we consider the three groups as whole, Personality variables are found to be significant predictors of academic achievement.

The relative contribution of Intelligence, Creativity, Achievement motivation and Personality variables as a whole on the academic achievement is also investigated in the present study.

In case of high achievers, the Multiple Regression Analysis revealed that Intelligence, Creativity, Achievement motivation and Personality variables as a whole are significant predictor of academic achievement. Same result has been observed in case of low achievers and three groups as a whole. In case of average achievers these variables as a whole have relatively minimum contribution on academic achievement.

T STATISTICS SHOWING THE MEAN DIFFERENCE AMONG RANK ACHIEVERS AND HIGH ACHIEVERS

Intelligence - The non-null hypothesis states that rank achievers will differ from the high achievers with respect to Intelligence and the result also confirms the hypothesis. It has been observed that rank achievers are not only differ significantly, they are high in Intelligence in comparison to the high achievers.

Creativity - The non-null hypothesis states that rank achievers
will differ from the high achievers with respect to their Creativity. It has been observed from the result that rank achievers not only significantly differ from the high achievers but they scored high on each component factors of the Creativity. They have scored high verbal, non verbal & composity Creativity than high achievers So the non-null hypothesis is retained here. From the present study it can be stated that rank achievers are more creative than high achievers. They have an inborn talent to think originally novel ideas and to fruitfully present it in testing situations.

**Achievement Motivation** - The non-null hypothesis states that the rank achievers will differ from the high achievers with respect to achievement motivation and its subfactor. It has been observed from the result no significant difference has found between rank and high achievers with respect to achievement motivation and its subfactors. The non-null hypothesis is not retained here. The result also shows that, high achievers have high achievement motivation than the rank achievers. This drive to achieve is a necessary component for better scholastic achievement. This inborn drive help rank achievers for better attainment of educational goals.

**Personality** - The non-null hypothesis states that the rank achievers will significantly differ from the high achievers with respect to Personality variables. The result shows that rank achievers differ significantly with respect to Empathy. So it can be interpreted that rank achievers are more tranquil and
warmhearted. They tried to share other person's feelings, needs and sufferings. These finest human qualities help them to achieve success.

Certain subhypothesis have been formulated inorder to verify the relation ship between high achievers and average achievers, high and low achievers, average and low achievers with respect to Intelligence, Creativity, Achievement motivation, and Personality. They are as follows-

**Intelligence** - 1) The non-null hypothesis states that high achievers will differ from the average achievers with respect to Intelligence.
2) The non-null hypothesis states that high achievers will differ from the low achievers with respect to Intelligence.
3) The non-null hypothesis states that low achievers will differ from average achievers with respect to Intelligence.

It is evident from the result that high achievers differed significantly from the average achievers and low achievers in respect to Intelligence. It has also been observed that average achievers have significant difference from the low achievers in this regard. So the non-null hypothesis is retained here.

**Creativity** - The non-null hypothesis states that the high achievers will differ from the average achievers with respect to Creativity and its component factor. It is evident that, these two groups differ with respect to v-fluency, v-flexibility, v-originality, v-elaboration, v-creativity, fig-originality, fig-elaboration, fig-creativity & comp-creativity. So the non-null hypothesis is
Another non-null hypothesis states that the high achievers will differ from the low achievers with respect to Creativity and its component factors. The finding showed that these two groups significantly differ with respect to all the variables of Creativity & its component factors. So the non-null hypothesis is retained here.

The non-null hypothesis states that average achievers will differ from the low achievers with respect to Creativity & its component factors and the result also confirm the hypothesis. These two groups significantly differ with respect to Creativity and its component factors. So the non-null hypothesis is retained here.

**Achievement motivation** - Here the non-null hypothesis states that high achievers will differ from the average achievers with respect to Achievement motivation & its subfactors.

Another non-null hypothesis states that high achievers will differ from the low achievers with respect to achievement motivation and its subfactors.

The non-null hypothesis also states that average achievers will differ from the low achievers with respect to achievement motivation and its subfactors.

It has been observed from the result that no significant difference has found between high and average achievers, high and low achievers, average and low achievers with respect to achievement motivation and its subfactors.

So none of the non-null hypothesis are retained here.
Personality - Here the non-null hypothesis states that high achievers will differ from the average achievers with respect to Personality variables. But the result indicates that these two groups did not differ with respect to personality variables. So the non-null hypothesis is not retained here.

Another non-null hypothesis states that high achievers will differ from the low achievers with respect to Personality variables. Result shows that these two groups differ with respect to Empathy and Dominance. High achievers have high mean score in Empathy & Dominance.

Another non-null hypothesis states that average achievers will differ from low achievers with respect to Personality variables. But here also the non-null hypothesis is not retained. Result shows that these two groups did not turn out to be significantly different with respect to Personality variables.

From the above discussion it can be stated in nutshell, that Intelligence, Creativity and certain Personality variables have significant attribution for the academic achievement in case of high, average, and low achieving students. It is also evident from the study, that rank achievers differed from the high achievers with respect to Intelligence and Creativity. They are found to be more self-confident in comparison to high achieving students. The analysis of results further show that, no significant difference has been found with respect to achievement motivation among these four groups. It is may be due to the fact that our educational system has little scope for the enhancement of motivational abilities.


Guilford, J.P. Christensen, Frick, J.W. & P.R. Merrifield. (1957). The relation of creative thinking aptitudes to nonaptitude personality traits. (Rep psychology.lab no 20) Los angles University of Southern California.


Mehedi, B. (1978). Creativity, Intelligence and achievement - some findings of recent research. Indian educational review. v 9(1) p 10-11.


Shepard, E.L. (1942). Measurement of certain nonverbal abilities of
urban and rural groups. Journal of educational psychology. V-33, p454-462.


