

**NON - COGNITIVE CORRELATES OF CREATIVITY
AMONG THE SECONDARY SCHOOL STUDENTS**

Thesis submitted for the Degree of
DOCTOR OF PHILOSOPHY IN EDUCATION
by
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This is to certify that the thesis entitled '**Non-Cognitive Correlates of Creativity among the Secondary School Students**' submitted by Mrs Varparhi Khlange for the degree of Doctor of Philosophy in Education of the North-Eastern Hill University, Shillong, is a record of bonafide study and research carried out by her. This thesis or any part thereto has not been previously submitted for any degree in this or any other University.



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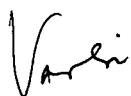
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DECLARATION

I hereby declare that the thesis 'Non-cognitive Correlates of Creativity Among the Secondary School Students' or any part thereto has not been submitted for any degree in this or any other University.

Place: Aizawl

Date: 30th June, 1987


(Varpachi Khiantse)

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CHAPTER I

INTRODUCTION

Any nation committed to human resource development can hardly ignore the problem of detecting and fostering talent among her youth. It is being increasingly recognised that human talent is a resource no less important for the current affairs and future progress than material resources. The talent development is, in fact, a necessary pre-condition for progress and planned development. The national planners in India, therefore, have rightly emphasized the development of human resources through the educational programmes. Asking for increased allocations to education is a testimony to the concern for the development of human resources through education.

The developments over the last two decades, however, make it clear that "desired improvements have not been materialised because neither the resources nor the measures for restructuring were commensurate with the imaginative and purposeful thrust of the education policy adopted in 1968".¹ Till recently, the stress has purely been on the intellectual side. Creative potential, the most precious human resource, has not been given much attention. Nevertheless, it has now been realised that it is not merely intelligence but also creativity which is responsible

1. Ministry of Education, Challenge of Education- a policy perspective.

New Delhi, Government of India 1985(Preface)

6

for overall progress. Creativity has become a central concept in educational research only very recently although creative thinking ability has been considered the highest of mental functions and creative production the peak of human achievement. Barron (1968) points out: "our capacity for creative thought and action may literally make all the difference in the world Human creativity may prove to be the key to success or failure in mankind's quest for knowledge, in his journey beyond the bounds of the sure and the seen, in his exploration of the unknown."² It was Toyanbee, the famous historian, who considered creativity as man's greatest asset and one of the most valued qualities. "Creativity is the type of talent which can make history through reshaping man's world and it is a matter of life and death for any society."³ The talent, thus needs to be assessed, nursed and nurtured through congenial educational climate. Again, in the words of Torrance, "the survival and progress of any society is closely dependent upon how it can conserve and utilize the precious human resource, the creative potential."⁴ Seen in the above perspective, conservation and proper utilization of creative potential assumes special significance.

2. Barron, F. Creativity and Personal Freedom, New Jersey; D. Van Nostrand Company Inc., 1968.

3. Toyanbee, A, "Is America Neglecting her Creative Minority?" in Taylor, C.W. (ed.) Widening Horizons in Creativity. New York; John Wiley and Sons Inc. 1964.

4. Torrance, E.P. Guiding Creative Talent. Englewood Cliffs, N.J.: Prentice Hall, 1962.

Need for the Study

India needs men of creative thinking ability who can produce a number of solutions for the problems facing the society, envisage different strategies, find original and novel ideas and view the problem from various angles. In this regard, the Education Commission (1964-66) observed that the talent has to be located early and allowed to grow in the best atmosphere and under the best teachers. This indicates that an understanding of the concept and correlates of creativity is essential for the identification and fostering of creative talent.

Not much work seems to have been done in the area of creativity in India. The studies conducted are mostly among the urban and more advanced regions. (Mehdi; 1985; Passi, 1982; Rainā, 1969).^{5,6,7,8} In a remote area like the North-East region, no substantial research has been done in this field. The North-East region of India presents a somewhat unique situation. The presence of a relatively large number

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5. Mehdi, B. "Research on Creativity" in S.K. Pal and P.C. Saxena (eds.) "Quality Control in Educational Research"; New Delhi ^{Metropolitan}; 1985; 469 - 493.
 6. Passi, B.K.: "Creativity in Education, Agra: Psychological Corporation, 1982.
 7. Raina, M. "Creativity Research in India" The Journal of Creative Behaviour 1969, Vol. 3: 111 - 114.

of racial and ethnic groups living as neighbours within a limited geographical region makes the region unlike other parts of India. Their racial and cultural backgrounds are different, and as result, they are not equally developed socio-economically and educationally. The tribal population of the region has remained comparatively backward and isolated from the mainstream of Indian life. This peculiar position of the tribals is being given special attention by the Central and the State governments. In all national and state plans of development, the yearning of these groups for a better life is being taken into consideration. However, not much seems to have been done for the fostering of talents in these regions. Consequently, there is a tremendous amount of wastage of the tribal talent due to the neglect and failure to identify and promote the potential to develop in conducive conditions.

There are few studies undertaken in the area of creativity or personality in the tribal regions. The significance of personality and other non-cognitive factors have been emphasized for planning the educational programmes and for fostering the creative talent (Parnes, 1972; Raina, 1971; Taylor, 1961; Torrance, 1970). ^{8,9,10,11} Mizoram.

8. Parnes, S.J. Creativity: Unlocking Human Potential. Buffalo D.O.K. 1972.

9. Raina, M.L. Research on Creative Functioning in India : A Review Indian Educational Review. 1971, 6, 2: 260-280.

10. Taylor, C.W. "A Tentative Description of Creative Individual" in W.B. Waetzen (ed.) Human Variability and Learning, Washington, 1961.

11. Torrance, E.P. Encouraging Creativity in the Classroom, Dubuqua Iowa Wm C. Brown, 1970.

the newly formed state in the North-East has tremendous potential for development. The land came under the influence of British missionaries after being annexed by the British in 1891. The people were converted to Christianity, and they discarded their former animistic belief and some of their social customs and practices. Introduction of formal education adoption of the Roman script for the Mizo language and the subsequent expansion of education are the other beneficial results of the missionaries' efforts (McCall, 1949¹²). The people have retained a consistently high rate of literacy (53.79 percent in 1971 and 59.88 percent in 1981) and are rated fourth in the all-India census.

But, in spite of the consistently high rate of literacy and the tremendous expansion of education, professionally trained manpower necessary for the development of the community appears to be lacking¹³. The lack of proper facilities and absence of a congenial climate to detect and cultivate the creative potential, may, among others, be important factors in this regard. This prompted the investigator to undertake the present research in order to examine the level of creative thinking ability and the personality characteristics of the creative students in the secondary schools in Mizoram.

12. McCall, A.G. Lushai Chrysalis, London: Lusac, 1949.

13. Sudhir, M.A., and Lalrinkimi, Modernity in the context of Education and Sociocultural Factors: A study of Social Attitudes in Mizoram. The Journal of Social Psychology, 1986, 126 (3): 375 - 380.

Statement of the Problem

Researches in the field of creativity have so far focussed primarily on the nature and concept of creativity and its relationship with intelligence and such other cognitive factors as scholastic achievement, language skills, memory and recall. Several attempts have been made to understand the personality traits associated with creativity (Barron, 1953; Getzels and Jackson, 1962; Mackinnon, 1960; Taylor, 1961; Torrance 14,15,16,17,18 1965).

In his personality studies of highly creative children, Torrance (1962) observed that three personality characteristics stand out, differentiating the highly creative children from the less creative but equally intelligent children. First, the highly creative children have a reputation for "having wild silly ideas" especially the boys. Secondly, their work is characterised by the production of ideas "off the beaten track", "outside this world". Third, their work is characterised by "humour, playfulness, relative lack of rigidity, and relaxation".

14. Barron, F. "Some Personality Correlates of Independent Judgement" Journal of Personality, 1953, 48, pp 287 - 297.
15. Getzels, J.W. and Jackson, P.W. Creativity and Intelligence: Explorations with Gifted Students, New York : Wiley, 1962.
16. Mackinnon, D.W. Personality and the realization of Creative Potential. American Psychologist, 1965, 28: 273- 281.
17. Taylor, C.W. Research Findings on Creativity Characteristics Studies in Art Education, Fall 1961, 3, No. 1, 9-16.
18. Torrance E.P. Rewarding Creative Behaviour, New Jersey, Prentice Hall, 1965.
19. Torrance E.P. Guiding Creative Talent. Englewood Cliffs, N.J.; Prentice Hall, 1962.

Taylor(1962) also gives picture of the creative individual, as "unconventional and as resisting the drives towards conformity and the conventional thinking often found in schools,"²⁰ Barron (1958) in his studies of highly creative people found them "more original, less suggestible and more tolerant of structural disorderliness."²¹ Drevdahl (1956)²² and Drevdahl and Cattell (1958)²³ found various creative groups low in extraversion, more concerned with ideas than with people, and rather uninterested in activities of a social nature. Taylor and Ellison (1964)²⁴ reported self-sufficiency and low sociability among the creative scientists, while Getzels and Csikszentmihalyi (1964) provide similar data for art students.²⁵ McClelland (1963) suggested "a willingness to take risks" as an important characteristic of a creative individual.²⁶ It has, however, to be noted that the comparisons

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20. Taylor, C.W. Who are Exceptionally Creative? Exceptional Children, April, 1962, 28: 421 - 429.
21. Barron, F. The Psychology of Imagination. Scientific American, Sept. 1958, 199: 150-166.
22. Drevdahl, J.E. Factors of importance for Creativity. Journal of Clinical Psychology, 1956, 12, 21 - 26.
23. Drevdahl, J.E. and Cattell, R.B. Personality and Creativity in Artists and Writers Jou. Clinical Psychology 14; 107-111.
24. Taylor, C.W. and Ellison, R.L. Predicting Creative Performance from Multiple Measures in Taylor, C.W.(ed.) Widening Horizons in Creativity, New York; Wiley, 1964; 227-260.
25. Getzels, J.W. and Csikszentmihalyi, M. Creativity Thinking in Art Students: An Exploratory Study. Cooperative Research Project No. E008. Chicago University, p. 1964. p. 202

of creative and noncreative individuals have produced both conflicting and inconsistent observations on a variety of non-cognitive characteristics and the picture is very uneven. Further, it has been found that "certain personality characteristics may lead to high creativity in some social settings but not in others, and some kind of social environment may be conducive to high creativity for certain types of personality but not for others" (Mehdi, 1979).²⁷

The present study has been designed with a view to examine the creative thinking ability among the secondary school students in Mizoram. The relationship between creativity and personality characteristics; sex differences, and locale differences in the context of personality correlates of the creative students were also studied. Accordingly, the study was entitled; "Non-cognitive Correlatives of Creativity among the Secondary School Students."

26. McClelland, D.C. *The Calculated Risk; An Aspect of Scientific Performance*. In Taylor, C.W. and Barron, F., (eds.) Scientific Creativity Its Recognition and Development. New York; Wiley, 1963.
27. Mehdi, B. *Socio-Psychological Factors in Creativity Among School Children*. ICSSR Research Abstracts Quarterly, vol. VIII, Jan - March, New Delhi, 1979.

Objectives of the Study

The study was designed primarily to realise the following objectives:

1. To compare the personality characteristics of the high creative and the low creative secondary school students.
2. To find the sex differences in personality characteristics of the high creative students.
3. To examine the locale differences in personality characteristics of the high creative boys and girls of the secondary schools in Mizoram.
4. To make suggestions for improving the educational practices in enhancing creative thinking abilities among the secondary school students.

Hypotheses Formulated

Statistical verification of the following hypotheses was undertaken:

1. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Reserved - Outgoing.
2. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Less intelligent - More intelligent.
3. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Affected by feelings - Emotionally stable.

4. There is no significant difference between the high creative and the low creative students with regards to personality characteristics: Pliant - Excitable.
5. There is no significant difference between the high creative and the low creative students with regards to personality characteristics: Obedient - Assertive
6. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Sober - Happy-go-lucky
7. There is no significant difference between the high creative and the low creative student with regard to personality characteristic: Expedient - Conscientious.
8. There is no significant difference between the high creative and the low creative student with regard to personality characteristic: Shy - Venturesome.
9. There is no significant difference between the high creative and the low creative student with regard to personality characteristic: Toughminded - Tenderminded.
10. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Vigorous - Doubting.
11. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: Placid - Apprehensive.

12. There is no significant difference between the high creative and the low creative students with regard to the personality characteristics: **Group-dependent - Self-sufficient.**
13. There is no significant difference between the high creative and the low creative students with regard to the personality characteristics: **Undisciplined - Controlled.**
14. There is no significant difference between the high creative and the low creative students with regard to personality characteristics: **Relaxed - Tense.**
15. There is no significant sex difference in personality correlates of the high creative students.
16. There is no significant difference in the personality correlates of the high creative boys and girls coming from rural and urban areas.

Design of the Study

The sample of the study consisted of 700 pupils (335 boys and 365 girls) selected randomly from Classes IX and X drawn from ten secondary schools in Mizoram.

The tools employed to gather the data included :

- (i) Cattell's (1973) ²⁸ 14 High School Personality Questionnaire (HSPQ), and
- (ii) 'Creativity Test' developed by the investigator especially for the study.

28. Cattell, R.B. Handbook of Jr.-Sr. High School Personality Questionnaire (HSPQ). Institute of Personality and Ability Testing: Illinois, 1973.

The 'Creativity Test' is a test battery developed on the line of Guilford Divergent Production Test (1967)²⁹ and Torrance Tests of Creative Thinking (1966)³³ and consists of five verbal tests : (i) seeing problems test; (ii) unusual uses test; (iii) consequences test; (iv) making things interesting and useful; and (v) similarities test. It also consists of three non-verbal tests; (i) picture construction; (ii) picture completion; and (iii) circles test. The coefficient of correlation for test-retest reliability on a sample of 100 students after an interval of 15 days was .802 for the whole test; .819 for the verbal and .725 for the non-verbal tests, significant at .01 level. The test was validated by comparing it with scores on HSPQ on calculated dimensions (Cattell, 1973)³¹ which yielded a statistically significant correlation coefficient of .703. The test was also validated against teacher rating for the total creativity score (N=100), the correlation coefficient being .532 significant at .01 level.

The scores on the 'Creativity Test' were taken as criterion for classifying the pupils into high creative and low creative groups, the highest twenty percent constituting the 'high creative group' (N=140), and lowest twenty percent the 'low creative group' (N=140).

29. Guilford, J.P. and et al., "A Factor Analysis Study of Creative Thinking II: Administration of Tests, and Analysis of Results' Reports from Psychological Laboratories. No. 8., Los Angeles: University of South California, 1967.
30. Torrance, E.P. Torrance Tests of Creative Thinking: Directions, Manual and Scoring Guide. Princeton, N.J: Personnel Press, 1966.
31. Cattell, R.B. Handbook of Jr.-Sr. High School Personality Questionnaire (HSPQ). Institute of Personality and Ability Testing: Illinois, 1973.

For testing the stated hypotheses, the obtained data were subjected to the 2x2x2 analysis of variance design. The three-way classification of ANOVA was done with respect to creativity, sex, and locale. The factor of creativity was varied in two ways - high creative and low creative groups. This was further treated in two ways, boys and girls on sex, and rural and urban on locale. The 't' test was applied to find out the nature and extent of relationship between the high creative and low creative groups with regard to personality scores and results interpreted accordingly.

Definition of Terms

1. Creativity: Creativity is taken as a divergent thinking process enabling the pupils for creative outputs (novel and useful) and measured through verbal and non-verbal creativity test on four primary traits, fluency, flexibility, originality and elaboration.
2. Non-cognitive correlates: Non-cognitive correlates designate the personality characteristics influencing creativity among the high school students. The personality characteristics are defined in terms of fourteen personality traits as measured by the Cattell's (1973) 14 High School Personality Questionnaire (HSPQ).

Organisation of the Report

The research report has been divided into six chapters. The introductory chapter, that is, the present one, outlines the research problem and its need and significance. It also enunciates the important objec-

tives, hypotheses and the design of the study. The conceptual analysis, and the theoretical formulations of creativity in various personality theories are presented in Chapter II. A review of studies conducted in creativity in relation to both non-cognitive and cognitive variables is undertaken in Chapter III. In Chapter IV is given a detailed description of the method of study - the sample, tools, and various techniques employed for analysis of the data. Chapter V presents the analysis and findings, and the concluding chapter gives a brief resume of the study together with the salient findings, their interpretations, educational implications, and suggestions for further research.

CREATIVITY: A CONCEPTUAL ANALYSIS

Creativity is conventionally considered as an ability to produce a work or thought of imagination along new or unconventional lines. Creative thinking is considered the highest of mental functions and creative production the peak of human achievement. There is no universally agreed upon definition of creativity. Morgan (1953)¹ published a list of twenty five definitions after a thorough review of literature. The consensus of these definitions enunciates that creativity involves the development of something unique, although the uniqueness has not been well-defined. Of course, human beings are endowed with uncommon powers, and of all their powers, creativity is the most unique. Even the computer can only repeat the mechanical orientations but cannot produce original ideas which the human mind is capable of doing - the work of creation. Rhodes (1961) after a thorough analysis of fifty definitions emphasized either one or a combination of four strands (Ps) of creativity : person, process, press and product.²

Systematic researches in the field of creativity using the four strands have evolved different approaches to the study of creativity in recent years and also given a comprehensive definition to the concept of creativity.

1. Morgan, D.N. Creativity Today, Journal of Aesthetic Art and Criticism, 1953, 12, 1 - 24.

2. Rhodes, M. An Analysis of Creativity, Phi Delta Kappan, 1961, 42, 305 - 310.



Creativity and Person

The concept of creativity envisaged in this approach explains the cognitive and non-cognitive variables influencing the functioning of creative person. Simpson (1922) emphasized the cognitive structure in creative ability. The mental qualities involved in searching, combining and synthesizing are given credence. He also used curiosity, imagination, discovery, innovation and invention prominently to indicate creative potentials. ³ Wallas (1926) observed that a number of abilities are involved in creative problem solving process such as bringing problem to the fore of the mind, originating or inventing an idea or concept, and the realization of solutions along new and unconventional lines. In other words, different mechanisms, laws and effects are used in creative thinking. ⁴ The first systematic hypothesis concerning dimensionality of creative thinking was proposed by the pioneering efforts of Gullford in 1950. In his model of the structure of intellect (SI), Gullford emphasized creativity as an individual's ability of generation of information from given data where the emphasis is upon variety of output from the same source (innovation, originality, unusual synthesis or perspective). On the basis of the factor analytic studies, Gullford conceived of two modes of intellectual operations, namely, convergent thinking and divergent thinking. The former refers to conventional type of intelligence, emphasizing the narrowing down of possibilities

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3. Simpson, R.M. Creative Imagination. American Journal of Psychology 1922, 33, 234 - 243.
 4. Wallas, G. The Art of Thought. New York: Harcourt Brace, 1926.

on the production of the alternative answers to a problem. Convergent thinking, thus refers to the generation of ideas arising from given information with emphasis on achieving conventionally acceptable answers.

Divergent thinking, on the other hand, is viewed as involving the production of as many answers as possible to a problem. It is concerned with thinking in different directions, sometimes searching, sometimes seeking variety. In other words, in divergent thinking, the emphasis centres on the logical possibilities while in the case of convergent thinking, it centres on logical necessities. The theory suggests that an optimal degree of internal consistency exists among the divergent intellectual abilities, and the abilities of fluency and flexibility in thinking bear special reference for creative thinking.⁵ Wilson et al. (1954) verified the hypothesis of Guilford using factor analysis in their study of creative thinking ability among the air cadets and student officers. The study isolated fluency, flexibility, originality, elaboration and re-definition as factors associated with creativity.⁶

Guilford's(1967) scheme for classification of human abilities includes four fluency factors namely, associational fluency, expressional fluency, word fluency and ideational fluency; and two flexibility factors, namely, spontaneous flexibility and adaptive flexibility, in addition to factors

5. Guilford, J.P. Creativity. American Psychologist, 1950, 14,469-479.

6. Wilson, R.C., Guilford, J.P., Christensen, R., and Lewis, D.J. A Factor Analytic Study of Creative Thinking Abilities. Psychometrika, 1954, 19, 297 - 311.

of originality, redefinition and elaboration. ⁷

These studies, no doubt formed the basis for practical and empirical explanations about creativity. The studies, further, paved the way for researchers and thinkers for practical utility of the findings of creative functioning. Thus, Lowenfeld (1952) explained eight characteristics of a creative person; sensitivity, fluency, flexibility, originality, redefinition, ability to abstract, ability to synthesize and coherence of organization. Torrance (1962), on the basis of systematic studies in the area, identified eighty four characteristics of creative people. ⁹

Crutchfield (1962) considered creative person as a conformity contrasting and an independent functioning unit. For Crutchfield, the independent thinkers were able to function effectively under stress, relatively unsusceptible to generalized anxiety, relatively free of feelings of inferiority and inadequacy, open and free in emotional process, ascendent in relations with others, persuasive and able to mobilize resources easily and effectively, active and vigorous, natural and free from pretence, expressive, and able to seek and enjoy aesthetic and sensuous impressions. ¹⁰ These scientific studies of creativity compel us to envisage that a creative person himself has a unique personality, and his unique characteristics may help him to sustain the creative activity throughout his life, a distinctive feature not found among the common man.

7. Gullford, J.P. The Nature of Human Intelligence, New York: McGraw Hill, 1967.

8. Lowenfeld, V. The Nature of Creative Activity. London: Routledge and Kegan Paul, 1952.

9. Torrance, E.P. Guilding Creative Talent. Englewood Cliffs, New Jersey; Prentice Hall, 1962.

10. Crutchfield, R.S. Conformity and Creative Thinking. In H.E. Gruber et al. (ed.) Contemporary Approaches to Creative Thinking, New York: Artherton Press, 1962.

Creativity as a Process

As a process, creativity is a type of thinking process which enables the person to think in different directions and to search for many possible solutions to a problem. Yamamoto (1964) defined creativity as "the process of forming new ideas or hypotheses, testing these ideas or hypotheses, and communicating the result."¹¹ Creativity according to Taylor (1955) is a result and process of social transaction, a novel work that is accepted and satisfying to a group at some point in time.¹²

Thinking process involved in creation are of two kinds; cognito, to shake and throw things together; and intelligo, to choose and discriminate from many alternative possibilities and then synthesize and bind together elements in new and original ways (Barchillon, 1961).¹³ Torrance (1969) defined creative thinking as "the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies and so on, identifying the difficulty, searching for new solutions, making guesses or formulating hypothesis about the deficiencies, testing and retesting these hypotheses and possibly modifying and retesting them, and finally communicating the results".¹⁴ The definitions based

11. Yamamoto, K. *Creative Thinkings: Some Thoughts on Research. Exceptional Children*, 1964, 34, 403-410.

12. Taylor, C.W. The Identification of Creative Scientific Talent. Salt Lake City, Utah: University of Utah Press, 1955.

13. Barchillon, J. *Creativity and Its Inhibition in Child Prodiges: Personality Dimensions of Creativity.* Lincoln Institute of Psychotherapy, N.Y., 1961 in E.P. Torrance, Rewarding Creative Talent: Experiments in Classroom Creativity. Englewood Cliffs, N.J. Prentice Hall, 1965.

14. Torrance E.P. *Identifying Talent in C.E. Bish (ed) Accent on Talent.* Illinois: The Committee for the study of Intellectual Talent, 1969.

on creativity as a process pay less stress on the person, but stress the process working within the psyche of the creator. According to Spearman(1930), who considered creation purely as a process, creative thinking is the process of seeing or creating relationships with both conscious or subconscious processes operating.¹⁵ Gullford also conceptualized the process when he defined divergent thinking as the 'process of hypothesis forming, testing and result communication'¹⁶

It was John Dewey (1910) who described the creative thinking process as : awareness that a problem or a difficulty exists; analysis of the problem; leading to an understanding of its nature; suggestion of possible solutions; and testing the alternative solutions by a process of judgement and accepting or rejecting solution.¹⁷ Wallas (1926) identified four stages in the creative process (i) preparation (ii) incubation (iii) illumination and (iv) verification.¹⁸ Harris (1959) suggested six steps : (1) realizing the need (2) gathering information (3) thinking through (4) imagining solutions (5) verifications and (6) putting the ideas to work. Vinacke (1960) viewed that "It is necessary to conceive of creative thinking in terms of dynamic inter-playing activities, rather than as more or less discrete stages."¹⁹ Ghiselin (1952) speaks of creativity as a process of change and development in the psychic life

15. Spearman, C.W. The Creative Mind, London: Cambridge University Press, 1930.

16. Gullford, J.P. Structure of Intellect. Psychological Bulletin. 1953, 53, 267 - 293.

17. Dewey, J. How we think. Boston, D.C.: Heath and Co., 1910.

18. Wallas, G. The Art of Thought. New York: Harcourt Brace, 1926.

19. Vinacke, W.E. The psychology of Thinking. New York : McGraw Hill, 1960.

of an individual leading to invention. ²⁰ Describing the process of invention, Rossman (1931) observed that there are seven salient steps in arriving at a new invention; a need or difficulty is observed, the problem is formulated, available information is surveyed; solutions are suggested; solutions are critically examined; new ideas are formulated; and finally new ideas are tested. ²¹

The creative thinking process is, thus, taken as a mental activity which translates internal experiences into abstract and non-verbal symbols that are meaningful and communicable pertaining to the issue.

According to MacKinnon (1960) creativity is a process with a time dimension involving originality, adaptiveness and realization. The phases of creativity according to him are : (1) a period of preparation during which one acquires the skills and techniques and the elements of experience which make it possible for one to pose a problem to oneself; (2) a period of concentrated effort to solve the problem which may be suddenly solved without much delay or difficulty, but which perhaps more often involves so much frustration and tension and discomfort that out of sheer self-protection one is led to; (3) a period of withdrawal from the problem, a psychological retreat of the field, a period of renunciation of the problem or recession from it; (4) a period of insight accompanied by the exhilaration, flow and elation;

20. Ghiselin, B. The Creative Process. New York: Mentor Books New American Library, 1952.

21. Rossman, J. The Psychology of the Inventor. Washington D.C.: Inventors Publishing Co., 1931.

and (5) a period of verification, evaluation and elaboration of the insight one experienced. ²²

Creativity and the Press

The interaction between the individual and his environment is taken as a basis to conceptualize creativity. In this approach, it is assumed that the effect (press) of the environment initiates the individual for creative activities. Although Maslow defined creativity on the basis of process, it was Freud who sprouted the idea. Freudian view holds that the sublimation of the repressed wishes of the unconscious mind determines creativity. Creative production is a form of substitute gratification and an extension of child's play and ordinary man's day dreams (Freud, 1955). In the creative act, the mind represses giving way to the 'games of the underground', combines incompatible ideas... and possess the fluidity of the 'primitive consciousness of the child.' ²³

Phillips (1957) following this viewpoint considers an artist as a successful 'neurotic' person who seeks through socially acceptable channel the outlets of his unconscious conflicts. The conflicts are created by the press which, in turn, acted upon the artist's psyche through the forces of the interacting environment. Social institutions such as family, church, charitable organisations, peer groups may constitute the interacting environment. ²⁴ The neo-Freudians, however,

22. McKinnon, D.W. Identifying and Developing Creativity Selection and Educational Differentiation. Berkeley : University of California, 1960, 75 -89.

23. Freud, A.H. The Interpretation of Dreams. New York: Basic Books, 1955.

24. Phillips, W.(ed.) Art and Psychoanalysis, New York: Criterion Books, 1957.

explained creativity through inferiority - superiority, or complexes or will power. Vinacke (1960) defined creativity as "an integrated harmony between external world of reality and the individual's internalized needs".²⁵ The seeds of creativeness seems to possess each and every soul, but the environment may fail to provide the congenial conditions for its cultivation, and the individual will never attain the potential. Maslow (1962) who explained self-actualization as a pattern of personality growth envisaged creativity as a fundamental change in personality structure occurring in the direction of fulfilment. He distinguished "special talent" creativeness and "self-actualizing" creativeness. The former is the result of high abilities in special fields and the latter due to independent mental health, springing directly from personality appearing as creative flexibility.²⁶ Rogers (1961) also emphasized "press" in defining creativity as his theory is based on "openness to experience."²⁷ May (1959) recognized conscious efforts rather than unconscious and suggests²⁸ "the encounter of intensively conscious human beings with his world."

Creativity as a product

In terms of product, creativity has been defined as the ability to produce something new- an idea, a theory, an invention, or a master-

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25. Vinacke, W.E. The Psychology of Thinking. New York : McGraw-Hill, 1960.
26. Maslow, A.H. Towards a Psychology of Being. Princeton, N.J. D. Van Nostrand, 1962.
27. Rogers, C.R. On Becoming a Person. Boston : Houghton Mifflin, 1961.
28. May, R. The Nature of Creativity in H. Anderson (ed) Creativity and Its Cultivation. New York : Harper and Row, 1959.

piece of art. In terms of manifest product, creativity is novel and useful. According to Barron (1965) "Creativity may be defined as the ability to bring something new into existence,"²⁹ Stein (1953) suggested that "creativity results in a novel work that is acceptable as tenable or useful by a group at some point in time."³⁰ Drevdahl (1956) defined creativity as the capacity of a person to produce compositions, products or ideas of any sort which are essentially new or novel, and previously unknown to the producer.³¹ MacKinnon (1962) maintained that true creativity"..... involves a response or idea that is novel or at the very least statistically infrequent....(that)...must to some extent be adaptive to, or of, reality. It must serve to solve a problem, fit a situation, or accomplish some recognizable goal. And...(it)....involves a sustaining of the original sight, an evaluation and elaboration of it, a developing of it to the full."³² Thus in this approach, the product which the creative individual evolves is the real measure and an extremely complex judgement is required to determine whether the product is creative or not. Describing a creative person, an artist or a scientist, it is his contribution and the quality of the contribution in terms of innovation, novelty and originality, are taken as criterion for creativity.

Gullford (1960) who originated psychometric procedures in the measurement of creativity, considered only divergent productions as creative

29. Barron, P. The Psychology of Creativity. In New Directions in Psychology II. New York, 1965, 1-34.

30. Stein, M.I. Creativity and Culture. Journal of Psychology 1953, 36, 311-322.

31. Drevdahl, J.E. Factors of Importance for Creativity. Journal of Clinical Psychology, 1956, 12, 21 - 26.

32. MacKinnon, D.W. The Nature and Nurture of Creative Talent. American Psychologist. 1962, 17, 484-495.

output; and his factor analytic studies showed that the components of creativity, such as fluency, flexibility and originality can be measured through psychological tests.³³ Bronowski (1958), on the other hand, distinguished discovery, invention and creativity by indicating that a fact is discovered, a theory is invented, but only a masterpiece is created.³⁴ For instance, Columbus discovered the West, Bell invented the telephone, and Shakespeare created "Othello". Maslow (1958)³⁵ and Rogers (1959)³⁶ also preferred to define and conceptualize creativity from the point of view of product. However, the quality of the material produced and the "press" generated to create the uniqueness are given due consideration by them. Definitions are also formulated in terms of the subjective experience involved in creation. Maslow (1962) mentions the importance of inspiration and the 'flash' of insight, the transcendent sensation itself, the issue being the "inspired moment" rather than the "inspired product".³⁷ Creativity is equated with imagination by many researchers. Osborn (1953) described creativity as "imagination combined with intent and effort".³⁸ Ariety (1976) stressed the

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33. Guilford, J.P. and et al. A Factor Analysis Study of Creative Thinking II: Administration of Tests and Analysis of Results. Reports From the Psychological Laboratory, No. 24, Los Angeles: University of Southern California, 1960.
34. Bronowski, J. The Creative Process. Scientific American, 1958, 199, 3, 58 - 66.
35. Maslow, A.H. Emotional Blocks to Creativity. Journal of Individual Creativity, 1953, 14, 51- 56.
36. Rogers, C.R. Toward a Theory of Creativity in H.H. Anderson (ed) Creativity and its Cultivation. New York: Harper, 1959.
37. Maslow, A.H. Towards a Psychology of Being. Princeton, N.J. :D. Van Nostrand, 1962.
38. Osborn, A.P. Applied Imagination. NYC: Charles Scribners, 1953.

importance of imagination as a precursor of creativity. Parnes³⁹
 (1979) related the function of imagination to the functions of knowledge
 and judgment as they together form the essence of the creative process.⁴⁰

Creativity and Personality

Another approach to study creativity is through personality traits. Researches adopting psychometric evaluation (Roe, 1946;⁴¹ MacKinnon, 1965)⁴² observed that the tests of personality can no doubt be applied to detect some of the subtle characteristics of the creative person as the indicators of creativity, which include casual and undirected observation in natural settings. Dellas and Galer (1970) after a review of researches in this area reports, "..... this evidence points up a common pattern of personality traits among creative persons and also that these personality factors may have some bearing on creative in the abstract regardless of field".⁴³ The studies further acknowledged that the personality characteristics of young creative bear similarity to those of creative adults and therefore, the conclusion seems tenable that these traits develop fairly early. Their manifestation at this level suggests that the characteristics may be determinants of creative performance rather than traits developed in response to recognition of creative behaviour. Summarizing a series of studies, Dellas and

39. Arieti, S. Creativity: the magic synthesis NYC : Basic Books, 1976.

40. Parnes, S.J. CPSI; the general system. The Journal of Creative Behaviour, 1977, 11,(1), 1-11.

41. Roe, A. "The Personality of Artists", Educational Psychology, 1946, 6: 401 - 408.

42. MacKinnon, D.W. "Personality and the realisation of Creative Potential". American Psychologist, 1965, 28: 273 - 281.

43. Dellas, M. and Galer, H.L. "Identification of Creativity: The Individual". Journal of Creative Behaviour, 1970, 73:1, 56- 73.

Galer concluded that the creative person is characterized by the following personality traits :

- (1) independence in attitude and social behaviour
- (2) dominance
- (3) intro-version
- (4) openness to stimuli
- (5) wide interests
- (6) self-acceptance
- (7) intuitiveness
- (8) flexibility
- (9) social presence and poise
- (10) an asocial attitude
- (11) unconcern for social norms.

Radicalism and rejection of external constraints are two other traits related to creative behaviour. The personality approach of creativity analyses the qualities of persons and helps in the identification of a creative individual. The creative person then appears to have certain distinctive personality characteristics, and these traits may be recognizable in younger individuals before adult accomplishments have been demonstrated. Associational fluency, expressional fluency, ideational fluency, spontaneous ⁴⁴ flexibility and adaptive flexibility were the factors identified by Guilford (1967) in his scheme of classification ⁴⁵ of human abilities for creativity. Lowenfeld (1952) reported eight

44. Guilford, J.P. "Creativity, Yesterday, Today and Tomorrow". Journal of Creative Behaviour, 1967, 1, 1:3 - 13.

45. Lowenfeld, V. The Nature of Creative Activity. London : Routledge and Kegan Paul, 1952.

characteristics of creative person, namely, sensitivity, fluency, flexibility, originality, redefinition, ability to abstract, ability to synthesize and coherence of organization.

The empirical approaches in the study of creative functioning and development of creativity among children has recognized the personality approach as the most feasible one. In this context, a close analysis of creativity dimension from the perspective of various personality theories will be worthwhile.

Creativity from Psychoanalytic viewpoint

Taylor (1975)⁴⁶ suggests that Freud was the first to undertake serious work on creative ability. In fact, an early systemic account for the personality-creativity relationship can be found in Freud's work and many of Freud's writings were concerned with the act of creation. According to Freud, the diversion of libidinal energy serves as a cause for the creative attainments of individuals and the basic tendency of all is to maximize instinctual gratification while minimizing punishment and guilt (Maddi, 1976; Freud, 1915).⁴⁷ Freud theorized that the source of creative content is the unconscious and the energy of creative drive is the result of sublimation. Sublimation results

46. Taylor, I.A. A Retrospective View of Creativity Investigation. In I.A. Taylor and J.W. Getzels (eds.) Perspectives in Creativity. Chicago ; Aldine, 1975.

47. Maddi, S.R. Personality Theories; A Comparative Analysis. Homewood II ; Dorsey Press 1976.

Freud, S. Instincts and their vicissitudes (1915). Standard Edition. Vol. 14, 1957.

in the diversion of libidinal energy from primitive sexual goals to more socially acceptable scientific or artistic activities (Dayton, 1976; Freud, 1930).⁴⁸ For example, Freud (1910)⁴⁹ observed that Leonardo da Vinci's painting of Madonnas was a sublimated longing for a mother from whom he was separated at an early age. In all cultural achievements, including creativity, occurs through the process of sublimation according to Freud and the development of civilization itself was made possible through the process. Freud viewed creative persons, particularly artists, as having an unusual capacity to arrive at sublimation (Klein, 1971).⁵⁰ The creative process originates from inside the individual and the creative product mirrors unconscious images which have been processed into socially acceptable forms by the ego. Sublimation is the defense generally associated with the genital stage of psychosexual development- the pinnacle of development and maturity. Creative thought derives from the elaboration and extension of the "freely rising" fantasies and ideas related to day-dreaming and childhood play. The creative individual challenges these "freely rising" fantasies and ideas while his low-creative counterpart suppresses them.

48. Dayton, G.C. Perceptual Creativity: where inner and outer reality come together. Journal of Creative Behaviour, 1976, 10, 256 - 264.

Freud, S. Civilisation and its discontents (1930). Standard Edition, Vol. 21. 1961.

49. Freud, S. Leonardo da Vinci and a memory of his childhood. (1910) Standard Edition, Vol. 11, 1957.

50. Klein, R.H. Creativity and Psychopathology; A theoretical model. Journal of Humanistic Psychology, 1971, 11(1), 40 - 52.

Getzels and Jackson (1962) ⁵¹ summarized Freud's position as follows:-

1. Creativity has its genesis in conflict, and the unconscious forces motivating the creative "solution" are parallel to the unconscious forces motivating the neurotic "solution".
2. The psychic function and effect of creative behaviour is the discharge of pent-up emotion resulting from conflict until a tolerable level is reached.
3. Creative thought derives from the elaboration of the "freely rising" fantasies and ideas related to day-dreaming and childhood play.
4. The creative person accepts these "freely rising" ideas, the noncreative person suppresses them.
5. It is when the unconscious processes become, so to speak, ego-syntonic that we have the occasion for "achievements of special perfection".
6. The role of childhood experience in creative production is emphasized, creative behaviour being seen as "a continuation and substitute for the play of childhood".

Jung also wrote extensively about creativity and observed creativity as springing from the unconscious, but emphasized the role of collective unconscious. "The creative process, so far as we are able to follow it all, consists in the unconscious activation of an archetypal image, and in elaborating and shaping this image into the finished work" (Jung,

51. Getzels, J.W. and Jackson, P.W. Creativity and Intelligence, NYC John Wiley, 1962.

1966).⁵² Jung postulated ~~two~~ types or processes of creativity. The "psychological" type which deals with materials drawn from the realm of human consciousness and experience, and a "visionary" type of creativity which stems from the unconscious. Describing artistic creation, Jung, further divided creativity influenced by the unconscious into "symptomatic art" which stems from the personal unconscious of the individual and "symbolic art" which stems from the collective unconscious of mankind. Jung seemed to consider the personal unconscious to be closer to consciousness, and criticized Freud's frame to find a work of art solely in terms of the personal unconscious of the artist (Jung, 1933).⁵³ He emphasized the collective unconscious which is in a sense, a store-house of racial memories handed down from the distant past in the form of archetypes. The concept of a collective unconscious represented a radical departure from Freud's concept of an unconscious consisting of repressed thoughts and memories. There are no inborn ideas, but there are inborn possibilities of ideas that set bounds to even the boldest fantasy and keep our fantasy activity within certain categories. Jung theorized that creativity products and ideas do not depend solely upon the unconscious, ~~but~~ rather stem from the interaction between the conscious and the unconscious mind. Psychic energy is needed to bring unconscious thoughts to the surface and the personality performs a "transcendent function" which mediates between conscious and unconscious during the creative process (Stein and Helze, 1960).⁵⁴ For Otto Rank, creativity was a construct central

52. Jung, C.G. On the relation of analytical psychology to poetry. In The Spirit in man, art, and literature, vol. 15, The collected Works of C.G. Jung, NYC: Bollingen Foundation, 1966.

53. Jung, C.G. Modern man in search of a soul. NYC: Harcourt Brace, 1933.

54. Stein, M.J. and Helze, S.J. Creativity and the individual: Summaries of selected literature in psychology and psychiatry. Glencoe, IL: Free Press, 1960.

to the understanding of healthy human behaviour, "Creativeness lies equally at the root of artistic production and of life experience. That is to say, lived experience can only be understood as the expression of volitional creative impulse....." (Rank, 1932).⁵⁵ Rank's ideal personality type is called the "artist". His artist has no necessary relationship to the conventional meaning of the term but rather describes the personality who has successfully accepted the "fear of life" - fear of being a separate individual; the "fear of death" - fear of union and dependency; and achieved an integration of the two (Rank, 1945)⁵⁶

In creativity, as in many of his constructs, Rank placed greater emphasis upon the influence of consciousness than did Freud. Rank did not deny completely the role of the unconscious in creative behaviour. He recognized the effects of the unconscious, the role of sublimation, fantasy and day-dreaming in artistic creation (Rank and Sachs, 1916)⁵⁷ but did not consider the creative personality as totally controlled by his or her unconscious.

Ernst Kris, known for his concept of "regression in the service of the ego"⁵⁸ considers creativity to stem out of conflicts. Kris (1952) ascribes two phases to artistic creation, inspiration and elaboration, the former likened to a state of creative madness in which the ego controls the primary process and puts it into its service, while the

55. Rank, O. Art and artist. NYC: Alfred Knopf, 1932.

56. Rank, O. Will therapy and truth and reality. NYC: Alfred Knopf, 1945.

57. Rank, O. and Sachs, H. Esthetics and psychology of the artist. In O. Rank and H. Sachs (eds.) The significance of psychoanalysis for the mental sciences. Washington D.C. Nervous and Mental Diseases Publishing Company, 1916.

58. Kris, E. Psychoanalytic exploration in art. NYC: International University Press, 1952.

latter deals with the experience of purposeful organization with the intent to solve problems. Kris reformulated Freudian theory, putting more emphasis upon the role of the ego in creativity (Kris, 1975)
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For Kubie, creativity stems from the preconscious, rather than the unconscious. Kubie expanded Kris's position on the role of preconscious functioning in creativity. For Kubie, the preconscious is the source of true creativity, the influence of the unconscious is more likely to result in neurotic processes which block creative behaviour. According to Kubie (1958)⁶⁰ a type of mental function called "the preconscious system" is the essential implement of all creative activity; and that unless preconscious processes can flow freely there can be no true creativity. Creativity, thus, depends upon the free flow of symbolic imagery available only in preconscious functioning.

Creativity has played a major role in Adler's theory of personality.

Adler advocated that individual possessed a creative power to shape his or her own life (Ansbacher and Ansbacher, 1961).⁶¹ This "creative power of the self" or "creative self" became the capstone concepts in Adler's theory. Such was its significance that Adler eventually subordinated all other concepts within his theoretical system to the construct of the creative self. Adler's view of man was basically teleological. Man interprets life rather than merely responding in a predisposed,

59. Kris, E. Psychoanalysis and study of creative imagination. In Selected papers of Ernst Kris New Haven: Yale University Press, 1975.

60. Kubie, L. Neurotic distortion of the creation process. Lawrence: University of Kansas Press, 1958.

61. Ansbacher, H.L. and Ansbacher, R.R. (eds.) The Individual Psychology of Alfred Adler. NYC : Basic Books, 1956.

instinctual manner. A unique self-structure is created for each individual based upon the inherited past, the active interpretation of experiences, and a search for new experiences. Adler's view of creativity is, thus, broader than a simple explanation of a creative process or act. Creativity and uniqueness are basic to life itself. The creative self gives meaning to life; it creates the goal as well as the means to the goal. The creative self is the active principle of human life.....
 (Hall and Lindzey, 1970).⁶² Taylor (1975)⁶³ associated Adler's emphasis upon social interest, to see creativity in terms of social usefulness. The creative individual, in this perspective, is seen as serving a ~~less~~ more useful social function than the non-creative person.

Erikson's psychosocial theory of development (1962)⁶⁴ is particularly useful in ~~deriving~~ an understanding of the specific tasks involved as the individual matures from infancy to old age. He defines eight stages, each representing a task that must be mastered by each individual, a conflict of two opposing forces that must be brought into balance by each individual. The undertaking of such a task is a creative process and its product a creation that is for each of us unique and valuable. The product of each task is the overall creation that comprises the individual personality, the self being the integration of the creative

62. Hall, C.S. and Lindzey, G. Theories of Personality; NYC: John Wiley, 1970.

63. Taylor, I.A. A retrospective view of creative imagination. In I.A. Taylor and J.W. Getzels(eds.) Perspective in Creativity. Chicago : Aldine, 1975.

64. Erikson, E.H. Childhood and Society. NYC: Norton and Co., 1962.

product of each developmental task. ~~If these stages are examined with regard to the specific task involved and the primary beneficiary of the task.~~ If these stages are examined with regard to the specific tasks involved and the primary beneficiary of the task product, one finds the emergence of a definite pattern. The first two stages, Basic Trust vs. Mistrust and Autonomy vs. Shame and Doubt, which represent times when one develops a foundation. Sense of identity and self-control, involve tasks which primarily serve the development of the individual with little benefit to others. Progression through the next three stages represents a transition between tasks that are oriented primarily towards the self, and those oriented primarily towards others. Erikson's third stage, Initiative vs. Guilt, involves the conflict between one's own decision with its resultant action and the effect of this on the environment. The fourth stage of Industry vs. Inferiority involves the relationship between one's work and production and the value, the culture places upon such work production. In the fifth stage is a transition period, Identity vs. Role confusion, the individuals must resolve the conflict between how they view themselves and how others view them. The conflicts in this transition period thus involve relating one's individual development to the resultant effect on the environment. Following this transition period comes a time of action in the wider world. The stages of Intimacy vs. Isolation and Generativity vs. Stagnation represent a period in which there is a major priority placed upon a task completion to benefit others. Both stages in this period involve the sharing of oneself with others. Erikson's final stage, Ego Integrity vs. Despair, returns full cycle to a final reintegration of self, and represents the completion of the life cycle.

Creativity in Humanistic Approach

Creative imagination is viewed as a powerful and central concept in personality according to humanistic psychologist. Murray (1959)⁶⁵ considers....."creativity as the formation of a new and consequential entities and patterns of activity which is a centrally determining capacity of nature, especially of human nature." Best known for his taxonomy of needs, it is not surprising to find the crucial role of "creative need" in Murray's postulates. In addition to this innate need for creativity, Murray suggests that some degree of creativity is required for adaptation of human beings to novel situations. In the absence of this capacity, the personality may not develop normally. Like Murray, another exponent of the humanistic psychology, Maslow, also stressed the hierarchy of needs while conceptualizing creativity. According to him, creativity stems from the attempts of achieving the self-actualizing need. "My feeling is that the concept of creativeness and the concept of the healthy, self-actualizing, fully functioning human being seem to be coming closer and closer together, and may perhaps turn out to be the same thing" (Maslow, 1971).⁶⁶ The term self-actualization seems to have been first used by Goldstein (1930)⁶⁷ as a description of the overriding drive in people to realize their full potential. For Maslow, self-actualization refers to the desire of human beings for self-fulfilment, the desire to become

65. Murray, H.A. Vicissitudes of Creativity in Anderson, H.H.(ed.) Creativity and its civilisation. NYC: Harper and Brother, 1959.

66. Maslow, A.H. The creative attitude (1963) in The further reaches of human nature. NYC : Viking Press, 1971.

67. Goldstein, K. The Organism, NYC : American Book, 1939.

everything that one is capable of becoming (Maslow, 1970).⁶⁸ In his studies of self-actualized people, Maslow identified a common trend toward creativeness and maintained that the capacity for creativity is fundamental to all human beings. Creativity exists as a potentiality present in all persons at birth. Maslow, however, drew a distinction between "primary" and "secondary" creativity. Primary creativeness is that "which comes out of the unconscious, which is the source of new discovery- of real novelty - of ideas which depart from what exists at this point". Secondary creativity is the type of rational logical productivity demonstrated by capable, well-adjusted, successful people. True creativity depends upon the utilization and integration of both primary and secondary processes in the personality. Maslow pointed out that healthy, creative (self-actualized) persons can be childlike....when they want to be (regression in the service of the ego). These same people can afterward....become grown-up, rational, sensible, orderly, and so on, and examine with a critical eye what they produced in a great burst of enthusiasm and creative fervour....A truly integrated person can be both secondary and primary; both childish and mature (Maslow, 1971).⁶⁹ Maslow (1959)⁷⁰ distinguished between "special talent creativeness" and "self-actualizing creativeness". Self-

68. Maslow, A.H. Motivation and Personality. (2nd ed.) NYC: Harper, 1970

69. Maslow, A.H. Emotional blocks to creativity. (1958). In The further reaches of human nature. NYC: Viking Press, 1971.

70. Maslow, A.H. Creativity in self-actualizing people. In Anderson, H.H. (ed.), Creativity and its cultivation. NYC: Harper, 1959.

actualizing creativeness is a creative capacity present in everyone, but particularly found in the fully integrated personality, and is correlated with mental health. As a humanistic personality theorist, Maslow was more devoted in the study of self-actualizing creativity than creative work based on special talent. The personality of the individual rather than his or her achievements, was given credence and the great works of art, philosophy and science are produced by an "integrated" creativity composed of the primary and ~~secondary~~ creative processes.

Roger's treatment of creativity is similar to Maslow's in many respects. For Rogers also, the motivation for creativity stems from self-actualization attempts. "The mainspring of creativity appears to be the same tendency which we discover so deeply as the curative force in psychotherapy-man's tendency to actualize himself, to become his potentialities. By this, I mean the directional trend which is evident in all organic and human life - the urge to expand, extend, develop, mature- the tendency to express and activate all the capacities of the organism, to the extent that such activation enhances the organism or the self. This tendency may become deeply buried under layer after layer of encrusted psychological defenses; it may be hidden behind elaborate facades which deny its existence; it is my belief, however, based upon my experience, that it exists in every individual and awaits only the proper conditions to be released and expressed. It is this tendency which is the primary motivation for creativity as the organism forms new relationships to the environment in its endeavour

most fully to be itself (Rogers, 1959).⁷¹ The creative personality, according to Rogers, is characterized by three conditions. Firstly, the creative personality is open to experience. This is a lack of rigidity and a tolerance for ambiguity - in essence the opposite of psychological defensiveness. Secondly, the source or locus of evaluative judgment is internal. For the creative person the value of the product of his or her efforts is established by the individual and not by others. And lastly, associated with the openness and lack of rigidity is the ability to play spontaneously with ideas, colours, shapes and relationships. The creative sees life in new and significant ways arising from the examination of countless possibilities (Rogers, 1961).⁷² Kelly's theory "the psychology of personal constructs" envisages a continual attempt by the individual to predict and control the events he or she experiences. In order to predict and control experience, the individual will engage in a process called "constructing" which means to "place an interpretation" on events so that they take on a shape or assume meaning. The end result of this constructing is the "construct". A construct then refers to the "pattern of template" with which an individual attempts to order his or her reality or understand his world. Creativity may be viewed as a cycle moving from "loose" constructs to more "tightened" constructs. The Creativity Cycle is one which starts with loosened

71. Rogers, C.R. Toward a theory of creativity. In Anderson, H.H.(ed.) Creativity and its Cultivation: NYC: Harper, 1959.

72. Rogers, C.R. On becoming a person. Boston: Houghton Mifflin, 1961.

construction and terminates with tightened and validated construction.....
 Loosened construction is that which is characterised by varying alignment of elements, while tightened construction involves rigid assignment of elements within the construct's context.....(Kelly, 1955)⁷³

Creativity and Behaviouristic Approach

According to Eric Fromm (1959)⁷⁴, creativity stems from people's basic need for transcendence. This need may be defined as the urge to rise above man's animal nature or his "situation as a creature". Fromm differentiated between creativity "in the sense of creating something new" and creativity as an attitude. Creativity when viewed as an attitude or character trait "is the ability to see, or to be aware, and to respond".

Behaviour theorists have typically had a bias towards environmentalism, a preoccupation with learning and a preference for stimulus-response laws. Creativity, despite its originality, from behaviourist viewpoint, is learned and can be explained in stimulus-response terms. S-R Psychologists have attempted to account for creativity in their own way, which involves the notion that human behaviour is essentially a matter of building up links or bonds between stimuli and responses. Creativity may be explained in terms of instrumental conditioning which involves building S-R bonds. Thus, a pattern of creative behaviour may be

established in a child and later in the adult by rewarding creative
 73. Kelly, G.A. The Psychology of personal constructs, Vol. I: A theory of personality and Vol. II: Clinical diagnosis and psychotherapy. NYC: Norton, 1955.

74. Fromm, E. The Creative Attitude. In Anderson, H.H. (ed) Creativity and its Cultivation, NYC: Harper, 1959.

thinking and activities when he or she is very young (Cropley, 1970)⁷⁵. Staats (1975)⁷⁶ argued that the exceedingly large number of behavioural repertoires coupled with the tremendous number of possible stimulus configurations provides ample opportunity for creative S-R combinations to occur. Mednick (1962)⁷⁷ views creative thinking as the formation of associative elements into new combinations which meet certain requirements or are in some way useful. A more creative solution or process will be built upon more mutually remote elements. That is, the creative person will form unusual S-R bonds, will tend to link stimuli with highly unusual responses. The formation of associative elements may result in attaining a "creative solution". Skinner pointed out that an explanation of creative behaviour presented an insoluble problem for classical stimulus-responses psychology. If behaviour is nothing but learned responses to stimuli, it can never be novel even though the stimuli may be. Skinner rescues us from this dilemma with his principle of operant conditioning which allows for responses to be under the influence of their consequences rather than being only determined by a prior stimulus. "Artists paint pictures because of the consequences, and people look at pictures because of the consequences" (Skinner, 1972)⁷⁸. In Skinner's view, creative thinking is primarily concerned with the production of "mutations". The consequences of behaviour determine which behavioural mutations are to be selected. Much of the research on creativity during the last several decades

75. Cropley, A.J. *S-R Psychology and Cognitive Psychology*. In Vernon, P.E. (ed.) *Creativity*. Harmondsworth, Middlesex, England: Penguin Book, 1970.

76. Staats, A.W. *Social Behaviourism*. Homewood, IL: Dorsey Press, 1975.

77. Mednick, S.A. *The associative basis of the Creative Process*. *Psychological Review*, 1962, 69, 221-229.

78. Skinner, B.F. *Creating the creative artist*. In *Cumulative Record* (3rd. ed.) NYC: Appleton-Century-Crofts, 1972.

falls into a category of theory which Taylor called "trait factorial". Personality theory in this tradition emphasizes the distinct traits of characteristics of the individual and relies heavily upon the use of factor analysis. Representatives of this approach, which focuses on the personality traits of creative persons, are Barron ((1972),⁷⁹ Helson (1971),⁸⁰ Mackinnon (1970),⁸¹ and Roe (1972).⁸² One of the better known theories in this area is Gullford's (1967)⁸³ "Structure-of-Intellect" (SI) model in which intelligence is defined as a collection of abilities or functions for processing information. These intellectual abilities are organized along three dimensions : content, product and operations. Content refers to the kinds of information contained in or used by the human mind. Product represents the form of the information. Operations refer to the basic processes performed with information by the mind. In Gullford's theory many different mental functions relate to creativity; however, the operation of "divergent production" is seen as being particularly critical for creative behaviour. This term has become fairly widely accepted and refers to adaptive flexibility

79. Barron, F. Artists in the making. NYC:Seminar Pres, 1972.

80. Helson, R. Women mathematicians and the creative personality. Journal of consulting and clinical Psychology, 1971, 36, 210-220.

81. Mackinnon, D.W. The personality correlates of creativity : a study of American architects. In Vernon, P.E. (ed.) Creativity. Harmondsworth, Middlesex, England : Penguin Books, 1971.

82. Roe, A. Maintenance of Creative output through the years: In Taylor, C.W.(ed.) Climate for creativity. NYC : Pergaman Press, 1972.

83. Gullford, J.P. The Nature of Human Intelligence. NYC : McGraw-Hill 1967.

or the ability to generate logical alternatives. (Gullford, 1975).⁸⁴

Cognitive Theory and Creativity

Theories of cognitive development also have much relevance to the concept of creativity. To understand creativity from a cognitive viewpoint, Piagetian concepts of organization, adaptation, assimilation and accommodation may be analysed first. Piaget terms organization and adaptation as invariant functions which are modalities through which ideological factors affect intelligence. Organization refers to the proclivity for all organisms to systematize or organize their processes into coherent physical or psychological systems (Ginsberg and Opper, 1969).⁸⁵ Adaptation, on the other hand, involves two complementary processes, assimilation and accommodation, depending on whether the individual's cognitive schemes shape (assimilation) or are shaped by (accommodation) the environment. These principles are central to Piaget's theory of cognitive development (1962),⁸⁶ and only when assimilation and accommodation are in equilibrium, adaptation and cognition possible. The very principles that Piaget defines as basic to the process of cognitive development may also relate to the creative process. Piaget claims that creative imagination (assimilation in a state of spontaneity) does not diminish with age but, as a result of the process of accommodation, is gradually re-integrat-

84. Gullford, J.P. Creativity: a quarter century of progress. In Taylor I.A. and Getzels, J.W. (eds.) Perspectives in Creativity. Chicago: Aldine, 1975.

85. Ginsberg, H. and Opper, S. Piaget's theory of intellectual development. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

86. Piaget, J. Play, dreams and imitation in childhood. NYC: Norton and Co., 1962.

ed in intelligence, and is, thereby, correspondingly broadened. Piaget implies that creative imagination, when integrated with accommodation, can result in a product that is at once evidence of both creativity and intelligence. He describes a process whereby creativity and intelligence nourish each other, and, through their interaction, produce intelligent activity at even more advancing levels. Piaget describes the infant as beginning life in an undifferentiated state in which he or she separates neither self from environment nor wish from reality. The infant is centred about the self. This process of separating self from environment and broadening one's perspective beyond self is termed by Piaget as decentration. The ability to see an event or stimulus from a multitude of perspectives, an essential factor in any creative process, is also the key process in allowing abstract intellectual processes to supercede those of a purely perceptual nature, and is acquired anew in each child. Piaget's concept of perception, concentration and decentration were further analysed by Gardner and his associates (1958).⁸⁷ They found that the accuracy of perception depend upon the capacity to decentrate attention and scan a greater area in the field and also assumed that there are individual differences in decentering attention. However, Bolton (1972)⁸⁸ did not agree with relating analytic perception to creativity, but agreed that flexibility (ability to switch attention from analytic to global modes) is related

87. Gardner, R.W. and others Cognitive control psychological issues vol. IV. New York: International University Press, 1959.

88. Bolton, N. The Psychology of Thinking. London: Methuen, 1972.

to creativity. Bloomberg (1971)⁸⁹ found field articulation related to flexibility; that flexibility was related to intelligence and not creativity. Ward (1969)⁹⁰ indicated that creative Ss gave more rich responses in rich than poor environments. He argued that scanning the environment for task-relevant information is important for creativity. The cognitive theorists, however, take a limited view of creativity, stressing creator's sensitivity to the world and emphasizing sense perceptions, but totally eliminate intellectual and personality dynamics.

Lesner and Hillman (1983)⁹¹ present a logical sequence of stages representing the life cycle of the creative consistent with Freud's, Erikson's and Piaget's theories. The first stage of creative development is that of Creative Internal Enrichment. Lasting from birth through adolescence, it is concurrent with basic neurophysiological and cognitive development. This is a time when the individual learns basic life skills and develops his or her own distinctive personality, culminating in a stable sense of identity. As such, the orientation of the creative drive is primarily to the self, enriching the self with creative products that are unique primarily to the self and of value primarily to the self.

89. Bloomberg, M. Creativity as related to field - independence and mobility. Journal of Genetic Psychology, 1971, 118,3-12

90. Ward, W.C. Creativity and environment cues in nursery school children. Developmental psychology, 1969, 1, 543-547.

91. Lesner, W.J. and Hillman, D.A. Developmental Schema of Creativity. The Journal of Creative Behaviour, 1983, 17,2, 103-114.

Creative External Enrichment is the second stage of the developmental cycle. Generally, this extends from late adolescence throughout one's middle years. This stage marked by a very gradual transition that reflects the underlying concurrent transition from the self-centred orientation seen in the first stage to a more outward, socially aware,, multifocused orientation which develops gradually as one matures.

The individual enters this stage with a certain sense of knowledge in, and assurance of, his or her own identity, and use this sense of self in order to enrich both him/herself as well as others. The internal creative identity endorses itself to a time of development of external creative identity. The individual strives to benefit him or herself, but also receives increasing individual satisfaction through the process of sharing oneself with others. Therefore, the primary goal during this phase is the sharing of one's own creative identity with others which can be achieved in either or both of two ways : the generativity of meaningful relationships, particularly offspring, or through the generativity of other creative products. Generativity can be achieved through the generation of products in fields such as art, science, engineering, business and so on. These creative products are as much of an extension of one's own creative self identity as but are distinct in that they are not dependent upon intimate interpersonal contact. For sharing one's creative identity directly with others, an intermediary agent is used - a creative product which may be in the form of thought or idea, an invention, a novel, etc., and the generativity of creative products is dependent upon a high level of cognitive functioning.

Individual person becomes a transient phenomenon, but the individual creation, through the process of generativity, can live on long after the body dies and thus, to some extent, fulfills the immortality aspirations which lies deep in the unconscious.

The final stage in this developmental schema is that of Creative Self-Evaluation and represents the completion of the creative life cycle. This stage begins in old age, continues until death and is a return to a narcissistic orientation that focuses on creative self-evaluation; it entails a process of assessment and taking stock of one's life in preparation for eventual death. The goal of this period is the acceptance of death which requires acceptance of and satisfaction with one's own life cycle. The two components of this process reflect the primary goals of the first two creative stages: the creation of the individual and the sharing of one's ^{internal} creative identity and external creative identity. The Major creative task is not an independent assessment of each of those two areas but, instead, is a process of relating the two areas to each other and placing them in a proper balance. Although achieving a balance between internal creative self and external creative self is, a life-long task, it culminates in the evaluate process of this stage. The product of this creative process is a personal, cognitive and emotional state of mind that is unique and of value primarily to the individual and plays a major role in determining the emotional well-being of the individual.

Axiomatic to this theory of creativity is that creative development is dependent upon both the emotional well-being and cognitive well-being of the individual. Since the quantity and quality of the creative output of any individual is going to be dependent upon a multitude of variables, both internal and environmental, there are major implications particularly for parents, systems of education and employers. To maximise the creative potential of any individual, the family, school and employer need to give attention to both the individual's emotional and cognitive well-being. Parents, for example, need to be aware of the importance of the "mundane" creative products of childhood so that such activities do not escape notice and go unreinforced. With an appreciation of the creativity seen in the first stage of creative development, parents can encourage and stimulate such creative development in their children.

In the educational sphere, a frequently heard criticism of our present education system is that it produces convergent thinking and conformity. All too often, the predominant index of predicting success for a child is a simple intelligence test. If a school would assume for its goal, not just the cognitive development, of its students, but also their creative development, then it would have to take an active positive role in the emotional well-being and the individual development of each child. It is not enough for the school to teach writing and arithmetic, or even music and art. If the school system wants to maximize the creative productivity of its students, it must give appropriate attention to the development of positive character traits, successful achievement of appropriate social tasks, success in interpersonal skills, as well as have some awareness of the emotional vicissitudes

of its students and how such states have an impact upon the students' performance. Although one might argue that this is the province of the family, schools have the virtue of being systematically reviewed and at least are somewhat egalitarian. The question, then, becomes how to maximize the positive influence of this major shaping force.

Non-cognitive factors and Creativity Research:

Need and significance of the study. Many theories discussed earlier stress that creativity itself is to be defined and described in terms of personality. Allport (1937)⁹² argues that the creative motive assumes functional autonomy in the individual. A tendency to effectuate a realization of one's nature in his creative achievements has been pointed by Goldstein (1939).⁹³ According to Barron (1955)⁹⁴ originality is habitual and the presence of certain enduring traits in an individual predisposes him towards originality. Rogers (1959)⁹⁵ reiterates the encounter between the uniqueness of the individual and his milieu in the process of creativity. May (1959)⁹⁶ mentions about the manifestations of one's feeling his own being in the world as creative. Maslow's

92. Allport, G.W. The functional autonomy of motives. American Journal of Psychology, 1937, 57, 141 - 156.

93. Goldstein, K. The Organism. NYC: American Book, 1939.

94. Barron, F. The Disposition toward originality. Journal of abnormal psychology, 1955, 51, 478-485.

95. Rogers, C.R. Toward a theory of creativity. In H.H. Anderson (ed.) Creativity and its cultivation. New York: Harper, 1959.

96. May, R. The Nature of Creativity. In H.H. Anderson (ed.) Creativity and its cultivation. New York: Harper, 1959.

(1959)⁹⁷ "self-actualizing(SA) creativeness" also stresses personality of the individual rather than his achievements, which are regarded as epiphenomena emitted by the personality itself. The theoretical evidences presented above indicate that research interest in creativity-personality area is highly phenomenal and it is being widely recognized that personality variable play a primary role in the identification and cultivation of creative talent. It was Golann (1963)⁹⁸ who proclaimed that personality variables can be used as criterion variables in the study of creativity. A number of studies have focussed their attention on the problem of creativity-personality relationship. Comparisons of creative and non-creative individuals have produced both conflicting and highly consistent observations on a variety of non-cognitive characteristics. Cattell (1954, 1963)⁹⁹ concluded from his study of scientists, that they are withdrawn, skeptical, internally preoccupied, precise and reliable. According to him, the average level of ego-strength and emotional stability is distinctly higher for effective scientific researchers rather than for the general population. The scientific workers are characterised by high anxiety level, high irritability and extitability, and are also found to be desurgent as compared to artists, businessmen

97. Maslow, A.H. Creativity in self-actualizing people. In Anderson, H.H. (ed.) Creativity and its cultivation. New York: Harper, 1959.

98. Golann, S.E. psychological study of creativity. Psychological Bulletin 1963, 60, 548 - 565.

99. Cattell, R.B. The Personality and Motivation of research scientists, New York: Academt of Sciences, 1954.

Cattell, R.B. The personality and motivation of the researcher from measurements of contemporaries and biography. In C.W. Taylor and F. Barron (eds.) Scientific creativity its recognition and development. New York : Wiley, 1963.

and others. Yet another study by Cattell and Drevdahl (1955)¹⁰⁰ revealed that the research scientists were significantly high on Factor A (schizothymia) and Factor Q₂(self-sufficiency), Drevdahl (1956)¹⁰¹ explored the personality factors of undergraduate population and it was found that the creative groups were higher than the non-creative on the factors of radicalism vs. conservatism, and self-sufficiency vs. lack of resolution; and lower on the factors of cyclothymia vs. schizothymia, and surgency vs. desurgency. The creative persons appeared to be considerably more withdrawn and quiescent than the non-creative persons. Drevdahl's (1964)¹⁰² study of creative and non-creative psychologists using Cattell's 16 PF observed differences in a number of traits. The results, in general, suggest that the creative group appears to be more interested in scientific investigation than in a more socially-oriented activity. They are characterised by a relative concern for other people, authority, rules, regulations and restrictions and the like indicating a definite degree of independence. Their personal social and emotional adjustment is found to be superior to that of their less eminent counterparts. They are unusually self-oriented,

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100. Cattell, R.B. and Drevdahl, J.E. A comparison of the personality profile of eminent researchers with that of eminent teachers and administrators and that of general population. British Journal of Psychology, 1955, 46, 248-261.
101. Drevdahl, J.E. Factors of Importance for Creativity. Journal of Clinical Psychology, 1956, 12, 21-26.
102. Drevdahl, J.E. Some Developmental and Environmental Factors in Creativity in C.W. Taylor (ed.) Widening Horizons in Creativity. New York, Wiley, 1964.

without showing concern to social and sexual relationships, and public and professional criticism. Studies by Drevdahl and Cattell(1968)¹⁰³ and Butcher (1968)¹⁰⁴ observed that the creative persons are introverted, and anxious, and have a high degree of ego-strength. Munsterberg and Mussen (1953)¹⁰⁵ maintained that artists tended to have greater guilt feelings, traits of introversion, a richer inner life and an unwillingness to comply to their parents in childhood as compared to their non-artist counterparts. Kubie (1958)¹⁰⁶ analysing a number of case-histories concluded that neurosis corrupted, mared, distorted and blocked creativeness in every field of human endeavour. The picture of the creative person emerging from Myden's (1959)¹⁰⁷ study showed creative as one of superior intelligence, intellectually oriented towards the outer-world with a rich inner life and a strong sense of his role in life, healthily non-conforming, interested in achievement and sexually more ambivalent. Kleisberg' and Springer's (1961)¹⁰⁸ study also revealed that creative children were rated significantly higher than the less creative ones on the strength of self-image, ease of early recall,

103. Cattell, R.B. and Drevdahl, J. The Prediction of Achievement and Creativity. Indianapolis: Bobbs-Merrill, 1968.

104. Drevdahl, J.E. and Cattell, R.B. Personality and Creativity in artists and writers, Journal of clinical psychology, 1958, 14, 107 - 111.

104. Cattell, R.B. and Butcher, J. The prediction of achievement and creativity. Indianapolis: Bobbs-Merrill, 1968.

105. Munsterberg, E. and Mussen, P.H. The personality structures of art students. Journal of Personality, 1953, 21: 457-466.

106. Kubie, L.S. Neurotic distortion of the creative process. Lawrence: Kansas Press, 1958.

107. Myden W. Interpretation and evaluation of certain personality characteristics involved in creative production. Percept-Motorskilld, 1959, 9: 139-158.

108. Weisberg, P.S. and Springer, K.J. Environmental factors in creative function. Archives of General Psychiatry, 1961, 5 :554-564

humour, availability of oedipal anxiety, and uneven ego development.

Research on creativity by Mackinnon (1963)¹⁰⁹ used master architects as creative subjects. These architects were found to enjoy sensuous experiences, have social poise and presence, appear socially at ease, genuinely dependable and responsible. Terman (1954)¹¹⁰ in his studies over a few decades of men of genius, emphasized that the special characteristics of gifted men pervade not only cognitive modes but also temperamental and personality spheres. Getzels and Jackson's (1962)¹¹¹ study of the personality structure of creative adolescents is also significant. According to them, the important distinction between highly creative and highly intelligent adolescent does not confine to the cognitive spheres alone; but it embraces the personality and other non-cognitive characteristics as well. The interaction of personality and creativity has been elucidated by Wallach and Kogan (1965)¹¹² in studies of young children. Freeman et al. (1969)¹¹³ rightly point out "it seems highly likely that differences in creativity are related more to non-cognitive than cognitive traits" after a recent review of literature on creativity.

109. Mackinnon, D.W. *The characteristics of creative architects and further reflections on their implications for architectural education. Garbrook Academy Papers, Bloomfield Hills, Michigan, 1963*

110. Terman, L.M. *Scientists and non-scientists in a group of 800 gifted students. New York: Wiley, 1964.*

112. Wallach, M.A. and Kogan, N. *Modes of Thinking in young children: a study of creativity-intelligence distinction.*

113. Freeman, J., Butcher, H.J. and Christie, T. *Creativity: a selective review of research. London: Society for Research into Higher Education Ltd., 1969.*

The theoretical and empirical evidences rightly acknowledge the significance of personality and other non-cognitive traits in the study of the creative individuals. To quote Dellas and Gater (1970)¹¹⁴ "the roots of creativity lie in personality and motivation."¹¹⁵ Forisha (1978) also reiterated that "throughout the literature of creativity, personality variables emerge as factors significantly affecting the utilization of imagery and the development of creativity." Therefore, it seems significant and highly worthwhile to explore the possibility of personality and other non-cognitive variables attributed to creative students. The results of such a research is definitely going to raise more questions than answers. This study is no exception. But, the need for developing means and measures for understanding and fostering the creative potential through effective educational system has prompted to undertake the present study among the secondary school students in Mizoram.

114. Dellas, M. and Gater, E.M. Identification of creativity. Psychology Bulletin, 1970, 73, 55-73.

115. Forisha, B. Mental imagery and creativity: review and speculations. Journal of Mental Imagery, 1978, 2, 209-238.

REVIEW OF RELATED STUDIES

Creativity was, for a long time, thought of as a divine power, and therefore, afforded no scope for scientific study. Today, this view has changed. During the latter half of the present century, creativity has become a field of concern for educationists and psychologists all over the world. The credit goes to Guilford who has greatly influenced the research work on this subject during the last nearly thirty years. The importance of creativity as a potential which influences human activity has also been felt by eminent Indian scholars. In their effort to arouse interest among researchers in India, they have conducted studies focusing on the development of tests to measure creativity and correlates of creativity. An attempt is made here to review studies on creativity, and its correlates, conducted in India and abroad.

The review of various studies has been presented under two parts:

- (A) Non-cognitive correlates of creativity and
- (B) the cognitive correlates of creativity.

Creativity research related to the personality, values, age, sex, locale and socio-economic status have been reviewed under the category of non-cognitive correlates. The studies investigating the relationship of creativity with cognitive variables such as intelligence, scholastic achievement and level of attainment in various academic subjects have been presented in the second part of survey.

A. Non-Cognitive Correlates of Creativity

1. Creativity and Personality

In the study of creative persons, it is vital to acknowledge the

presence of certain personality traits. Dellas and Gater (1970)¹ stated that the roots of creativity lie in personality and motivation. Forisha (1978)² observed that throughout the literature of creativity, personality variables emerge as factors significantly affecting the development of creativity. Many researchers of the creative personality have identified the qualities and characteristics attributed to these persons. Roe (1963)³ specifically emphasized openness to experience, heightened perception, extreme curiosity, tolerance of ambiguity and preference for complexities as some of the important characteristics. Research in creativity-personality area is characterized by diversity of interests, motives, and approaches. The role of personality in creativity has been analysed in a number of investigations and it is being widely recognised that personality variables play decisive roles in creativity.

Galton (1869, 1874)^{4,5}, was the first to initiate empirical research in creativity-personality relationship. His bio-graphical study of men of genius and study of scientist by questionnaire method revealed

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1. Dellas, M. and Gater, E.M. Identification of Creativity. Psychological bulletin, 1970, 73, 55 - 73.
 2. Forisha, B. Mental Imagery and Creativity: review and speculations. Journal of Mental Imagery, 1978, 2, 209 - 238.
 3. Roe, A. Psychological approaches to creativity in science. NYC: New York University Press, 1963, 153 - 182.
 4. Galton, F. Hereditary genius: an inquiry into its laws and consequences. New York: Macmillan, 1869.
 5. Galton, F. English men of science: their nature and nurture. London : Macmillan, 1874.

that the geniuses and eminent men can be distinguished by the originality of their ideas. Cattell (1903)⁶ conducted a similar study on American men of eminence. Terman (1954)⁷ observed interesting differences between two groups of men rated highest and lowest for success in life on emotional stability, social adjustment and various traits of personality. The high group was found to excel the low group on prudence, self-confidence and perseverance. The high group was also significantly rated higher on leadership, popularity and sensitiveness to approval and disapproval. This group also showed higher social adjustment, all-round mental stability, self-confidence and freedom from inferiority feelings.

Taylor (1962)⁸ portrays the creative individual as "unconventional and as resisting the drives towards conformity and the unconventional thinking often found in the schools". Barron (1958)⁹ in his studies of highly creative people found them "more original, less suggestible and more tolerant of structural disorderliness". Reid, King and Wickwire (1959)¹⁰ investigated the differences in the personality attributes between

6. Cattell, J. Mck. A statistical study of eminent men. Popular Science Monograph, 62, 1903, 359 - 377.

7. Terman, L.M. Scientists and non-scientists in a group of 800 gifted men. Psychological Monograph, 68, 1954

8. Taylor, C.W. Who are exceptionally creative? Exceptional Children, April, 1962, 28, 421-429.

9. Barron, F. The Psychology of Imagination. Scientific Americans September, 1958, 199, p. 150-166.

10. Reid, J.B., King, F.J., and Wickwire, P. Cognitive and other Personality characteristics of Gifted Children. Psychological Reports, 1959, 5, p. 529-537.

twenty four creative and twenty four non-creative seven-graders as nominated by peer ratings. The creative children were more sociable, more warm-hearted and less anxious. Students from upper class socio-economic backgrounds appeared more stable emotionally than creative lower class boys, but no differences were found among upper class boys. Creative lower class girls however, were less confident and self-sufficient than non-creative lower class girls. Mackinnon (1970)¹¹

depicts a syndrome of creativity, enlisting such aspects as : the creative person's self-image as one who should be respected, his sense of duty about self, his openness to experience, his struggling towards reconciliation of opposites, his seeking to tolerate increasing tension while striving for creative solutions to even more difficult problems, and his orientation to aesthetic and theoretical interests and values. In his personality studies of highly creative children, Torrance (1962)¹²

found that three personality characteristics stand out, differentiating the highly creative children from the less creative but equally intelligent children. First, the highly creative children have a reputation for having wild silly ideas, especially the boys. Secondly, their work is characterised by the production of ideas "off the beaten track", "outside this world". Third, their work is characterised by "humour, playfulness, relative lack of rigidity, and relaxation".

11. Mackinnon, D.W. *The Personality correlates of creativity: a study of American architects*. In Vernon, P.E.(ed.) *Creativity*. Harmondsworth, Middlesex, England: Penguin Books, 1970.

12. Torrance, E.P. *Guilding Creative Talent*. Englewood Cliffs, N.J: Prentice Hall, 1962.

Getzels and Jackson (1962)¹³ also conducted several studies to explore the personality characteristics of creative adolescents. The studies were conclusive in their findings that the high creatives displayed humour and playfulness, enjoyed taking risks, preferred to be independent and liked unconventional occupations such as adventurer, inventor, writer and artist. Guilford and his associates (1957)¹⁴ studied the relationship between traits of temperament and motivation to creative performance. Significant correlations were obtained between non-aptitude traits and fluency and originality; and according to them fluency was related to impulsiveness, self-confidence, ascendance, appreciation for originality and inclination for neuroticism. Van Zeist and Kerr (1954)¹⁵ found the creative people as imaginative, subjective, curious, impulsive, enthusiastic, original, confident, unconventional, less worrying, less inhibited and less contented.

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13. Getzels, J.W. and Jackson, P.W. Creativity and Intelligence : Explorations with Gifted students. New York: Wiley and Sons, 1962.
14. Guilford, J.P., Christensen, P.R., Frick, J.W. and Merrifield, P.R. The Relations of Creative Thinking Aptitudes to Non-aptitude Personality Traits. Report of Psychological Laboratory No. 20. Los Angeles, University of Southern California, 1957.
15. Van Zeist, R.H. and Kerr, W.A. Personality self-assessment of Scientific and Technical Personnel. Journal of Applied Psychology, 1954, 38, 145-147.

Personality of creative infants was studied by Andrews (1930)¹⁶

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Grispen (1933) and Markey (1933) through the medium of painting, games and a host of other activities of the infants. The infants were observed to have marked imaginative power, a capacity for novelty and curiosity as per the finding of these studies. In a study using psychiatric interview, the Rorschach and Draw-a-family technique, Weisberg and Springer (1961)¹⁹ observed the personality of creative school children. They were found to have strong self-image, unconventional in response, and sensitive. Carmichael and McFarlane (1971)²⁰ showed a relationship between creativity and personality in children. The findings of many investigations into the personality characteristics of creative adolescents reveal that they enjoy taking risks, and adventure, prefer unconventional occupations, deep feelings, determination and ambition, independence, rebelliousness,

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16. Andrew, E.G. The Development of Imagination in the Pre-school child. University of Iowa studies in character, 1930,3(4).
 17. Grispen, V.B. A study of creative artistic imagination in children by the constant contact procedure. Psychological Monograph 1933, 45 (1), 63-81.
 18. Markey, F.V. Imaginative Behaviour in Pre-school children. New York : Bureau of Publications, Teachers College, Columbia University, 1935.
 19. Weisberg, P.S. and Springer, K.J. Environmental Factors Influencing Creative Function in Gifted Children. Cincinnati, Dept. of Psychiatry, Cincinnati General Hospital, 1961.
 20. Carmichael, L.M. and McFarlane, M.B. Expressions of Personality in Creation of Latency Age Children, Journal of Genetic Psychology, 1971, 118(2), 271 - 279.

self-awareness and self-expression (Getzels and Jackson, 1959;²¹ Holland, 1961;²² Hammer, 1961;²³ Febinger (1966)²⁴ Anmacht (1967)²⁵ and Jenkins (1967)²⁶ reported a positive and significant relation between teacher creativity and personality characteristics such as venturesomeness, dominance, radicalism and self-sufficiency. In the year 1961, Torrance²⁷ and others observed creative adults to have an urge to search for answers to puzzling questions, to explore and to experiment. 27 Barron's (1969)²⁸ study of creative adults revealed that they are open to ideas and not hasty to passing passing judgment. Iwata (1968)²⁹ observed creatives as independent, introverted, dominant and having less social traits. Roe (1946)³⁰ had also reported in her study of the personality of painters that in general, the painters are highly sensitive, abstract thinkers and less aggressive.

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21. Getzels, J.W. and Jackson, P.W. The Highly Intelligent and the Highly Creative Adolescent: a summary of some research findings. In C.W. Taylor's (ed.) The third University of Utah Research Conference on the identification of creative scientific talent. Salt Lake City, University of Utah Press, 1959, 46 - 57.
 22. Holland, J.L. Creative and academic performance among talented adolescents. Journal of Educational Psychology, 1961, 52,m 136- 147.
 23. Hammer, E.F. Creativity. New York: Random House, 1961.
 24. Febinger, G.N. A study of the personality correlates and other variables associated with the openness and closeness of the belief systems of prospective teachers. Doctoral Dissertation, University of Colorado, Boulder, 1966.
 26. Jenkins, J.M. A study of the characteristics associated with innovative behaviour in teachers. Doctoral Dissertation University of Miami, Coral Gables, 1967.
 27. Torrance, E.P. and others. Rewarding Creative Thinking, Minneapolis, Minnesota, Bureau of Educational Research, University of Minnesota, 1961.
 28. Barron, F. Creative person and creative process, No. 4, Pineheart Winston Inc. 1969.
 29. Iwata, Osamu. Some relationships of creativity with intelligence and personality variables. Psychologica: an international journal of psychology in the Orient, 1966,11(3-4),211-220.
 30. Roe, Anne. The Personality of Artists. Educational Psychological Measurement, 1946,6, 401-408.

Barron (1952)³¹ compared the characteristics of artists with non-artists and found that the former were more gloomy, bitter, cool, unstable, dissatisfied, pleasure-seeking and emotional. In the same year, Roe(1952)³² observed that a creative scientist was one who had experienced many problems and different situations early in life; he was one who had made a late decision on a vocation and finally, being satisfied with his choice, was one who worked hard at it. Bloom (1956)³³ also revealed that a creative scientist is a zealous worker but had difficulty in making friends. Cattell and Drevdahl (1955)³⁴ and Gough (1964)³⁵ found creative scientists to be highly intelligent, independent-minded, dominant but at the same time sensitive and responsive to the interest of others. Clifford (1958)³⁶ observed a competitive spirit in them. This same spirit was seen by McClelland (1956)³⁷ when he reported creative scientists as having a high need for achievement.

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31. Barron, F. Personality style and perceptual choice. Journal of personality, 1952, 20, 385-401.
32. Roe, A. The Making of a Scientist. New York: Dodd, Mead & Co., 1952.
33. Bloom, B.S. Report on creativity research at the University of Chicago. In W.Taylor (ed.) The University of Utah Research Conference on the Identification of Creative Scientific Talent. Salt Lake City, University of Utah Press, 1956.
34. Cattell, R.B. and Drevdahl, J.E. A Comparison of the personality profile (16 PF) of eminent researchers with that of eminent teachers and administrators and the general population. British Journal of Psychology, 1955, 46,248-61.
35. Gough, H.G. Identifying the Creative man, Jr. Value Enng, 1964, 2, 5 - 12.
36. Clifford, P.J. Emotional contents with external world manifested by a selected group of highly creative chemists and mathematicians. Perceptual Motor Skills, 1958,8, 3 - 26.
37. McClelland, D.C. The Calculated Risk: An Aspect of Scientific Performance. The 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent. Salt Lake City, University of Utah Press, 1956, 96 - 110.

This finding was supported by MacKinnon (1962)³⁸ in his study which revealed an independent trait and a need for achievement. In his study, Barron (1969)³⁹ showed that the ability to make independent judgment enabled architects and writers to become creative. Cattell (1954),⁴⁰ from his study of the personality and motivation of research scientists, concluded that scientific researchers were generally withdrawn, skeptical, internally pre-occupied, precise and reliable. They were characterised by high anxiety level, high irritability and excitability and had a higher ego-strength and emotional stability than the general population. Drevdahl (1956)⁴¹ analysed the personality factors related to creativity in an undergraduate population. The creative groups were higher than the non-creative on the factors of radicalism vs. conservatism, and self-sufficiency vs. lack of resolution; and were lower on the factors of cyclothymia vs. schizothymia, and surgency vs. desurgency. The creative undergraduates appeared to be considerably more withdrawn and quiescent than the non-creative. Studies by

38. MacKinnon, D.W. The Nature and Nurture of Creative Talent. American Psychologist, 1962(D), 38, 166-174.

39. Barron, F. The Creative Person and the Creative Process. New York Holt, 1969.

40. Cattell, R.B. The personality and motivation of research scientists. Wenner -Green Prize Essay, New York Academy of Sciences, 1954.

41. Drevdahl, J.E. Factors of Importance for Creativity. Journal of Clinical Psychology, 12, 1956, 21 - 26.

Drevañ and Cattell (1958)⁴² on artists and writers; and Cross, Cattell and Butcher (1967)⁴³ on creative artists also found the creative persons to be introverted, anxious and possessing a high degree of ego strength.

In India, Raychaudhuri's (1961)⁴⁴ studies have shown that artistic persons including musicians (i) have feelings of depression in their childhood (ii) have strong oedipal attachment (iii) are basically dependent, submissive type of person with a low need for physical activity (iv) have a high degree of sensitivity (v) have vivid fantasy life, a tendency for daydreaming and ability for playful pre-logical thinking and (vi) have the capacity to channelize their aggression into sublimated actions. Subsequent study (Raychaudhuri, 1963)⁴⁵ remarks about a group of creative musicians whose personality data were statistically analysed. The creative musician is more distinctly marked by his emotional and temperamental characteristics than by other aspects of his personality.

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42. Drevañ, J.E. and Cattell, R.B. Personality and Creativity in artists and writers. Journal of Clinical Psychology, 14, 1958, 107- 111.
43. Cross, P.G., Cattell, R.B. and Butcher, H.J. The Personality Pattern of Creative Artists. British Journal of Educational Psychology, 1967, 37, 292 - 299.
44. Raychaudhuri, M. Exploration in the personality of the artist, musician and literateur. Proceedings of Indian Science Congress, Part III(Abstract), 1961, p. 572.
45. Raychaudhuri, M. Some perceptual characteristics of inceptent artists. Indian Journal of Psychology, 38, 1963, p.13-17.

Raina (1968)⁴⁶ reported that greater achievements, change and endurance, and independence characterised the high creatives. Ahmed (1969)⁴⁷ associated traits such as a sense of guilt, conflicts with parents, less openly aggressive and dominant to creativity. Goyal (1974)⁴⁸ also observed high creatives as having a high guilt proneness along with social boldness and high self-sentiment. Joshi (1974)⁴⁹ found that high creative students were characterised by high self-sentiment, intellect and super-ego strength. Rehman and Hussain (1973)⁵⁰ reported high creatives as having less need for social approval. Rao (1976)⁵¹ observed the independent traits possessed by creative persons while Nair (1976)⁵² noted self-reliance in the creatives. He found creatives as characterised by high self-reliance, sense of personal worth, personal freedom, freedom from withdrawal, nervousness, and anti-social tendencies, a sense of belonging, and involvement with family, school and community.

46. Raina, M.K. A study of some correlates of creativity in Indian students. Ph.D. Education, Rajasthan University, 1968.

47. Ahmed, Najma, A study of the personality correlates of creative girls at the Middle School Age. Unpublished M.A. Thesis Aligarh Muslim University, 1969.

48. Goyal, R.P. A study of some personality correlates of creativity in Secondary School Teachers under training. Ph.D. Education, Punjab University, 1974.

49. Joshi, R.J. A study of creativity and some personality traits of Intellectually Gifted High School Students. Ph.D. Education, M.S. University, 1974.

50. Rehman, A. and Hussain, M.G. Creativity and Social Desirability. The Educational Trends, Vol. 8, No.1-4, 1973, p. 163-165.

51. Rao, B.P. Some Cognitive correlates of Creativity, Ph.D. Psychology, Jabalpur University, 1976.

52. Nair, M. Personality Characteristics of Creative High school Pupils. M.Ed. Dissertation, Kerala University, 1976.

Contradictory findings on the personality dimension introversion-extraversion were obtained by Kumar (1978)⁵³ and Kumar (1981)⁵⁴. It was observed by Kumar (1978) that high creatives were introverts in comparison to low creatives. However, in the second study by Kumar (1981), it was found that high creatives were significantly more extroverts than the low creatives. Chauhan (1977)⁵⁵ revealed in his work that creativity and introversion are related and this personality trait promotes originality in the individual. Gulati (1979)⁵⁶

also found that introverts' performance on fluency, flexibility and originality aspects of creativity was superior to the performance of the extroverts.⁵⁷ Jarid and Sharma (1981) on the other hand, observed that there was no significant difference between introverts and extroverts in fluency, flexibility and originality dimensions of creativity.

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53. Kumar, G. Creative functioning in relation to personality, value-orientation, and motivation. Indian Educational Review, Vol. 13, No. 2, 1978, pp 110 - 114.
54. Kumar, A. Personality Identification of high and low creatives at age 13 or older. Journal of Creative Behaviour, 15(1), 1981, p. 73.
55. Chauhan, N.S. Second stratum personality factors, sex and age of adolescence as correlates of originality. Indian Psychological Review, Vol. 14 No.1, 1977, p. 15 -
56. Gulati, S. Creativity as a function of intelligence, artistic aptitude and neuroticism. Educational Trends, Vol. 14, No.1, 1979, p. 35 - 44.
57. Jarid, Gurpal Singh and Sharma, A.K. Effect of personality types, grade levels and their interaction upon creativity and its components. The Educational Review, 1981.

Creative science students were characterised by high intelligence, high emotional stability, tough-mindedness and better adjustment (Goyal, 1974).⁵⁸ In another study of creative science group, Gopal (1975)⁵⁹ found them to be more reserved, emotionally stable, assertive, sober, expedient, venturesome, suspicious, imaginative, shrewd, experimenting, self-sufficient and relaxed. Jha's (1975)⁶⁰ observation of creative persons revealed traits such as rational optimism, high ego-strength, realistic and healthy attitude towards life, openness to experience, assertive, self-confidence and tendency for self-actualisation. The creative individual is also stable in personality organisation, and is characterised by high theoretical and aesthetic values (Gakhar, 1973;⁶¹ Gakhar and Luthra, 1974).⁶² Mallappa and Upadhyaya's study in 1977, showed that though high creatives were high in intellectual capacity, they were low on emotional stability.⁶³

58. Goyal, R.P. A study of some personality correlates of creativity in secondary school teachers under training. Ph.D. Education. Punjab University, 1974.

59. Gopal, A.K. Certain differentiating personality variables of creative and non-creative science and engineering students. Ph.D. Education, Kurukshetra University, 1974.

60. Jha, S.K. An analysis of certain dimensions of creativity. Ph.D. Education, M.S. University, Baroda, 1975.

61. Gakhar, S. Creativity as a function of interacting dimensions of extroversion and neuroticism among teacher-trainees. Creativity Newsletter, 1973, 4, 28 - 34.

62. Gakhar, S. and Luthra, S. Effect of anxiety and test administration on creative performance. Creativity Newsletter, 1974, 3, 9-17.

63. Mallappa, K.R. and Upadhyaya, R.C. Creativity and Personality. Indian Psychological Review, Vol. 14, No 2, 1977, pp. 31 - 35.

In an investigation on the personality traits of male and female creatives, Goyal (1974)⁶⁴ reported that they possessed high intelligence, were adventurous, inclined to self-conflict, moralistic and socially bold; moreover, males were suspicious and tough-minded. On the other hand, Singh's (1978)⁶⁵ study showed creative males to be adventurous, self-assured, confident, secure, shy, timid, restrained and sensitive to threats. While comparing the creative and non-creative male pupil teachers, Pandey(1980)⁶⁶ found the creatives characterised by good nature, co-operative, easy-going and imaginative. Creative females were found highly intelligent, independent, fault-finders, socially bold, and self-assured by the same investigator. Jyotsna (1980)⁶⁷ also revealed that high creative students tend to be reserved, critical, more intelligent more self-reliant and having a higher super-ego strength, and less frustrated than their less creative counterparts. The creatives were also found to possess high self-concept (Singh, 1978).⁶⁸

64. Goyal, R.P. Op. cit., 1974.

65. Singh, R.J. The psychological make up and sociological background of creative and non-creative student teachers. Indian Educational Review, Vd. 13, No. 4. 1978, p. 119-123.

66. Pandey, K. A comparative study of the personality characteristics and value of creative and non-creative pupil-teachers. Unpublished M.Ed. dissertation, Allahabad University, 1980.

67. Jyotsna, A study of personality correlates of high and low creative students - A cross-cultural study of Western U.P. Ph.D. Psychology, Rohilkhand University, Bareilly, 1980.

68. Singh, A. A study of creativity in school teachers as measured by Mehdi's Test in relation to their self-concept, attitude towards teaching and classroom verbal interaction, Unpublished Ph.D thesis in Education, Meerut University, 1978.

Raina (1968)⁶⁹ found that the low creatives were characterised by heterosexuality and greater anxiety. An imbalance was observed between aspiration level and creativity level (Bhan, 1973);⁷⁰ and the low creatives also had high need for social approval (Rehman and Hussain, 1973).⁷¹ The less creatives were also found to have high anxiety (Nair, 1976);⁷² and low intellect, less flexibility, low self-acceptance, and less self-sufficiency (Gakhar, 1975).⁷³

The empirical research in creativity-personality dimension has accumulated an exhaustive amount of personality data. The creative personality emerging through the empirical frame, is autonomous and dominant, having independence of judgment and freedom of expression, largely withdrawn and inner-directed, self-expressive, effeminate, emotionally more reactive and expansive, sensitive, imaginative and aesthetic. However, the results are not at all conclusive and the

69. Raina, M.K. A study of some correlates of creativity in Indian students, Ph.D Education, Rajasthan University, 1968.
70. Bhan, R. Relationship between creative potential and the level of aspiration. Journal of Education and psychology, vol.31. No.1, 1973, p. 52 - 54.
71. Rehman, A. and Hussain, M.G. Creativity and Social desirability, The Educational Trends, Vol. 8, No. 1-4, 1973, p. 163 - 165.
72. Nair, M. Personality Characteristics of creative high school pupils. Masters Thesis, Kerala University, 1976.
73. Gakhar, S. Intellectual and Personality correlates of creativity. Ph.D Psychology, Punjab University, 1975.

composite picture of the creative personality that emerges is not clear and congruent due to constant inconsistency of the findings.

Also, the results have to be seen and interpreted in the light of the techniques and the criterion employed for the identification of the creative group, and the cultural contexts in which the studies have been carried out. This opens up new avenues and scope for conducting creativity research using improved techniques and ⁱⁿ diverse social settings.

2. Creativity and Values

The fact that the values and attitudes of highly creative students differ from those of other students prompted Torrance (1962)⁷⁴ to stress the need to understand the values and attitudes of high and low creative students. But researches conducted to study the relationship between creativity and value patterns are very few. The study conducted by Taylor and Holland (1964)⁷⁵ showed that creative airforce scientists regarded thinking, manipulating ideas, and aesthetics to be of great value. Paramesh (1969)⁷⁶ found that creative individuals have high theoretical and aesthetic values. Paramesh (1970)⁷⁷ also repor-

74. Torrance, E.P. Guiding Creative Talent New Delhi: Prentice Hall of India Ltd., 1962.

75. Taylor, C.W. and Holland, J.L. Predictors of Creative Performance in Taylor, C.W.(ed.) Creativity: Progress and Potential. New York McGraw Hill, 1964.

76. Paramesh, C.R. A study of creativity in relation to extra- version, emotionality, body image and values, University of Madras, Ph.D thesis in Psychology, 1969.

77. Paramesh, C.R. Value orientations of creative persons. Psychological studies, 1970, 15(2), 108 - 112.

ted that creative high school students scored low on economic values, whereas the same value was more prominent in the average and low creatives. Contrary to this finding, Singh and Gupta (1977)⁷⁸ showed that economic values were more prominent in ^{high} creative individuals than in the low creatives. Paramesh (1973)⁷⁹ found that a creative matured person is characterised by high theoretical and aesthetic values. A similar report was given by Gakhar (1973),⁸⁰ and Gakhar and Luthra (1974).⁸¹ In studying creativity among teachers, Singh (1977)⁸² reported that high creativity tends to go with high economic value, and low creativity seems to be associated with high theoretical value.

78. Singh, L. and Gupta, G. Creativity as related to the values of the Indian Adolescent Students. Indian Psychological Review, Vol. 14, No.3, 1977, p. 73 - 76.

79. Paramesh, C.R. Creativity, Intelligence and Academic Achievement. The Educational Trends, Vol. 8, No. 1 - 4, 1973, p. 129 - 137.

80. Gakhar, S. Creativity as a function of interacting dimensions of extraversion and neuroticism among teacher-trainees. Creativity Newsletter, 1973, 4, 28 - 34.

81. Gakhar, S. and Luthra, S. Effect of anxiety and test administration on creative performance. Creativity Newsletter, 1974, 3, 9 - 17.

82. Singh, R.J. An investigation into the psychological make-up and sociological background of creative and non-creative student-teachers. Ph.D Education, Lucknow University, 1977.

Using the Creativity Test by Chauhan and Tiwari, and Allport-Vernon Scale of Values adopted by Bhatnagar and Tandon, Kumar (1978)⁸³ pointed out the superiority of high creatives on theoretical and aesthetic values over low creative students of Class IX. High creative students were also found to place more value on social service, independence, variety, knowledge and aesthetic by Misra (1978).⁸⁴ A study of 200 teacher-trainees by Pandey (1980)⁸⁵ showed that there was no significant difference between the high and low creative males on any of the values. On the other hand, it was observed that high creative females scored higher than the low creative females on values like social service, aesthetic and knowledge. Mackinnon (1980)⁸⁶ also revealed that theoretical and aesthetic value pattern is a marked characteristic of creative individual and that scientists were found to possess more of theoretical value, and architects more of aesthetic values.

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83. Kumar, G. Creative functioning in relation to personality, value-orientation, and achievement motivation. Indian Educational Review, Vol. 13, No. 2, 1978, pp. 110-114.
84. Misra, K.S. Perception of work-values by creative teachers. Journal of Indian Education, Vol. 4, No.3, 1978, p. 56-61.
85. Pandey, K. A comparative study of the personality characteristics and values of creative and non-creative pupil-teachers. Unpublished M.Ed dissertation, Allahabad University, 1980.
86. Mackinnon, D.W. Research on Creativity in M.K. Raina (Ed.) Creativity / Research : International Perspective. New Delhi : National Council of Educational Research and Training, 1980, 236-252.

3. Creativity and Sex

Psychologists have probed into the relationship between creativity and sex to understand the complex nature of creativity. Moreover, the knowledge thus gleaned could be used in the development of creativity in both the sexes; to get the best and most desired results for the progress of society in which males and females now have an equal share in the social responsibilities.

The superiority of the fair sex over their counterparts has been observed by several investigators. Using the Torrance Tests of Creative Thinking and the Bell's Adjustment Inventory, Singh (1975)⁸⁷ found that girls were superior to boys on all dimensions of creativity and composite creativity. Raina (1980) in his study of one hundred and ten ninth-grade science students (68 males and 42 females) belonging to three higher secondary schools administered two activities each from the verbal and non-verbal forms of the Torrance Tests of Creative Thinking, yielding scores for fluency, flexibility, and originality. The mean ages of the boys and girls were 13.80 and 13.77, respectively. Analysis of results indicated an absence of any significant difference between the sexes on either the three dimensions or the total creativity

87. Singh, R.A study of creativity among X class students in relation to their adjustment and sex. Unpublished M.Lit. Dissertation, Punjab University, 1975.

score on the Verbal Form (Product Improvement and Unusual Uses). Though none of the 't' ratios reached a five percent level of significance, the overall differences among the three dimensions and the total scores were in favour of the girls. On the Figural Form (Figure Completion and Circles Test) again, the scores remained higher for girls on the three dimensions and the total creativity score. Though the differences were statistically insignificant, the boys' scores edged the girls in originality, while the girls were a shade higher than the boys on flexibility.⁸⁸ Superiority of girls over boys has been reported by Yamamoto (1960);⁸⁹ Torrance (1962,1963); Neufeld(1964); Solomon(1968);

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88. Raina, T.N. Sex differences in creativity in India: a second look. The Journal of Creative Behaviour, 1980,14,3, p. 218
89. Yamamoto, K. Further analysis of ask-and-test. Research Memorandum BER-60-11, Minneapolis Bureau of Educational Research, University of Minnesota, 1960.
90. Torrance, E.P. Guiding Creative Talent, N.D. Prentice Hall of India Ltd., 1962.
91. Torrance, E.P. Towards the more humane education of gifted children. Gifted Child Quarterly, 1963,7,135 - 145.
92. Neufeld, J.J. The relationship of creative thinking abilities to the academic achievement of adolescents. Dissertation Abstracts, 1964, 25, 404.
93. Solomon, A.O. A comparative analysis of creative and intelligent behaviour of elementary school children with different socio-economic background. Dissertation Abstracts, 1968, 29, 5, 1457 - A.

Ogletree (1968) ;⁹⁴ Fletcher (1968) ;⁹⁵ Passi (1972) ;⁹⁶
 Raina (1971) ;⁹⁷ Bowers (1971) ;⁹⁸ Burgess (1972) ;⁹⁹

94. Ogletree, E.J. A cross-cultural exploratory of the creativeness of Steiner and state school pupils in England, Scotland and Germany, Dissertation Abstract, 1968, 29, 2, 516-A.
95. Fletcher, F.P. The human relationships of creative individuals. Journal of Creative Behaviour, 1968,2(2), 111-118
96. Passi, B.K. An exploratory study of creativity and its relationship with intelligence and achievement in school subjects of higher secondary stage, Ph.D Education, Punjab University, 1972.
97. Raina, M.K. Verbal and non-verbal creative thinking ability- A study of sex differences. Journal of Education and Psychology, Vol. 29, No.3, 1971, p.175-179.
98. Bowers, K.S. Sex and susceptibility as moderator variables in the relationship of creativity and hypnotic suggestibility, Journal of Abnormal Psychology, 1971, 78(1), 93 - 100.
99. Burgess, W.V. The analysis of teacher creativity, pupil age, and pupil sex as sources of variation among elementary pupils' performance on pre-and-post-tests of creative thinking. Dissertation Abstract International, 1971, 32, 1329 - A.

Cacha (1971),¹⁰⁰ Bedi (1974),¹⁰¹ Hussain (1974),¹⁰² and Razik (1964).¹⁰³

On the originality dimension of creativity, MacGregor and Smith (1965)¹⁰⁴ Raina (1971),¹⁰⁵ Pandit (1976),¹⁰⁶ Singh (1978);¹⁰⁷ and Jarid and Sharma (1981),¹⁰⁸ have observed that females score higher than the males in originality aspect of verbal creativity, on the ~~Passi Tests of Creativity~~. The significant superiority of females over males in verbal originality has been reported by Hussain (1974).¹⁰⁹

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100. Cacha, F.B. A study of the relation of creative thinking abilities to personality factors and peer nominations of fifth grade children. Dissertation Abstracts International, 1971, 32, 1329-A.
101. Bedi, R.K. Experimental Attitude and Creativity. Unpublished M.Ed. Dissertation, Indore University, 1974.
102. Hussain, M.G. Creativity and sex differences. Psychological studies, Vol. 19, No. 2, 1974, p. 127 - 129.
103. Razik, T.M.A. An investigation of creative thinking among college students. Dissertation Abstracts, 1964, 24, 7, 2775.
104. MacGregor, M. and Smith, J.L. Originality and role perception in elementary and junior high school children. Dissertation Abstracts. 1965, 25, 11, 6762.
105. Raina, M.K. Verbal and non-verbal creative thinking ability : A study in sex differences. Journal of Education and Psychology, 1971, 29(3), 175 - 179.
106. Pandit, R. A study of creativity in relation to adjustment, socio-economic status, and scholastic achievement of the students. Unpublished M.Ed Dissertation, Indore University, 1976.
107. Singh, R.P. Divergent thinking abilities and personality dimensions of bright adolescent boys and girls: A comparative study. Indian Educational Review, Vol. 13, No. 4 1978, p. 82-91.
108. Jarid, G.S. and Sharma, A.K. Sex roles in verbal creative thinking abilities. Psycho-lingua, 11(1), 1981, pp. 15 - 18.
109. Hussain, M.G. Creativity and sex differences. Psychological Studies, Vol. 19, No. 2, 1974, p. 127 - 129.

Superiority of girls over boys in fluency aspect of creativity was also revealed in a number of researches. Goyal (1973)¹¹⁰ found female students markedly higher on verbal fluency and flexibility than the male counterparts in his study of teacher training college students. In yet another study on high school students, girls scored significantly higher than boys on verbal fluency (Dhir, 1973).¹¹¹ The same result was reported in a study of tribal boys and girls by Krishnakumari, Lalitha and Paramaji (1986).¹¹² They noted that tribal girls scored high on fluency; besides this, they also excelled the tribal boys in verbal originality and elaboration. A study by Pandit (1976)¹¹³ also showed that females were significantly superior to males on fluency and flexibility dimensions of creativity.

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110. Goyal, R.P. A study of some personality correlates of creativity in secondary school teachers under training. Unpublished Doctoral Dissertation, Punjabi University, 1973.
111. Dhir, S. Performance of High School Students on verbal and figural tests of creative thinking. Master's Dissertation, Punjabi University, 1973.
112. Krishnakumari, P., Lalitha and Paramaji, S. Study of creative abilities of tribal children in relation to their sex and socio-economic status: Journal of the Institute of Educational Research, Vol 9, No. 4, March, 1986, P. 1 - 4.
113. Pandit, R.A study of creativity in relation to adjustment, socio-economic status, and scholastic achievement of the students, Unpublished M.Ed dissertation, Indore University, 1976.

Regarding verbal creativity, Passi (1972);¹¹⁴ Singh (1975);¹¹⁵ Rawat and Garg (1977);¹¹⁶ Arora (1978);¹¹⁷ and Jarial (1981)¹¹⁸ found female students significantly superior to their male counterparts. Girls have also been noted to score higher than boys on non-verbal creativity by Bedi (1974)¹¹⁹ and Jarial (1981).¹²⁰ This finding was supported by Dutta (1982)¹²¹ whose study of sex difference in creativity among the tribes of Meghalaya showed that girls scored higher than the boys in non-verbal creative thinking.

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114. Passi, B.K. An exploratory study of creativity and its relationship with intelligence and achievement in school subjects at higher secondary stage, Ph.D Education, Punjab University, 1972.
115. Singh, R.A study of creativity among X class students in relation to their adjustment and sex. Unpublished M.Litt dissertation, Punjab University, 1975.
116. Rawat, M.S. and Garg, M.K. A study of creativity and level of aspiration of high school students. Indian Psychological Review, Vol. 4, No.2, 1977. p. 51 - 53.
117. Arora, G.L. Relationship of sex with creativity, general anxiety, vocational anxiety and teaching success. Journal of Education and Psychology, Vol. 36, No. 3, 1978, p. 133- 139.
118. Jarial, G.S. Creativity, Intelligence and Academic Achievement -their relationship and differences with reference to sex and academic subjects. Journal of Education and Psychology, Vol. 39, No. 2, 1981.
119. Bedi, R.K. op. cit., 1974.
120. Jarial, G.S. op. cit., 1981.
121. Dutta, G. Sex differences in creativity among the tribe of Meghalaya, Journal of the Institute of Educational Research, Vol. 6, No. 2, May, 1982, p. 23 - 26.

However, there are many investigators whose studies show that males excel the females in creativity. Prakash (1966)¹²² compared the creativity of boys and girls studying in Class IV and found boys significantly higher in creativity than girls. Raina (1968)¹²³ and Gangneja (1972)¹²⁴ also reported similar findings. Torrance's study (1973)¹²⁵ indicated the superiority of Indian boys over girls in verbal creativity. Significant superiority of males over females on verbal creativity was also found by Rawat and Agarwal (1977)¹²⁶ Badrinath and Satyanarayanan (1979)¹²⁷ and Sharma (1979).¹²⁸ By administering the Torrance Test of Creative Thinking (TTCT) verbal and figural - Dharmangadan (1981)¹²⁹ found that male students scored significantly higher than females in all

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122. Prakash, A.O. understanding the Fourth Grade Slump; A study of the creative thinking abilities of Indian children. Master's Dissertation, University of Minnesota, 1966.
123. Raina, M.K. A study of some correlates of creativity in Indian students. Doctoral Dissertation, University of Rajasthan, 1968.
124. Gangneja, S.C. A study of creativity in ninth class students in relation to sex, residential background, academic achievement and parental occupation. Master's Dissertation, Punjabi University, 1972.
125. Torrance, E.P. Cross-cultural studies of creative development in seven selected societies. The Educational Trends, 1973, 8 (1-4), 28-38.
126. Rawat, M.S. and Agarwal. A study of creative thinking (with reference to intelligence, age, sex, communities, and income groups) Indian Psychological Review, Vd. 14, No. 2, 1977, 36 - 40.
127. Badrinath, S. and Styanarayanan, S.B. Correlates of creative thinking of high school students. Creativity Newsletter, Vd. 7 & 8, No. 2 & 1, 1979.
128. Sharma, K.N. Multi-trait multidimensional approach to creativity. Creativity Newsletter, Vd. 7 & 8, Nos 2 & 1, 1979.
129. Dharmangadan, B. Creativity in relation to sex, age, and locale. Psychological Studies, Vd. 26, No. 1, 1981, 28 - 33.

measures of verbal and figural creativity. However, Dutta (1982)¹³⁰ in her study of sex differences in creativity among the tribes of Meghalaya, obtained no significant difference in verbal creativity among the boys and girls of the area. Kelley (1965)¹³¹ found girls scoring significantly lower than the boys in non-verbal creativity. On this measure, Passi (1972)¹³² observed the male superiority over the females. Earlier, Middents (1968)¹³³ had also found males excelling in non-verbal elaboration.

Dhir (1973)¹³⁴ observed the superiority of boys on figural originality. In a study by Raina (1971)¹³⁵ male students scored significantly higher than females on originality. Boys were found superior on elaboration

130. Dutta, G. op.cit., 1982.

131. Kelley, G.R. Creativity, school attitude and intelligence relationships in grades four, six and eight. Dissertation Abstracts, 1965, 25, 11, 6390

132. Passi, B.K. op.cit., 1972.

133. Middents, G.J. Relationship of creativity and anxiety. Dissertation Abstracts, 1968, 28, 7, 2562-A.

134. Dhir, S. Performance of high school students on verbal and figural tests of creative thinking. Master's Dissertation, Punjabi University, 1973.

135. Raina, M.K. Verbal and Non-verbal Creative Thinking Ability: A study in sex differences. Journal of Education and psychology, 1971, 29(3), 175 - 179.

(Singh, 1978);¹³⁶ and scored higher than girls on fluency and originality (Awasthy, 1979; and Jarial and Sharma, 1981).^{137, 138}

The findings of Gakhar (1974)¹³⁹ were that boys and girls differed significantly in flexibility at Class X, whereas no significant differences were found between the sexes on other grades and different aspects of creativity. Another study by Vohra (1975)¹⁴⁰ showed that male and female students of Primary class did not differ significantly on non-verbal creativity in studies conducted by Thammaprateep (1976)¹⁴¹ Dutt and others (1977);¹⁴² Lal (1977);¹⁴³ Singh (1977);¹⁴⁴ Thorat

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136. Singh, R.P. Divergent thinking abilities and personality dimensions of bright adolescent boys and girls: a comparative study. Indian Educational Review, Vol. 13, No.4, 1978, p. 82 - 91.
137. Awasthy, M. A study of creativity, intelligence, scholastic achievement and factors of socio-economic status. Unpublished M.Ed Dissertation, Indore University, 1979.
138. Jarial, G.S. and Sharma A.K. op.cit., 1981
139. Gakhar, S. Creativity in relation to age and sex. Journal of Education and Psychology, Vol.32, No.3, 1974.
140. Vohra, I.N. A study of non-verbal creativity in relation to socio-economic status, age, sex, medium of instruction and personality characteristics amongst the pupils of English and Gujarati medium of 'Bazm-E-Hidayat' primary school from Baroda city. Unpublished M.Ed Dissertation, M.S. University, 1975.
141. Thammaprateep, V. A comparative study of creativity of Indian students (Baroda) and Thai students (Nakornsawan) of Grade IX. Unpublished M.Ed Dissertation, M.S. University, 1976.
142. Dutt, N.K., Bountra, P. and Sabhrawal, V.K. A study of creativity in relation to intelligence, extroversion and neuroticism. Indian Educational Review, Vol. 8, No.2, 1977, 81 - 85.
143. Lal, G. Relationship of sex with creativity. General Anxiety, Vocational anxiety and teaching success. Journal of Educational Research and Extension, Vol. 14, No.2, 1977.
144. Singh, A. A study of creativity of popular, isolates and rejectees in relation to their socio-economic status and scholastic achievement. Unpublished M.Ed Dissertation, Indore University, 1977.

(1977);¹⁴⁵ Gupta (1979);¹⁴⁶ Masih (1979);¹⁴⁷ and Pandey (1980).¹⁴⁸

A study of 12th grade school students showed that boys and girls differed significantly on fluency factor of creativity, but no significant difference was found on other creativity measures. Studies of Pathak (1962);¹⁴⁹ Karsten (1968);¹⁵⁰ Ashin (1962);¹⁵¹ Castle (1965);¹⁵² Mayhon (1966);¹⁵³

145. Thorat, N. Study of creativity of student players in relation to their scholastic achievement and socio-economic status Unpublished M.Ed Dissertation, University of Indore, 1977.
146. Gupta, G.S. A comparative psychological study of creativity of Indian Adolescent students at various educational levels. Indian Psychological Review, Vol. 18, No. 1 & 4, 1979, p. 42 - 44.
147. Masih, S. Creativity and teacher effectiveness. Quest in Education, Vol. 16, No. 2, 1979.
148. Pandey, K. op. cit., 1980.
149. Pathak, P. Experimental study of creativity, intelligence and school achievement. Psychological Studies, 1962, 7, 1-9.
150. Karsten, M.O.K. The relationship of tested creative abilities and selected factors of academic achievement, intelligence, sex, socio-economic status, and pupil attitudes. Dissertation Abstracts, 1968, 28, 7, 2557-A.
151. Ashin, G.M. The relationship among selected subject variables and level of creativity. Dissertation Abstracts, 1964, 24, 6, 2365.
152. Castle, A.D. A comparison of the creativity of urban and rural students in Oklahoma. Dissertation Abstracts, 1965, 26, 3, 1420.
153. Mayhon, W.G. The relationship of creativity to achievement and other student variables. Dissertation Abstracts, 1966, 27, 6, 1713 - A.

Jackson (1968),¹⁵⁴ Burns (1969),¹⁵⁵ Phillips and Torrance (1971),¹⁵⁶ Kloss (1972),¹⁵⁷ and Ward and Cox (1974),¹⁵⁸ did not find any sex difference in total creativity or other creativity abilities.

The above survey indicates that the studies on sex difference in creativity and its components have obtained varied and diverse results, and the findings are inconsistent to draw any clear conclusions.

4. Creativity and Locale

The relationship between locale and creativity has been explored in only a few studies. Aaron, Marthal and Mdatesha (1972)¹⁵⁹ probed into the differences in creativity among the rural and urban students. Their study did not reveal any significant locale differences

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154. Jackson, R.L. An investigation of the creative growth curves of University students. Dissertation Abstracts, 1968, 28, 9, 3508-A.
155. Burns, M.J. Selected characteristics of children's individual tests of creativity. Dissertation Abstracts International, 1969, 30, 5, 1859-A.
156. Phillips, V.K. and Torrance, E.P. Divergent thinking, remote associations, and concept attainment strategies, Journal of Psychology, 1971, 77, 223 - 228.
157. Kloss, M.G. The relation between adolescent creativity and selected variables: sex, adjustment, art-science preference complexity-simplicity, and type of school. Dissertation Abstracts International, 1972, 33(5), 2324-B.
158. Ward, W.C. and Cox, P.W. A field study of non-verbal creativity. Journal of Personality, 1974, 42(2), 202-219.
159. Aaron, P.G., Marthal and Mdatesha, R.N. Fluency, Flexibility and Motivation. Journal of Education and Psychology, Vol. 30, No. 1, 1972, 7 - 10.

among the high school students. Sehgal's study (1978)¹⁶⁰ of secondary schools students on the Hindi adaptation of Wallach and Kogan's tests of Creativity, also supported the above findings as there was no significant difference in creativity scores of students coming from urban or rural backgrounds.

The superiority of the urban students over the rural students in creativity has been reported in a number of researches conducted in India (Passi, 1972; Singh, 1977; Srivastava, 1977; and Singh, 1979)^{161, 162, 163, 164}. The superiority of the urban groups over the semi-urban in scientific creativity was demonstrated by Singh (1981)¹⁶⁵ in his study of secondary school students.

160. Sehgal, K. School systems as related to creativity of students. The Progress of Education, Vd. 52, No. 10 and 11, 1978, p. 207 - 211.

161. Passi, B.K. op. cit., 1972

162. Singh, R.J. op. cit. 1977.

163. Srivastava, S.S. Study of Creativity in relation to neuroticism and extroversion in high school students. Ph.D Education Patna University, 1977.

164. Singh, R.J. Teacher creativity in relation to rural-urban background Avagahana, Vd. 3, No. 1, 1979.

165. Singh, D. Scientific Creativity and Personality. Agras National Psychological Corporation, 1981.

However, studies conducted by Sharma (1972; 1974)^{166, 167} on rural-urban differences on creativity scores have shown that rural students were significantly more creative than their urban counterparts. Similar findings have been reported by Hussain and Sahay (1975)¹⁶⁸ when they observed that tribal students were equally creative as, and superior in certain dimensions of creativity to the students in urban areas.

The studies reviewed have not shown any definite pattern with respect to the relationship between rural-urban differences and creativity. The paucity and insufficiency of studies make it impossible to generalize and reach any definite conclusions. The review also stress the need to have more studies relating the locale and creativity.

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166. Sharma, K.N. Rural urban differences in creativity. Journal of Psychological Researches, Vol. 16, No. 3, 1972, p. 121 - 122.
167. Sharma, K.N. Creativity as a function of Intelligence, Fine arts interests and Culture. Indian Journal of Psychology, Vol. 42, No. 4, 1974, p. 313 - 319.
168. Hussain, M.G. and Sahay, M. Cultural impact on the development of creative potential in M.G. Hussain and Q. Hussain's Cultural Roles, Sex Differences and Creativity. Educational Trends, 1975, 10,2, 141 - 145.

5. Creativity and Age

Attempts have been made to study the age-level at which creative characteristics develop in persons from infancy to adulthood. Though a difficult task, it is essential for understanding how and when creativity can be nurtured in an individual.

The earliest study was undertaken by Ribot (1906).¹⁶⁹ By exploring imagination and reason from childhood to adulthood, he was able to show that imagination works during youth after which only reason does. Another study made by Andrews (1930)¹⁷⁰ also revealed that the power of imagination develops in infancy and drops at the age of five. Grippen (1933)¹⁷¹ on the other hand, observed a negative development of the creative imagination during infancy.

In a study of children from grade three to twelve, Calvin and Meyer (1906)¹⁷² found a general decline in imagination. Simpson's (1922)¹⁷³ study signified an increase of this same power at the third

169. Ribot, T. Essay on the creative imagination. London, Kegan Paul and Co., 1906.

170. Andrews, E.G. The development of imagination in the pre-schol child. University of Iowa studies in character, 1930, 3(4).

171. Grippen, V.B. A study of creative artistic imagination in children by the constant contact procedure. Psychological Monograph, 1933, 45 (1), 63-81.

172. Calvin, S.S. and Meyer, I.F. Imaginative elements in the written works of school children. Pedagogical Seminary, 1906, 13, 84 - 93.

173. Simpson, R.M. Creative Imagination. American Journal of Psychology, 1922, 33, 234-243.

grade, and a decline in the next class. An increase was seen in next two classes, reaching its peak at Class VI which again declined in the next two grades. Barkon (1960)¹⁷⁴ found that in the development of the process, children showed spurts in creativity at different age levels.

Citing examples of eminent men, Cole (1940)¹⁷⁵ claimed adolescence as an important stage for creativity development.

Rossmann (1935)¹⁷⁶ made a study of inventors to determine the most productive period in their life. Out of the 710 inventors, 61 per cent made their inventions before they attained 25 years of age. Lehman (1953)¹⁷⁷ observed "that superior creativity generally rises rapidly to its highest point in the thirties and declines slowly thereafter". In his study of persons in different fields, Lehman found that Chemists contribute most during 26 to 30 years of age; Mathematicians between 30 to 40; Musicians between 30 to 40; and Authors under 45. Movie actors were found to reach their popularity between 30 to 40.

In a study that used the Rorschach tests, Lalitha (1957)¹⁷⁸ studied the development of imagination among Indian children between the age 8 to 11 years, and no significant relation was observed

174. Barkon, M. Through art to creativity. Boston, Massachusetts: Allyn and Bacon Inc., 1960.

175. Cole, N.R. The Arts in the class-room. N.Y. John Day Co., Inc., 1940.

176. Rossmann, J. A study of the childhood, education and age of 710 inventors. Journal of Patent Office Society, 1933, 17, 411-421.

177. Lehman, H.C. Age and achievement. Princeton, N.J. Princeton University Press, 1953.

178. Lalitha, M.S. A study of the development of imagination in children. Journal of Psychological Researches, 1957, 2, 39 - 48.

between age and creativity. The same result was obtained in the studies undertaken by Bhargava in 1979,¹⁷⁹ Passi (1971),¹⁸⁰ Thammaprateep (1979),¹⁸¹ Rawat and Agarwal (1977)¹⁸² and Singh (1971).¹⁸³ However, a positive and significant relationship between creativity and age has been obtained in a number of studies. Raina's (1970)¹⁸⁴ study revealed that total creativity and originality and elaboration were positively and significantly related to age; fluency aspect of creativity was negatively and significantly related to age; and flexibility aspect of creativity was not significantly related to age. Khire (1971)¹⁸⁵ and Badrinath and Satyanarayanan (1979)¹⁸⁶ showed an increase in creativity up to the age of 13 years; but unlike intelligence, did not increase linearly at 13+. Joshi (1974)¹⁸⁷ and Gakhar (1975)¹⁸⁸ found an increase in creativity

179. Bhargava, M. Personal variables and second order personality correlates of creativity. Indian Psychological Review, Vol. 17, No. 3-4, 1979, p. 63 - 67.

180. Passi, B.K. op. cit., 1971.

181. Thammaprateep, op. cit., 1976.

182. Rawat and Agarwal, op. cit., 1977.

183. Singh, R.P. 1986, op. cit.

184. Raina, M.K. A study of Creativity in teachers. Psychological Studies, Vol. 15, No. 1 and 2, 1970, p. 28-33.

185. Khire, U.S. Creativity in relation to intelligence and personality factors. Ph.D Psychology, Poona University, 1971.

186. Badrinath, S. and Satyanarayanan, S.B. op. cit., 1979.

187. Joshi, R.J. A study of creativity and some personality traits of the intellectually gifted high school students. Ph.D Education, M.S. University, 1974.

188. Gakhar, S. op. cit., 1975.

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up to the age of 15 years. In a study by Gakhar (1974), it was observed that the fluency and flexibility scores of the students showed an upward trend from IX to X grades which was followed by a decline from X to XI classes. It was also observed that the growth of creativity was possible until the tenth class for girls; and in the case of boys, creativity reached its maximum at IX class. Singh (1979) conducted a study to find out the relationship between age and creativity scores of 442 B.Ed students. Using Torrance Test of Creative Thinking (TTCT), the study revealed that in the age group 18 to 26 years there were more chances to get creative student-teachers; the chances were less in the age group of 27 to 32 years. Sansanwal and Jarial (1980) used the Passi's Tests of Creativity on 903 students, and observed an increase in fluency, originality and total creativity in children from 12 to 16 years, but a fall was observed in the above aspects of creativity beyond the age of 16 years. The study however, did not show any consistent dominance of a particular age group on fluency, flexibility, originality and total creativity. Ahmed (1977) acknowledged an increase in verbal and non-verbal creativity among the high school students during their study from classes VII to XI. Dharmagadan (1981) also observed that 15 years old students scored significantly

189, Gakhar, S. op. cit., 1974.

190. Singh, R.J. Creativity and the age of student-teachers. Journal of the Institute of Educational Research, Vol. 3, No.3, 1979, 27 - 31.

191. Sansanwal, D.N. and Jarial, G.S. Creativity and age. Creativity Newsletter, 1980.

192. Ahmed, S.I. A study of certain creativity factors among school children. Psychological Studies, 1977, 22,24-27.

193. Dharmagadan, B. op. cit., 1981.

higher than 14 years old students in all measures of verbal creativity, but the difference with respect to figural creativity was not found significant. Considerable amount of research seems to have been done on the relationship between age and creativity. A positive and significant relationship has been observed in many studies between the two variables.

6. Creativity and Socio-Economic Status

The effect of socio-economic status (SES) on the development of creativity was the theme in a number of studies conducted in India and abroad. Ogletree (1971)¹⁹⁴ observed the influence of SES on the creativity scores of the individual, and this finding was later confirmed by Ogletree and Ujaki (1973).¹⁹⁵ There are several studies where investigators have shown that highly creative individuals hail from the high socio-economic backgrounds. The researchers are Rossman (1931),¹⁹⁶ Mackinnon (1965),¹⁹⁷ Pareek (1966),¹⁹⁸ Solomon (1968),¹⁹⁹ Ratna

194. Ogletree, E.J. A cross-cultural examination of the creative thinking ability of public and private school pupils in England, Scotland and Germany, Journal of Social Psychology, April, 83(2), 1971, p. 301 - 302.

195. Ogletree, E.J. and Ujaki. Effects of socio-economic status on tests of creative behaviour. Journal of Educational Research, 67(4), Dec. 1973, p. 149 - 152.

196. Rossman, J. The Psychology of the Inventor. Washington D.C. Inventors Pub. Co., 1931.

197. Mackinnon, D.W. Personality and the realization of the creative potential. American Psychologist, 1965, 20, 273-281.

198. Pareek, S.S. An Investigation into the creative thinking of students at different levels and the relationship between creative thinking and other related factors. Unpublished M.A. Dissertation, Rajasthan University, 1966.

199. Solomon, A.O. A comparative analysis of creative and intelligent behaviour of elementary school children with different socio-economic backgrounds. Dissertation Abstracts, 1968, 29, 5, 1457-A.

(1969),²⁰⁰ Volra (1975),²⁰¹ Rawat and Agarwal (1977),²⁰² Singh (1977),²⁰³ Thorat (1977),²⁰⁴ Srivastava (1978),²⁰⁵ Pandit (1976),²⁰⁶ Sharma (1979),²⁰⁷ Bhargava (1979),²⁰⁸ Jarid (1979),²⁰⁹ Singh (1980),²¹⁰ and Ahmed (1980),²¹¹ However, Pandey, Pandey and Rai (1986)²¹² found a positive but non significant relationship between creativity and upper SES.

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200. Ratna, M.K. Creativity Research in India: An Analysis. The Journal of Creative Behaviour, 1969, 3, 200-210.
201. Volra, I.N. op. cit., 1975.
202. Rawat, M.S. and Agarwal, op. cit., 1977.
203. Singh, A. A study of creativity of populars, isolates and rejectees in relation to their socio-economic status and scholastic achievement. Unpublished M.Ed Dissertation. Indore University, 1977.
204. Thorat, N. Study of creativity of student players in relation to their scholastic achievement and socio-economic status. Unpublished M.Ed Dissertation, Indore University, 1977.
205. Srivastava, R. Creativity as a function of birth-order, socio-economic status and personality types. Journal of Education and Psychology, Vd. 41, No.3, 1978, p. 113 - 117.
206. Pandit, R. op. cit., 1976.
207. Sharma, K.N. Multi-trait, multi-dimensional approach to creativity. Creativity Newsletter, Vd. 7 &8, No. 2 & 1, 1979.
208. Bhargava, M. op. cit., 1979.
209. Jarid, G.K. Verbal creative thinking among the students with different socio-economic status backgrounds and birth-orders. Psycho-Lingua, Vd. 9, No. 2, 1979, p. 85 - 90.
210. Singh, R.J. Teacher creativity and family background: A study of relationship. Asian Journal of Psychology and Education. Vd. 6, No. 3, 1980, p. 42 -48.
211. Ahmed, S. Effect of socio-cultural disadvantage on creative thinking. Journal of Psychological Researches, Vd. 24, No. 2, 1980, 96 - 106.
212. Pandey, R.C.; Pandey, R.N. and Rai, R.N. A study of creativity in relation to socio-economic status of high school students. The Journal of Institute of Educational Research, Vd. 10. No. 1, 1986, 9 - 12.

Sharma and Jarid (1980)²¹³ reported that samples from the high SES are significantly higher than those from the low SES in fluency; whereas students of high and low SES did not differ significantly in verbal flexibility, originality and total creativity. In a study of higher secondary school students, Awasthy (1979)²¹⁴ found that the students of very high SES were superior to the students of high, average and low strata of SES in flexibility, originality and total creativity; the students of high SES were noted as superior to students of very high, average and low SES in fluency. In total creativity, students of high SES scored higher than those of low SES, and the students of very high SES were significantly superior to students of low and average SES in fluency aspect of creativity. A similar result was found by Srivastava (1978).²¹⁵ The study revealed that students from families of high income group were significantly high on creativity test in comparison with the middle and low income group; it was

213. Sharma, A.K., and Jarid, G.S. Factorial study of the effect of SES, Grade levels, and their interaction upon creativity and its components. Trends in Education, Vol. 7, No. 1 & 2, 1980, p. 37 - 42.

214. Awasthy, M. A study of creativity, intelligence, scholastic achievement, and the factors of socio-economic status. Unpublished M.Ed Dissertation, Indore University, 1979.

215. Srivastava, R. op. cit., 1978.

also observed that the education of parents influenced the creativity of the children. In 1961, Welsberg and Springer²¹⁶ had noted that the degree to which the father was professionally autonomous was very significantly related with the child's creativity.

The size of the family, an indicator of SES, has been found to play an important role in the creativity of children. Kennett (1974)²¹⁷ studied children of Class VII and came to the conclusion that the larger family in the upper SES group provides a social and cultural family environment favourable to both convergent and divergent thinking. In a study made by Jarial (1981),²¹⁸ creativity scores from small, average and large families were compared. The result obtained was that students of small families were significantly superior to students of average, and large families in fluency, flexibility and composite creativity, whereas they did not differ with respect to originality component of creativity. It was also found by Ahmed and Joshi (1984)²¹⁹ that originality in verbal creative thinking is very much affected by an enriched home background. An earlier study by the same investigators on the non-verbal creativity performance has revealed that home background played a relatively insignificant role in case of

216. Welsberg, P.S. and Springer, K.J. Environmental factors influencing creative function in gifted children, Cincinnati, Dept. of Psychiatry, 1961.

217. Kennett, K.F. Creativity, family size and socio-economic status. The paper presented at the XV Inter-American Congress of Psychology in Bogota, Columbia, 1974.

218. Jarial, G.S. Creativity and family size. Journal of Education and Psychology, 1981.

219. Ahmed, S. and Joshi, R.K. Effect of socio-cultural disadvantage on verbal originality, fluency and flexibility. Journal of Institute of Educational Research, May, 1984, Vol. 8, No. 2, 16 - 23.

students attending extremely advantaged and extremely disadvantaged schools, while on the other hand, the role of home was found to be relatively dominant when slightly advantaged and slightly disadvantaged schools were compared (Ahmed and Joshi, 1977).²²⁰

Raina (1968)²²¹ compared the middle class subjects with the lower class subjects and found that high creatives belonged to the middle class, and the low creative subjects to the lower class. Ford (1968)²²² also reported that children from upper-middle and lower-middle classes seemed to be more creative than youngsters from the working class. Contrary to the above findings, some studies have reported the superiority of subjects from low SES background over those from the high and average SES (Smith, 1966; Singh, 1980; and Torrance, 1980).^{223, 224, 225} There are also investigators who have revealed that there exists no significant relationship between creativity and SES

220. Ahmed, S. and Joshi R.K. Effect of socio-cultural disadvantages on non-verbal. Creative Thinking Ability among school going children. Indian Journal of Psychology. Vol. 52, Part 4, 1977, 342 - 349.

221. Raina, M.K. A study of some correlates of Creativity in Indian students. Doctoral Dissertation, University of Rajasthan, 1968.

222. Ford, E.D. The relationship of certain socio-cultural factors among Junior or High school students to creativity in Art. Dissertation Abstracts, 28,(9-A), 3502, 1968.

223. Smith, J.A. Setting Conditions for Creative teaching. Boston Allyn and Bacon, 1966.

224. Singh A.K. To study the incidence of creativity among the socio-economic disadvantaged children with reference to Central U.P. Unpublished Ph.D thesis, Rohakhan University, Bareilly, 1980.

225. Torrance, E.P. Georgia studies of creative behaviour : A brief summary of activities and results in M.K. Raina (Ed.) Creativity Research : International Perspective. New Delhi : National Council of Educational Research and Training, 1980.

(Kartsen, 1968; Canty, 1974; McDaniel, 1974; and Badrinath and Satyanarayanan, 1979).^{226, 227, 228, 229} In a summary of studies conducted on the effect of SES on creativity, Torrance (1972)²³⁰ came to the conclusion that there were no significant differences in the subject's creativity on account of difference in SES.

B. Cognitive Correlates of Creativity

1. Creativity and Achievement

Getzels and Jackson (1962)²³¹ have remarked that "since creative students tend to be non-conforming and disruptive of classroom routine and, hence, often irritate their teachers, it seems reasonable to anticipate a negative relationship between creativity and academic performance".

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226. Kartsen, M.O. The relationship of tested creative abilities and selected factors of academic achievement, intelligence, sex, socio-economic status and pupil attitudes. Dissertation Abstracts International, 38(8), 4732, 1968, 1977 - 78.
227. Canty, R.E. The relationship of father absence, socio-economic status and other variables to creative abilities in 5th grade boys. Dissertation Abstracts International, 34 & -A, 3981, Jan. 1974.
228. McDaniel, E.R. An investigation of the relationship between creativity and socio-economic status, race and sex of seventh grade pupils. Dissertation Abstracts International, 34, 7A, 3997-98, 1974.
229. Badrinath, S. and Satyanarayanan, S.B. Correlates of creative thinking of high school students. Creativity Newsletter, Vol. 7 & 8, No. 2 & 1, 1979.
231. Torrance, E.P. Validity studies of two brief screening devices for studying the creative personality. Journal of Creative Behaviour, Vol. 5 1972, 94 - 103.
231. Getzels, J.V. and Jackson, P.W. Creativity and Intelligence: Explorations with Gifted students. New York, Wiley, 1962.

Creativity and scholastic achievement were not found related in studies conducted by Holland (1961);²³² Singh, (1977),²³³ Ld and Chhana (1977),²³⁴ and Sharma (1981).²³⁵ Badrinath and Satyanarayanan (1979)²³⁶ did not find any significant difference in the creativity scores of the students of low, middle and high academic achievement groups in creativity. Sandhu (1979)²³⁷ observed that there was no significant relation between creativity and achievement when the effect of intelligence was controlled. Paramesh (1973)²³⁸ found that a subject's achievement in English, Mathematics, Science, Vernacular and Geography had a positive and significant relationship with creativity whereas no relationship could be observed between creativity and academic achievement in the rest of the academic subjects. Joshi's (1974)²³⁹ study revealed a positive and significant relationship between creativity and achievement in English; the relationship was however, low in

232. Holland, J.L. Creative and Academic performance among talented adolescent, Journal of Educational Psychology, 1961, 52, 136 - 147.

233. Singh, A. op. cit., 1977.

234. Ld, B.N. and Chhana, M.R. Relationship of creativity with achievement motivation in science students. The Educational Trends, Vd. 12, No. 1 & 2, 1977, p. 99 - 103.

235. Sharma, A.K. Divergent thinking in relation to academic achievement and sex. Trends in Education. Vd. 8, No. 1 & 2, 1981, p. 9-11.

236. Badrinath, S. and Satyanarayanan, S.B. op. cit., 1979.

237. Sandhu, T.S. Relationship of Creativity with academic achievement in science subjects. Creativity Newsletter, Vd. 7 & 8, No. 1 & 2, 1979.

238. Paramesh, C.R. Creativity, Intelligence and Academic achievement The Educational Trends, Vd. 8, No. 1-4, 1973, p. 129 - 137.

239. Joshi, R.J. A study of creativity and some personality traits ~~of~~ the intellectually gifted high school students. Ph.D Education. M.S. University, 1974.

the other subjects. Dhalwal and Saint (1976)²⁴⁰ reported a positive and significant relationship between creativity and achievement in history and geography, but there was no relationship between creativity and achievement in mathematics.

In trying to establish the link between creativity and achievement among students, a positive and significant relationship has been reported in many studies. Raina (1968)²⁴¹ studied the correlates of creativity by administering the Minnesota Test of Creative Thinking to Indian students. The investigator found that the high creative students scored significantly higher than the low creatives in academic achievement than the low creative males and females. Others such as Yamamoto (1960)²⁴², Wallach and Kogan (1965)²⁴³, Pareek (1966)²⁴⁴, Trivedi (1969)²⁴⁵, Khire (1971)²⁴⁶, Lalithamma (1973)²⁴⁷, Bedi (1974)²⁴⁸, Mehdi (1977)²⁴⁹;

240. Dhalwal, A.S. and Saint, B.S. Relationship of creativity with over and under academic achievement. Psychological Studies, Vol. 21, No. 2, 1976, p. 30 - 40.

241. Raina, M.K. op. cit., 1968.

242. Yamamoto, K. Further analysis of Ask-and-Guess tests. Research Memorandum BER-60-11, Minneapolis, Minnesota Bureau of Educational Research, University of Minnesota, 1960.

243. Wallach, W.J. and Kogan, N. A new look at the creativity-intelligence distinction. New York: Holt, 1969.

244. Pareek, S.S. An investigation into the creative thinking of students at different levels, and the relationship between creative thinking and other related factors. Unpublished M.A. Dissertation, Rajasthan University, 1966.

245. Trivedi, R.C. To establish the reliability and validity of the tests of creativity. Unpublished M.Ed Dissertation, Punjab University, 1969.

246. Khire, U.S. op. cit., 1971

247. Lalithamma, M.S. Self-concept and creativity of over, normal and under-achievers amongst grade X students of Baroda city. Unpublished M.Ed Dissertation, M.S. University, 1973.

248. Bedi, R.K. op. cit., 1974.

249. Mehdi, B. Creativity, intelligence and achievement-A correlational study. Psychological Studies. Vol. 22, No.1, 1977, p. 55 - 62.

Singh, Mathur and Saxena (1977);²⁵⁰ Singh (1978)²⁵¹ have shown that creativity and achievement scores were positively and significantly related. Passi (1972)²⁵² reported that scholastic achievement was found to be influenced by creativity. Further, the study revealed that achievement was significantly and positively related with fluency and originality. Pandit (1976)²⁵³ also showed that each area of creativity was positively and significantly related to levels of scholastic achievement.

A study of the class IX science students by Kumar (1978)²⁵⁴ revealed that the high creative individuals were more achievement motivated than the low creatives. Using the verbal creativity test of Mehdi²⁵⁵ and the scholastic achievement from school records, Awasthy (1979)

250. Singh, R.B., Mathur, S.R. and Saxena, S. Creativity as related to intelligence, achievement and security - insecurity. Indian Psychological Review, Vol. 14, No. 3, 1977, p. 84 - 88.

251. Singh, R.P. op. cit., 1978.

252. Passi, B.K. An exploratory study of creativity and its relationship with intelligence and achievement in school subjects at Higher Secondary Stage. Ph.D Education, Punjab University, 1972.

253. Pandit, R. op. cit., 1976.

254. Kumar, G. Creative functioning in relation to personality, value-orientation and achievement motivation. Indian Educational Review, Vol. 13, No. 2, 1978, p. 110 - 114.

255. Awasthy, M op. cit., 1979.

showed that scholastic achievement was significantly related to the different areas of creativity. In exploring this same relationship, Gupta (1979)²⁵⁶ used the verbal and non-verbal Creativity Test by Mehdi and Kishore, and the academic achievement scores of students from annual examination results. It was found that a positive and significant relationship existed between creativity and the academic achievement scores.

Asha (1980)²⁵⁷ also observed positive and significant relationship between creativity and achievement scores of males as well as female students of class X. In a study of 68 female B.Ed students, Safaya²⁵⁸ (1981) administered the Torrance Tests of Creative Thinking (verbal and non-verbal) to identify the creative students. The academic achievement of the students was taken from their final examination records. The study revealed that the academic achievement of the students was positively and significantly related to verbal and non-verbal creativity. Jarid (1981)²⁵⁹ observed a positive and significant relationship

256. Gupta, K.K. Creativity, Intelligence and Achievement. The Educational Review, Vd. 85, No. 11, 1979, p. 208 - 212.

257. Asha, C.B. Creativity and Academic achievement among secondary school children. Asian Journal of psychology and Education, Vd. 6, No. 1, 1980.

258. Safaya, R. Academic achievement of B.Ed trainees as related to intelligence, creativity and adjustment. Trends in Education, Vd. 8, No. 1 & 2, 1981, 18 - 25.

259. Joshi, G.S. Creativity, intelligence and academic achievement - their relationship and differences with reference to sex and academic subjects. Journal of Education and Psychology, Vd. 39, No. 2, 1981.

with the verbal and non-verbal creativity scores. Joshi (1982)²⁶⁰ found a difference in co-efficient of correlation between creativity scores and achievement scores for rural and urban areas. A significant relation was seen between achievement score and creativity for urban area sample; correlation was found to be low in rural sample.

2. Creativity and Intelligence

Investigators having an interest in the relationship between intelligence and creativity conducted studies to find out the nature, extent and trend of relationship between these two variables. At the conference of American Psychological Association in 1950, Guilford made a protest against the practise of psychologists to consider creativity as akin to intelligence or include it in the domain of intelligence.

Later in 1956, Guilford and his associates brought to light the existence of two distinct types of thinking abilities. The first, called convergent production produces facts from known information and was synonymous with intelligence. The second ability termed divergent production inculcates new ideas or things, is minimally dependent upon known information and came to be understood by the term creativity.

Studies had been made earlier by researchers like Calvin and Meyer (1906)²⁶¹, Chassell (1916)²⁶², Andrews (1930)²⁶³, McCloy and Meter

260. Joshi, S.P. A study of verbal creativity in Marathi language in relation to achievement in Marathi and environmental factors of the students as well as teaching in High schools. Ph.D Education, Bombay University, 1982.

261. Calvin, S.S. and Meyer, I.F. op. cit., 1906

262. Chassell, L.M. Tests for Originality. Journal of Educational Psychology, 1916, 7, 317 - 328.

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263. Andrews, E.G. The development of imagination in the pre-school child. University of Iowa Studies in Character, 1930, 3(4).

264 (1939); Welch (1946); 265 and Thurston (1950). 266 But they could not state the exact nature of relationship between creativity and intelligence.

Getzels and Jackson (1962)²⁶⁷ conducted the first systematic study aimed at laying a clear cut distinction between intelligence and creativity; the result indicated that the two are separate ways of thinking. Their finding was also supported by Taylor (1962)²⁶⁸ and Guilford (1962).²⁶⁹ Wallach and Kogan (1965),²⁷⁰ by constructing their own measures of creativity brought out a clear distinction between the two. They reported that "creativity exists almost independent of another dimension called intelligence". Commenting on their work, Butcher (1968)²⁷¹ wrote that one could put more trust on the claim they made as their method of work was "far less crude than that of their predecessors." Similar findings were shown by Cropley (1966),²⁷² Ward (1967)

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264. McCloy, W. and Meter, N.C. Re-creative Imagination. Psychological Monograph, 1939, 51,5, 108 - 116.
265. Welch, L. Recombination of ideas in creative thinking. Journal of Applied Psychology, 1946, 30, 638 - 643.
266. Thurston, L.L. Creative Talent- Report of Psychometric Lab. University of Chicago, 1950, 61.
267. Getzels, J.W. and Jackson, P.W. Creativity and Intelligence. N.Y. John Wiley & Sons, 1962.
268. Taylor, C.W. Who are exceptionally creative? Exceptional Children, April, 1962, 28, 421 - 429.
269. Guilford, J.P. Potentiality to Creativity. Gifted Child Quarterly, 1962, (1)6, 87 - 90.
270. Wallach, M.A. and Kogan, N.A. A new look at the creativity intelligence distinction. Journal of Personality, 1965, 33, 348 - 369.
271. Butcher, H.J. Human Intelligence : its nature and assessments. London, Methuen and Co., 1968.
272. Cropley, A.J. Creativity and Intelligence. British Journal of Educational Psychology, 1967.



²⁷³ Kazelskis, Jenkins and Lingle (1972),²⁷⁴ who all reported a substantial independence between measures of creativity and intelligence.

Contrary to the findings that there is no association between intelligence and creativity, there are those who have noted significant correlations between divergent and convergent abilities. They are researchers like Vernon (1967),²⁷⁵ Dacey and others (1969),²⁷⁶ and Callaway (1969).²⁷⁷ A high significant relationship between intelligence and creativity was found by Torrance (1962),²⁷⁸ Yamamoto (1963),²⁷⁹ Butcher (1967),²⁸⁰

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273. Ward, J. An oblique factorization of Wallach and Kogan's Creativity Correlations. British Journal of Educational Psychology, 1967.
274. Kazelskis, R., Jenkins, R.K., and Lingle, R.K. Two alternative definitions of creativity and their relationship with intelligence Journal of Experimental Education, 1972, Vo. 41 (1).
275. Vernon, P.E. A cross-cultural study of creativity tests with 11 year old boys. New Research in Educational, 1967, 1, 135 - 146.
276. Dacey, J., Madaus, G.F., and Allen, A. The relationship of creativity and intelligence in Irish Adolescents. British Journal of Educational Psychology, 1969, 39, 261 - 266.
277. Callaway, W.R. A historic conception of creativity and its relationship to intelligence, Gifted Child Quarterly, 1969, 13(4), 237 - 241.
278. Torrance, E.P. op. cit., 1962.
279. Yamamoto, K. Relationships between creative thinking abilities of teachers and achievement and adjustment of pupils. Journal of Exceptional Education, 1963, 32, 3-26.
280. Butcher, H.J. Human Intelligence : its nature and assesment. London Methuen and Co., Ltd., 1967.

and Perry (1966)²⁸¹ Pankove and Kogan (1972)²⁸² reported that in their study of 5th and 10th grade pupils, there was no correlation in the creativity and intelligence measures of the 5th grade pupils, but the 10th grade data showed a significant positive correlation.

Majority of the studies conducted in India on measures of creativity and intelligence have reported a positive and significant relationship between the two. Using the Minnesota Non-verbal tasks of Creative Thinking to measure creativity, and the Pathak's draw a man scale²⁸³ to determine intelligence, Pathak (1962) found a significant association between creativity and intelligence. Others who showed the same significance were Ratna (1968)²⁸⁴; Trivedi (1969)²⁸⁵; Passi (1971)²⁸⁶; Sharma (1972)²⁸⁷; Bedi (1974)²⁸⁸; Joshi (1974)²⁸⁹; Patel and Joshi (1976)²⁹⁰ and Chadha and Sen (1981).²⁹¹

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281. Perry, J.M. Correlation of teacher prediction for student success six years beyond sixth grade. Doctoral Dissertation, University of Illinois, 1966.
282. Pankove, E. and Kogan, N. Creative Ability over a 5 year span. Child Development, June, 1972, Vd. 43(2), pp. 427-442.
283. Pathak, P. Experimental study of Creativity and Intelligence and school Achievement. Psychological Studies, 1962, 7, 1-9.
284. Raina, M.K. op. cit., 1968.
285. Trivedi, R.C. op. cit., 1969.
286. Passi, B.K. op. cit., 1971.
287. Sharma, K.N. Creativity in relation to intelligence. Psychological Studies, 1972, (a), 17, 1, 64 - 67.
288. Bedi, R.K. op. cit., 1974.
289. Joshi, R.J. op. cit., 1974.
290. Patel, A.S. and Joshi, R.J. An enquiry into the relation of creativity to intellectual giftedness. Indian Journal of psychology, Vol. 53, No. 3, 1978, p. 140 - 144.
291. Chadha, N.K. and Sen, A.K. Creativity as a function of intelligence, socio-economic status and sex among 12th grade school students. Journal of Education and Psychology, Vd. 39, No. 1, 1981, p. 52 - 56

Dutt, Bountra, and Sabhrawal (1977)²⁹² revealed that creativity and intelligence are correlated to a certain extent, but thereafter takes different directions. Badrinath and Satyanarayanan (1979)²⁹³ found that students of high intelligence group were significantly higher than students of low intelligence group in verbal creativity^{and} that non-verbal creativity was not related with intelligence. A study by Awasthy (1979)²⁹⁴ using the verbal creativity test of Mehdi and the General Intelligence Test by Mehta showed that intelligence was significantly related to fluency and total creativity of science and arts students. The same result was observed by Muddu (1982)²⁹⁵ using the Passi's Tests of Creativity and a group test of general mental ability test.

Safaya's (1981)²⁹⁶ study showed that fluency, flexibility and originality aspects of verbal creativity were positively and significantly related to intelligence ; so also fluency and originality dimensions of non-verbal creativity were found positively related to intelligence. On the other hand, the study revealed that flexibility and elaboration aspects were negatively related to creativity.

292. Dutt, N.K. et. al. op. cit., 1972.

293. Badrinath, S. and Satyanarayanan, S.B. op. cit., 1979.

294. Awasthy, M op. cit., 1979.

295. Muddu, V. Relationship between creative abilities (Dimensions) and intelligence. Experiments in Education, 1982, Vol. 9, No.2, 189 - 191.

296. Safaya, R. op. cit., 1981.

Mehdi (1977)²⁹⁷ observed that while there was a positive correlation between creativity and intelligence in case of students coming from rural locality, there was negative correlation for students in urban locality. Studies conducted by Holland (1961)²⁹⁸; Sandhu (1979)²⁹⁹; Khire (1971)³⁰⁰; Lalithamma (1973)³⁰¹; Rawat and Agarwal (1977)³⁰² and Safaya (1981)³⁰³ did not reveal any relation between creativity and intelligence.

Conclusion

The review indicates that creativity research as a subject of study has been receiving serious attention only very recently. In India, creativity research is relatively new and much remains to be accomplished. One of the bottlenecks in creativity research in India, perhaps, is the paucity of dependable creativity measuring tests suitable for diverse cultural settings. In this context, there is a general agreement that the main focus of research in creativity should be the development of creativity tests. Secondly, studies in remote and tribal areas are very few, as such, priority in creativity research should be to undertake

297. Mehdi, B. *Creativity, Intelligence and Achievement : A correlational study*. Psychological Studies, Vol. 22, No. 1, 1977, p. 55-62.

298. Holland, J.L. op. cit., 1961.

299. Sandhu, T.S. op. cit., 1979.

300. Khire, U.S. op. cit., 1971.

301. Lalithamma, M.S. op. cit., 1973.

302. Rawat, M.S. and Agarwal, op. cit., 1973.

303. Safaya, R. op. cit., 1981.

studies in rural, tribal and backward regions. With respect to the scope of the studies, the review acknowledges that the majority of studies conducted in India and abroad are to find the relationship between creativity and personality, and that of the cognitive variables; very few attempts have been made to find the influence of other non-cognitive factors like sex, locale, age and socio-economic status on creativity. Further, the interacting influence of the non-cognitive factors including that of personality on the creativity has been left unexplored.

The present research is undertaken while keeping the above considerations in view. The creativity test used in the study to measure the creative thinking ability is the first of its kind developed in North-Eastern India. The study is designed with a view to indentify the personality characteristics of the creative children. The study also assumes significance as it is directed to analyse the personality patterns of the creative boys and girls from rural and urban backgrounds. It is envisaged that the study will throw light on the nature of relationship of non-cognitive correlates on creativity, and will inculcate insights and interest in creativity research in tribal and backward regions in India.

METHOD OF STUDY

This chapter deals with the methodology adopted in the present investigation. The chapter has been divided into the following five parts :

- (i) The setting of the study*
- (ii) The sample*
- (iii) Tools used*
- (iv) Collection of data, and*
- (v) Statistical techniques for analysis*

The Setting of the Study

*The study has been conducted on secondary school students of Mizoram. Mizoram is a newly formed state in the North-East India with an area of 21,081 square kilometres and a population of 4,93,757. The state has retained a consistently high rate of literacy, 53.79% in 1971 and 59.88% in 1981, and is rated fourth in the all-India census. Administratively, the state is divided into three districts. But for the purpose of effective educational administration, it has seven educational sub-divisions. There are 994 primary schools (classes I to IV), 443 middle schools (classes V to VII), 154 secondary schools (classes VIII to X), and 11 colleges in the state.*¹

1. Government of Mizoram, Directorate of Education, Aizawl.

The Sample

The universe of the study constituted the students on rolls of Classes IX and X in the secondary schools of Mizoram. A stratified random sample of 700 students were selected for the purpose of the study after giving proper weightage to sex, locale, and the type of schools. Cluster sampling technique using class as a unit was employed for the selection of the sample. The design of multi-staged randomization of clusters was employed. For this, the schools were randomly selected, keeping in view sex-ratio, rural-urban differences, and the type of schools under study. Thus, out of the 10 schools selected, four were government high schools and the rest were private schools. Of the two girls' high schools in the state, one was represented in the sample. Since the enrolment in the urban schools were proportionately higher than in the rural areas, the sample included more students from the urban schools of Aizawl East and West Educational sub-divisions.

The students were chosen at random from all sections of classes IX and X of these schools. The actual sample selected for the study consisted of 700 students (335 boys and 365 girls). The details of the final sample selected for the study are given in Table I.

TABLE I

DETAILS OF SAMPLE SELECTED FOR THE STUDY

Sl. No.	Name of the school	Govt/ Pvt	Rural/ Urban	Class IX		Class X		Total
				Boys	Girls	Boys	Girls	
1.	Govt. Higher Secondary School	Govt.	Urban	18	21	18	15	72
2.	K.V.M.High School	Pvt	Urban	15	18	20	14	67
3.	Synod High School	Pvt	Urban	17	14	15	18	64
4.	Serehhip Govt HighSchool	Govt	Rural	19	20	18	10	70
5.	Chimphal High School	Govt	Rural	26	18	24	18	86
6.	Brangchhuana High School	Pvt	Urban	18	16	15	15	64
7.	Republic High School	Pvt	Urban	16	21	12	18	67
8.	Bungtown High School	Pvt	Urban	23	15	20	12	70
9.	J.L. High School	Pvt	Urban	20	14	21	17	72
10.	Mamawii Girls' High School	Govt	Urban		36		32	68
Total-				172	193	163	172	700

Tools Used

The following tools were used to collect data in the present investigation :

- (i) Cattell's 14 High School Personality Questionnaire (HSPQ)
- (ii) Creativity Test especially devised for the study

High School Personality Questionnaire

The Jr.-Sr. High School Personality Questionnaire (or HSPQ) developed by Cattell and Cattell (1969)² is an instrument that gives an objective analysis of the individual personality. The reading level of the test is adapted to ages 11 or 12 years through 18 years. The HSPQ is a standardized test that can be given within a class period, to a single individual or in groups. The HSPQ measures fourteen distinct dimensions or traits of personality which have been found by psychologists to come near to covering the total personality. Each of the fourteen dimensions of personality measured by HSPQ has a technical name and an alphabetical symbol for convenience and rapid reference.

Each dimension is defined by two poles or extremes. The left hand one is a score at the low end and the right hand at the high end.

The description of the fourteen factors are given in Table 2. The test is administered without a time limit, but takes generally 30 to 40 minutes. It can be administered to a class without any difficulty and the scoring can be done rapidly by a stencil key. The test was

used in an earlier study conducted in Mizoram (Laldusanga, 1982)³

and was found quite feasible to yield a general assessment of personality among the secondary school students. A copy of the HSPQ is given as Appendix I.

2. Cattell, R.B. and Cattell, M.D. The High School Personality Questionnaire, Champaign, IPAT, 1969.

3. Laldusanga, J. A study of Personality Factor Patterns of Low, Normal and High Achievers in Secondary School Science. Unpublished M.Ed. Dissertation, North-Eastern Hill University, Mizoram Campus, Aizawl, 1983, pp 40 - 56.

TABLE 2

BRIEF DESCRIPTION OF THE FOURTEEN HSPQ PERSONALITY FACTORS

Low score: A boy or girl with low score is :	Alphabetic Designation of Factor	High score: A boy or girl with high score is :
RESERVED, detached critical, aloof, stiff	A	WARMHEARTED, outgoing, participating
LESS INTELLIGENT, concrete thinking, of lower scholastic mental capacity	B	MORE INTELLIGENT, abstract thinking, bright, of higher scholastic capacity
AFFECTED WITH FEELINGS, emotionally less stable easily upset, changeable, of lower ego-strength	C	EMOTIONALLY STABLE, mature, faces reality calmly, of higher ego-strength
UNDEMONSTRATIVE, deliberate, inactive stodgy, phlegmatic	D	EXCITABLE, impatient, demanding, overactive, unrestrained

OBEDIENT, mild, E
easily led, accommodative
submissive

SOBER, taciturn, F
serious prudent

DISREGARDS RULES, G
expedient, undependable,
weaker super ego strength

SHY, timid, H
restrained, diffident

TOUGH-MINDED, I
self-reliant realistic

ZESTFUL, likes J
group action

ASSERTIVE, competitive,
aggressive, stubborn,
dominant

ENTHUSIASTIC,
heedless, happy-go-lucky
gay

CONSCIENTIOUS,
persistent, moralistic,
staid, rule-bound,
stronger super ego
strength

ADVENTUROUS,
socially bold, uninhibited,
spontaneous

TENDER-MINDED,
sensitive, clinging,
over-protective

CIRCUMSPECT
INDIVIDUALISTIC,
reflective, internally
restrained

SELF-ASSURED, placid, secure, Complacent untroubled	O	APPREHENSIVE, worrying, insecure, guilt-prone, self- reproaching
SOCIALLY GROUP DEPENDENT, a "joiner" and a sound follower	Q ₂	SELF-SUFFICIENT, prefers own decisions, resourceful
UNCONTROLLED, α, follows urges, careless of social rules, has low integration	Q ₃	CONTROLLED, compulsive, socially precise, self- disciplined, has high self- concept control
RELAXED, tranquil, torpid, unfrustrated, composed	Q ₄	TENSE, driven, overwrought; frustrated, fretful

Creativity Test

Several tests have been developed in India (Mehdi, 1973; Passi, 1971) and abroad (Torrance, 1966; Guilford, 1967; Mednick and Mednick, 1967; Wallach and Kogan, 1965) for the measurement of creativity. These standardised tests have been extensively used all over the world in researches as such, or with necessary adaptations. However, the psychological tests especially the creativity tests, whether verbal or non-verbal are not culture fair tests. Therefore, these tests are not wholly applicable to a different culture; and the tribal cultures of India with their unique characteristics need tests specifically relevant to their cultural fabrics.

The present test battery is an attempt to meet this challenge. The test is intended to measure the four primary components of creativity namely the fluency, flexibility, originality and elaboration among the secondary school students in Mizoram in the age group 12 to 18. Both verbal and non-verbal tests are employed. The test battery included seeing problems test, unusual uses test, consequences test, making things more interesting and useful, similes, picture construction, picture completion and circles tests. The test items are based on the Mizo culture and are developed on the model of Guilford Divergent Production Tests (1967),⁴ Torrance Tests of Creative Thinking (1966),⁵ and Wallach and Kogan's Test of Creativity (1965).⁶ The two pioneering Indian Tests of Creativity, the verbal and non-verbal tests of creative thinking (Mehdi, 1973)⁷ and Passi test of creativity (1979)⁸ were also consulted.

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4. Guilford, J.E. et al. A Factor Analysis Study of Creative Thinking II; Administration of Tests and Analysis of Results. Reports from Psychological Laboratory, No. 24. Los Angeles, University of South, California, 1967.
 5. Torrance, E.P. Torrance Tests of Creative Thinking: Norms-Technical Manual (Research Edition), Princeton, N.J.: Personal Press, 1966.
 6. Wallach, M.A. and Kogan, Modes of thinking in young children: a study of creativity-intelligence distinction. New York: Holt, Rinehart and Winston, 1965.
 7. Mehdi, B. Verbal and non-verbal tests of creative thinking, Agra: National Psychological Corporation, 1973.
 8. Passi, B.K. Passi Tests of Creativity (verbal and non-verbal). Agra National Psychological Corporation, 1979.

Brief description of the eight sub-tests of the creativity test is given below :

(i) Seeing Problems Test

This test has been developed by adopting the Guilford (1962)⁹ pattern, and it designed to measure the degree of sensitivity to problem which is considered a component dimension of creativity. This verbal test measures the comprehensive ability regarding the problems concerned with the working of simple items of day to day use. The draft test included six items namely television, jeep, shoes, gun, thatched house and bicycle. The duration for this test is 12 minutes - 2 minutes for each item. Instructions to this effect and practice items were also given prior to the administration of the test.

(ii) Unusual Uses Tests

Designed on the model of the Brick Uses Test (Guilford et. al. 1952) and Torrance's Unusual Uses Test (1962)¹⁰ the test consisted of six items within the psychological and physical proximity of the students. The test of unusual uses tries to find out the purposes of common things, and the students are requested to reflect as many interesting and unusual responses as possible. The maximum time limit for each item on the test is four minutes.

9. Guilford, J.P. et al. A Factor Analysis Study of Creative Thinking II: Administration of Tests and Analysis of Results, Report from the Psychological Laboratory, No.8, Los Angeles University of Southern California, 1952.

10. Torrance, E.P. Torrance Tests of Creative Thinking: Princeton, N.J.: Personl Press, 1966.

(iii) The Consequences Test

The test is developed on the lines of Guilford et al. (1952) and Torrance (1962) and measures the creative components—fluency, flexibility, originality. Items such as "If everybody started dancing", "If we cut down all plants, "If all the hills turned into plains," "If we have no fire", "If man had wings" are included on the consequences test, and two minutes are given for the completion of each of the item on the test.

(iv) Making Things Interesting and Useful

The popular legendary Mizo story of Maurawkeia's Monkey Drum has been used in this test. The children in Mizoram are fond of this story of a drum with magical qualities. The quality of the magical drum which has the power to yield to the wishes of the owner, is related in making interesting and useful the items given, namely, Billy-cart and Vir-mep. The Billy-cart is a useful toy which the children use for joy rides and even the elders use it to carry things from the hills. It is a very common and familiar object in Mizoram. Vir-mep or the wheel is made up of bamboo and paper by the children themselves and they enjoy the thrill of the wheel turning round with the force of the wind as they run with it. Students are asked to imagine the situations by which the magic drum with its legendary qualities can be made use of in the making of the familiar objects more useful and interesting. The test yields scores in fluency and originality, and six minutes are given for each of the item.

(v) Similarities Test

The qualities of two objects are to be compared in this test.

There were 8 items - (1) Sun and the Moon (2) Y.M.A. (Young Mizo Association) and K.T.P. (Christian Youth Fellowship) (3) Radio and Newspaper (4) Fish and Frog (5) A young lady and a puppy (6) Flower and Tree (7) A ladder and a table (8) Cigarette and Pencil.

The test battery on creativity included 3 non-verbal tests.

(vi) Picture Construction Test

The test presents the student with three figures : a triangle, a semi-circle, and a spiral. The subject is required to use this figure as an integral part while elaborating it to a complete form. Originality is emphasized so as to make the students produce a novel figure; and elaboration for the details they may add to complete the picture. The pictures are scored for elaboration and originality. The title may also be scored for the verbal elaboration and originality. The total time assigned for the test is 15 minutes, and the students are informed about the time after every 5 minutes.

(vii) Picture Completion Test

The activity consists of 4 line-drawings, and these are to be made into meaningful pictures of different objects. The students are required to complete the drawing and to give interesting and suitable title to each picture. They are given 12 minutes for the test, 3 minutes each for the completion of individual items. The pictures are scored for originality and elaboration. Titles are scored for verbal elaboration and originality, but the scoring is optional.

(viii) Circles Test

In this non-verbal test, 20 circles are given and the subjects are asked to draw as many pictures as they can. They can add to the circle inside, outside or both with the help of a pencil. The time limit is 5 minutes and the students are directed to draw unusual figures which their friends may not have thought of. They are also asked to give the title in case the figure is not clear. The test is scored for originality and elaboration.

For the purpose of standardization of the creativity test, the usual steps of preparing the preliminary draft, the try out, the item analysis, computing of reliability and validity, were undertaken and are detailed below :

The item-pool for the test

A preliminary draft of items on the above activities was prepared with the help of specialists and by referring to the standard literature on the subject. The items given in Passi (1979) and Mehdi (1973) tests were also consulted. The initial draft of items was revised as a result of consultation with experts and administration to students.

The draft was also sent to five judges for their comments along with a short description of the tests. Upon their suggestions, some items were rejected, while some were modified. Thus, the first draft containing 33 items classified on the eight sub-tests, five verbal and three non-verbal was ready for the try-out.

The Item Analysis

The test was administered to a sample of 100 Class IX and X students selected at random from two secondary schools in Alzawl.

The details of sample for try-out are given in Table 3.

TABLE 3

**SAMPLES SELECTED FOR ITEM ANALYSIS AND FOR ESTABLISHING
THE RELIABILITY AND VALIDITY**

Name of School	<u>Class IX</u>		<u>Class X</u>		Total
	Boys	Girls	Boys	Girls	
1. Govt. High School	13	13	12	12	50
2. Synod High School	12	12	13	13	50
Total	25	25	25	25	100

The item analysis was done with the calculation of item discrimination in terms of t-ratio, taking the upper (U) and lower (L) 27 percent cases of the try-out sample. Items on the merit of their 't' values significant at .01 level were only considered for the final test. Details regarding item analysis are given in Table 4.

TABLE 4**ITEM ANALYSIS DATA FOR THE CREATIVITY TEST**

<i>Item</i>	<i>No. in Draft Test</i>	<i>Difference in Mean Scores</i>	<i>Discriminating Index ('t' value)</i>	<i>Accepted or Rejected</i>	<i>S.L. No. of the selected item in the final test</i>
<u>Activity I: Seeing Problem Test</u>					
<i>Television</i>	<i>1</i>	<i>2.56</i>	<i>5.82</i>	<i>Accepted</i>	<i>1</i>
<i>Jeep</i>	<i>2</i>	<i>0.48</i>	<i>1.420</i>	<i>Rejected</i>	<i>-</i>
<i>Shoes</i>	<i>3</i>	<i>0.23</i>	<i>0.898</i>	<i>Rejected</i>	<i>-</i>
<i>Gun</i>	<i>4</i>	<i>3.42</i>	<i>7.023</i>	<i>Accepted</i>	<i>2</i>
<i>Thatched house</i>	<i>5</i>	<i>3.6</i>	<i>8.001</i>	<i>Accepted</i>	<i>3</i>
<i>Bicycle</i>	<i>6</i>	<i>1.14</i>	<i>1.54</i>	<i>Rejected</i>	<i>-</i>
<u>Activity II: Unusual Uses Test</u>					
<i>Bottle Gourd</i>	<i>7</i>	<i>1.97</i>	<i>4.05</i>	<i>Accepted</i>	<i>4</i>
<i>Mizo Basket</i>	<i>8</i>	<i>1.7</i>	<i>3.91</i>	<i>Accepted</i>	<i>5</i>
<i>Mizo Puan</i>	<i>9</i>	<i>0.6</i>	<i>2.022</i>	<i>Rejected</i>	<i>-</i>
<i>Bamboo</i>	<i>10</i>	<i>2.8</i>	<i>4.156</i>	<i>Accepted</i>	<i>6</i>
<i>Paper</i>	<i>11</i>	<i>0.89</i>	<i>0.821</i>	<i>Rejected</i>	<i>-</i>
<i>Water</i>	<i>12</i>	<i>1.1</i>	<i>1.063</i>	<i>Rejected</i>	<i>-</i>
<u>Activity III: Consequences Test</u>					
<i>If all people start dancing</i>	<i>13</i>	<i>2.0</i>	<i>4.614</i>	<i>Accepted</i>	<i>7</i>
<i>If we cut down all the grass and trees</i>	<i>14</i>	<i>1.23</i>	<i>2.044</i>	<i>Rejected</i>	<i>-</i>

<i>If all the hills turned into plains</i>	15	3.56	6.288	Accepted	8
<i>If there was no fire</i>	16	0.91	1.703	Rejected	-
<i>If man had wings</i>	17	1.01	1.92	Rejected	-
<i>If it did not rain at all</i>	18	2.47	4.01	Accepted	9




Activity IV: Making things interesting and useful

<i>Billy Cart</i>	19	2.8	4.117	Accepted	10
<i>Toy-propeller</i>	20	2.25	3.096	Accepted	11




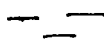
Activity V: Similarities test

<i>Sun and moon</i>	21	0.8	1.400	Rejected	
<i>Y.M.A. and K.T.P.</i>	22	0.74	1.22	Rejected	
<i>Radio and newspaper</i>	23	1.21	2.173	Rejected	
<i>Fish and frog</i>	24	2.3	4.130	Accepted	12
<i>A lady and a puppy</i>	25	1.32	2.16	Rejected	
<i>Flower and tree</i>	26	2.44	3.84	Accepted	13

Activity VI: Picture Construction

	26	3.4	6.002	Accepted	14
	27	1.1	2.22	Rejected	
	28	2.76	4.576	Accepted	15

Activity VII: Picture Completion

	29	2.30	3.92	Accepted	16
	30	1.06	1.80	Rejected	
	31	2.25	2.59	Accepted	17
	32	0.12	1.301	Rejected	

Activity VIII: Circles test

	33	3.43	4.820	Accepted	18
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The creativity test after the item analysis consisted of eighteen items on eight sub-tests. The final form of the Creativity test is presented as Appendix II.

Item validity

The scores on each of the items, thus selected were taken separately. The raw scores for each item for fluency, flexibility and originality on the first five verbal tests, and elaboration and originality on the three non-verbal tests were converted into T scores with a mean of 50 and SD of 10, and were added up to get the item score. The item scores were then correlated with the total activity scores and again each of the total activity scores was correlated with the grand total.

Correlation co-efficient between various factors of creativity (fluency, flexibility and originality) scores taken separately, and the total creativity score was calculated to determine the item validity. Details are shown in Table 5 and 6.

TABLE 5

Correlation of Item Scores with the Activity Score and the Activity Score with the total creativity score (N=100)

Activity	Item	Correlation with Activity Total	Correlation with Grand Total
I	1	.601	.530
	2	.593	.482
	3	.744	.525
Activity I scores vs. Total score			.572

(Table 5 contd.)

II	4	.791	.680
	5	.704	.661
	6	.669	.634
Activity II scores vs. Total score			.601
<hr/>			
III	7	.841	.699
	8	.793	.702
	9	.735	.680
Activity III scores vs. Total score			.625
<hr/>			
IV	10	.744	.583
	11	.702	.496
Activity IV vs. Total score			.477
<hr/>			
V	12	.882	.704
	13	.760	.458
Activity V scores vs. Total score			.452
<hr/>			
VI	14	.544	.401
	15	.482	.386
Activity VI scores v. Total score			.355
<hr/>			
VII	16	.499	.352
	17	.473	.390
Activity VII scores vs. Total score			.326
<hr/>			
VIII	18	1.000	.742
<hr/>			

All correlations are significant at .01 level.

TABLE 6

Correlation co-efficients between various factors of creativity and the total creativity score (N=100)

Factor	Fluency	Flexibility	Originality	Elaboration
Fluency	-			
Flexibility	.822	-		
Originality	.690	.771	-	
Elaboration	.725	.493	.505	-
Creativity	.837	.786	.601	.684 ^a

All correlations are significant at .01 level.

The correlation coefficients in Tables 5 and 6 indicate that

- (i) the items in each activity correlate significantly with the total creativity scores,
- (ii) the correlations of each item score and activity total score with grand total score are also significantly high,
- (iii) the inter-correlations between the various factors (fluency, flexibility, originality and elaboration), and that with the total creativity scores are also found to be considerably high.

The results reveal that the test enjoys considerable internal consistency and the items and activities together are measuring the same thing. The inter-correlations also signify the internal validity of the test.

Further, the validity coefficient of .532 against the teacher ratings for the total creativity score (N=100) was found to be significant (.01 level). Also the scores of the creativity test were correlated with the scores on HSPQ on calculated dimensions (Cattell, 1979) and the resultant value of .703 was found to be quite satisfactory.

Reliability

The reliability of the test of creativity was determined by the test-retest method. The test was administered to the same 100 students from two schools for the second time after a gap of 15 days. The sample size was considered adequate as supported by other researches in determining the reliability of creativity test, the Minnesota Tests of Creative Thinking on a sample of 56 students (Moss and Duencck, 1967), Passl Tests of Creativity on a sample of 60 subjects (Passl, 1979) and Verbal and Non-verbal tests of Creativity Thinking on a sample of 31 (Mehdt, 1973).

Test-retest reliability coefficients for the creativity test and the various sub-tests were computed by correlating the scores of subjects on first and second administration. The reliability of the test was found to be quite satisfactory. The value of coefficient of correlations were .802 for the whole test, .819 for the verbal test, .725 for the non-verbal tests, .61 seeing problems test, .86 unusual uses test, .73 consequences test, .83 making things interesting, .64 similarities, .70 picture construction, .66 picture completion and .84 circles test, all significant at .01 level. This gives credence to accept creativity test used in the present investigation as a reliable tool.

Further, test-retest reliabilities on the factor scores (fluency, .642; flexibility .589; originality .605; elaboration .552) were also found to be highly significant to accept the reliability of the creativity test. Test constructors in creativity have accepted reliability coefficients between .28 and .78 for verbal tests (Wodtke, 1964)¹¹; .80 with stability coefficients of the part scores between .65 to .70 for the Minnesota Tests of Creative Thinking (Torrance, 1972)¹², and coefficients ranging between .068 and 0.97 for the Passi Test of Creativity (Passi, 1979).¹³

Administration and Scoring

The creativity test includes five verbal tests and three non-verbal tests, and can be administered individually as well as in convenient groups of thirty. Before administering the test, the students should be properly motivated and the necessary instructions given. A pencil and pen should be made available to the students along with the test-booklets. A stopwatch should be used to keep the time for each activity. The test administrator should see that the students follow the instructions carefully and have studied the practice items.

Procedure for Scoring

The scoring for the test should be done in a systematic manner for the four components of creativity. The first five verbal test are scored for fluency, flexibility and originality while the

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11. Wodtke, K.H. Some data on the reliability and validity of creativity tests at the elementary school level. Educational Psychology Measurement, 1964, 24, 399 - 408.
 12. Torrance, E.P. Predictive Validity of the Torrance test of creative thinking. Journal of Creative Behaviour, 1972, 6, 137 - 154.
 13. Passi, B.K. Passi Test of Creativity (Verbal and Non-verbal). Agra, National Psychological Corporation, 1979.

~~tests are scored for originality while the three non-verbal tests are scored for originality and elaboration. The scoring scheme developed for the present investigation is shown below.~~

Scoring for fluency: In scoring for fluency, the responses to the items on the verbal tests should be scrutinised carefully and the irrelevant responses and repetitions should be deleted. The remaining number of responses should be counted and entered as the fluency score for the item in the appropriate box in the answer-sheet.

Scoring for Flexibility

The responses which differ in approach and thought trend are identified. All responses belonging to the same approach or trend are considered as one category for flexibility scoring. The number of categories based on the different approaches or thought-trends are noted down and taken as the flexibility score. The flexibility scoring can be done through assigning an alphabet against each response indicating the category of approach or thought-trend. Then, the flexibility score will be the total number of different alphabet serial used.

Scoring for Originality

Uncommonness in responses i.e., the responses given by less than 5% of the students are scored for originality. Responses given by 5% or more of students are given no score. The relative weightage for originality scoring is given in the following scheme :

<u>Percentage of Response</u>	<u>Originality Weightage</u>
0.1% to 0.99 %	5
1 % to 1.99 %	4
2 % to 2.99 %	3
3 % to 3.99 %	2
4 % to 4.99 %	1
5 % and above	0

Scoring for Elaboration

The non-verbal tests i.e., Activities 6,7, and 8 are considered for scores on the creativity factor-elaboration. The ability to add relevant details to the minimum and primary response (the essential response) to the figural stimulus which gives meaning to the picture is marked. If the figure is not relevant and meaningful, it should be ignored. The total elaboration score will consist of a score of one for the primary and minimum response plus one score each for all the additional details

Scoring of the Title

The titles of the non-verbal tests are scored for originality and elaboration. In scoring the title for elaboration, the primary and minimum (essential) response has to be identified first and all additional ideas should be taken as elaborations. The essential response should be given a score of one, and one score each for each of the additional ideas. For instance, 'A Mizo youth returning home after community work'. The elaboration score for this title will be the number of ideas included in the title -

one for Mizo youth, plus
 one for returning home and
 one for community work.

The title is to be evaluated for originality. The scheme is given below :

Names of the subjects like cat, dog, man etc. - no score

A descriptive title like Mizo youth, clever jackal etc. -1 score

An imaginative title such as 'A white elephant' - a score of two (2)

An abstract title which is beyond observation but relevant and appropriate - a score of three (3) e.g. 'Jesus who was crucified for the sinners'.

Score summary

The scores for fluency, flexibility, originality and elaboration on different activities obtained by the students can be entered in a 'summary-sheet' specifically devised for the purpose and added up to obtain the total scores on the four components of creativity. The composite creativity score can be calculated by converting the raw component scores into standard scores. A blank summary sheet is attached as Appendix III.

The scores on the creativity test were taken as criteria for classifying the students into the high and the low creative groups. The students having the highest twenty percent scores constitute the 'high creative group' and the pupils possessing the lowest twenty percent of scores form the 'low creative group'.

Data collection

The collection of data was spread over almost three months. The investigator personally visited the schools selected for the study. The schools, from which the sample for the present study was drawn, were intimated well in advance about the administration of the test. The investigator took the help of the teachers who were given instructions regarding the procedures to be adopted during the administration of the test. A set of type-written instructions were also given, to be strictly followed during the testing programme. The creativity tests were given together with the identification sheet in the first instance. The students were asked to do the practice items of each sub-test first and clear instructions were given for taking the test.

The personality test was administered on the second day. The sequence of administration of the tools was kept uniform for all the schools. The data collection was done during the second term of the academic session i.e. during the months of June, July and August, 1984.

Statistical Techniques

The following statistical techniques were used for the analysis of data :

1. Descriptive statistics - Measures of central tendency, dispersion, skewness and kurtosis were employed to know the nature of score distribution.

2. Test of significance for mean difference

The difference between the mean personality scores of the sub-groups based on creativity, sex and locale was tested for significance using the 't' test (Garrett, 1966).¹⁴

3. Analysis of variance

The technique of analysis of variance (ANOVA) was employed to study the significant difference among the various sub-groups in relation to the fourteen factors of personality, sex and locale (Lindquist, 1970).¹⁵ The three way classification of analysis of variance with (2x2x2) factorial design was employed to test the effects of creativity, (C), sex (S) and locale (L) on the personality traits.

14. Garrett, H.E. Statistics in Psychology and Education. Bombay : Vakils, Feffer and Simons pvt. Ltd., 1966.

15. Lindquist, E.P. Statistical Analysis in Educational Research. New Delhi : IBM, 1970.

ANALYSIS OF DATA

Nature of Variables in the Study

The nature of distribution obtained on tests of creativity and personality are examined by descriptive statistics to verify whether the conditions and basic assumptions for the statistical techniques used for the analysis are satisfied or not. The measures of central tendencies, standard deviations, skewness and kurtosis for all the variables of the study were computed for the total sample. Table 7 presents the results for the fourteen personality variables.

The results indicate that the values of mean, median and mode for the 14 personality factors did not show wide variation from one another. The measures of central tendency approximated to each other, indicating thereby the normality of the scores on personality variables. The distribution of scores - positively and negatively skewed, was demonstrated by the value of skewness computed for the difference between the mean and median scores. It was noted that none of the factors exhibited extreme skewness or assymetry as the values were less than one (Odell, 1957). Factors D.H.I. and J were positively skewed, and factors A,B,C,E,F,G,O, Q_2 , Q_3 , Q_4 , were negatively skewed. The value of kurtosis calculated for all the 14 personality factors indicated that the variations are within the acceptable limits of chance fluctuations thereby, suggesting that the proximity of distributions conformed to normal shape.

TABLE 7

**Mean, Median, Mode, Standard deviation, Skewness and Kurtosis for the measures of
Fourteen Factors of Personality**

Sl No.	Variable	Mean	Median	Mode	SD	SK	KU	Inference
1.	Factor A	8.210	9.033	9.405	2.812	-0.292	.302	p < .01
2	Factor B	5.712	5.825	4.112	1.422	-0.238	.234	p < .01
3	Factor C	8.053	8.184	8.437	2.604	-0.151	.201	p < .01
4	Factor D	5.415	5.306	6.602	2.731	0.120	.275	
5.	Factor E	6.004	6.134	6.101	2.004	-0.047	.248	p < .01
6.	Factor F	8.332	8.958	9.002	2.708	-0.694	.253	p < .01
7	Factor G	9.886	10.160	11.456	2.447	-0.581	.316	p < .01
8.	Factor H	8.317	7.901	7.128	2.608	0.478	.217	

9.	Factor I	8.667	8.540	8.401	2.602	0.478	.239	
10	Factor J	9.011	8.902	8.832	2.708	0.121	.281	
11.	Factor O	6.851	6.860	6.901	2.885	-0.030	.301	$p < .01$
12.	Factor Q ₂	10.602	10.852	11.24	2.711	-.277	.248	$p < .01$
13	Factor Q ₃	8.086	8.141	8.223	2.804	-0.058	.252	$p < .01$
14	Factor Q ₄	7.503	7.675	8.021	2.703	-0.191	.238	$p < .01$
	Creativity	52.256	52.047	50.933	8.269	.127	.254	

Table 7 also presents the values calculated for the scores on the creativity test. The values of mean and median are found to be approximating to each other for the creativity scores of the total sample. The value of mode, however, shows minor departure from that of the scores on mean and median. The skewness and kurtosis values computed for the total sample indicate that the values are well within the acceptable limits of chance fluctuations. Thus, the scores on Creativity Test are nearly normally distributed.

Results of study by Hypotheses

The hypotheses of the study were tested through the application of the factorial (2x2x2) design of the analysis of variance. The comparison of the personality correlates were undertaken in the context of Creativity (C), Sex (S), and Locale (L). The three-way classification of analysis of variance with 2x2x2 factorial design treated the creativity factor in two ways: high creative and low creative. This was treated further in two ways : boys and girls (sex); and rural and urban (locale). The scores on the 'Creativity Test' were taken as criteria for classifying the pupils into high and low creative groups, the highest twenty percent constituting the 'high creative group' (N=140) and the lowest twenty percent the 'low creative group', (N=140). The students reading in the Secondary Schools of Alzawl town constituted the 'urban, and those from the secondary schools from outside the town, the rural group.

The following four basic assumptions underlying the technique of analysis of variance (Gullford, 1956) were tested prior to the actual application of the technique:

- (i) observation within experimentally homogeneous sets should be from normally distributed populations;
- (ii) the sampling within sets should be random and mutually exclusive ;
- (iii) variances from within the various sets must be approximately equal ; and
- (iv) the contribution of the local sample must be additive.

The normality of the personality and creative scores was tested by the measures of mean, median, mode, standard deviation, skewness and kurtosis for the sub-groups as well as the total sample. The scores were found to be normal in all the fourteen personality variable under study. The second assumption of analysis of variance was satisfied in assigning random and mutually exclusive cases in each cell of the 2x2x2 factorial design. A total number of 280 students were selected from the main sample of 700 students, 140 getting the highest scores on the creativity test (20% upper group of high creative students) and 140 getting the lowest scores (20% lower group of low creative students). Eight sub-groups were formed by dividing the groups separately for boys and girls, and again sub-divided into urban and rural groups on the basis of the location of their residence. Bartlette's test of homogeneity of variance was applied for 14 personality variables to test the third assumption. The chi-square values were found to be insignificant in all the fourteen cases, thereby, revealing the homogeneity of variance. Thus, the third basic assumption was also fulfilled. The fourth assumption of additivity of variance was also found satisfied as the variance of the scores of each factor of personality could be added up separately.

The mean and standard deviation of each of the high creative and low-creative groups were calculated for the scores obtained on the fourteen personality factors on the Cattell's HSPQ. Factors shown significant on *F* test were further analysed by calculating Critical Ratios. This was done in order to ascertain the significance of difference and the nature of difference in scores between the groups. Thus, the fourteen hypotheses advanced for the study were tested and the details are given in the following pages.

Testing of Hypothesis 1

The hypothesis states: "There is no significant difference among the high and the low creative students with regard to personality characteristic Reserved-Outgoing (Factor A)".

In order to find out whether any significant difference occurs among the groups, analysis of variance was resorted to. Table 8 gives the summary of the analysis of variance, thus, computed for the personality Factor A.

The contribution of the creativity towards variance in Factor A (Reserved vs Outgoing) was found to be significant at .01 level ($F=4.055$, df 1/272). This indicates that the high creative and the low-creative students differ significantly in respect of Reserved vs Outgoing dimension of personality. The variable of sex, however, was not found significant suggesting thereby that the girls and boys have more or less similar personality styles in respect of factor A. The locale also does not influence the Reserved-Outgoing trait of personality.

TABLE 8

Summary of Analysis of Variance (2x2x2) design for factor A of Personality

:Reserved - Outgoing

<i>Sources of Variation</i>	<i>Sums of Squares</i>	<i>df</i>	<i>MS</i>	<i>F Ratio</i>	<i>Inference</i>
<i>C</i>	<i>35.149</i>	<i>1</i>	<i>35.149</i>	<i>4.055</i>	<i>P < .05</i>
<i>S</i>	<i>.744</i>	<i>1</i>	<i>.744</i>	<i>.089</i>	
<i>L</i>	<i>15.620</i>	<i>1</i>	<i>15.620</i>	<i>1.734</i>	
<i>CXS</i>	<i>63.674</i>	<i>1</i>	<i>63.674</i>	<i>7.485</i>	<i>P < .01</i>
<i>CXL</i>	<i>24.899</i>	<i>1</i>	<i>24.899</i>	<i>3.110</i>	
<i>LXS</i>	<i>.751</i>	<i>1</i>	<i>.751</i>	<i>.079</i>	
<i>CXSXL</i>	<i>20.986</i>	<i>1</i>	<i>20.986</i>	<i>2.582</i>	
<i>Within</i>	<i>2299.6515</i>	<i>272</i>	<i>8.244</i>		
<i>Total</i>	<i>2430.127</i>	<i>279</i>			

The variable of sex when coupled with the variable of creativity also showed statistically significant difference in the scores on the personality dimension, Reserved-Outgoing. ($F=7.485$, $d=1/272$, $p<.01$). Hence, the hypothesis that there is no significant difference among the high creative and low creative students with students regard to personality characteristic Reserved- Outgoing (Factor A) is rejected.

Further, the scores on personality Factor A of the students of the high and low creative groups were compared. For this purpose, critical ratios were calculated. Subsequently, the scores of male and female students of the creative group and that of the rural and urban students were taken separately and their mean scores compared.

Calculation of critical Ratio

(1) The calculation of the critical ratio between the mean scores of the high creative and low creative groups for the personality characteristic Reserved - Outgoing (Factor A) is as follows :

<u>High creative group</u>	<u>Low creative group</u>
N = 140	N = 140
Mean = 4.981	Mean = 8.902
S.D. = 2.081	S.D.= 2.616

Difference between mean = 3.921

SE of difference between means = 0.2824

Critical ratio = 13.889

The obtained value of 13.289 is significant at .01 level. Also, the mean score of the low creative group is greater than that of the high creative group. Therefore, the low and high creative groups differ significantly on Factor A of personality at .01 level, the low creative students showing greater affinity towards the affectothymia dimension of personality. The results indicate that the high creative students are rather reserved, detached, critical and cool, and like things rather than people. They are precise and dependable in their work, but their aloofness and stiffness may not be attractive socially. The low creatives, on the other hand, are out-going, warm-hearted, easy-going and participating in nature. They tend to be good-natured, emotionally expressive, ready to co-operate, attentive and adaptable. The results agree with the findings of previous researches (Cattell, 1963; Cattell and Drevdahl, 1955; and Drevdahl, 1956).

Testing of Hypothesis 2

Hypothesis 2 predicted that "there is no significant difference among the high and low creative students with regard to personality characteristic Less intelligent - More intelligent (Factor B)." Table 9 gives the summary of the analysis of variance carried out to test the hypothesis.

The variable B of the personality is differentiated by the creativity at .05 level of confidence. None of the other variables and interactions showed any significant result. This indicates that creativity is affected by this dimension of personality. The F value of 5.395 for 1/272 is significant at .05 level. Hence, the hypothesis that there is no significant

TABLE 9

Summary of Analysis of Variance (2x2x2) design for factor B of Personality :

Sources of Variation	Total Sum of squares	df	MS	Less intelligent- More intelligent	
				F Ratio	Inference
C	9.028	1	9.028	5.395	P < .05
S	1.986	1	1.986	1.186	
L	5.175	1	5.175	3.079	
CXS	1.810	1	1.810	1.124	
CXL	2.815	1	2.815	1.684	
CXSXL	1.211	1	1.211	.719	
Within	454.506	272	1.583		
Total =	470.157	279			

difference among the creative and low-creative students is rejected at .05 level of significance.

Calculation of Critical Ratio

The calculation of the critical ratio between the mean scores of the high creative and the low creative groups for the personality characteristic Less intelligent - More intelligent (Factor B) is as follows

<u>High Creative Group</u>	<u>Low-creative Group</u>
N = 140	N = 140
Mean = 5.601	Mean = 5.111
SD = 1.013	SD = 1.285

Difference between means = 0.490

SE for difference between means = 0.211

Critical ratio 2.322

The obtained value is significant at .05 level. Also the mean personality score of the high creative group is greater than that of the low creative group. The high creative group with a significantly higher mean score on Factor B, showed a higher scholastic mental capacity than their low creative counterparts. They are thus intelligent, fast learners, and tend to be quick in grasping ideas. On the other hand, the low creatives are dull, slow to learn and to grasp new ideas, and are given to concrete and literal interpretation. The results obtained are in agreement with the results of a number of other researchers (Joshi, 1973 ; Lalithamma, 1973; Paramesh and Narayanan, 1974; and Chawla, 1976).

Testing of Hypothesis 3

The hypothesis states : "There is no significant difference among the high creative and the low creative students with regard to personality characteristic Affected by Feelings - Emotionally Stable (Factor C)." Table 10 gives the summary of analysis of variance.

The contribution of creativity towards variance in Factor C of personality was found to be significant at .01 level ($F = 7.104$, $df = 1/272$, $p < .01$), thereby, indicating that the high creative students are differentiated from the low-creative on the personality style of emotional stability. The sex difference was also found to be significant for variance in Factor C at .01 level ($F = 10.572$, $df = 1/272$, $p < .01$). This indicates that the boys are different from girls on this dimension of personality. Locale difference (Rural - Urban residences) were not found influencing this emotional dimension of personality. However, when the sex variable is coupled with the residence, there is significant difference ($F = 9.386$, $df = 1/272$, $p < .01$) in factor C of personality. The finding is quite significant as the boys and girls with particular residential backgrounds, rural or urban, vary in their emotional stability. But the difference was not found significant on interaction with creativity.

Calculation of Critical Ratio

The calculation of the critical ratio between the mean scores of the high creative and low creative groups on factor C of personality is given below :

TABLE 10

**Summary of the Analysis of Variance (2x2x2) design for factor C of Personality:
Affected by feeling- Emotionally stable**

Sources of Variation	Total sum of squares	df	MS	F. Ratio	Inference
C	44.536	1	44.536	7.104	p < .01
S	69.058	1	69.058	10.572	P < .01
L	19.822	1	19.822	3.120	
CXS	20.281	1	20.281	3.044	
CXL	13.558	1	13.558	2.101	
SXL	61.122	1	61.122	9.386	P < .01
CXSXL	.626	1	.626	.086	
Within	17614.622	272	6481		
Total=	1086.907	279			

High Creative Group

N = 140

Mean = 8.195

SD = 2.502

Low Creative Group

N = 140

Mean = 9.112

SD = 2.617

Difference between means = 0.917

SE for difference between means = 0.304

Critical ratio = 3.016

The obtained value is significant at .01 level. Also, the mean score of the low creative group is greater than that of the high creative group. Hence, the hypothesis that there is no significant difference among the high creative and the low creative group with regard to personality characteristic Affected by feelings - Emotionally stable (Factor C) is rejected at .01 level of significance. The results indicate that the ^{high} creative students are more affected by feelings than their low creative group counterparts. They tend to be emotionally less stable, unrealistic about life and have lower ego strength.

Testing of Hypothesis 4

In order to find out whether any significant difference occurs among the high creative and the low creative groups in personality factor D: phlegmatic - excitable, analysis of variance was resorted to. Table 11 gives the summary of the analysis of variance. The personality trait of Phlegmatic vs Excitable does not interfere with creative performance. The F ratio computed was not found to be significant at .05 and .01 levels of confidence. Similarly, variables of sex and location do not show any significance. The interaction among concerned variable also did not yield any significant results.

TABLE 11

*Summary of Analysis of Variance (2x2x2) Design for Factor D of Personality :
Pneumatic - Excitable*

Sources of Variation	Total Sum of squares	df	MS	F.Ratio	Inference
C	6.121	1	6.121	.701	Ns
S	10.857	1	10.857	1.196	Ns
L	5.609	1	5.609	.660	Ns
CXS	.960	1	.960	1.182	Ns
CXL	.644	1	.644	.074	Ns
SXL	2.900	1	2.900	.338	Ns
CXSXL	1.765	1	1.765	.214	
Within	2335.096	272	8.612		
Total =	2370.474	279			

High Creative Group

N = 140

Mean = 5.547

SD = 2.990

Low Creative Group

N = 140

Mean = 5.706

SD = 2.839

Difference between means = 0.159

SE of difference between means = 0.347

Critical ratio = 0.458

The obtained value of 0.458 is not significant at any level. Hence, the hypothesis that there is no significant difference among the high creative and the low creative groups in respect of the personality characteristic Phlegmatic - Excitable (Factor D) cannot be rejected.

Testing of Hypothesis 5

The details of the analysis of variance to test the significant difference of the creative groups with regard to personality characteristic Obedient - Assertive is given in Table 12.

The variance in the personality trait of Obedient vs Assertive by creativity is found significant at .05 level of confidence ($F = 3.896$, $df = 1/272$). The mean scores on personality Factor E of the high creative and the low creative groups were compared by computing the critical ratio. Details are as follows :

High Creative Group

N = 140

Mean = 6.746

SD = 2.351

Low Creative Group

N = 140

Mean = 6.048

SD = 2.439

Difference between means = 0.698

SE of difference between means = 0.285

Critical ratio = 2.449

TABLE 12**Summary of Analysis of Variance (2x2x2) design for Factor E of Personality:****Obedient - Assertive**

Sources of Variation	Total sum of squares	df	Ms	F. Ratio	Inference
C	20.965	1	20.965	3.896	P < .05
S	1.624	1	1.624	.269	
L	2.212	1	2.212	.403	
CXS	11.420	1	11.420	2.006	
CXL	2.273	1	2.273	.384	
SXL	.126	1	.126	.019	
CXSXL	4.028	1	4.028	.739	
Within	1478.436	272	5.375		
Total =	1520.428	270			

The obtained value of critical ratio is significant at .05 level. Also, the mean of the high creative group is greater than that of the lower creative group. Hence, the hypothesis that there is no significant difference among the high creative and the low creative students with regard to personality characteristic Obedient - Assertive (Factor E) is rejected at .05 level of significance. The results indicate that the high creatives are significantly differentiated from the low creative, and have higher mean score than low creative group. Thus, the high creative students tend to be self-assertive, independent, aggressive and stubborn whereas the low creatives are submissive as against the dominant nature of the creative. The finding is supported by research findings of Taylor (1964), Barron (1958) and Torrance (1958).

The sex of the student has no influence on the personality traits of Obedient - Assertive. Similarly, the variable of location of residence does not have any influence, thereby, indicating that the rural and the urban students have similar disposition on the Obedient - Assertive dimension of personality. All the interactions also were found to be not significant. Thus, it may be concluded that the obedient - assertive dimension of personality differentiates the high creative from the low creative group.

Testing of Hypothesis 6

The hypothesis with regard to personality Factor F was tested by applying the ANOVA. Results are shown in Table 13.

The high creative and low creative do not differentiate on Factor F of the personality. None of the other two variables also contribute variance in the personality dimension Sober vs Obedient. The interaction also failed to yield significant differences, thereby, indicating that a sober-happy-go-lucky continuum of personality does not differentiate significantly the high creative and the low creative boys and girls, and rural and urban students. The critical ratio computed for the mean difference of the high creative and the low creative groups was also not found significant at any level of confidence.

<u>High Creative Group</u>	<u>Low Creative Group</u>
N = 140	N = 140
Mean = 9.027	Mean = 8.565
SD = 2.911	SD = 2.677

Difference between the means = 0.462

SE for difference between means = 0.333

Critical ratio = 1.387

Hence, the hypothesis that there is no significant difference among the high creative and the low creative groups with regard to personality characteristic sober-happy-go-lucky (Factor F) cannot be rejected.

TABLE 19

Summary of Analysis of Variance (2x2x2) design for Factor F of Personality :

Sober - Happy-go-lucky

Sources of Variation	Sum of Squares	df	MS	F.Ratio	Inference
C	18.301	1	18.301	2.408	NS
S	3.870	1	3.870	.512	NS
L	10.257	1	10.257	1.373	NS
CXS	14.120	1	14.120	1.899	NS
CXL	3.142	1	3.142	.425	NS
SXL	17.962	1	17.962	2.401	NS
CXSXL	5.068	1	5.068	.679	NS
Within	2023.2121	272	7.292		
Total=	2077.548	279			

Testing of Hypothesis 7

The hypothesis 7 states : "There is no significant difference among the high creative and the low creative with regard to personality characteristic Expedient - Conscientious (Factor G)". In order to test the hypothesis, analysis of variance was resorted to. Table 14 gives the summary of analysis of variance.

The personality trait on ego strength does not differentiate significantly on variables : creativity, sex and locale. But the interaction of sex and place of residence is found significant at .05 level, and the interaction when creativity, sex and locale taken together is found significant at .01 level of confidence ($F = 2.872$, $df=1/272$). These results signify that the student of a particular creative potential, of a particular sex, of particular residential background can be differentiated from the other on this dimension of personality.

Calculation of the Critical Ratio

(1) Calculation of the critical ratio between the mean scores of the high creative and the low creative groups for the personality characteristic Expedient - Conscientious (Factor G) is as follows :

<u>High Creative Group</u>	<u>Low Creative Group</u>
N = 140	N = 140
Mean = 8.580	Mean = 8.873
SD = 2.524	SD = 2.442

Difference between means = 0.313

SE of difference between means = 0.296

Critical ratio = 1.057

TABLE 14

Summary of Analysis of Variance (2x2x2) design for Factor G of Personality :

Disregard rules - Conscientious

Source of Variation	Total sum of Squares	df	MS	F.Ratio	Inference
C	18.901	1	18.901	2.872	
S	11.650	1	11.650	1.759	
L	6.012	1	6.012	.909	
CXS	.856	1	.856	.128	
CXL	5.695	1	5.695	.857	
SXL	22.359	1	22.359	3.408	P < .05
CXSXL	73.268	1	73.268	11.214	P < .01
Within	1770.262	272	6.1025		
Total =	1901.628	279			

The critical ratio of 1.057 is not found significant at .05 level. Therefore, the hypothesis advanced for the Factor G that there is no significant difference among the creative and low creative for the personality characteristic Expedient - Conscientious can not be rejected at .05 level.

Testing of Hypothesis 3

The hypothesis states that "There is no significant difference among the high creative and the low creative students with regard to personality characteristic Shy - Venturesome (Factor H). Summary of the analysis of variance to test the hypothesis is given in Table 15.

The contribution of creativity variable towards Factor H of personality : Shy vs Venturesome is found to be significant at .05 level ($F=3.159$, $df = 1/272$, $p < .05$). The shy and venturesome dimension of personality significantly differentiates the high creative from the low creative students. The variables of residence and sex as well as all interactions do not differentiate in this personality dimension, thereby, signifying that creativity is the only variable contributing towards the variance of this factor.

Calculation of Critical Ratio

<u>High Creative Group</u>	<u>Low Creative Group</u>
N = 140	N = 140
Mean = 8.014	Mean = 7.009
SD = 2.537	SD = 2.425

Difference between means = 1.005

SE of the difference between means = 0.294

Critical ratio = 3.418

TABLE 15

Summary of Analysis of Variance (2x2x2) design for Factor ^H of Personality :

Shy-Venturesome

Sources of Variation	Total sum of squares	df	MS	F.Ratio	Inference
C	23.450	1	23.450	3.159	P<.05
S	.624	1	.624	.1022	
L	1.068	1	1.068	.1729	
CXS	10.916	1	10.916	1.833	
CXL	14.512	1	14.512	2.438	
SXL	.144	1	.144	.026	
CXSXL	12.086	1	12.086	.353	
Within	1600.162	272	5.901		
Total =	1667.019	279			

The value of 3.418 is found significant at .01 level. Also, the mean of the creative group is greater than the mean of the low creative group. The results indicate that the two groups differ significantly and the hypothesis that there is no significant difference among the high creative and low creative groups with regard to personality characteristic Shy - Venturesome (Factor H) is rejected at .01 level of significance. It may be inferred that the high creative students are venturesome, socially-bold, uninhibited and spontaneous whereas the low creative are shy, restrained, diffident and timid (Mallapa and Upadhyaya, 1979).

Testing of Hypothesis 9

The hypothesis with regard to the personality characteristic Tough-minded-Tender-minded (Factor I) was tested, applying the test of analysis of variance. Table 16 gives the summary of the analysis of variance. The variable of creativity significantly contributes to the total variance of the Factor I of personality. This implies that the high creative students are differentiated from the low creatives on the tough-minded vs tender-minded continuum of personality. The finding supports the research work of Pearce (1968). Sex difference, locale difference and any of the interactions do not show significance at any level of confidence. Thus, the variance in this dimension of personality is mainly contributed by creative thinking ability of the students.

TABLE 16

Summary of the Analysis of Variance (2x2x2) design for Factor I of Personality :

Tough-minded - Tender-minded

Sources of Variation	Total sum of squares	df	MS	F. Ratio	Inference
C	97.120	1	97.120	12.901	p < .01
S	9.634	1	9.634	1.281	
L	2.508	1	2.508	.340	
CXS	43.965	1	43.965	.528	
CXL	3.756	1	3.756	.451	
SXL	20.811	1	20.811	2.755	
CXSXL	9.943	1	9.943	.962	
Within	2044.112	272	7.305		
Total =	2186.001	279			

Calculation of the Critical Ratio**High Creative Group**

N = 140

Mean = 9.282

SD = 2.608

Low Creative Group

N = 140

Mean = 8.055

SD = 2.536

Difference between means = 1.227

SE of difference between means = 0.306

Critical ratio = 4.009

The critical ratio of 4.009 is significant at .01 level. Also, the mean of the high creative group is greater than that of the low creative group. The F value and the CR being significant at .01, the hypothesis that there is no significant difference among the high creative and the low creative groups with regard to personality characteristic Tough-minded - Tender-minded (Factor I) is rejected.

On Factor I, the high creative group by virtue of their significantly higher mean score tend to be tender-minded, dependent, overprotected and sensitive. The low creative, on the other hand, tend to be tough-minded, self-reliant, realistic, practical, unmoved, hard and cynical.

Testing of Hypothesis 10

The hypothesis states that there is no significant difference among the high creative and the low creative students with regard to personality characteristic, Vigorous - Doubting (Factor J). The hypothesis was tested by applying analysis of variance. The data are given in Table 17.

TABLE 17**Summary of Analysis of Variance (2x2x2) design for Factor J of Personality :****Vigorous - Doubting**

Sources of Variation	Total sum of squares	df	MS	F. Ratio	Inference
C	30.204	1	30.204	3.931	P < .05
S	3.815	1	3.815	.528	
L	2.266	1	2.266	.301	
CXS	16.601	1	16.601	1.109	
CXL	13.385	1	13.385		
SXL	1.509	1	1.509	.198	
CXSXL	7.630	1	7.630	.998	
Within	2080.225	272	7.608		
Total =	2154.242	279			

The Factor J : Virgorous - Doubting is significantly influenced by the variable of creativity at .05 level. The other variables viz sex and residence together with all the interactions are found to be not significant in their contribution towards variance of Factor J.

Calculation of Critical Ratio

The calculation of critical ratio between the mean scores of the high creative and low creative groups for the personality Factor J is as follows :

High Creative Group

N = 140
Mean = 8.712
SD = 2.930

Low Creative Group

N = 140
Mean = 8.016
SD = 2.442

Difference between means = 0.696

SE of difference between means = 0.321

Critical ratio = 2.168

The value of 2.168 is significant at .05 level. Also, the mean of the high creative group is greater than that of the low creative group. The two groups differ significantly on the personality characteristic, Vigorous - Doubting (Factor J) at 0.05 level, the mean of the high creative group being greater than that of the low creative group. Hence, the hypothesis that there is no significant difference among the high creative and the low creative students with regard to Factor J of personality is rejected at .05 level of significance.

The high creative students by achieving a significantly high score on this trait tend to be circumspect and obstructive. The high creative's approach is individualistic and reflective. They are internally restrained and are not given to group action. The low creative on the other hand are quite vigorous, zestful and like group action.

Testing of Hypothesis 11

The hypothesis with regard to personality characteristic Flacid - Apprehensive (Factor O) of the high creative and the low creative students was tested. Table 18 gives the summary of the test of analysis of variance.

TABLE 18

**Summary of the Analysis of Variance (2x2x2) design for Factor O of Personality ;
Placid vs. Apprehensive**

Sources of Variation	Total sum of squares	df	MS	F. Ratio	Inference
C	45.410	1	45.410	4.571	P < .01
S	.704	1	.704	.072	
L	.161	1	.161	.016	
CXS	14.925	1	14.925	1.614	
CXL	8.614	1	8.614	.808	
SXL	20.281	1	20.281	2.110	
CXSXL	13.055	1	13.055	1.247	
Within	2611.224	272			
Total =	2734.150	279			

Of the variables under study : creativity, sex and locale, creativity is found to be an influencing factor of placid vs dimension of personality at .01 level of significance. The variables of sex and locale and the interactions do not differentiate this dimension of personality.

Calculation of Critical Ratio

Critical ratio was computed for the difference between the mean scores of the high creative and the low creative groups.

Details are shown below :

High Creative Group

N = 140

Mean = 6.472

SD = 3.032

Low Creative Group

N = 140

Mean = 7.457

SD = 2.901

Difference between means = 0.985

SE of difference between means = 0.353

Critical ratio = 2.790

The value of 2.79 was found significant at .01 level and the mean score of the low creative group was greater than that of the high creative group. Hence, the hypothesis that there is no significant difference among students who are high creative and those who are low creative with regard to personality characteristic. Placid - Apprehensive (Factor O) stand rejected at .01 level of significance. The results reveal that the creative tend to be placid, self-assured, confident and serene as against the apprehensive, worrying, depressive and guilt-prone low-creative students.

Testing of Hypothesis 12

This hypothesis states that there is no significant difference among the students who are high creative and low creative with regard to personality characteristic Group-dependent - Self-sufficient (Factor Q_2). Table 19 gives the summary of the analysis of variance to test the hypothesis.

The Factor Q_2 of the personality dimension was not found influenced by any one of the factors under study : creativity, sex and locale. The interaction among these variables also failed to yield significant results at .05 and .01 levels of confidence. The results indicate that this dimension of personality does not differentiate among the high creative and the low creative, the boys and girls and students from the rural and urban areas.

The F value of 2.501 for df 1/272 is not significant at .05 level. Hence, the hypothesis that there is no significant

TABLE 19

Summary of the Analysis of Variance (2x2x2) design for Factor Q_2 :

Group-dependent - Self-sufficient

Sources of Variation	Total sum of squares	df	MS	F.Ratio	Inference
C	26.214	1	26.214	2.501	Ns
S	11.431	1	11.431	1.016	Ns
L	12.240	1	12.240	1.145	Ns
CXS	6.122	1	6.122	.564	Ns
CXL	8.067	1	8.067	.746	Ns
SXL	35.988	1	35.988	3.499	Ns
CXSXL	5.412	1	5.412	.5203	Ns
Within	2837.403	272	10.354		
Total =	2950.450	279			

difference among students who are high creative and low creative with regard to personality characteristic Group-dependent - Self-sufficient (Factor Q_2) is not rejected. This means that two groups are more or less the same or homogenous in nature on Factor Q_2 of personality dimension.

<u>High Creative Group</u>	<u>Low Creative Group</u>
N = 140	N = 140
Mean = 6.472	Mean = 7.457
SD = 3.032	SD = 2.901

Difference between means = 2.284

SE of difference between means = 0.330

Critical ratio = 0.860

The value of 0.860 is not significant at .05 level of significance.

Testing of Hypothesis 13

The hypothesis with regard to personality characteristic Undisciplined - Controlled (Factor Q_3) was tested applying analysis of variance. The results of the test are given in Table 20. The contribution of the variable of creativity towards Factor Q_3 was not found significant. None of the other concerned variables also showed any significance. All the interactions were also found not significant. This means that the undisciplined - controlled dimension of personality does not significantly differentiate the high creative and the low creative students. Hence, the hypothesis that there is no difference among the students who are high creative and low creative with regard to personality characteristic Undisciplined - Controlled (Factor Q_3) is not rejected at .05 level of significance. The critical ratio computed for the difference between the mean scores in personality of the two groups is also not significant at .05 level.

TABLE 20

Summary of the Analysis of Variance(2x2x2) design for Factor Q₃ of Personality :

Undisciplined -Controlled

Sources of Variation	Total sum of squares	df	MS	F Ratio	Inference
C	16.895	1	16.895	2.328	Ns
S	6.702	1	6.702	.914	Ns
L	12.700	1	12.700	1.732	Ns
CXS	13.236	1	13.236	1.826	Ns
CXL	13.851	1	13.851	1.924	Ns
SXL	11.824	1	11.824	1.635	Ns
CXSXL	10.233	1	10.233	1.406	Ns
Within	1061.101	272			
Total =	1159.024	279			

<u>High Creative Group</u>	<u>Low Creative Group</u>
N = 140	N = 140
Mean = 7.955	Mean = 7.702
SD = 2.471	SD = 2.543
Difference between mean scores = 0.253	
SE of difference between means = 0.300	
Critical ratio = 0.844	

Testing of Hypothesis 14

The hypothesis states : "There is no significant difference among students who are high creative and low creative with regard to personality characteristic Relaxed - Tense (Factor Q_4)". In order to test the hypothesis, analysis of variance was resorted to. Table 21 gives the summary of the analysis of variance.

The factor of personality Relaxed - Tense is differentiated significantly by the variables of sex, and locale at .05 level of confidence. The interaction of creativity and place of residence also yielded a significant result at .05 level. While boys and girls and the rural and urban students differed in this trait of personality style, the personality of the high creative with a particular residential background is notably different from the other ones.

The F value of 2.230 for df 1/272 is not significant at .05 level. Hence, the hypothesis that there is no significant difference among the students who are high creative and low creative with regard to personality characteristic Relaxed - Tense (Factor Q_4) is not rejected at .05 level. This means that the mean scores of the two groups are the same on this personality characteristic

TABLE 21

Summary of the Analysis of Variance (2x2x2) design for Factor Q₄ of Personality :

4

Relaxed - Tense

Sources of Variation	Total sum of squares	df	MS	F Ratio	Inference
C	17.582	1	17.582	2.230	
S	14.006	1	14.006	5.882	P < .05
L	49.332	1	49.332	6.256	P < .05
CXS	6.864	1	6.864	.868	
CXL	46.930	1	46.930	5.952	P < .05
SXL	15.362	1	15.362	1.948	
CXSXL	15.389	1	15.389	1.959	
Within	2147.828	272	7.912		
Total =	2301.464	279			

(Factor Q_4). The critical ratio computed between the mean difference in scores of the two groups were also not found statistically significant.

	<u>High Creative Group</u>	<u>Low Creative Group</u>
	N = 140	N = 140
Mean	= 7.047	Mean = 7.512
SD	= 2.164	SD = 2.986

Difference between means = 0.465

SE of difference between means = 0.310

Critical ratio = 1.500

Sex and Locale difference among the Creative Students

Analysis of the personality characteristics of the high creative students (N=140) has been undertaken in this section. The high creative group included 66 boys and 74 girls. They were compared on the 14 factors of personality. Further, they were divided into rural and urban groups. Students from the secondary schools of Aizawl town constituted the urban group (N=77) and the students from the village schools of Mizoram, the rural group (N=63). The personality characteristics of the students from the rural and urban groups were compared. Comparison of the fourteen personality factors of the high creative boys and girls from rural and urban backgrounds was also carried out. The analysis was done so as to arrive at meaningful results and the hypotheses advanced with respect to sex and locale difference tested.

Testing of Hypothesis 15

The hypothesis states that "there are no sex difference in personality correlates of the high creative students."

It has to be noted that the hypothesis has partially been already tested by 2x2x2 factorial design of the analysis of variance while testing the hypotheses 1 to 14. Further, the mean scores of the boys (N=66) and that of girls (N= 74) on fourteen factors of personality were compared by computing the critical ratios. Summary of the results are given in Table 22.

Discussion of Results

It has been found from Table 22 that the high creative girls are differentiated from the high creative boys significantly at .05 level of Factors A,C,D, and Q₄ of personality. The groups differed significantly at .01 level of significance on Factor B. While the high creative boys had greater mean scores than that of high creative girls on Factors A,B,C and D, the high creative girls achieved a higher mean personality score with respect to Factor Q₄ . The results indicate that the hypothesis "there are no significant sex differences in personality correlates of the high creative group" stands refected with respect to Factors A,B,C,D and Q₄ .

Both the high creative boys and the high creative girls by virtue of their low mean scores on Factor A tend to be reserved, detached, critical and aloof. However, the relatively higher mean score significant at .05 level in favour of boys revealed that the high creative boys are more oriented than the high creative

TABLE 22

*Mean Differences between Scores of Creative Girls and Boys on Fourteen
Factors of Personality*

Personality Factors	Mean/Standard Deviation	Creative Girls (N= 66)	Creative Boys (N=74)	Mean Diff- erence	't' value	Inference
1. 'A'	M. S. D.	4.958 3.100	5.441 2.564	1.053	2.237	P < .05
2. 'B'	M. S. D.	5.869 2.702	9.378 2.778	3.509	8.169	P < .01
3 'C'	M. S. D.	7.901 2.745	9.053 2.289	1.752	4.074	P < .05
4.'D'	M. S. D.	5.548 3.017	5.709 2.703	1.173	2.412	P < .05
5'E'	M. S. D.	6.865 2.30	6.325 2.146	0.539	1.426	N s
6. 'F'	M. S. D.	8.564 2.257	9.120 2.604	0.556	1.354	Ns
7. 'G'	M. S. D.	9.643 2.035	9.302 2.521	0.341	0.885	Ns

TABLE 22 (cont.)

8. 'H'	M.	7.486	7.154	0.332	0.848	N s
	S. D.	2.003	2.614			
9. 'I'	M.	9.431	9.401	0.030	0.061	Ns
	S. D.	2.570	3.282			
10 'J'	M.	8.498	8.586	0.090	0.218	Ns
	S. D.	2.421	2.464			
11. 'O'	M.	6.546	6.537	0.009	0.019	Ns
	S. D.	2.948	2.644			
12 'Q' 2	M.	11.510	11.536	0.026	0.058	Ns
	S. D.	4.939	2.421			
13. 'Q' 3	M.	7.648	8.162	0.514	1.260	Ns
	S. D.	2.326	2.501			
14. 'Q' 4	M.	8.223	7.050	1.173	2.412	P < . 0 5
	S. D.	3.016	2.730			

girls on the affectothymia dimension of personality. Singh (1978) and Pandey (1980) also reported similar results that the creative males were found to be good-natured, easy-going, co-operative and imaginative, and creative females were independent, fault-finders, socially bold and self-assured.

With regard to Factor B, the high creative boys showed a mean score of 9.378 and the high creative girls achieved only a score of 5.869, the difference in mean scores of 3.509 being statistically significant at .01 level. The high creative boys are thus definitely superior to their female counterparts in scholastic mental capacity and in abstract thinking. They tend to be quick to grasp ideas, are intelligent and fast in learning. This finding is at variance with the findings of Goyal (1974) and Pandey (1980) who reported that females were characterized by intelligence and venturesome traits. The reason for the superiority of the boys over girls may be due to the male dominated patriarchal society of the Mizos, where the boys enjoy more freedom and higher confidence in their endeavours than the girls.

On Factor C, the high creative boys with a mean score of 9.053 were found to have a higher ego strength than that of the high creative girls ($M=7.301$). The mean difference of 1.752 being statistically significant at .05 level, the high creative boys tend to be more emotionally mature, more stable, realistic about life, less unruffled, and better able to maintain group morale than the

high creative girls. The results are in agreement with the findings of the study by Gopal (1975) that the creative scientists are reserved, emotionally stable and realistic about their life. However, the study refuted the observation made by Verma (1973) that the male and female students did not show any significant difference on ego-strength. The anomaly in result may be due to the cultural configuration that might have brought out the differences in the ego-strength.

The high creative boys differed significantly from the high creative girls on personality characteristic : Phlegmatic - Excitable at .05 level of significance. The higher mean personality score in favour of the boys indicates that they are comparatively more oriented on Factor D, are impatient, demanding and over active than their female counterparts. However, the relatively average mean scores (5.872 for the high creative boys and 5.055 for the high creative girls) reflect that the two groups do not deviate to the extremes on this continuum of personality. This is to say that they are neither phlegmatic, deliberate, inactive and stodgy, nor are they highly excitable, impatient, demanding and over active.

On factor Q₄ of the personality, the high creative girls obtained a higher statistically significant mean score than the high creative boys. The result indicates that the girls with higher mean score on Factor Q₄ have higher ergic tension than their male counterparts. The high creative girls are more tense and restless; they have an excess of stimulated but undischarged drives and take a poor view of the degree of unity, orderliness and leadership. Singh (1978)

and Pardey (1980) also have come to similar conclusions in their research that female creatives were apprehensive, worrying, depressive troubled, tense, frustrated and overwrought. The study, thus, concludes that while the high creative boys differed from the high creative girls significantly in favour of personality traits outgoing, intelligent, emotionally stable and excitable, the high creative girls tend to be more tense, restless, fretful and impatient.

Hypothesis 16

This hypothesis predicted that there is no significant difference in the personality correlates of the high creative boys and high creative girls coming from the rural and urban areas.

The hypothesis has partially been already tested by (2x2x2) factorial design of analysis of variance. Further, the mean personality scores of the high creative students from urban (N=77) and rural (N= 63) group were compared by employing 't' test. The results are given in Table 23. The mean scores^o_^ of the rural (N=31) and (N=32) high creative girls are compared in Table 24. Table 25 presents the comparison of the mean personality scores of the rural (N=32) and urban (N=42) high creative boys.

The results in Table 24 show that the rural high creative girls are differentiated from the urban high creative girls at .05 level for factors B,C and O; and at .01 level for the personality factor G. The mean scores of the urban girls were higher than the rural girls on the above four factors of personality. The results indicate that the high creative girls from the urban areas are more intelligent, emotionally stable, conscientious and apprehensive than the high creative girls from the rural areas.

TABLE 23**Mean Difference on Fourteen Factors of Personality of Creative Students from rural and urban areas.**

Personality Factor	Mean/Standard Deviation	Creative Students		Mean Diff- erence	't' Value	Inference
		Rural (N=63)	Urban (N=77)			
1. 'A'	M.	5.562	4.493	1.069	2.190	P < .05
	S. D.	3.003	2.708			
2. 'B'	M.	5.826	5.032	0.794	2.006	P < .05
	S. D.	2.522	2.073			
3. 'C'	M.	7.829	7.637	0.192	0.500	Ns
	S. D.	2.012	2.532			
4. 'D'	M.	5.872	5.055	0.817	1.542	Ns
	S. D.	3.204	3.010			
5. 'E'	M.	7.067	6.364	0.703	1.938	Ns
	S. D.	2.066	2.217			
6. 'F'	M.	9.544	8.625	0.919	2.507	P < .05
	S. D.	2.257	2.031			
7. 'G'	M.	9.880	9.426	0.454	1.182	Ns
	S. D.	2.412	2.065			

8. 'H'	M.	7.907	7.237	0.634	1.801	Ns
	S. D.	2.031	2.122			
9. 'I'	M.	9.650	9.025	0.625	1.286	Ns
	S. D.	2.893	2.822			
10. 'J'	M.	8.605	9.524	0.919	1.679	Ns
	S. D.	3.120	3.342			
11. 'O'	M.	6.514	7.140	0.626	1.161	Ns
	S. D.	3.121	3.236			
12. 'Q' 2	M.	11.953	9.632	2.321	6.088	$P < . 0 1$
	S. D.	2.060	2.451			
13. 'Q' 3	M.	8.430	7.038	1.392	3.186	$P < .01$
	S. D.	2.147	3.011			
14. 'Q' 4	M.	7.665	7.042	0.623	1.323	Ns
	S. D.	2.317	3.241			

TABLE 24

Mean Difference in Scores on Fourteen Personality Factors of Creative Girls with respect to Rural and Urban areas.

Personality Factors	Mean/Standard Deviation	Creative Girls		Mean Difference	't' Value	Inference
		Rural (N=31)	Urban (N=32)			
1. 'A'	M. S. D.	4.776 2.041	4.034 3.100	0.742	1.126	Ns
2. 'B'	M. S. D.	5.935 1.389	6.022 1.004	0.687	2.443	P < .05
3. 'C'	M. S. D.	6.903 2.304	7.554 1.618	0.651	2.573	P < .05
4. 'D'	M. S. D.	5.274 3.008	5.237 2.560	0.544	0.772	Ns
5. 'E'	M. S. D.	7.195 2.028	6.684 2.388	0.511	0.916	Ns
6. 'F'	M. S. D.	8.160 2.768	8.797 2.522	0.637	0.954	Ns
7. 'G'	M. S. D.	8.144 2.001	10.205 2.426	2.061	3.684	P < .01

8. 'H'	M.	8.106	7.485	0.621	1.189	Ns
	S. D.	2.112	2.092			
9. 'I'	M.	9.774	9.401	0.373	0.688	Ns
	S. D.	1.268	2.780			
10. 'J'	M.	8.086	9.407	1.021	1.45	Ns
	S. D.	3.071	2.452			
11. 'O'	M.	5.785	7.601	1.816	2.068	P < . 0 5
	S. D.	3.556	3.407			
12. 'Q' ₂	M	10.774	12.011	1.237	1.152	Ns
	S. D.	1.963	5.738			
13. 'Q' ₃	M.	8.049	7.241	0.808	1.475	Ns
	S. D.	2.130	2.216			
14. 'Q' ₄	M.	7.880	8.636	0.756	1.171	Ns
	S. D.	2.026	3.017			

TABLE 25

Mean Difference in Scores of Fourteen Personality Factors of Creative Boys with respect to Rural and Urban areas.

Personality Factor	Mean/Standard Deviation	Creative Boys		Mean Difference	't' Value	Inference
		Rural (N=32)	Urban (N=42)			
1. 'A'	M.	5.025	3.108	1.917	2.794	P < .01
	S. D.	3.002	2.819			
2. 'B'	M.	5.973	5.566	0.407	1.506	Ns
	S. D.	1.043	1.282			
3. 'C'	M.	8.221	7.863	0.354	0.635	Ns
	S. D.	2.102	2.750			
4. 'D'	M.	5.980	5.465	0.515	0.898	Ns
	S. D.	2.102	2.833			
5. 'E'	M.	6.846	6.012	0.834	1.918	Ns
	S. D.	1.708	2.028			
6. 'F'	M.	9.001	8.857	0.114	0.229	Ns
	S. D.	2.565	2.808			
7. 'G'	M.	10.028	8.184	1.844	3.257	P .01
	S. D.	2.506	2.284			

(Table 25 cont.)

8. 'H'	M.	7.538	7.021	0.517	1.008	Ns
	S. D.	2.304	2.018			
9. 'I'	M.	9.763	8.086	1.677	2.415	P < .05
	S. D.	3.005	2.899			
10. 'J'	M.	8.322	9.440	1.118	1.983	P < .05
	S. D.	2.401	2.407			
11. 'O'	M.	6.863	6.202	0.661	1.339	Ns
	S. D.	2.128	2.071			
12. 'Q' 2	M.	11.998	10.292	1.706	3.358	P < .01
	S. D.	2.044	2.314			
13. 'Q' 3	M.	8.553	7.749	0.804	1.258	Ns
	S. D.	2.486	3.008			
14. 'Q'	M.	7.547	6.508	0.939	1.727	Ns
	S. D.	2.044	2.874			

Analysis of locale differences in the case of the high creative boys (Table 25) showed that the rural and the urban groups differed significantly on personality factors A, G, and Q_2 at .01 level, and on factors I and J at .05 level of significance.

While the rural high creative boys achieved higher mean personality scores on Factors A, G, I, and Q_2 , the mean difference was in favour of the urban students on the personality Factor J. The results reveal that the high creative boys with rural backgrounds are more outgoing, warmhearted, easygoing, participating, (Factor A), conscientious - persevering, stable and rule-bound (Factor G), tender-minded, dependent, overprotected, sensitive (Factor J) and self-sufficient, prefer own ideas, and resourceful (Factor Q_2) than their urban creative counterparts. However, the urban high creative boys achieved a higher mean score on Factor J of the personality, thereby indicating that they tend to be more circumspect and internally restrained than the rural boys.

In Table 23 the personality characteristics of the high creative students from the rural and the urban areas are compared irrespective of their sex. The groups differed significantly on Factors A, B, and F, at .05 level and Q_2 and Q_3 at .01 level of significance. The mean difference was in favour of the rural students on all the above factors of personality. The results reveal that the rural high creative students have a higher level of self-sufficiency, better self-concept, self-control, and better general social behaviour than the high creative students from the urban areas. Again, rural high creatives are found to be outgoing (Factor A), warmhearted, easygoing and participating, more intelligent (Factor B), and happy-go-lucky (Factor F), self-sufficient and resourceful (Factor Q_2); and controlled and socially precise

(Factor Q₃) than the students with urban backgrounds. It is inferred that the null hypothesis advanced in respect of locale differences among the high creative boys and the high creative girls is not tenable with respect to personality Factors A, B, F, Q and Q₂ and Q₃ as the rural and urban groups showed significantly different mean scores.

Summary of Results and Conclusions

The scores on the fourteen factors of HSPQ were analysed by a 2x2 factorial design of variables—creativity, sex and locale. The summary of results derived by analysis of variance for 14 factors of personality are as follows :

1. The F ratios for the main effects of creativity were found to be significant

for the following factors :

Factor A : Reserved - Outgoing

Factor B : Less intelligent - More intelligent

Factor C : Affected by feelings - Emotionally stable

Factor E : Obedient - Assertive

Factor H : Shy - Venturesome

Factor I : Tough-minded - Tender-minded

Factor J : Vigorous - Doubting

Factor O : Racial - Apprehensive

2. The *F* ratios for the main effects of sex were found to be significant for the following factors :

Factor C : Affected by feelings - Emotionally stable

Factor Q₄ : Relaxed - Tense

3. The *F* ratio for the main effects of the variable of locale was found to be significant for Factor Q : Relaxed- Tense

4

4. The *F* ratios were significant for interactions on the following personality factors :

Factor A : Reserved - Outgoing (Creativity x Sex)

Factor C : Affected by feeling - Emotionally Stable (Sex x Locale)

Factor G : Expedient - Conscientious (Sex x Locale)

(Creativity x Sex x Locale)

Factor Q₄ : Relaxed - Tense (Creativity x Locale)

The results were further analysed by computing the critical ratios in order to determine the significance of difference of mean scores of each of the personality variables between the high creative and low creative groups. The following personality factors were found to distinguish the two groups. The superiority of the high creative groups are indicated by giving a plus sign, and a minus sign indicates the superiority of the low creative groups on the particular personality factor.

Factor A : Reserved - Outgoing (C.R. = 13.289 $p < .01$ - A)

Factor B : Less Intelligent - More Intelligent

(C.R. = 2.322 $p < .05$ +B)

Factor C : Affected by feelings - Emotionally Stable

(C.R. = 3.016 $p < .01$ -C)

Factor E : Obedient - Assertive (C.R. = 2.499 $p < .05$ +E)

Factor H : Shy - Adventurous (C.R.= 3.418 $p < .01$ +H)

Factor I : Toughminded - Tenderminded (C.R.= 4.009 $p < .01$ +I)

Factor J : Vigorous - Doubting (C.R.= 2.168 $p < .05$ + J)

Factor O : Placid - Apprehensive (C.R.= 2.790 $p < .01$ -O)

The following conclusions are drawn on the basis of the results of the present research :

- (i) The high creative students are found to be reserved, detached, critical and aloof when compared to their warm-hearted and easy going low creative counterparts.**
- (ii) The high creative students seemed to be more intelligent than the low creative students.**
- (iii) The high creative students are affected by feelings much more than the emotionally stable, low creative students.**
- (iv) The high creative students are more assertive in nature than the obedient low creative students.**
- (v) The high creative students are found to be adventurous as against the shy, low creative students.**
- (vi) The high creative students are tender-minded and sensitive when compared with the tough-minded low creative students.**
- (vii) The high creative students appeared to be circumspect and internally restrained as against their zestful, low creative counterparts.**
- (viii) The high creatives are self-assured, whereas the low creative students appeared to be apprehensive in nature.**

The hypothesis related to sex difference in personality characteristics of high creative students was tested by applying the 't' test, and also partially by application of analysis of variance. Significant sex differences were observed in personality variables A,B,C,D and Q_4 . While the mean personality scores of the high creative boys were found to be greater than that of the girls with respect to factors A,B,C and D, the girls outscored the boys on factor Q_4 of the personality.

- (i) The result on personality factor A reveals that the high creative girls by virtue of their significantly lower mean score are more reserved, detached, critical and aloof than their high creative counterparts.
- (ii) With regard to factor B, the high creative boys are superior to high creative girls in scholastic mental capacity.
- (iii) On factor C, the high creative boys proved to have a higher ego strength than the high creative girls.
- (iv) The high creative boys appeared to be more excitable, impatient, overactive and unrestrained when compared to the high creative girls (Factor D).
- (v) The significantly higher mean score of high creative girls on factor Q_4 of personality indicates that they are more tense, restless and fretful than their relaxed, torpid and composed high creative counterparts.

The personality patterns of the high creative students from the rural and urban areas were compared, and the results revealed that the two groups differed in their mean scores on personality factors A, B, F, Q₂ and Q₃. The rural high creative students secured a statistically significant higher mean score than their urban counterparts. While the rural high creative girls were significantly higher in their mean scores on the personality characteristics B, C, O and G than the urban girls; the rural high creative boys scored higher on personality factor A, G, I and Q₂ than the urban boys. On factor J of the personality, the urban high creative boys held a statistically significant higher mean score than their rural counterparts.

The significantly higher mean score of the high creative rural students on personality factors A, B, F, Q₂ and Q₃ indicate that they are more intelligent, outgoing, happy-go-lucky, self-sufficient and controlled than the high creative urban students. Again, rural girls showed their superiority to urban girls in intelligence, emotional stability, and conscientious characteristics of personality. They also appeared more apprehensive than the urban girls. On the other hand, rural high creative boys tend to be more warmhearted, conscientious, tender-minded, and self-sufficient than the high creative urban boys. The high creative boys were found to be more circumspect when compared to rural boys.

SUMMARY AND CONCLUSION

Introduction

Creativity has become a central concept in educational research only very recently although creative thinking ability as the highest of mental functions and creative production the peak of human achievement have long been accepted. Considerable amount of research has been undertaken in the area of creativity during recent decades. Research interest has mainly been focused on the study of the nature of creativity and its relationship with intelligence. Attempts to understand the personality correlations of creativity have been undertaken in a number of researches (MacKinnon, 1960; Torrance, 1962; Getzels and Jackson, 1968). Both theoretical and empirical evidence indicate that creativity - personality area of research is highly significant and it is being widely recognized that the personality variables play an important role in the identification and cultivation of creative talent. In other words, personality variables can be used as criterion variables in the study of creativity.

Comparisons of high creative and low creative individuals have revealed both conflicting as well as consistent observations on a number of non-cognitive characteristics. Cattell (1954) concluded that the creatives are withdrawn, skeptical, internally preoccupied, precise and reliable.

Barron (1958) in his study of highly creative people found them "more original, less suggestible and more tolerant of structural disorderliness". Reid, King and Wickwire (1959) observed from their study of seven graders that the creative children were more sociable, more warm-hearted and less anxious. Getzels and Jackson's (1962) study of the personality

structure of the creative adolescents is also significant in that they stressed the need for study of the personality and non-cognitive characteristics. It is, however, difficult to formulate generalizations from the research on personality and other non-cognitive variables relating to creative children as most of the studies were limited in their scope with regard to the population with which they were concerned and were also confined to urban areas. Not much work seems to have been done in India in this field. And, the studies conducted are mainly among the urban and advanced regions (Raina, 1968; Mehdi, 1971; Passi, 1971). In a tribal and remote area like Mizoram, no substantial research has been undertaken in this field. Systematic explorations to understand the phenomenon of creativity and its relationship with personality and other non-cognitive characteristics are needed for planning educational programmes for creative talent in India especially in backward regions. The Education Commission (1964-66) observed that the 'talent has to be located early and allowed to grow in the best atmosphere and under the best teachers.' An understanding of the concept and correlates of creativity is, therefore, essential for the identification and fostering of the talent. This felt need for developing means and measures for understanding and nurturing of the creative potential especially in a very backward and remote region through effective educational programmes has prompted the researcher to undertake the present investigation.

Statement of the problem

The present study has been designed with a view to examine the creative thinking ability among the secondary school students in Mizoram. The relationship between creativity and personality characteristics of the secondary school students has been studied. Sex differences and locale differences in the context of personality correlates of the creative students were also analysed. Accordingly, the study was entitled, "Non-cognitive Correlates of Creativity among the Secondary School Students".

Objectives of the study

The study was designed primarily to realise the following major objectives :

1. To compare the personality characteristics of the high creative and the low creative secondary school students.
2. To find the sex differences in personality characteristics of the high creative students.
3. To examine the locale differences in personality characteristics of the high creative boys and girls.
4. To make suggestions for improving the educational practices in enhancing creative thinking abilities among the secondary school students.

Hypotheses

Statistical verification of the following hypotheses was undertaken:

1. There is no significant difference between the high creative and the low creative student with regard to personality characteristics:

Reserved - Outgoing.

2. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Less intelligent - More intelligent.*
3. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Affected by feelings - Emotionally stable.*
4. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Phlegmatic - Excitable.*
5. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Obedient - Assertive.*
6. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Sober - Happy-go-lucky.*
7. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Expedient - Conscientious.*
8. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Shy - Venturesome*
9. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Toughminded - Tenderminded.*
10. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Vigorous - Doubting.*
11. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Placid - Apprehensive.*
12. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Group-dependent - Self-sufficient.*

13. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Undisciplined - Controlled.*
14. There is no significant difference between the high creative and the low creative students with regard to personality characteristic: *Relaxed - Tense.*
15. There is no significant sex differences in the personality correlates of the high creative students.
16. There is no significant difference in the personality correlates of the high creative boys and girls coming from rural and urban areas.

Definition of Terms

1. Creativity Creativity is taken as a divergent thinking process enabling the pupils for creative outputs (novel and useful) and measured through verbal and non-verbal creativity test on four primary traits: fluency, flexibility, originality and elaboration.

2. Non-cognitive Correlates Non-cognitive correlates designate the personality characteristics influencing creativity among the high school students. The personality characteristics are defined in terms of fourteen personality traits as measured by the Cattell's (1973) 14 High School Personality Questionnaire(HSPQ).

Sample

The sample of the study consisted of 700 students (335 boys and 365 girls) selected randomly from classes IX and X studying in ten secondary schools in Mizoram.

Tools

The following tools were used to gather the data :

- (i) Cattell's 14 High School Personality Questionnaire (HSPQ).
- (ii) 'Creativity Test' developed by the investigator especially for the study. This is a test-battery developed on the lines of Guilford Divergent Production Test (1967) and Torrance Tests of Creative Thinking (1966) and consists of five verbal tests :
- (i) seeing problems test
 - (ii) unusual uses test
 - (iii) consequences test
 - (iv) making things interesting and
 - (v) similarities test.
- It also consists of three non-verbal tests (i) picture construction (ii) picture completion, and (iii) circles test. The coefficient of correlation for test-retest reliability on a sample of 100 after an interval of 15 days was .802 for the whole test; .819 for the verbal and .725 for the non-verbal tests, all significant at .01 level. The test was validated by comparing it with the scores on HSPQ on calculated dimensions (Cattell, 1979) which yielded a statistically significant correlation of .703 (N=100). It was also validated against teachers rating, the correlation coefficient of .532 being significant at .01 level.

The major hypotheses of this investigation have been tested through the application of a 2x2x2 analysis of variance design. The three-way classification of ANOVA was done with respect to creativity, sex and locale. The factor of creativity was varied in two ways - the high creatives and the low creatives. This was further treated in two ways, boys and girls on sex, and rural and urban on locale.

The scores on the 'Creativity Test' were taken as criterion for classifying the students into the high and the low creative groups, the highest twenty percent constituting the 'high creative group' (N=140) and the lowest twenty percent forming the 'low creative group' (N=140).

Results

The *F* ratios for the main effect of the variable of creativity were found statistically significant for the personality factors A,B,C, E, H,I,J, and O. The prediction in hypotheses 1,2,3,5,8,9,10 and 11 stated in null form failed to find acceptance as the test of variance returned statistically significant results on the following personality factors

(i)	reserved-outgoing	(<i>F</i> =4.055 df=1/272 <i>P</i> < .01)
(ii)	less intelligent-more intelligent	(<i>F</i> =4.395 df=1/272 <i>P</i> < .05)
(iii)	affected by feeling - emotionally stable	(<i>F</i> =7.104 df=1/272 <i>P</i> < .01)
(iv)	obedient - assertive	(<i>F</i> =3.896 df=1/272 <i>P</i> < .05)
(v)	Shy - venturesome	(<i>F</i> =3.159 df=1/272 <i>P</i> < .05)
(vi)	toughminded - tenderminded	(<i>F</i> =2.901 df=1/272 <i>P</i> < .05)
(vii)	vigorous-doubting	(<i>F</i> =3.931 df=1/272 <i>P</i> < .05)
(viii)	placid -apprehensive	(<i>F</i> =4.571 df=1/272 <i>P</i> < .01)

The personality scores of the high and low creative students were further tested by applying the 't' test to know the nature and extent of relationship. The results revealed that the high creative had significantly higher mean scores than the low creative on personality factors A,B,E and J at .05 level, and on factors H and I at .01 level of significance. On factors C and O, however, the mean personality scores of the low creative group were higher than the mean scores of the high creative group and were found significant at .01 level.

On the basis of the above findings, it may be concluded that the above eight personality factors differentiated between the high creative and the low creative students. The high creative students were found to be superior to the low creative students in abstract thinking. They were also found to be assertive, affected by feelings, tenderminded, placid, doubting, venturesome and reserved. Thus, intelligence, sensitivity, independence, assertiveness and spontaneity have been observed as the significant correlates of creativity. The results corroborate with the findings of a number of other studies on creativity and personality (Taylor, 1959; Raychaudhari, 1965, Torrance, 1966; Joshi, 1974; Gakhar, 1975).

The sex differences in personality traits of the high creative students were analysed and it was found that the high creative boys differed significantly from the high creative girls on personality factors A,C,D and Q₄ at .05 level and on factor B at .01 level. The high creative boys possessed higher mean scores on factors A,C,D and B while the high creative girls scored higher than the high creative boys on factor Q₄. The results reveal that (i) the high creative boys are better oriented on affectothymia factor of personality than the high creative girls ($t=2.237$ $P < .05$); (ii) the high creative boys are superior in scholastic mental ability to high creative girls ($t=8.169$ $P < .01$); (iii) the high creative boys proved to have better ego-strength than the high creative girls ($t=4.074$ $P < .05$); (iv) the high creative boys are better oriented on phlegmatic-excitable characteristic of personality

($t=2.412$ $P < .05$); and (v) the high creative girls have higher degree of ergic-tension than the high creative boys and are tense, restless and take a poor view of the degree of unity, orderliness and leadership ($t=2.412$ $P < .05$).

Analysis of locale differences in personality factors of the creative students showed that the rural creative group had significantly higher mean scores on personality factor A, B, F, Q_2 and Q_3 . The results reveal that the rural high creatives when compared to the urban high creative group are more intelligent ($t=2.006$ $P < .05$), happy-go-lucky ($t=2.507$ $P < .05$), outgoing ($t=2.190$ $P < .05$), self-sufficient ($t=6.088$ $P < .01$) and controlled ($t=3.186$ $P < .01$). However, a comparison of personality factors of the rural and urban high creative girls showed that high creative girls from urban areas were found to be more intelligent, emotionally stable, conscientious and apprehensive than the high creative girls from rural background. The rural high creative boys were found to be outgoing, conscientious, tenderminded and self-sufficient as against their reserved, group-dependent and expedient urban counterparts.

Educational Implications

The research findings of the present investigation have great relevance with regard to the identification, fostering and guidance of the creative potential at the secondary school stage. The present study, apart from developing a test to measure the creative thinking ability among the tribal students, has identified a number of personality correlates of the creative students. Higher

scholastic ability and the assertive, adventurous and ~~spontaneous~~^{spontaneous} nature of the ^{high} creative clearly indicate that they are humming with mental and physical activities. A direct implication of this finding is an emphasis on providing responsive and favourable institutional environment so as to channel the exuberant creative energy.

The study has also revealed that the creative students are affected by feelings, and are tender-minded, apprehensive, and circumspect. These non-cognitive correlates of creative personality call for individual attention, guidance and counselling ^{necessary} for pupil development. Provision of differential promotions, special classes and schools, enriched and diversified curriculum, subgrouping within the class for individualised instruction etc., might be some of the strategies which could be incorporated in the national policy on education for the creative at the secondary stage. Further, the development of the creative potential can be ensured if the dogmatic, authoritarian, restrictive and pedantic influences are removed from the educational institutions. To take up the creative challenge in education, the system should develop individual initiative, a spirit of inquiry, and a taste for exploration instead of rote-memory, subject mastery and strict obedience among the students. Therefore, it is obligatory on the part of policy makers to enrich the educational programme in such a way as to cultivate the creative imagination among the students.

Suggestions for Further Research

Creativity research is still in its infancy in India. Studies on creative thinking abilities with special implications to education are needed to plan strategies and to qualify the present system of education for talent development. The study being the first of its kind in Mizoram has examined the personality factors of the high creative students at the secondary stage. A test to measure the creative thinking ability has also been developed. Thus, as a pioneering effort the study, no doubt, has evolved criterion for creativity testing and will help in the detection of talent in this tribal area. Beyond the problem of incorporating the findings of the present research into broader educational plans for cultivating the creative potential, the following other related issues seem promising and significant in fostering the talent which are recommended as further investigations :

- (i) Home environment as related to the development of creativity among the tribal students.
- (ii) Socio-cultural correlates of creativity with special reference to tribal pupils.
- (iii) Personality correlates of creativity among the arts, commerce and science college students.
- (iv) Effect of differential environment in the development of creative thinking abilities among pupils with different personality characteristics.
- (v) Parental perception and child rearing practices as related to the development of creativity among the tribal students.

- (vi) Development of teacher models and strategies for the development of creative thinking ability for the high school students.
- (vii) Curriculum innovation and enrichment for fostering creative potential at the secondary stage.
- (viii) Sex differences in the verbal and non-verbal creative thinking ability with implications to education.
- (ix) Creativity in relation to classroom climate and teacher behaviour.
- (x) Creativity as related to the achievement motivation, adjustment, and achievement among the secondary school students.

The creativity test developed in the study may be adapted for use on other tribal pupils in the North-East. Norms can be developed on different tribes. The test is likely to inculcate research interest in creativity and can thus be used as a scientific tool in the detection and fostering of creative talent among the tribals of the North-Eastern region.

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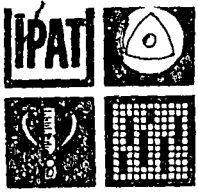
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**HSPQ**

WHAT TO DO: You have a Booklet and an Answer Sheet. Write your name, age, etc., on the Answer Sheet where it tells you to.

The Booklet before you has in it questions about your interests and your likes and dislikes. Although you are to read the questions in *this* Booklet, *you must put your answers on the Answer Sheet*, making sure that the number of your answer *matches* the number of the question in the Booklet.

First, we shall give you two examples so that you will know exactly what to do. After each of the questions there are three answers. Read the following examples and fill in the right boxes where it says Example 1 and Example 2, on the Answer Sheet, below your name. Fill in the left-hand box if your answer choice is the "a" answer, the middle box if your choice is the "b" answer, and the right-hand box if you choose the "c" answer.

EXAMPLES:

- | | |
|---|--|
| 1. Which would you rather do:
a. visit a zoo,
b. uncertain,
c. go up in an airplane? | 2. If you have a quarrel, do you
make friends again quickly?
a. yes, b. in between, c. no. |
|---|--|

As you see from these examples, there are *usually* no right or wrong answers, although sometimes a correct answer is expected. Each person is different and you should say only what is true for *you*. You can always find one answer that suits you a *little* better than the others, so never leave a question without marking one of the answers.

Inside you will find more questions like the ones above. When you are told to turn the page, begin with number 1 and go on until you finish all the questions. In answering them, please keep these four points in mind:

1. Answer the questions frankly and truthfully. There is no advantage in giving an untrue answer about yourself because you think it is the "right thing to say."
2. Answer the questions as quickly as you can. Don't spend too much time thinking about them. Give the first, natural answer that comes to you. Some questions may seem much like others, but no two are exactly alike so your answers will often be different too.
3. Use the middle answer *only* when it is *absolutely impossible* to decide on one of the other choices. In other words, the "a" or the "c" answer should be used *most* of the time.
4. Don't skip any questions. Sometimes a statement may not seem to apply to you, but answer every question, somehow.

If there is anything you don't understand, please ask your questions now. If you have no question now, but later on come across a word you don't know, ask the examiner then.

DO NOT TURN PAGE UNTIL TOLD TO DO SO

1. Have you understood the instructions?
a. yes, b. uncertain, c. no.
2. At a picnic would you rather spend some time:
a. exploring the woods alone,
b. uncertain,
c. playing around the campfire with the crowd?
3. In a group discussion, do you like to tell what you think?
a. yes, b. sometimes, c. no.
4. When you do a foolish thing, do you feel so bad that you wish the earth would just swallow you up?
a. yes, b. perhaps, c. no.
5. Do you find it easy to keep an exciting secret?
a. yes, b. sometimes, c. no.
6. When you decide something, do you:
a. wonder if you may want to change your mind,
b. in between,
c. feel sure you're satisfied with it?
7. Can you work hard on something, without being bothered if there's a lot of noise around you?
a. yes, b. perhaps, c. no.
8. If friends' ideas differ from yours, do you keep from saying yours are better, so as not to hurt their feelings?
a. yes, b. sometimes, c. no.
9. Do you usually ask someone else to help you when you have a hard problem?
a. seldom, b. sometimes, c. often.
10. Would you say that *some* rules and regulations are stupid and out of date?
a. yes, and I don't bother with them if I can help it,
b. uncertain,
c. no, most rules are necessary and should be obeyed.
11. Which of these says better what you are like?
a. a dependable leader,
b. in between,
c. charming, good looking.
12. Do you sometimes feel, before a big party or outing, that you are not so interested in going?
a. yes, b. perhaps, c. no.
13. When you rightly feel angry with people, do you think it's all right for you to shout at them?
a. yes, b. perhaps, c. no.
14. When classmates play a joke on you, do you usually enjoy it as much as others without feeling at all upset?
a. yes, b. perhaps, c. no.
15. Are there times when you think, "People are so unreasonable, they can't even be trusted to look after their own good"?
a. true, b. perhaps, c. false.
16. Can you stay cheerful even when things go wrong?
a. yes, b. uncertain, c. no.
17. Do you try to keep up with the fads of your classmates?
a. yes, b. sometimes, c. no.
18. Do most people have more friends than you do?
a. yes, b. uncertain, c. no.
19. Would you rather be:
a. a traveling TV actor,
b. uncertain,
c. a medical doctor?
20. Do you think that life runs more smoothly and more satisfyingly for you than for many other people?
a. yes, b. perhaps, c. no.
21. Do you have trouble remembering someone's joke well enough to tell it yourself?
a. yes, b. sometimes, c. no.

22. Have you enjoyed being in drama, such as school plays?
a. yes, b. uncertain, c. no.
23. "Mend" means the same as:
a. repair, b. heal, c. patch.
24. "Truth" is the opposite of:
a. fancy, b. falsehood, c. denial.
25. Do you completely understand what you read in school?
a. yes, b. usually, c. no.
26. When chalk screeches on the blackboard does it "give you the shivers"?
a. yes, b. perhaps, c. no.
27. When something goes all wrong, do you get very angry with people before you start to think what can be done about it?
a. often, b. sometimes, c. seldom.
28. When you finish school, would you like to:
a. do something that will make people like you, though you are poor,
b. uncertain,
c. make a lot of money?
29. Do you avoid going into narrow caves or climbing to high places?
a. yes, b. sometimes, c. no.
30. Are you always ready to show, in front of everyone, how well you can do things compared with others?
a. yes, b. perhaps, c. no.
31. Do you ask advice from your parents about the best things to do at school?
a. often, b. sometimes, c. seldom.
32. Can you talk to a group of strangers without stammering a little or without finding it hard to say what you want to?
a. yes, b. perhaps, c. no.
33. Do some types of movies upset you?
a. yes, b. perhaps, c. no.
34. Would you enjoy more watching a boxing match than a beautiful dance?
a. yes, b. perhaps, c. no.
35. If someone has been unkind to you, do you soon trust him again and give him another chance?
a. yes, b. perhaps, c. no.
36. Do you sometimes feel you are not much good, and that you never do anything worthwhile?
a. yes, b. perhaps, c. no.
37. When a group of people are doing something, do you:
a. take an active part in what they are doing,
b. in between,
c. usually only watch?
38. Do you tend to be quiet when out with a group of friends?
a. yes, b. sometimes, c. no.
39. Do people say you are a person who can always be counted on to do things exactly and properly?
a. yes, b. perhaps, c. no.
40. When you read an adventure story, do you:
a. just enjoy the story as it goes along,
b. uncertain,
c. get bothered whether it's going to end happily?
41. Does it bother you if you have to sit still and wait for something to begin?
a. yes, b. in between, c. no.

42. Do you feel hurt if people borrow your things without asking you?
a. yes, b. perhaps, c. no.
43. "Firm" is the opposite of:
a. easy, b. kind, c. loose.
44. "Rich" is to "money" as "sad" is to:
a. trouble, b. friends, c. land.
45. Have you always got along really well with your parents, brothers, and sisters?
a. yes, b. in between, c. no.
46. If your classmates leave you out of a game, do you:
a. think it just an accident,
b. in between,
c. feel hurt and angry?
47. Do people say you are sometimes excitable and scatterbrained though they think you are a fine person?
a. yes, b. perhaps, c. no.
48. When you are on a bus or train, do you talk:
a. in your ordinary voice,
b. in between,
c. as quietly as possible?
49. Which would you rather be:
a. the most popular person in school,
b. uncertain,
c. the person with the best grades?
50. In a group of people, are you generally one of those who tells jokes and funny stories?
a. yes, b. perhaps, c. no.
51. Do you like to tell people to follow proper rules and regulations?
a. yes, b. sometimes, c. no.
52. Are your feelings easily hurt?
a. yes, b. perhaps, c. no.
53. In a play, would you rather act the part of a famous teacher of art than that of a tough pirate?
a. yes, b. perhaps, c. no.
54. Which course would you rather take:
a. practical mathematics,
b. uncertain,
c. foreign language or drama?
55. Would you rather spend free time:
a. by yourself, on a book or stamp collection,
b. uncertain,
c. working under others in a group project?
56. Do you feel that you are getting along well, and that you do everything that could be expected of you?
a. yes, b. perhaps, c. no.
57. Do you have trouble acting like or being like other people expect you to be?
a. yes, b. uncertain, c. no.
58. If you found you had nothing to do some evening, would you:
a. call up some friends and do something with them,
b. not sure,
c. read a good book or work on a hobby?
59. Would you like to be extremely good-looking, so that people would notice you wherever you go?
a. yes, b. perhaps, c. no.
60. When something important is coming up, such as a test or a big game, do you:
a. stay very calm and relaxed,
b. in between,
c. get very tense and worried?
61. If someone puts on noisy music while you are trying to work, do you feel you *must* get away?
a. yes, b. perhaps, c. no.

62. In dancing or music, do you pick up a new rhythm easily?
a. yes, b. sometimes, c. no.
63. "Run" is to "pant" as "eat" is to:
a. exercise, b. indigestion, c. sleep.
64. If Joan's mother is my father's sister, what relation is Joan's father to my brother?
a. second cousin, b. grandfather, c. uncle.
65. Do you often make big plans and get excited about them, only to find that they just won't work out?
a. yes, b. occasionally, c. no.
66. When things go wrong and upset you, do you believe in:
a. just smiling,
b. in between,
c. making a fuss?
67. Do you often remember things differently from other people, so that you have to disagree about what really happened?
a. yes, b. perhaps, c. no.
68. Are there times when you feel so pleased with the world that you just have to sing and shout?
a. yes, b. perhaps, c. no.
69. When you are ready for a job, would you like one that:
a. is steady and safe, even if it takes hard work,
b. uncertain,
c. has lots of change and meetings with lively people?
70. Do you like doing really unexpected and startling things to people?
a. yes, b. once in a while, c. no.
71. If everyone were doing something you think is wrong, would you:
a. go along with them,
b. uncertain,
c. do what you think is right?
72. Can you work just as well, without feeling uncomfortable, when people are watching you?
a. yes, b. perhaps, c. no.
73. Would you rather spend a free afternoon:
a. in a place with beautiful pictures and gardens,
b. uncertain,
c. in a duck shooting match?
74. Would you rather spend an afternoon by a lake:
a. watching dangerous speed boat racing,
b. uncertain,
c. walking by the lovely shore with a friend?
75. When you are in a group, do you spend more time:
a. enjoying the friendship,
b. uncertain,
c. watching what happens?
76. Can you always tell what your real feelings are, for example, whether you are tired or just bored?
a. yes, b. perhaps, c. no.
77. When things are going wonderfully, do you:
a. actually almost "jump with joy,"
b. uncertain,
c. feel good inside, while appearing calm?
78. Would you rather be:
a. a builder of bridges,
b. uncertain,
c. a member of a traveling circus?
79. When something is bothering you a lot, do you think it's better to:
a. try to ignore it until you cool off,
b. uncertain,
c. blow off steam?
80. Do you sometimes say silly things, just to see what people will say?
a. yes, b. perhaps, c. no.
81. When you do poorly in an important game, do you:
a. say, "This is just a game,"
b. uncertain,
c. get angry and "kick yourself"?

82. Do you go out of your way to avoid crowded buses and streets?
a. yes, b. perhaps, c. no.
83. "Usually" means the same as:
a. sometimes, b. always, c. generally.
84. The grandmother of the daughter of my brother's sister is my:
a. mother, b. sister-in-law, c. niece.
85. Are you almost always contented?
a. yes, b. in between, c. no.
86. If you keep breaking and accidentally wasting things when you are making something, do you keep calm just the same?
a. yes, b. perhaps, c. no, I get furious.
87. Have you ever felt dissatisfied and said to yourself, "I bet I could run this school better than the teachers do"?
a. yes, b. perhaps, c. no.
88. Would you rather be:
a. someone who plans homes and parks,
b. uncertain,
c. a singer or member of a dance band?
89. If you had a chance to do something really wild and adventurous, but also rather dangerous, would you:
a. probably not do it,
b. not sure,
c. certainly do it?
90. When you have homework to do, do you:
a. very often just not do it,
b. in between,
c. always get it done on time?
91. Do you usually discuss your activities with your parents?
a. yes, b. sometimes, c. no.
92. When the class is discussing something, do you usually have something to say?
a. almost never,
b. once in a while,
c. always.
93. Do you stand up before your class without looking nervous and ill-at-ease?
a. yes, b. perhaps, c. no.
94. Which would you rather watch on a fine evening:
a. car racing,
b. uncertain,
c. an open-air musical play?
95. Have you ever thought what you would do if you were the only person left in the world?
a. yes, b. not sure, c. no.
96. Do you learn games quickly?
a. yes, b. in between, c. no.
97. Do you wish you could learn to be more carefree and lighthearted about your school work?
a. yes, b. perhaps, c. no.
98. Are you, like a lot of people, slightly afraid of lightning?
a. yes, b. perhaps, c. no.
99. Do you ever suggest to the teacher a new subject for the class to discuss?
a. yes, b. perhaps, c. no.
100. Would you rather spend a break between morning and afternoon classes in:
a. a card game,
b. uncertain,
c. catching up on homework?
101. When you are walking in a quiet street in the dark, do you often get the feeling you are being followed?
a. yes, b. perhaps, c. no.

102. In talking with your classmates, do you dislike telling your most private feelings?
a. yes, b. sometimes, c. no.
103. When you go into a new group, do you:
a. quickly feel you know everyone,
b. in between,
c. take a long time to get to know people?
104. Look at these five words: *mostly, gladly, chiefly, mainly, highly*. The word that does not belong with the others is:
a. mostly, b. gladly, c. highly.
105. Do you sometimes feel happy and sometimes feel depressed without real reason?
a. yes, b. uncertain, c. no.
106. When people around you laugh and talk while you are listening to radio or TV:
a. are you happy,
b. in between,
c. does it spoil things and annoy you?
107. If you accidentally say something odd in company, do you stay uncomfortable a long time and find it hard to forget?
a. yes, b. perhaps, c. no.
108. Which would you rather read about:
a. how to win at basketball,
b. uncertain,
c. how to be nice to everyone?
109. Are you best thought of as a person who:
a. thinks, b. in between, c. acts?
110. Do you spend most of your weekly allowance for fun (instead of saving some for future needs)?
a. yes, b. perhaps, c. no.
111. Do other people often get in your way?
a. yes, b. in between, c. no.
112. How would you rate yourself?
a. inclined to be moody,
b. in between,
c. not at all moody.
113. How often do you go places or do things with a group of friends:
a. very often, b. sometimes, c. hardly ever.
114. What kind of movie do you like best?
a. musicals. b. uncertain, c. war stories.
115. Do you get in trouble more often by saying to a group that wants to do something:
a. "Let's go!"
b. uncertain,
c. "I'd rather not join in"?
116. When you were growing up, did you expect the world to be:
a. kinder and more considerate than it is,
b. uncertain,
c. tougher and harder than it is?
117. Do you find it easy to go up and introduce yourself to an important person?
a. yes, b. perhaps, c. no.
118. Do you think that often a committee of your classmates takes more time and makes poorer decisions than one person would?
a. yes, b. perhaps, c. no.
119. Do you feel you are doing pretty much what you should be doing in life?
a. yes, b. uncertain, c. no.
120. Do you sometimes feel so mixed up that you don't know what you are doing?
a. yes, b. perhaps, c. no.
121. When someone is disagreeing with you, do you:
a. let him say all he has to say,
b. uncertain,
c. tend to interrupt before he finishes?

122. Would you rather live:
 a. in a deep forest, with only the song of birds,
 b. uncertain,
 c. on a busy street corner, where a lot happens?
123. If you were to work on a railroad, would you rather:
 a. be a conductor and talk to the passengers,
 b. uncertain,
 c. be the engineer and run the train?
124. Look at these five words: *below, beside, above, behind, between*. The word that does not belong with the others is:
 a. below, b. between, c. beside.
125. If someone asks you to do a new and difficult job, do you:
 a. feel glad and show what you can do,
 b. in between,
 c. feel you will make a mess of it?
126. When you raise your hand to answer a question in class, and many others raise their hands too, do you get excited?
 a. sometimes, b. not often, c. never.
127. Would you rather be:
 a. a teacher, b. uncertain, c. a scientist?
128. On your birthday, do you prefer:
 a. to be asked beforehand to choose the present you want,
 b. uncertain,
 c. to have the fun of getting a present that's a complete surprise?
129. Are you very careful not to hurt anyone's feelings or startle anyone, even in fun?
 a. yes, b. perhaps, c. no.
130. If you were working with groups in class, would you rather:
 a. walk around to carry things from one person to another,
 b. uncertain,
 c. specialize in showing people how to do one difficult part?
131. Do you take trouble to be sure you are right before you say anything in class?
 a. always, b. generally, c. not usually.
132. Are you so afraid of what might happen that you avoid making decisions one way or the other?
 a. often, b. sometimes, c. never.
133. When things are frightening, can you laugh and not be bothered?
 a. yes, b. perhaps, c. no.
134. Do some books and plays almost make you cry?
 a. yes, often, b. sometimes, c. no, never.
135. Would you like better, when in the country:
 a. running a class picnic,
 b. uncertain,
 c. learning to know all the different trees in the woods?
136. In group discussions, do you often find yourself:
 a. taking a lone stand,
 b. uncertain,
 c. agreeing with the group?
137. Do your feelings get so bottled up that you feel you could burst?
 a. often, b. sometimes, c. seldom.
138. Which kind of friends do you like? Those who like to:
 a. "kid around,"
 b. uncertain,
 c. be more serious?
139. If you were not a human being, would you rather be:
 a. an eagle on a far mountain,
 b. uncertain,
 c. a seal, in a seal colony by the seashore?
140. Are you usually a very careful person?
 a. yes, b. in between, c. no.
141. Do small troubles sometimes "get on your nerves" even though you know that they are not very important?
 a. yes, b. perhaps, c. no.
142. Are you sure you have answered every question?
 a. yes, b. perhaps, c. no.