

# **Creativity in Adolescents and its Relationship to their Adjustment**

By

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## **Introduction**

## I. INTRODUCTION

'The creative and the talented are seed people, concept changers and pulse takers of the society.'

- Zarghar and Dhar(1988)

Creativity is the ultimate answer to man's problems, innovation of new ideas and things and ultimately the civilization of life. The value and worth of this potential is unlimited. It has been the subject of research for psychologists since the past. But recently it has gained tremendous importance among researchers who are taking interest in the study of creativity with diversified aims.

Creativity is a unique gift of nature, a highly valued human quality which has been known for a long time to have its influence on scientific, technological and artistic spheres of human activity. Having realised the unlimited value and worth of creative potential, there is now creativity and giftedness movement and concern everywhere. In one form or other, there is an international concern for giftedness and creativity (Zarghar and Dhar, 1988). Guilford (1966) refers creativity as 'divergent thinking'. One of the pioneer workers in creativity, Torrance (1969) opines

that creativity is to understand the gaps, mistakes and unknown principles and draw speculations or hypotheses to evaluate them, search out conclusions and convey them to others and examine them again. According to Hurlock (1981) creativity is regarded as a process by which something new, either an idea or an object in a new form or arrangement is produced. Venkateswaran (1987) says creativity includes the personality traits, attributes, values, motivation and interests too.

The New Educaiton Policy (1986) emphasizes the need for the development of the creative potentials of the students. The recent approach to education, is entirely based on creativity.

The period from 14-16 years is regarded as the time for helping the individual think about his abilities and how he can use them to achieve success in his career and avocation. It is the period of learning the skills of creative problem solving and for practicing the skill of finding creative solutions (Torrance, 1969).

The 16-18 years old needs to give his/her imagination full reign, as he/she sorts what is and is not important. He/she can develop vision for his life in terms of optimistic aspirations and for the arts and social activity as means of enriched living.

The adolescent needs to be given full opportunity for exploration and development of their creative potential. At this stage they need to be exposed to problems which enables them to express themselves creatively and the influence of variables on creative potential needs to be explored.

Sumangala (1988) opines that one of the most serious criticisms of our educational system is that it has neglected and all too often suppressed the natural creativity of the young. Realising this and the significant role of creative potentials in developing the modern technologies, increased attempts are being made by our educators to identify and nurture creativity at the school age itself.

The studies in the area done by psychologists and educationists on various factors which affect the level of creativity show that creativity among school children is related to their psychological, social and environmental characteristics.

Vyas and Jayapoorni (1972), Vijayalakshmi (1980), Kumari et al. (1986), Dwivedi and Sharma (1987) and Hussain (1985) have reported the existence of significant correlation between creativity and socio economic status while Das (1957), Cavington (1964) and Zambito (1968) found low correlation between the two

variables as reviewed by Singh (1982). Studies have reported that education of parents, social and intellectual bases of the family, professional background and vocational independence of parents influence creative abilities of children.

Research on the relationship of creativity with different variables has brought out inconsistent and inconclusive results that necessitates further research. Consistent and appropriate findings are necessary to enlighten the teachers, parents, administrators and all concerned to work for the development of the creative potential of the child to the fullest extent possible. The present study aims to find out the relationship of creativity with familial and other variables. The following are the specific objectives of this study.

1. To study the relationship of creativity of adolescents in relation to motivation received at home, academic achievement along with other familial variables.
2. To find out if there is any significant relationship between creativity and various areas of adjustment viz. home, health, social, emotional and educational.

The hypotheses framed for conducting the present study are enlisted below.

1. There is a difference in creativity between boys and girls.
2. There is a significant relationship between creativity and familial variables.
3. There is a significant relationship between creativity and motivation received at home.
4. There is no significant relationship between creativity and personal adjustment.
5. There is no significant relationship between creativity and academic achievement.

## **Review of Literature**

## II. REVIEW OF LITERATURE

Since the present study was concerned with creativity in adolescents and its relationship to adjustment in adolescents, the related literature reviewed consisted of

- A. Concept and definitions of creativity
- B. Significance of creativity
- C. Types of creativity
- D. Characteristics of a creative person
- E. Creativity in relation to various attributes

### A. Concept and Definitions of Creativity:

Creativity has been gaining a considerable amount of recognition in our country since the last decade and since then researchers in the field of psychology and related fields have been trying their best to give the concept of creativity.

Mathur and George (1985) states quite recently creativity has become delineated into a number of aspects like dimensionality, dynamics, personality and measurement.

Sharma and Sharma (1982) remarks that the use

of creativity by educators and psychologists is highly individualistic. Malhara (1985) points out that creativity has two aspects: one, the process of creation and two, the product of creation. While the process of creation is an inner happening, the products of creativity can be seen and defined.

Experts are of the view that creative ability has five components. These are

- i) Fluency: the ability to think about a number of ideas.
- ii) Flexibility: the ability to think about a number of categories of ideas.
- iii) Originality: the ability to think about unusual and uncommon ideas.
- iv) Elaboration: the ability to think about the complete details of an idea (Mathur and George, 1985).
- v) Evaluation: the ability to think critically about an idea.

Morgan et al. (1986) holds that though there are individual differences in the ways creative people think, there is a recurring pattern. Creative thinking proceeds in five stages; preparation, incubation, illumination, evaluation and revision.

In Stage 1, the thinker formulates the problem and collects the factors and materials considered necessary for the new solution. In stage 2, some of the solution tend to fade. The creative thinker may have experiences that provides clues to the solution. In Stage 3, an idea for the solution suddenly wells up into consciousness. In Stage 4, the apparent solution is tested to see if it satisfactorily solves the problem. In Stage 5, revision is tested, the insight become generally satisfactory but needs some modification or the solution of minor problems to be really "good" new idea.

Edigar (1986) cautions that it is necessary to be careful in defining creativity and distinguishing it from other similar intellectual function. Guilford (1966) defines creativity as a problem solving behaviour. Romey (1975) has defined creativity simply as the combination of old ideas and observations and information to form something that is new to us. It is the invention of a new and previously 'hidden' connection (Prasad and Ojha, 1987).

Medinnus (1976) states that creativity is the capacity of persons to produce compositions, products or ideas of any sort which are essentially new or novel

and previously unknown to the producer.

Levin (1983) defines creativity as a special ability whereby a person puts ideas together in new and different ways. Creativity is like the rainbow reflecting all the colours of human activities adding a new dimension to life (Pamela, 1985).

In the opinion of Kundu (1985) creativity stands for the capacity to accept challenge, the freedom to exercise choice, the readiness to change self and the capacity to change one's environment. To Kumari et al (1986) creativity is a process of obtaining new combination of processes of attributes that are novel to the creator. Creativity is finding a solution that is both unique and useful. It is an important aspect of mental functioning as proclaimed by Steven and Yussen (1987), (Gayathri and Jayapoorni, 1989). Dwivedi and Sharma (1987) referred creativity as "rare and unique talent in a particular field of endeavour".

Venkataraman (1987) viewed creativity as original, divergent thinking towards solving problems in a more flexible way. As exerted by Kundu and Mallick (1987) creativity is a mysterious functioning

of the mental process. These processes subsist on the experiences right from childhood to adult stage.

Casey (1988) defines creativity as a process in a way of gathering and using information.

#### B. Significance of Creativity:

Men are all inventors sailing forth  
on a voyage of discovery - Emerson.

Creativity has been gaining tremendous importance since the last decade. It has gained popularity as one of the greatest assets of human mental ability next to intelligence. The power of creativity distinguishes one person from another and enables the person to present himself or herself as an individual.

Of all the unique powers human beings are endowed with, creativity is the most unique. In each of us are little used powers of creativity which may be termed as 'spark of genius', waiting to be freed. Even a computer which can work at an amazing pace; cannot match it, as it can only repeat the mechanical orientations but cannot produce original ideas, while the human mind is capable of doing the work of creation (Ediger, 1986). Lyon (1976) has aptly remarked, one of the world's survival depends on how successfully the potential of the gifted and creative children is realized and integrated.

Malhara (1985) holds that man is remarkable because of his fantastic creative powers. The more he plunges into the ocean of creativity, the more he achieves. Scientists like Einstein, Newton, Edison, Galileo and Bhabha entered into this material world and searched out thousands of things whereas Kalidas, Valmiki, Keats, Shakespeare, Tolstoy, Leonardo, Goya entered into the human consciousness and found out innumerable mysteries, persons like Mahaveera, Budha, Christ, Socrates, Kabi took the voyage of their own inner unchartered ocean and realized their "Real self" All these creators had enriched this world.

Malhara (1985) further claims that it is creativity that opens the doors to the everlasting treasure house of joy. The artists, the scientists, the poets, the teachers, the technologists the philosophers who have the flame of creativity and sustain it by their incessant efforts are the most creative persons in the real sense of the term. Such persons are the pioneers of civilization who illuminate themselves, enlighten others and lead the world towards more beauty, more comforts, riches and more happiness. Hence it is of paramount importance that the creative abilities of the students should be developed right from the very beginning. Zarghar and Dhar (1988) opine that we have been able to see the dawn of civilization only

through the creative efforts of individuals who were endowed with this wonderful gift. So, it is the greatest need and demand of present times to promote and nurture this talent at all levels.

Raina (1985) has stressed that man power specialists have observed that countries may not be able to sustain economic growth unless all the reserves of the creative talent in the population are actively sought out and attracted into needed educational channels.

### C. Types of Creativity:

Taylor (1975) and Baber (1984) points out five types of creativity which are outlined below (Gayathri and Jayapoorni, 1989).

1. Expressive creativity: It refers to independent expression in which skills, originality and quality are relatively unimportant.

2. Productive creativity: In which the individual produces intellectual products by way of mastery over some portion of the environment.

3. Inventive creativity: Involves ingenuity in visualizing new uses for old parts where no new basic idea is involved.

4. Innovative creativity: Involves significant alternatives in the basic foundations of the principles of theory or situation in which the individual needs to possess and apply highly developed abstract skills of conceptualization.

5. Emergentive creativity: Applies to absorb the experiences which are commonly provided by the environment and from these conventional experiences to produce something entirely new.

D. Characteristics of a Creative Person:

Malhara (1985) offers the view that creativity is a complex phenomenon and a great manifestation covering a great pile of human traits. A great number of psychologists have studied deeply the creative persons and found out various characteristics of their personality.

Briefly they are listed below:

Creative persons are inventive, imaginative, perceptive and they have a sense of humour.

They have strong self image, easy recall, oedipal anxiety and uneven ego development.

They are non-conventional in response, unreal in perceptions, fanciful, imaginative, sensitive and independent from environmental influence.

They have liking for wild and silky ideas. Their ideas are off the beaten track. They show humour, playfulness, lack of rigidity. They are independent and open to experience.

The highly creative children make stimulus free themes, unexpected endings. They also enjoy risks and uncertainty of the unknown.

They are rebellious, self-aware, ambitious, more tolerant and emotional.

They are cognitively complex, innovative, curious, risk-taker, adventurous, original, imaginative, constructing, discontented, independent of judgement, never bored, self confident, sensitive and sincere. They have varied interests and desire to excel.

They are inclined to sloppiness and disorganization. They change plans quickly, question rules and authority. They are inclined to be chummy with strangers, think of people as individuals. They are open minded and tolerant.

They have faith in goodness and disdain conformists. They discipline themselves and act impulsively.

They have maturity of sensation, verbal fluency, flexibility and radical.

They lack in personal love. They are unsocial and less sexual. They are interested in emotional and intellectual work, indifferent to emotional behaviour, sensitive to themselves and others, receptive to their internal needs and wishes. They are reserved, introspective and cool.

According to Morgan (1986) creative people tend to

Prefer complexity and some degree of apparent imbalance in phenomena.

Be more complex psychodynamically and have greater personal scope.

They are more independent in their judgement.

They are more self assertive and dominant.

They reject suppressors as a mechanism for the control of impulse. This implies that they forbid themselves fewer thoughts, dislike policing themselves and others, and are disposed to entertain impulses and idea that are commonly a taboo.

Aiken (1987) quotes the characteristics proposed by Mac\_Kinnon (1962) as ideational fluency, flexibility, unconventionalism, social sensitivity, non defensiveness, a greater willingness to concede faults and close ties to parents. Torrance (1969) found as many as 84 characteristics of creative individuals which comprise almost most of them in the above list.

#### **E. Creativity in relation to various attributes:**

The study of the relationship between creativity and different variables is an important issue in creativity research. Adequate evidences are presented by researchers regarding motivation received at home, socio economic status and academic achievement.

a) Socio economic status

Kundu and Mallick (1987) and Vyas and Jayapoorni (1987) studied the factors affecting creativity and found that socio economic status is an important factor in fostering creativity. The influence upon the person's creative ability may be both positive and negative. From the very nature of the inner conditions of an individual, it is evident that creativity cannot be forced but may be stimulated to emerge and there may be an optimum level under the favourable environmental conditions.

Kumari et al (1986) quotes the findings of several researchers; Weishburg and Springer, 1961; MacKinnon, 1962, Oden, 1968; Savocoa, 1965 and Raina, 1969 who supported the existence of significant correlation between creativity and socio economic status, while Das (1957) and Zambito (1968) found low relationship between creativity and socio economic status.

Hurlock (1981) states that children from higher socio economic groups tend to be more creative than those of the lower SES as there are more opportunities for giving the knowledge and experience necessary for creativity. The former for the most part

are brought up under democratic child training methods while the later<sup>t</sup> are far more likely to experience authoritarian training. Democratic control fosters creativity by giving children more opportunities to express their individuality and~~o~~pursue interests and activities of their own choice.

Vijayalakshmi (1980) has revealed significant differences between high and low creatives in socio economic status in a study conducted among 425 pupils from six secondary schools in the age range 13-15 years. In a study done with 150 tribal children in Warangal town in~~S~~imla it was found that lower socio economic status groups were inferior in the level of creative thinking.

Dwivedi and Sharma (1987) investigated the factors affecting creative thinking amongst 40 high school boys from IX standard and found<sup>that</sup> environment played a major role in affecting creative thinking among the high school boys.

#### b) Family size

Children from small families other conditions being equal tend to be more creative than children from large families (Hurlock, 1981). Vyas and Jayapoorni (1972) mention family/size as a factor in developing creativity. Children from small families were said to be more creative than those from large families.

Jariwal (1988) studied the effect of family size on the fluency, flexibility and total creativity for students from small families (1-3 siblings) and students from moderate sized families (4-6 siblings). No significant difference was observed between the two groups. In a study conducted by Kaur (1986) among 50 female and 50 male students from 5th grades from government high schools in Ludhiana, it was found that creative ability was independent of family size.

c) Occupation of Parents

There is not much evidence on the relationship between occupation of parents and creativity. Reviewing the studies of Dhar (1960) and Schaffer (1968), Chowdhury (1980) points out that parental income and occupation is related to creativity. The higher the income, the more talented, kind and encouraging the parents are towards the creative efforts of the child. Anderson (1966) claims that higher occupational levels positively influence the creativity of children.

d) Motivation received at home:

"Home is the eternal school of life",

Shamsuddin (1987). It is in the home that the child has been getting education from time immemorial and will continue to get it till the last man exists on earth. In school, it is hard to be recognised and paid attention to, for this home is the best place. Here parents can pay individual attention to them and develop their personal selves.

Adams and Gullota (1980) opine that creative children appear to have parents who treated them with respect, have confidence in their abilities, give them responsibility with autonomy and freedom and expect them to do well.

Creativity is not a monopoly of a few; if opportunities are provided everyone has the potential to be creative in his own way (Mishra, 1986).

Jain (1987) states that family motivation refers to the influence of family in guiding and directing the educational and occupational choices of adolescents. Sharma et al (1985) states creativity thrives better if motivation is present. Malhara (1985) offers the view that many people possess the seeds of creativeness, but unfortunately the environment fails to provide the needed environment for their growth. He states some ways useful in fostering creativity such as encouragement of overlearning, avoidance of criticism and encouragement of free

thinking.

Singh (1985) exhorts that parental support compensates the disadvantage of low intellectual abilities and socio economic status in the academic achievement and development of mental capabilities of school going children. Kohn (1987) emphasizes research on intrinsic task motivation, a delight in doing something for its own sake and examines the relation between creativity, external rewards and motivation.

Wright (1987) presents an ecological model of the interaction of home and school environment in the development of creative skills in young children. He emphasizes on the primary influence of the family on developing creativity.

e) Creativity and adjustment in adolescents

The term 'adjustment' refers to the extent to which an individual's personality functions efficiently in the world of people. There are certain patterns of behaviour as stated by Hurlock (1981) that are characteristically associated with well adjusted children and others with poorly adjusted children. Ashrafullah and Pillai (1977) state that the individual in order to live a contented and happy life, should meet physiological and psychological demands and achieve harmony with himself and the social set up.

This harmony is known as adjustment. Thus the process of adjustment involves two aspects, adjustment of the individual to his physiological and psychological needs and adjustment of the individual to the social set up. If an individual lacks adjustment of these two aspects he develops adjustment problems.

Thinking is one of the most effective instruments for survival and adjustment and creativity is one of the most important aspects of thinking process (Pandey, 1988).

Singh (1977) remarks that original ideas face an open criticism in the family. The society has a coercive attitude towards divergent thinking. People with original ideas are said to become aggressive; hostile and feel insecure and try to escape from the society and all these lead to social maladjustment.

Zarghar and Dhar (1988) have reviewed the studies conducted by Fransworth (1988), Greenacre (1958), Goertzel and Goertzel (1962), Sinha and Sharma (1978) and Kaur (1980) and revealed that creatives were less adjusted as compared to non creatives. On the other hand, studies conducted by Gust (1964), Terman (1964), Mallappa and Upadhyay (1977) and Singh (1980) contradict the above mentioned findings.

Arora (1982) reviewed the studies made by Reid, Kind and Wickwire (1959), Crutch (1963) and Wallach and Kagan (1965) and reported creatives to be less anxious than non-creatives. Crutchfield (1969) further found that creative students were able to function effectively under stress and strain and preferred complexity. Creative potentiality is considered to be the basic need to solve problems with greater ease and confidence. As quoted by Narthrop (1953), creative persons are viewed by some to be more sensitive and more aware of the problematic nature of their environment than less creatives.

Singh (1977) had undertaken an investigation to study the adjustment of highly/original individuals. The sample consisted of 250 students from class X. Individuals with originality in them were not adjusted in family and society. They had poor health and emotional adjustment. They were maladjusted personalities irrespective their sex differences. Sensitivity, self esteem and confidence of the original creative individuals were the ultimate causes of depression of their personality and directed toward their maladjustment.

Singh (1980) made an attempt to find out the nature and extent of the relationship between creativity and adjustment. Six hundred students from class IX and X were taken for the study. The results revealed that there exists a positive relationship between creativity and adjustment except in the case of emotional adjustment.

Sumangala (1987) studied the relationship between social adjustment and creativity with 262 secondary school pupils (107 boys and 155 girls) of standard IX selected from 12 schools in Kerala and concluded that the relationship between creativity and social adjustment can be explained by assessing creative activities that are performed by subjects to communicate with others and to gain acceptance. It may be this communication ability that <sup>u</sup>ca<sub>s</sub>e the relationship between creativity and social adjustment.

Zarghar and Dhar (1988) investigated the problems of adjustments of creative and non creative students among a group of 490 comprising both boys and girls in the age range 15 to 19 years from 7 colleges. From the 400 subjects, two groups (Creative and non creative) were drawn on the basis of total creativity score obtained by each subject. The results showed

that creative group experienced more problems than non creative ones.

Saxena et al (1986) made an empirical investigation of adjustment patterns of high and low creative adolescents. The sample comprised of 20 high and 20 low creative students. Scores obtained for emotional, social, educational and overall adjustment revealed that in comparison to low creative, high creative scored higher on emotional and social adjustment but lower on educational and overall adjustment.

Ohuche (1987) administered an ideal pupil check list to 127 Igbo secondary school teachers. The results yielded good health/in relation to creative personality. Sharma (1986) reviewed researches on the relation between creativity and personality traits. Most creative persons were well-adjusted.

f) Academic achievement:

Academic achievement is a central concept in the area of educational psychology, as stated by Dehspande and Lodhi(1981).

A person with a good academic performance performs creatively well and vice versa. But this is not true in all cases. There are students who perform very well academically but lack creativity, again there are students who are highly creative but show poor performance in academic work.

Garrison and Garrison (1975) exhort that the high creatives often appear to set high goals for themselves than they can possibly reach considering grades received in grade and high school. The high creatives tend to receive better marks than low creatives. Gakhar (1985) reviewed the studies made by researchers and mentioned that Cline et al (1963) Passi (1971), Crawford (1974) and Yamamoto (1964) found a high correlation between creativity and academic achievement. But Pathak (1961), Flecher (1963) and Edward and Taylor (1965) are of the view that creativity is unrelated to academic achievement.

Singh (1987) claims to provide equal opportunities of education for all the children. There is need to identify the abilities of the students who constitute the two extremes of the continuum of academic achievement that is, high achievers and low achievers so as to plan the curricula in accordance with the abilities of such specific groups. He studied the relationship between creativity and academic achievement among 300 students from Xth

grade, comprising of 154 boys and 146 girls drawn randomly from 4 selected high schools situated in the districts of Simla and Salem in Himachal Pradesh. The results showed that high creative students have significantly higher academic achievement. Yamamoto (1964) found that urban students perform much better than low creative students on standard achievements, regardless of the subject matter involved at the high school level.

Gakkhar (1985) has remarked that the wide range of variation in the value of correlation between intelligence and academic achievement prove the existence of some factors other than intelligence and that is why researchers have lent support to the increasing use of creative tests and attempts to show that such tests are usefully related to academic achievement.

Venkateswaran (1987) found that among 100 students of 11 and 12 standards from Matriculation Higher Secondary School in Madurai, there was no significant difference between creativity and academic achievement. Lewis (1973) found a low correlation of general creativity with academic achievement and intelligence. Wallach and Kagan (1965) did not find any positive correlation between creativity and academic achievement (Dutt, 1988).

Cicerelli (1965) in an attempt to clarify the nature of the relationship among IQ, creativity and academic achievement found an interaction between creativity and IQ as they affect academic achievement. Kaile (1989) studied the relationship of creativity with achievement in languages at three levels of socio economic status with 250 students of 9th standard (in the age range 12 to 16 years) from three urban schools in Ludhiana and Sangrur district and found that creativity has significant relationship with achievement in first language(Punjabi) and English and not with achievement in second language(Hindi).

In a study conducted by Joshi (1982) among 935 capably gifted (IQ, 120 and above irrespective of their level of achievement) and 120 functionally gifted (IQ, 120 and above along with high academic achievement) students randomly selected from VIII to XI students of 23 secondary schools of Baroda city, results revealed that in the case of capably gifted group, correlation between creativity and academic achievement was marked while not so in the case of functionally gifted.

## **Methodology**

### III. METHODOLOGY

The methodology for this study on "Creativity in adolescents and its relationship to their adjustment" included the following steps:

- A. Selection of area
- B. Selection of samples
- C. Selection of tool
- D. Collection of data
- and E. Data processing

#### A. Selection of Area:

Three Higher Secondary Schools, two in Coimbatore and one in Periyanaickenpalayam were selected for this study for its easy accessibility and presence of the required number of students in English medium. They were Avinashilingam Higher Secondary School, Suburban Higher Secondary School, Coimbatore and Swami Shivananda Higher Secondary School, Perianaickenpalayam, Coimbatore respectively.

#### B. Selection of Sample:

Following random sampling procedure adolescents in the age range 13-18 years from class IX and XI from each of the three schools were selected. The total samples consisted of 80 girls and 70 boys. The number of students selected from each school is indicated

below.

	Class IX	Class XI
Avinashilingam Higher Secondary School	40 girls	40 girls
Swami Shivananda Higher Secondary School	--	40 boys
Suburban Higher Secondary School	30 boys	--

### C. Selection of Tools:

The tools for the study consisted of (i) a questionnaire to elicit information regarding the family background and motivation received at home from the parents to develop the child's creative potentials (ii) a test to find out the creative thinking and (iii) an inventory to assess the adjustment in the different areas such as emotional, social, home, health and education.

- i) Tool to elicit information regarding family background and motivation received at home:

A questionnaire (Annexure I) was prepared to collect information from the parents of the selected students. It consisted of questions on aspects such as socio economic status, parents concept of creativity, parent's interest and involvement in guiding their adolescent's creative activities and opportunities and experiences offered to their

children to develop creativity.

ii) Tools to assess creative ability:

The Verbal Test of Creative Thinking (Annexure II) developed by Mehdi (1973) is in use for more than a decade now and has been found consistently reliable and valid tool in the research studies conducted in the area of creativity. Prasad (1979) and Singh (1989) have used the tool to ascertain the effect of teaching methods like problem solving and specially designed teaching strategy on creativity. Singh (1980), Mehra and Singh (1982); Agarwal and Sushila(1982); Singh (1981) and Singh (1985) have used this test successfully.

The battery consists of four main activities or sub-tests namely Consequences test, Unusual Uses Test, New Relationships tests and Product Improvement Test. The different aspects tested by the tool are (a) Fluency (b) Flexibility (c) Originality and (d) Elaboration.

iii) Tools to assess the adjustment of the adolescents.

Adjustment Inventory for adolescents (Annexure VI) evolved by Sinha and Singh (1985) have been used to collect the necessary information regarding the

adjustment of the students. It consists of 102 questions that give necessary information regarding the adjustment of the adolescents in five different areas namely (a) emotional (b) social (c) educational (d) home and (e) health. It can be administered in a group or individually. The positive responses are added to arrive at the total scoring. Lower scores corresponds with better adjustment, while higher scores implies poor adjustment as in score sheet (Annexure - VI).

D. Collection of Data:

After securing permission from the Headmaster/Headmistress in each of the selected schools, necessary arrangements were made in the schools for the selection of the samples and administration of the tests.

Prior to the administration of the tests the students selected for this study were explained about the purpose of the study. After establishing rapport with the students, the creativity test and Adjustment inventory were administered. Then the questionnaires were distributed to the selected students to elicit information regarding motivation received at home.

E. Data Processing:

The relationship between sex and creativity, familial variables and creativity, motivation and creativity and academic achievement and creativity were processed with the help of statistical analysis (correlation coefficient) and the difference between adjustment of high and low creatives and creativity of boys and girls were processed with the help of 't' test.

## **Results and Discussion**

#### IV. RESULTS AND DISCUSSION

The results of this study on "Creativity in Adolescents and its Relationship to their Adjustment" are presented under the following headings:

- A. Background of the selected adolescents
- B. Parents perception of creativity and their role in developing creativity.
- C. Performance of adolescents in creativity test
- D. Low, mediOCre and high creatives
- E. Adjustment status of the adolescents
- F. Relationship analysis between creativity and selected attributes.

##### A. Background of the Selected Adolescents:

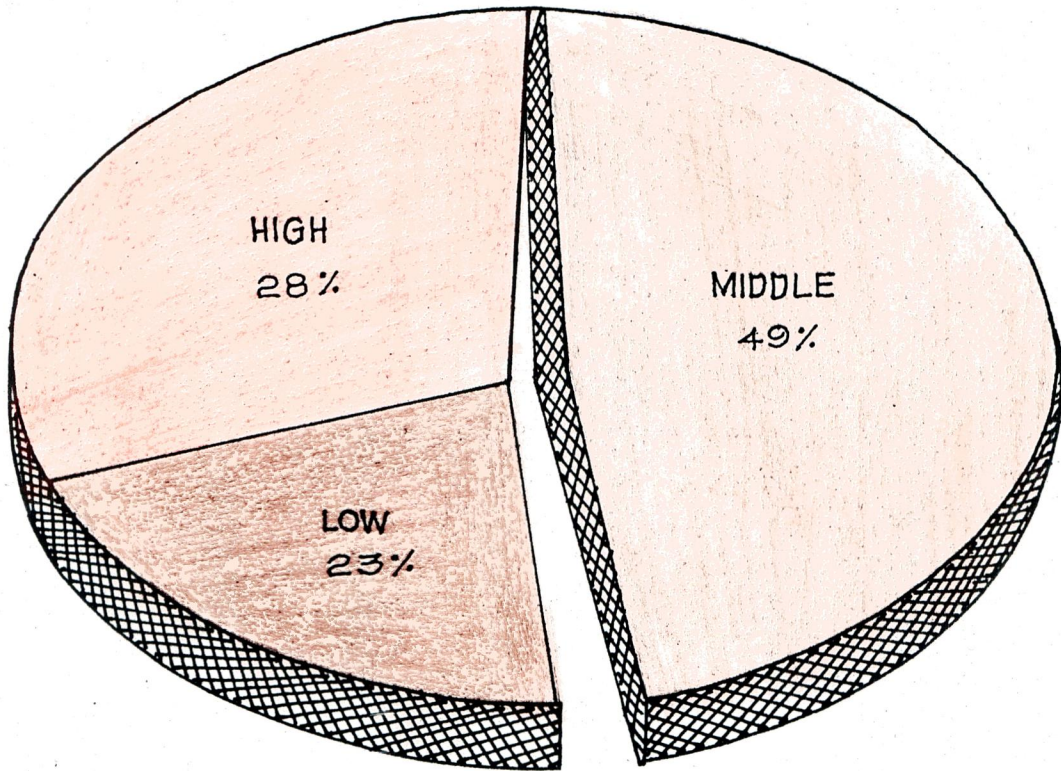
Table I features the socio economic status, family size and occupation of the head of the family of the selected samples.

TABLE I  
BACKGROUND OF THE SELECTED SAMPLES

Details	Status	Income Range	Number in Percentage
SES	Low	Below 1,500	23
	Middle	1,500 - 2,500	49
	High	Above 2,500	28
Family Size	Large	(1-4)	82
	Small	(5 and above)	18
Occupation of the head of family	Government employees		58
	Business		27
	Employees in private concern		9
	Employee in workshop		3
	Agriculturist		3

As per the income division proposed by HUDCO (1985), majority of the adolescents of this study (48%) came from middle income group. Those belonging to lower socio economic status accounted for 23 per cent, while 28 per cent belonged to high socio economic group (Fig.1). Excepting 18 per cent who belonged to large families, majority of the adolescents (82 per cent) were from small families.

Majority of the fathers (56 per cent) were government employees and were working as doctors,



**SOCIO ECONOMIC STATUS OF THE ADOLESCENTS**

Figure 1

engineers, teachers, chartered accountants, clerks and supervisors. Next highest number (27 per cent) were engaged in business. Those who were agriculturists and involved in private concerns in workshops were very few.

B. Parents Perception of Creativity and Their Role in Developing Creativity:

As parents play a significant role in fostering creativity at home, the parents of the adolescents were asked to indicate their concept of creativity, opportunities provided by them for promoting creative growth of their children and how they get involved in the task.

1. Parents' perception of creativity.

Table II presents responses in the meaning of creativity.

TABLE II  
PARENTS' PERCEPTION OF CREATIVITY

S.No.	Responses	Percentage n:140
1.	Creativity is innovative thinking	75
2.	Creativity leads to fruitful spending of time	55
3.	School is responsible to promote creativity	35
4.	Creativity grows, if adequately stimulated at home	16
5.	Creativity is a means of overcoming difficulties	12

It is heartening to note that 75 per cent of the parents viewed creativity as innovative thinking. Their ideas appear similar to Levin (1980), Kumari et al (1986) and Medinus (1976) who held creativity as the process by which something new or novel is created. About 55 per cent realistically stated that creativity leads to fruitful spending of time. While 35 per cent of the parents assigned the total responsibility of developing creativity to schools, 16 per cent supported the views expressed by Bauri (1988) that adequate stimulation at home should be provided to the adolescents for fostering creativity. Perhaps parents need to be made aware of the fact that both home and school play an important

role to kindle the creative potentials of children.

Guilford's (1966) view of creativity as a problem solving activity was held by 12 per cent of the parents of the selected adolescents. Their concept of creativity as a means of overcoming difficulties appears need based.

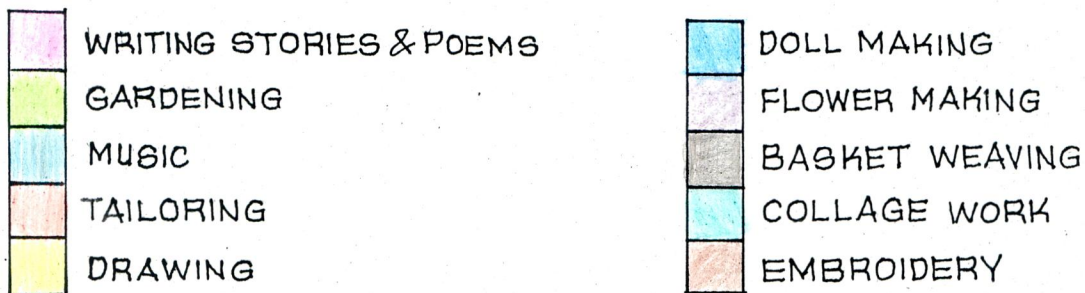
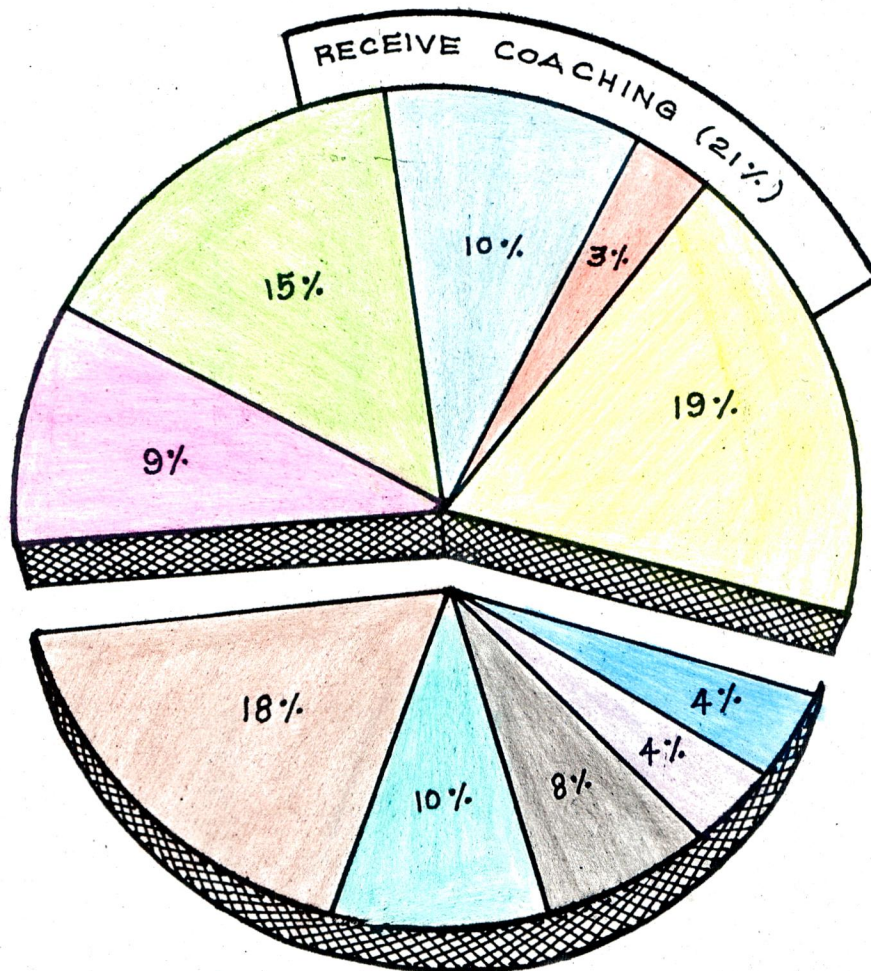
2. Opportunities provided to the adolescents by the parents:

Table III and Figure 2 focus the opportunities provided to the adolescents by the parents to develop creativity.

TABLE III  
 OPPORTUNITIES PROVIDED TO THE ADOLESCENTS  
 BY THE PARENTS

S.No.	Activities provided	Number in Percentage
1.	Handicrafts	(47) .
	Embroidery	18
	Collage work	10
	Basket weaving	8
	Doll making	4
	Flower making	4
	Tailoring	3
2.	Drawing and Painting	19
3.	Gardening	15
4.	Music	(10)
	Dancing	7
	Singing	3
	Playing instruments	2
5.	Writing poems and stories	7
6.	Did not provide any experience	38

Figure 2 shows the percentage of adolescents exposed to different kinds of creative activities. Among the various opportunities provided, majority of the adolescents (47 per cent) had the privilege to involve themselves in various kinds of handicrafts. The number involved in drawing and painting and



OPPORTUNITIES PROVIDED FOR CREATIVE ACTIVITIES AT HOME

Figure 2

gardening were 19 and 15 per cent followed by music (10%) and writing poems and stories (7%).

During adolescence, individuals are capable of innovation, creation and testing. It is disappointing to note that only 23 per cent received more than two opportunities and about 21 per cent did not get any opportunity for any type of creative activities. The parents obviously tend to pay more attention to academic performance of their children overlooking the very essential components of creativity in the child's life. Such negligence to creativity may be attributed to their higher educational aspirations. Parents need to be educated on the lasting values of creativity and its outcomes. Perhaps media can include more programmes to draw their attention to the various issues of creativity.

### 3. Involvement of the parents in creative activities of the adolescents

It is disappointing to learn that only 43 per cent of the parents were involved in helping their children in creative activities.

Table IV projects the ways in which the limited number of parents involved themselves in guiding the adolescents in creative activities.

TABLE IV

## INVOLVEMENT OF PARENTS IN THE CREATIVE ACTIVITIES OF THE ADOLESCENTS

S.No.		Number in Percentage
	Parents involved	43
	Parents not involved	57
	<b>Ways of involvement:</b>	
1.	Handicrafts	55
	Help in selecting and purchasing materials	34
	Selecting the design	25
	Go through craft books	15
	Take the child to exhibitions and workshops	14
2.	Drawing and painting	35
	Give instructions on how to do	20
	Selection of pencils, colours, brushes and material to draw	18
	Help in exchange of ideas through discussion	15
3.	Gardening	
	Introduce new concepts of nature through books and magazines	35
	Visit gardens and other places of interest	27
	Provide necessary tools for gardening	26
4.	Music	
	Sing and play instruments, watch the child practicing dance and giving instructions	45
	Watch T.V. and videos to gain more ideas	41
	Accompany the adolescent to dance recitals	12
	Encourage the adolescent to take part in cultural shows and competitions	10
5.	Write poems and stories	
	Read what the adolescent writes	65
	Encourage the adolescent to listen to the radio, cassettes and watch T.V. to get ideas	52
	Participate in story writing and poem writing competitions	35
	Membership of a library	3
	Provide books and journals	56
	Encourage the child to contribute articles for magazines	15

It is impressive to note that the adolescents who were bestowed with opportunities at home 43% received full co-operation from their parents. They received stimulation from the parents in the form of encouragement, assistance, support, appreciation and reward. The parents had encouraged the adolescents to take part in various competitions connected with creative activities(10%). They accompanied the adolescents to exhibitions and cultural shows that would foster their creativity (10%). Among the parents who did not directly involve themselves, five per cent reported that they did not have the time to spend with their children. Their occupational and domestic affairs had restricted their spending time for the adolescents.

### C. Performance of the Adolescents in Creativity Test:

Table V and Figure 3 project the performance of the adolescents in Verbal Test of Creative Thinking developed by Mehdi (1973) in terms of fluency, flexibility and originality.

TABLE V  
PERFORMANCE OF ADOLESCENTS IN CREATIVITY TEST

S.No.	Score Range	No. of adolescents		
		Fluency	Flexi- bility	Origi- nality
1.	0 - 10	6	2	28
2.	10 - 20	34	22	34
3.	20 - 30	24	40	18
4.	30 - 40	21	23	6
5.	40 - 50	8	9	7
6.	50 - 60	5	2	3
7.	60 - 70	1	2	2
8.	70 - 80	1	0	2

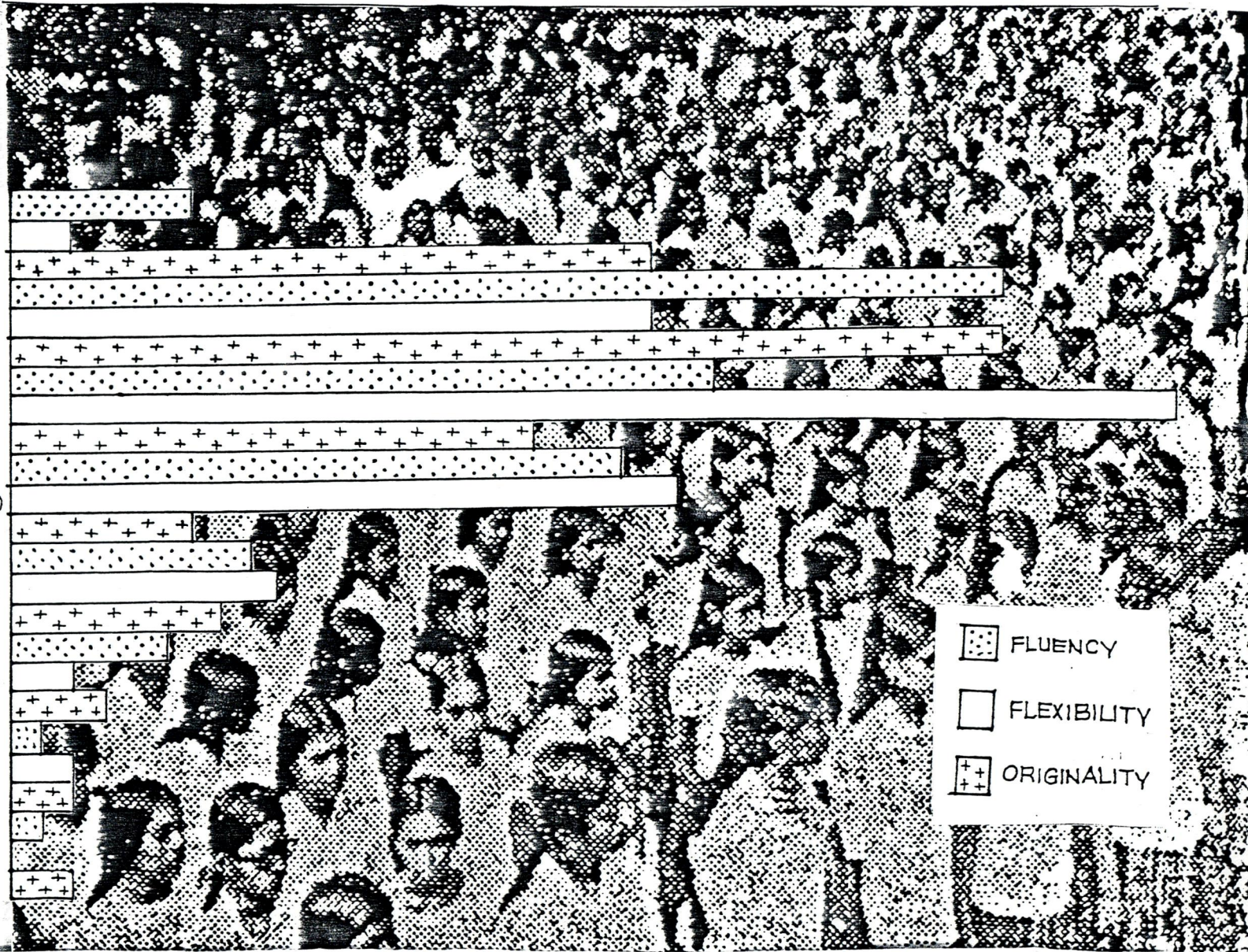
Of the selected adolescents, those who scored more than 50 per cent in fluency, flexibility and originality were 7, 4 and 7 per cent respectively. A large majority scored less than 50 per cent marks in fluency (93 per cent), flexibility (94 per cent) and originality (93 per cent) respectively. The poor performance of the adolescents in the creativity test reflects lack of training in creativity in the present system of education and at home and the need to develop creative dimensions in the adolescents.

# NO. OF ADOLESCENTS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

RANGE OF CREATIVITY SCORES

0-10  
10-20  
20-30  
30-40  
40-50  
50-60  
60-70  
70-80






 FLUENCY  
 FLEXIBILITY  
 ORIGINALITY

Figure : 3 CREATIVITY SCORES OF ADOLESCENTS

One may achieve abundance in many aspects, yet he may be far away from real happiness. It is creativity that opens the doors to the everlasting treasure-house of joy. Hence, it is of paramount importance that the creative abilities of the children are developed right from the very beginning.

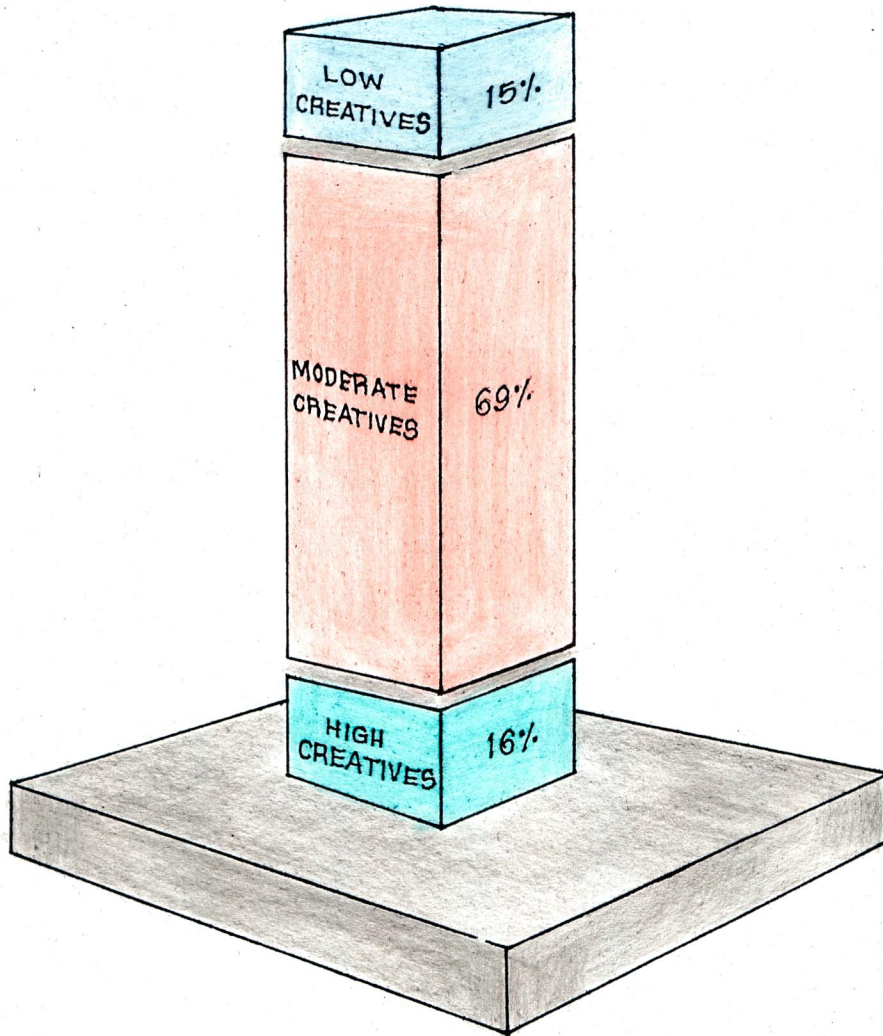
D. Low, Mediocres and High Creatives:

Table VI and Figure 4 present the low creatives, moderate creatives and high creatives among the selected adolescents.

TABLE VI  
LOW, MODERATE AND HIGH CREATIVES

S.No.		Percentage
1.	Low creatives	15
2.	Moderate creatives	69
3.	High creatives	16

As per the norm given by Mehdi (1973) the selected adolescents were divided into three groups; low, mediocre and high creatives (Annexure<sup>IV</sup>). The low creatives accounted for 15 per cent while the high creatives constituted 16 per cent. The majority (69%) belonged to the category of mediocres. It is distressing to note that 69 per cent remain mediocre in their creative functioning. This suggests that



**DISTRIBUTION OF LOW AND HIGH CREATIVES IN THE SAMPLE**

Figure 4

the adolescents need training and adequate opportunities at home and at school in order to develop creative thinking and experiences.

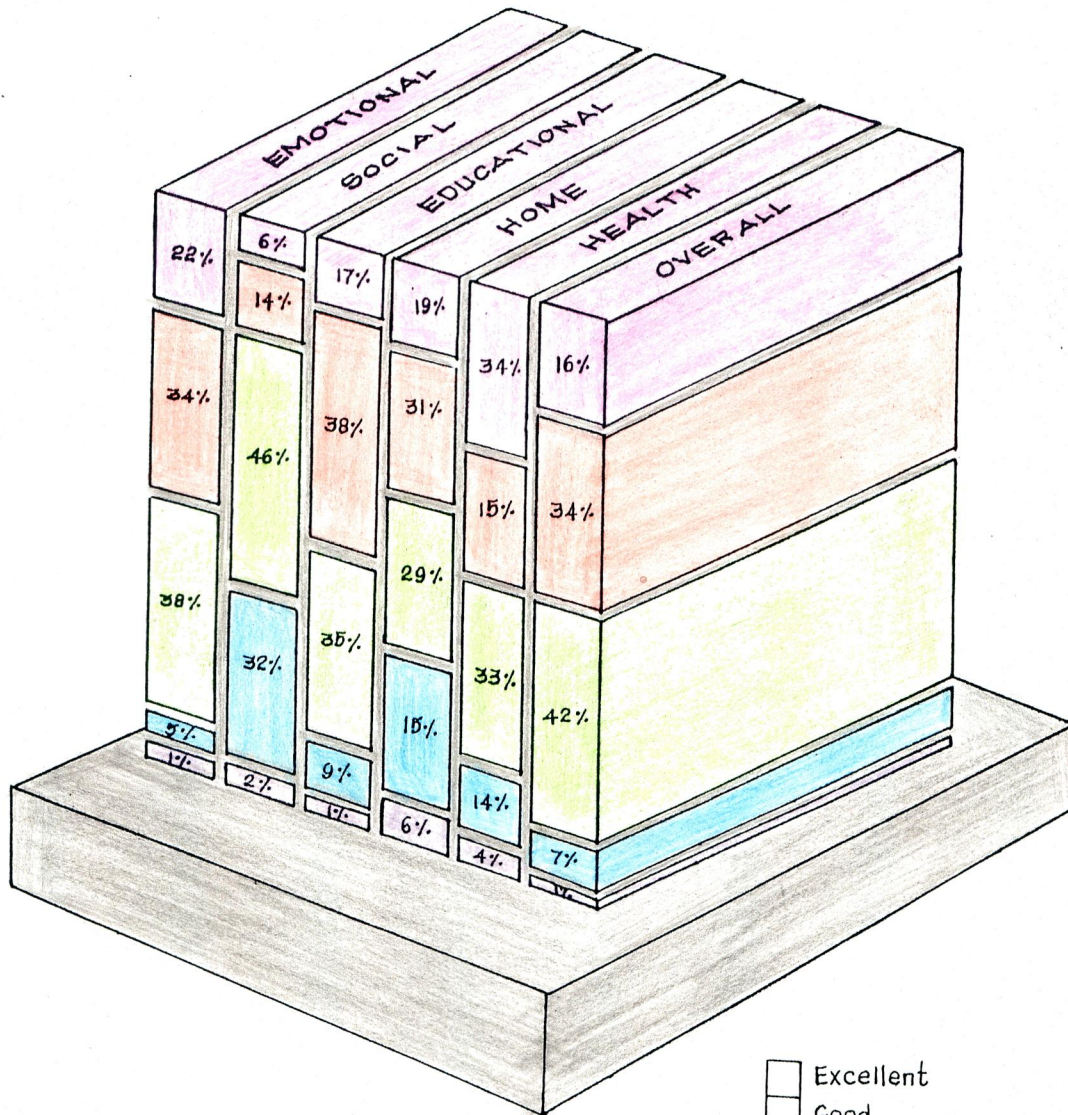
#### E. Adjustment Status of Adolescents

Based on the scores obtained by the adolescents in the Adjustment Inventory devised by Sinha and Singh (1985), they have been grouped under the various categories such as excellent, good, average, unsatisfactory, very unsatisfactory, in their adjustment.

Table VII and Figure 5 show the adjustment status of the selected samples.

TABLE VII  
ADJUSTMENT STATUS OF THE ADOLESCENTS

Areas of adjustment	No. of adolescents rated				
	Excellent	Good	Average	Unsatis- factory	Very unsatis- factory
Emotional	1	5	38	34	22
Social	2	32	46	14	6
Educational	1	9	35	38	17
Home	6	15	29	35	25
Health	4	11	33	15	37
Overall	15	7	42	34	16



- Excellent
- Good
- Average
- Unsatisfactory
- V. Unsatisfactory

ADJUSTMENT SCORES OF THE SELECTED ADOLESCENTS

Figure 5

The adolescents rated to be having good and excellent adjustment in all areas were only 22 totally bringing forth the fact that the adjustment of modern youth in the society is in a state of flux. This result correlates with findings of Pandey (1986) who has reported that adolescents in general show poor adjustment in all areas.

In the area of emotional adjustment it is disheartening to note that only a very few adolescents(6%) were above average. A large number (56%) were below average in their emotional adjustment. The emotional force that shape and determine the behaviour pattern of today's youth used to be thoroughly identified in order to develop them desirably.

In the area of social adjustment, a little less than 50 per cent displayed average social adjustment. Thirty two per cent were above average in their social relationship and adjustment, while 20 per cent were below average as per the ratings accorded to them. Perhaps the societal constraints in the fulfilment of the adolescents' needs have had their influence leading them to poor social adjustment. The adolescents should be given more appropriate opportunities and experiences for social interaction and dynamic relationships.

The adolescents' profile in terms of educational adjustment with just 10 per cent having above average presents a dismal picture. More than 50 per cent having poor adjustment brings forth the emerging need to develop appropriate education that would be challenging for the adolescents. Education should be integrated with practical experience rather than a monotonous routine and the system of examination which does not actually assess the knowledge and creativity of the child but rather test their memory power must be changed for the best.

Very few adolescents had good and excellent home and health adjustment. These two areas where the highest number of adolescents manifest problems pose immediate demands for indepth research.

**F. The Relationship Analysis:**

This section includes relationship analysis on the following:

- Creativity and sex
- Creativity and familial variables
- Creativity and motivation
- Creativity and adjustment
- Creativity and academic achievement
- Creativity among girls and boys.

The 't' values derived to find out the difference between boys and girls in their creativity scores are presented in Table VIII.

TABLE VIII  
CREATIVITY SCORES OF GIRLS AND BOYS

Creativity components	Sex	Mean	SD	Total
Verbal creativity	Girls*	20.40	12.56	0.67
	Boys*	31.93	12.28	
Fluency	Girls	20.40	12.56	2.1
	Boys	10.07	12.28	
Flexibility	Girls	10.11	12.56	1.86
	Boys	23.94	9.48	
Originality	Girls	8.70	16.79	2.55**
	Boys	7.19	13.49	

\*\*Significant at 5 per cent level.

\*No. of girls - 74; No. of boys - 66.

There is no difference in fluency component among boys and girls. The results support the findings of Venkateswaran (1986) that there is no significant sex difference in creativity. As for the component of flexibility also, the trend is similar. Fluency and flexibility more or less depends on the general awareness of an individual and they are

influenced by a person's ability to understand concepts. Today girls and boys get equal opportunities to acquire and assimilate information and knowledge. This may be the reasons for boys and girls being equal in fluency and flexibility scores in this study.

Boys have surpassed girls in their scores for originality and the difference is significant. Originality requires a sense of uniqueness in thinking. Girls get few opportunities to express their divergent thoughts, to take decisions in domestic affairs and to solve problems. It is a fact that parents take all decisions minor to major for their daughters, restricting the chances to think of their own.

Hence, it is essential that parents give an opportunity to their daughters to communicate and express freely their unique thinking and analysis. Decision making should be encouraged so that they would learn to think and act independently.

## 2. Creativity and familial variables

The relationship between familial variables

such as SES, family size and occupation and creativity scores were derived using correlation coefficient and the results are presented in Table IX.

TABLE IX  
FAMILIAL VARIABLES AND CREATIVITY

S.No.	Variables	'r' value
1.	SES and creativity	-0.0643
2.	Family size and creativity	-0.0029
3.	Occupation of the head of the family and creativity	-0.0450

The above table indicates that there is no correlation between familial variables and creativity. The findings support the earlier findings of Zambito (1968) that there is no correlation between SES and creativity. Creativity is influenced by the environment no doubt but one cannot deny the fact that it is an innovative process and much depends on the attitude of the adolescents. An adolescent who wants to learn and enhance his environment will do so even with limited stimulation. He would make the best use of the simple and ordinary stimuli provided to learn. So it is important to include right type of taste and appreciation towards creativism.

The negative correlation between creativity and family size is in tune with the findings of Jariwal (1988). While children from small families tend to get better opportunities and encouragement from their parents for development, children from large families may have better ideas derived as a result of interaction with many individuals. Probably this fact has resulted in the negative correlation between family size and creativity.

It can also be inferred that the type of occupation of the head of the family per se does not have considerable impact on the creativity rather, the interest and attitude of the parents have in various kinds of creative activities a pervasive influence.

### 3. Motivation and creativity

From the responses of adolescents, they were divided into three groups. Those who were favoured with only one creative activity were brought under the category of low motivation; those who received opportunities for more than one creative activity were brought under the category 'moderately motivated' and those who received opportunities for more than two activities along with special coaching were brought under the category of 'highly motivated'.

The relationship between motivation and creativity was found out using correlation coefficient and the results are presented in Table X.

TABLE X  
MOTIVATION AND CREATIVITY

Level of motivation	No.	Creative Score range				'r' value
		20-60	60-100	100-140	140-180	
Low	55	10	17	21	7	0.1884
Moderate	22	4	2	5	11	
High	10	2	1	2	5	

The above table reveals that there is a positive correlation between creativity and motivation provided at home. The results endorse Mehta's (1983) view that home environment plays an important role in fostering the creativity of adolescents.

#### 4. Creativity and adjustment of the adolescents.

Table XI indicates the correlator coefficient arrived at between adolescents' creativity and their adjustment.

TABLE XI  
CREATIVITY AND ADJUSTMENT

S.No.	Variables	'r' Value
1.	Creativity and emotional adjustment	-0.020
2.	Creativity and social adjustment	-0.0053
3.	Creativity and educational adjustment	-0.0013
4.	Creativity and home adjustment	-0.666
5.	Creativity and health adjustment	-0.2201
6.	Creativity and overall adjustment	-0.1854

There was negative correlation between creativity and all areas of adjustment such as emotional, social, educational, home and health. This study supports the findings of Singh (1980) that there is no correlation between adjustment and creativity. Creative people show maladjustment perhaps due to the fact that they have uniqueness more than usual and not accepted by the parents as they deviate from the stereotypes and manifest divergent thinking and action.

#### 5. Low and high creatives and their adjustment.

The total sample of 140 adolescents were divided into low, middle and high creatives on the basis of the norm derived by Mehdi (1973) presented

in Annexure IV . Twenty three high creatives and 21 low creatives were drawn from the sample and statistical analysis was done to find the difference between the adjustment level of high and low creative groups in the areas of emotional, social, educational, health and overall adjustment, using 't' test (Annexure<sup>VII</sup><sub>A</sub>). Table XIV and Annexure VIII show the result of the analysis.

TABLE XII  
LOW AND HIGH CREATIVES AND THEIR ADJUSTMENT

Areas	High creatives n:23	Low creatives n:21	't' value
Emotional	376	351	0.2140
Social	154	158	0.1440
Educational	207	178	0.4027
Home	144	145	0.5639
Health	102	99	0.2621
Overall adjustment	1001	931	0.0113

Here again there was no significant difference between high and low creatives in the areas such as emotional, social, educational, home, health and overall adjustment. Creativity perhaps does not play a significant role in determining the adjustment of adolescents as they are independent attributes.

On the basis of the findings it may be said that both high and low creatives have equal capacity for adjustment in the various areas such as emotional, social, educational, home, health and overall adjustment.

#### 6. Creativity and academic achievement.

The relationship between creativity and academic achievement (Fig. 6) was found out applying correlation coefficient (Annexure VII) and the results are presented in Table XIII.

TABLE XIII  
CREATIVITY AND ACADEMIC ACHIEVEMENT

Variables	'r' value
Creativity Scores	0.0007
Academic achievement scores	

A positive correlation is revealed on the basis of statistical analysis which correlates with the findings of Singh (1987) that the high creatives are remarkably high in their academic achievement. The positive correlation between creativity and academic achievement is obviously because both creativity and intelligence are integral aspects of an individual's mental functioning. The adolescents who are rightly

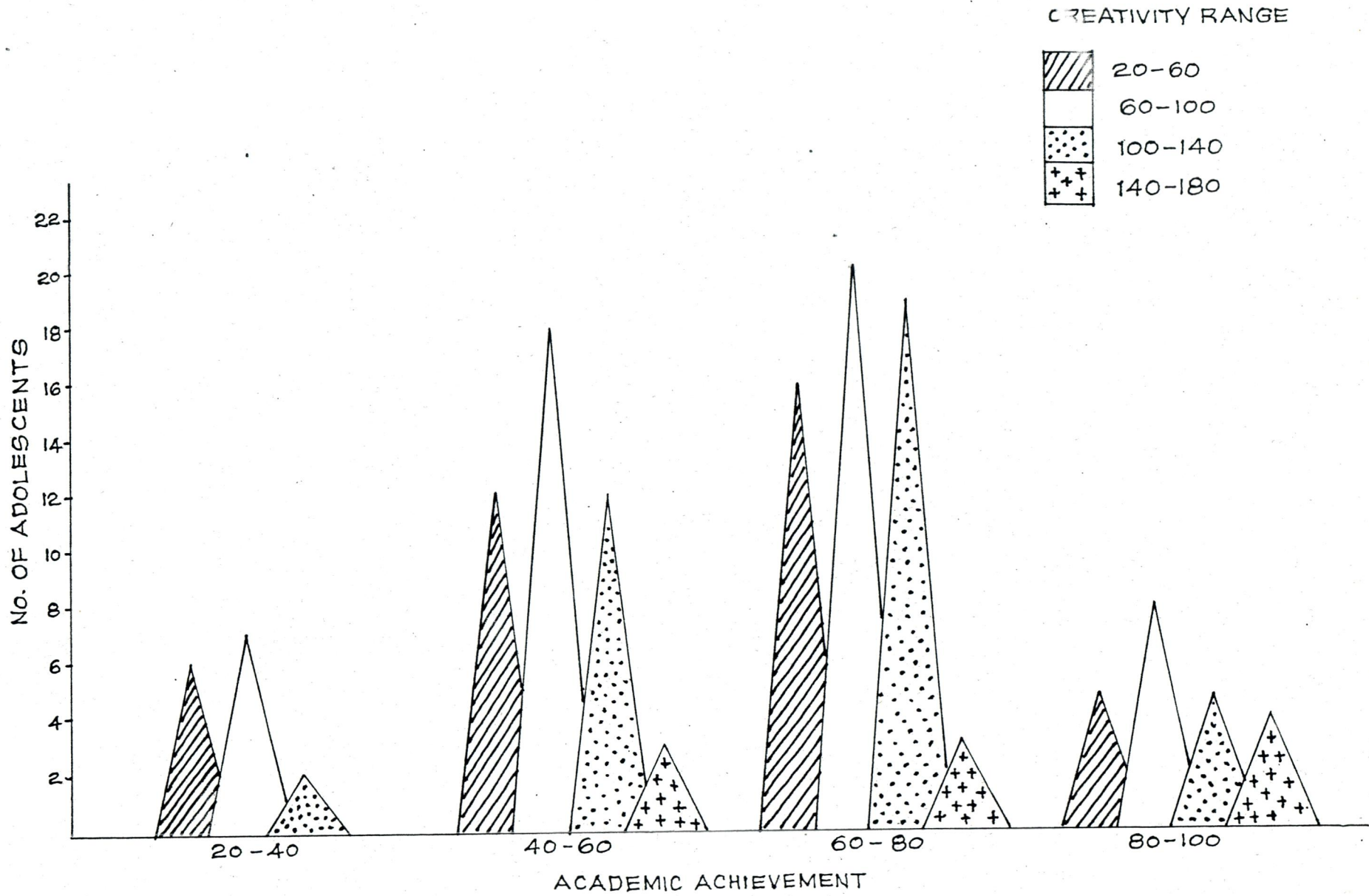


Figure 6

SHOWING CREATIVITY SCORES AND ACADEMIC ACHIEVEMENT

*not needed*

initiated and urged to aspire for higher academic performance move forward without much difficulties. On the other hand, those who lack such help, become poor achievers and dedicate more time to studies in order to cope up with the expectations. Thus they are struck with studies and hardly devote time and efforts to think something creative other than their studies.

## **Summary and Conclusion**

## V. SUMMARY AND CONCLUSION

This study on 'Creativity of Adolescents and its Relationship to their Adjustment' was carried out with 140 adolescents selected from Avinashilingam Higher Secondary School, Swami Shivananda Higher Secondary School and Suburban Higher Secondary School in Coimbatore city.

This study mainly included

1. Assessment of creativity of the adolescents using Verbal Test of Creative Thinking (Mehdi, 1973).
2. Assessment of the adjustment of the adolescents using an adjustment inventory (Sinha and Singh, 1983).

Statistical appraisals were done to study the relationship of creativity with variables such as sex, socio economic status, family size, occupation of the head of the family, academic achievement, adjustment of the adolescents and motivation provided at home.

The background information collected revealed that, about 50 per cent of the adolescents belonged to middle SES. Those belonging to low and high SES were 23 and 28 per cent respectively. Excepting 18 per cent, the rest hailed from large families. More

than 50 per cent of the parents of the adolescents were well placed in their occupations.

The summary of the results of this study is presented below:

1. As perceived by the parents, creativity is a process of innovative thinking (75%), involves fruitful spending of time (55%), a responsibility to be borne by the school and home (35%) and is a means of overcoming difficulties(12%).

2. The adolescents (62%) got inadequate opportunities to develop their creativity and the type of activities were also few and stereotyped. Very few (11%) had received and made use of opportunities to involve themselves in more than one creative activity.

3. Very few parents (32%) involved themselves in guiding the activities of the children. As part of their involvement parents mainly accompanied the adolescents to exhibitions, cultural shows and to other places of interest (23%).

4. The adolescents who scored less than 50 per cent in fluency, flexibility and originality, each in the verbal test of creativity were above 93.

5. Of the total sample, 69 per cent were moderate creatives against 15 per cent of low and <sup>16 Per cent</sup> high creatives.

6. The adolescents fared low with only 5, 32, 8, 15 and 11 per cent rated as having good and excellent adjustment in the emotional, social, educational, home and health adjustment.

7. The adolescents showed a good academic performance with a majority (74 per cent) getting more than 50 per cent marks.

8. There was no relationship between creativity and the overall adjustment was negative. Each areawise emotional, social, educational, home and health also, the trend was similar.

9. A positive correlation was observed between creativity and academic achievement of the adolescents.

The following recommendations emerge out of this study:

1. Educationists and administrators should bring about an awareness among parents to give more importance to the creative expression of the adolescents.

2. The schools should play an important role in fostering creativity of children by making the whole system of education need based and action oriented.

3. Voluntary organisations, youth clubs should introduced meaningful creativity camps, workshops, demonstrations and exhibitions in their performances.

4. The Education Departments, Councils should organise special training for the teachers in promoting creative activities.

5. The relationship between creativity and motivation provided at home needs further investigation.

6. The media system should develop more focus on the need and perspectives of supporting and supplementing creative growth in children.

7. Almost all the studies that relate adjustment and creativity seem to make use of conventional inventories which do not take into account the special problems of adjustment confronted by children. This indicates a need for a systematic and structural method of studying problems specific to creative children.

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## **Annexures**

**ANNEXURE - I**

Questionnaire to elicit information regarding creativity of adolescents from their parents.

1. a) Name of the respondent:

Address

Age

Occupation

b)

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S. No.	Name	Relation to Head of family	Marital status	Age	Educa- tion	Occupa- tion	Family Income per month
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c) For other sources of income (per moth mention below:

2. What is your idea about creativity?

3. What are the creative activities you are interested in?

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Interested	Activities made possible for your adolescents	Reasons
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4. What is your child mostly interested in?

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Activities interested in	Reasons
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5. Do you involve yourself in guiding your adolescent's creative activities?

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Activities guided	Reasons
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6. Does your child receive special coaching in any activity (mention if yes).

7. What you have done to fulfil your child's interests?

8. What opportunities do you give to your children to show their talents in the best way?

9. How do you want your child to progress in creative activities?

**ANNEXURE - II**

**REMINDER**

To

The parents/Guardian,

I would like to request you to kindly fill up the questionnaire as I have selected your son/daughter as sample for my dissertation titled **"Creativity and its relationship with adjustment in adolescence"**

Looking forward for your early reply,

Thanking you,

Yours sincerely,

II M.Sc student

Avinashilingam Deemed University  
Coimbatore 641 043.

ANNEXURE - III

THINKING CREATIVITY WITH WORDS

Dr. BAQER MEHDI,  
M.A.(COLUMBIA) Ph.d. (ALIGARH)  
Professor in Education,  
NCERT,  
NEW DELHI 110 016.

Name	Birth date	Age
Std.	Faculty	
Institution . . . . .		
Father/Guardian's Name . . . . .		
Occupation of Father/Guardian . . . . .		
Address of Home . . . . .		Date . . . . .

INSTRUCTIONS:

1) "Novelty, originality and creative ability play an important role in man's life. All inventions are the result of man's ability to think in novel ways. There are many things in this world which can be made more interesting and useful by the use of our imagination and creative thinking. People who possess this ability have been responsible for many new inventions and discoveries.

2. "On the following pages in this booklet you will find mentioned some interesting problems which, if tackled imaginatively and creatively, may result in interesting and novel responses. You will enjoy doing these problems.

3. "The activities given in this booklet relate to problems of your daily life. They do not have right or wrong answers. You have to think of as many novel and interesting things about them as you can. Try to think of such things as no one else in your class may have thought of. In fact, your novel and creative responses will enable us to know about your ability to think about things in a creative manner. Therefore, write as many novel and interesting ideas as you possibly can, even if they appear to you to be impossible.

4. "You have been given four activities to do. For convenience sake, each activity has been separately timed. Try to work as quickly as you can. If you finish an activity before the time for it is up, do not go to the next activity until you are told to do so. Use your remaining time to think quietly about the different tasks of the activity, and write whatever new ideas come to your mind about any of the tasks in that activity. At the end, you will be given five minutes extra. If you get any new idea about any of the problems which you could not mention at the time you were working on them, Please write it in the extra time allowed to you.

5. "Attempt every task of the four activities. When you are asked to begin, immediately start your work. If you have to ask any thing, please do it now. If you have no difficulty now, but find one later, quietly raise your hand from your seat so that your difficulty may be removed".

#### INSTRUCTIONS FOR ACTIVITY I

1. " On the following pages you have been given some situations which will appear to you as impossible. You have to think what would happen if such situations actually arise.

2. "Give as many ideas as may come to your mind but try to think as many novel ideas as you possibly can, ideas which you think no one else might have thought. Write your responses in the space provided.

3. "You will be given 15 minutes for the three items of this activity. After every five minutes you will be told the time so that you may move on to the next item in the activity.

4. "Below is given an example which will help you to know what you have to do.

## PROBLEMS

1. What will happen if man starts to fly like birds?
2. What will happen if your school gets wheels?
3. What will happen if it is not necessary for man to eat?

## ACTIVITY NO (II) UNUSUAL USES TEST

### INSTRUCTIONS FOR ACTIVITY II

1. " On the following pages you have been given names of certain things which could be used in many different and new ways. You have to think in now many different and new ways the things may be used.

2. " Write as many uses as you can, but try to think those which are novel i.e. those which you think no one else might have thought.

3. " You will be given 12 minutes for the three items of this activity. After every four minutes you will be told the time so that you may move on to the next item in the activity.

4. " Below is given an example which will help you to know that you have to do.

### PROBLEMS

1. Piece of stone

2. A wooden stick

3. Water

ACTIVITY NO (III) NEW RELATIONSHIPS TEST

INSTRUCTIONS FOR ACTIVITY NO (III)

1. " On the following pages you have been given pairs of words which can be related to each other in many different ways. You have to think in how many different and new ways are they related.

2. "Write as many relationships as you can, but also try to think those which are novel, that is, those which you think no one else might have thought.

3. You will be given 15 minutes for the three items of this activity. After every 5 minutes you will be told the time so that you may move on to the next item in the activity.

4. Below is given an example which will help you to know what you have to do.

#### PROBLEMS

1. Tree and House

2. Chair and staircase

3. Air and Water

ACTIVITY NO (IV) PRODUCT IMPROVEMENT TEST

INSTRUCTIONS

"Just keep in mind a simple model of a toy horse. You have to imagine in what ways you can change this into an interesting and novel one. You may think of adding any number of parts or accessories in order to make it really beautiful and or useful. Do not bother about the cost of the new parts or accessories that you would like to use.

" Write all the ideas that come to your mind in serial order in the space given below".

" You will be given 6 minutes for this activity".

## ANNEXURE - IV

### PROCEDURE FOR SCORING

As there is no right or wrong responses for the test much care has to be exercised at the time of scoring. The scorer has to acquaint himself fully with the method of scoring and the use of scoring sheet.

The following points have to be kept in mind while scoring:

1) Each item is to be scored for fluency, flexibility, and originality. The definitions of these terms are given below:

**FLUENCY:** Fluency is represented by the number of relevant and unrepeated ideas which the testee produces. Relevance is judged on the basis of the appropriateness of the response when considered in relation to the test problem. An unrepeated idea is one which has been expressed only once under a given problem.

**FLEXIBILITY:** Flexibility is represented by a person's ability to produce ideas which differ in approach or thought trend. All ideas which fall under one category of approach or thought trend are treated as one for purposes of flexibility scoring. Thus if five ideas are produced and

all belong to only one category of approach or thought trend, then the score will be five. There could be intermediate scores for flexibility depending on the number of categories of thought trends to which the responses belong.

ORIGINALITY: Originality is represented by uncommonness of a given response. Responses given by less than 5% of the group are treated as original.

2) The scores may be directly entered on the answer sheet by closely following the scoring guide.

3) If the scorer comes across responses which are not mentioned in the scoring guide, he should briefly mention them on the backside of the scoring-sheet and score them for originality after all the test scripts have been scored. The instructions for scoring the new responses for originality are also given on the scoringsheet.

Flexibility categories for such new responses will also have to be determined at the time of scoring. If the new response falls in a category which is already given in the scoring guide, the same should be used. But if the new

responses seems to belong to an entirely new category then a new alphabet serial should be used for scoring.

#### INSTRUCTIONS FOR SCORING

1) Scoring for fluency: In scoring for fluency, the scorer should go through the responses to the item in question carefully and strike off those which are irrelevant and or have been repeated. He should then count the remaining number of responses and enter this number as the fluency score for the item in the appropriate box in the scoringsheet.

2) Scoring for flexibility: In scoring for flexibility, the scorer should first acquaint himself with the categories of responses given for each item in the scoring guide. For convenience sake, he should note in bracket against each response, the alphabet serial of the category to which it belongs. If he comes across a response which has not been mentioned in the scoring guide, he should himself determine the category to which it would seem to belong. If the response is such that it belongs to an entirely new category not considered in the scoring guide, he should give it a new alphabet serial, and note it down in bracket against the response in question. After he has gone through all the responses to a given item, he should see how many different

categories have been used by the testee. This can be easily determined on the basis of the number of different alphabet serials used. The flexibility score will be the total number of different alphabet serials used. Thus, if out of eight responses given by the testee to an item, two have been given under category A, three have been given under category B, one has been given under category C, and two have been given under category D, then the flexibility score for this item will be four.

3) SCORING FOR ORIGINALITY: As has been said above, originality scoring is done on the basis of statistical uncommonness of responses. the more uncommon the response, the higher the originality weight. The weights for originality scoring have been determined on the basis of the following scheme. If a response has been given by 1% to 1.99% of the testees, then the response will get an originality weight of 4; if a response has been given by 2% to 2.99% of the testee, then the response will get an originality weight of 3; if a response has been given by 3% to 3.99% of the testees, then the response will get an originality weight of 2; and if response has been given by 4% to 4.99% of the testees, then the response will get an originality weight of 1. Response given by 5% or more of the testees will get an originality weight of zero.

In the scoring guide, the originality weights have been mentioned for all the original responses, and should be used as such. They are based on a sample of 300 urban children of Aligarh City studying in classes VII and VIII. It is difficult to say that all possible original responses have been obtained, but it would seem that most of such responses have been obtained. However, if the test user finds in his own sample, certain responses which have not been mentioned in the scoring guide, he should note them down separately on the reverse side of the scoring sheet, and when he has scored all the answer scripts, he should work out the originality weight for those responses on the basis of the scoring scheme given above, and then add these scores by putting a plus sign in the appropriate box where he has already noted the originality scores based on the originality weight given in the scoring guide.

#### SCORING SUMMARY:

A table has been provided in the scoring sheet to summarize the scores for fluency, flexibility and originality obtained by the testee on different activities. The total fluency, flexibility, and originality scores have to be entered in the appropriate columns of the table. The composite creativity scores should be entered after converting the raw

scores into standard scores. This is necessary because the standard deviations of the three scores sometimes markedly vary, and if raw scores are added up then the ranking will be greatly affected.

Procedure of converting raw scores into T scores:

Once the total raw scores have been obtained for fluency, flexibility, and originality dimensions of creativity, the following procedure for converting raw scores into T scores should be adopted.

1) Calculate Mean and SD for the total raw scores of each dimension.

2) For converting the raw scores into 'T' scores with  $M = 50$  and  $SD = 10$ , use the following

$$\text{formula } T = \frac{10 (X-M)}{SD} + 50$$

3. For making the calculations easier the formula can be written as  $10/SD (X-M) + 50$  where  $10/SD$  will be a constant value by which each  $X-M$  can be multiplied; then add 50. In the total sample, the same raw score may occur a number of times, therefore the calculation of T scores can

be further facilitated by first preparing a conversion table. The conversion table can be used easily for converting the actual raw scores by merely looking at the conversion table.

4. Mean and SD of the different creativity dimensions can be easily calculated with the help of hand calculator.

Interpretation of scores:

**Norm tables** for urban and rural samples of Classes VII and VIII have been provided for the different scores obtained on the test. It is however suggested that norms should be used only as guide, if the test user thinks that his sample is different from the samples for which norms have been prepared.

Norms for special groups and for pupils at different age levels will be developed as more and more data are collected on the test.

The following points have been mentioned in order to facilitate the interpretation of scores by the test user:

1) The scores on the test give information about those thinking abilities which are not measured by intelligence test. These abilities have been found to be related to creative thinking.

2. In the absence of norms for different groups, interpretation has to be based on high and low scores on the tests. If the group is sufficiently heterogenous it is recommended that scores which are I.S.D above the mean should be used to mark out the high creativity group and those which are I.S.D below the mean should be used to designate the 'low creavity' group.

3. The total raw fluency, flexibility and originality scores should not be added up to obtain a composite creativity score without converting them to standard scores. The composite creavity scores should be based on standard scores instead of raw scores. As has been pointed above this is because of differences in strandard deviations of fluency, flexibility and originality scores.

4. In the absence of information about the use of separate factor scores, it is recommended that only the composite creavity score should be used for grading pupils on creativity.

5. Research workers who use the test on a specific sample should prepare their own norms, if necessary.

**A N N E X U R E V**  
**S C O R I N G G U I D E**

List of Categories and the Responses on Verbal Test of Creativity

Activity No.	Item No.	Category Alphabet Serial	Category	Response	Originality weight
1	2	3	4	5	6
1 (Consequences)	1	A	Effect on Transport and Travel	1. Disuse of Vehicles 2. Disuse of aeroplanes 3. Disuse of parachute 4. Ease in travel	4
		B	Effect on Communication	1. Disuse of telephone 2. Disuse of postal communication	5
		C	Effect on Living Habits	1. No walking 2. Less privacy 3. No use of stairs 4. Living on trees possible 5. Need for tight clothes	1 2
		D	Thrill of New Experience	1. Moon travel made easy 2. Travel to fairy land 3. Meeting with angels	4 3
		E	Man-Bird Relationship	1. Competition between species 2. New friendships 3. Hostility with birds	2

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F	Self-Defence	1. Safety from fire 2. Safety from dangerous animals 3. Safety from flood	
G	Biological Changes	1. Legs will become shorter 2. Tail will be developed 3. Wings will be developed 4. Sharp visual activity 5. Brain will become more alert	5 4
H	Overcoming Hurdles	1. No need for bridges 2. Going to hill top easier 3. Ditch crossing easier 4. Plucking of fruits from trees possible 5. Hunting will become easy	1 2
I	Effect on sports, Games Recreation	1. Ease in high jump 2. New sky games will be developed 3. Competition in flying	3 4 5
J	Observation Facility	1. Can see from above 2. Spotting lost persons easier 3. Riot control easier	2
K	Effect on Economy	1. Saving of money in travel 2. Loss to shoe industry 3. Loss to automobile Industry 4. Profit to goggle industry	4 2 5

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	L	Legal and Administrative Implications	<ol style="list-style-type: none"> <li>1. More thefts</li> <li>2. Ease in smuggling</li> <li>3. Ease in spying</li> <li>4. More illegal crossing into other's territory</li> </ol>	4	
	M	Problems of Traffic Control	<ol style="list-style-type: none"> <li>1. Need for new rules</li> <li>2. No traffic jams</li> <li>3. Crowding in air</li> <li>4. Possibilities of more accidents</li> </ol>	3 2	
	N	Social and Political consequences	<ol style="list-style-type: none"> <li>1. New pattern of society will be evolved</li> <li>2. Less number of suicides</li> <li>3. Less number of deaths due to accidents</li> <li>4. New types of Housing problems</li> </ol>	4 2 2	
	O	Psychological Consequences	<ol style="list-style-type: none"> <li>1. Tensions reduced</li> <li>2. Removal of inferiority complex</li> </ol>	4 4	
	P	Art, Literature and Poetry	<ol style="list-style-type: none"> <li>1. New ideas for poets</li> </ol>	3	
1	2	A	Educational Implications	<ol style="list-style-type: none"> <li>1. Rural population benefited</li> <li>2. Increase in mobility</li> <li>3. Ease in study</li> <li>4. New concepts of education may develop</li> <li>5. Admission</li> </ol>	4

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B	Problem of Location	1. No. Address	2
		2. Difficulty in searching school	3
		3. Seasonal change in location	
C	Traffic Problem	1. Traffic Jams, etc.	
		2. Accidents	
		3. Broad roads will be required	1
D	Inconveniences and Hazards	1. Reading inconvenience	4
		2. Black board falling	
		3. Electricity connections	5
		4. Water supply	
E	Psychological Effect	1. Lack of concentration	3
		2. Less boredom	4
F	Social consequences	1. Unemployment	4
		2. Will bring people and places nearer	
G	Economic Implications	1. Need for fuel, engine	1
		2. Saving of money	3
		3. No school bus	2
H	Special Advantages to pupils	1. No late coming	
		2. Ease in coming	
I	Effect on school Building	1. Cracking of walls	3
J	Amusement	1. Recreation	
		2. Tours	

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1	3	A	Social consequences	1. No begging	1
				2. No. food problems	
				3. Relief to poor	2
				4. No. population problem	
				5. No feeding problem	
				6. No. famines	
		B	Effect on Man's Morals and Religion	1. No. hoarding	
				2. More honesty	3
				3. No jealousy	1
				4. No fasting	4
		C	Change in scientific Research	1. No agricultural research	1
				2. Chemical research will take new turn	2
		D	Effect on Human Biology and physique	1. Man will become machine	2
				2. Live by water alone	
				3. No digestive system	4
				4. Lazy	
				5. Better vocal organ	4
		E	Effect on Economy and occupation	1. No. farming	
				2. No hotel	
				3. No unemployment	
				4. No food export	
				5. More cotton	3
		F	Effect on sanitation	1. Disuse of lavatory	
				2. Decrease in pollution	3

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		G	Amusement and Recreation	1. Joy of life reduced 2. More sports 3. Ease in long travel	3 2
		H	Psychological Implitations	1. Deprivation 2. Lack of motivation 3. Less worries	3
		I	Miscellaneous Responses	1. More time to study 2. Animal's position Improved 3. No need for crockery 4. Saving of time 5. More time for love 6. More progress 7. No war	1 3 4
II	I	A	Games and Paly	1. Doll 2. Throw in air 3. Wave in water	
Unusual uses		B	Instrumental use	1. Lightening 2. Fire 3. Grinding 4. Sharpening 5. Plucking	4
		C	Anti social use	1. Hunting 2. Damaging	
		D	Building Purpose	1. Repair 2. Plugging holes	2

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	E	Defensive use	1. Defence	
	F	Decoration	1. As a show piece	1
			2. As a present	3
			3. To build path	
	G	Weights	1. As paper weight	
	H	Scientific use	1. To perform practical tests	
	I	Writing use	1. For writing	
	J	Use as support	1. Support	
2	A	Self defence	1. Saving life	
Wooden stick	B	Anti-social purpose	1. For hurting others	
			2. As a weapon	
	C	As an accessory	1. For writing	
			2. Plucking	
			3. Pointer	
			4. Flag hoisting	3
	D	Support	1. For supporting	
			2. Hanging things	
	E	Games & Sports	1. Use as pole vault	4
			2. Stand	
	F	Decoration	1. As baton	2
			2. Gift pieces	

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	G	Measurement	1. As foot	
	H	Domestic use	1. Housing building 2. Furniture 3. To make hole 4. Burning	1
3	A	Saving of life	1. Man 2. Animal 3. Plant	
Water	B	For Cleaning Purposes	1. Washing clothes 2. Bath 3. Cleaning wounds 4. Cleaning (General) 5. Purification	3 2
	C	Play and fun	1. Swimming 2. Sailing 3. Fountains 4. Throwing on others	4 5
	D	Industrial uses	1. Solvent 2. Steam 3. Ice 4. Mixing	1 2
	E	Destructive use	1. Killing	
	F	Domestic and Everyday use	1. Decoration 2. Extinguisher 3. Cooking	

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		G	Miscellaneous uses	1. Irrigation 2. Digestion 3. Drinking 4. Cooking	
III New Re- latio- ships	1 Tree & Building	A	Commonness in Physical Characteristics	1. Rigidity 2. Strength 3. Can be demolished 4. Need ground 5. Have foundation 6. Have climatic effect 7. Can be burnt 8. Have definite size	4 2
		B	Place of Frequent Visits	1. For birds 2. For evil spirits 3. For man 4. For animals	3
		C	Shelter	1. Living 2. For shade 3. For hiding	5
		D	Place for Entertainment	1. Love and romance 2. Games (Indoor) 3. Debates	4 1
	2	A	Commonness in physical Characteristics	1. Breakability 2. Made of wood 3. Both have legs 4. May fall down 5. Moveable	2 1

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	B	Commonness in Everyday use	1. Sitting 2. Climbing	
	C	Use in Games	1. Games 2. Sports	2
	D	Sundry Responses	1. Lifeless 2. Both have centre of Graving	4 5
3 Air & Water	A	Essential for life	1. Essential 2. useful	
	B	Commonness in Chemical Properties	1. Can be mixed 2. Both have oxygen 3. Fluid 4. Fluent flow 5. No size 6. Expand on heating 7. Found every where 8. Both can be impure	4 3 2
	C	Medium of Transfer	1. Disease 2. Goods	5
	D	Agents of change	1. Climatic 2. Cooling agent	4
	E	Games and Play	1. Play and fun	
	F	Extinguisher	1. To extinguish fire	

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IV Product Improvement	Toy House	A	Mechanical Arrangement	1. Can be mechanized	4
				2. Open and shut mouth	
				3. Add motor	
				4. Whistle	
		B	Construction Material	1. Transparent material	
				2. Plastic	
		3. Iron			
		4. Wood			
C	Decoration	1. Paint			
		2. Garland			
		3. Seat doll			
D	Making Body parts unusual	1. Unusual nose	1		
		2. Wings		2	
		3. Illuminating eye		4	
		4. Movable ear			
E	Adding New Things	1. Cart	4		
		2. Wheels			
		3. Engine			
		4. Radio			
		5. Saddle			
		6. Handle			
		7. Chariot			
		8. Spectacles			
		9. Seat			
		10. Briddle			
		11. Bell			
		12. Man on seat			
F	Unusual postures	1. Dancing			
		2. Jumping			
		3. Long Tail			

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G      Motion Arrangement

1. Movable
2. Able to run

H      Electrification

1. Electrification

4

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## ANNEXURE VI

### ADJUSTMENT INVENTORY FOR ADOLESCENTS

Reusable Booklet.

A I C S

(English Version)

Confidential,

Prof. A.K.P. Sinha (Raipur)

Dr. R.P Singh (Patna)

#### INSTRUCTIONS

Do not open or turn any page of this booklet until you are told to do so.

Do not make any mark in this booklet and handle it with care.

You have this booklet in which some questions relating to your personality are given and your answers are to be marked on the separate answer sheet provided. You will find two cells against each questions on the answer sheet, from your side left hand cell is indicating 'Yes' response while right hand cell is indicative of 'No' response. Out of these two cells, you have to draw a circle around any one which is applicable on you. Keep in mind that no item is false or true. What is true concerning you, draw a circle around that only. If the answer of question is 'Yes' about you, draw a circle around on left hand cell and if it is 'No' draw a circle on right hand cell.

Your responses will be kept in complete secret, so answer them without any hesitation. There is no time limit, but try to finish it as early as possible.

NATIONAL PSYCHOLOGICAL CORPORATION

4/230 Kacheri Ghat

AGRA - 282 004 (U.P)

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1. a) Have you ever strongly desired to go home?
2. b) Do you often daydream?
3. e) Do you feel that many of your friends have better educational background than you in many subjects?
4. d) It is difficult for you to sleep sometimes even when there is no noise disturbing you?
5. c) Do you avoid meeting your friends in a public place?
6. a) Do you feel that true love and affection is lacking in your home?

7. b) Do you feel quite tired by the end of the day?
8. d) Do you feel difficulty sometimes?
9. e) Are you often worried because of your memory?
10. a) Has your home become full of problems for you due to lack of money?
11. d) Do you get discouraged easily?
12. c) Are you of a shy nature?
13. d) Do you get excited in debates?
14. e) Are you more interested in the cinema actors than the learned people?
15. a) Have your parents interfered or objected to the company of some of your friends with whom you move around?
16. b) Have you ever had a major operation?
17. a) Does your father or mother get irritated soon?
18. c) Do you ask the speaker some questions in a meeting?
19. d) Do you believe that you are nervous?
20. a) Do you often quarrel with your brothers and sisters?
21. b) Do you often feel dizzy?
22. d) Does it displease you when something small is said against you?

23. e) Do you forget easily what you have read?
24. b) Do your eyes get exerted when you see?
25. c) Have you ever organised any social function by yourself?
26. d) Are you unable to sleep because of some disturbed thoughts in your mind?
27. a) Do you feel that your parents are more strict with you than they should be?
28. b) Do you feel tired when you get up in the morning?
29. d) Do you worry over an insulating experience for a long time?
30. e) Do you worry over what your future job will be?
31. d) Are you afraid of telling your problems to your teacher?
32. c) Is it difficult for you to speak in public?
33. d) Do you cry easily over simple things?
34. a) Do you get contrary ideas of love and hate towards your family members?
35. b) Do you often complain about sickening feeling or vomiting feeling?

36. b) Do you often have throat troubles?
37. c) Do you think that your teachers take side of the other students?
38. a) Has any one of your respected family members made you unhappy by passing comments on your appearance?
39. c) Do you experience loneliness even when you are among the people?
40. d) Do you feel gloomy when you get less marks in the examination?
41. e) Do you feel that your friends get better results in the examination because they have better facilities?
42. b) Were you sick for a long time in your childhood?
43. d) Do you hate the kind of happiness that makes others happy?
44. d) Are you afraid of appearing for examinations?
45. a) Are you happy and satisfied with the present atmosphere at home?
46. b) Do you sometimes get strong headache?

47. d) Do you fear that you might jump when you climb to a high place?
48. c) Is it difficult for you to grasp the subjectmatter taught in the class?
49. a) Do you get very little help from home?
50. b) Are you often absent from school due to sickness?
51. c) Have you ever been unable to answer a question in calss because of being afraid to speak?
52. d) Do you get angry easily?
53. e) Is it difficult for you to get your mind into studies?
54. a) Do you feel inferior that your friends' home atmosphere is happier than yours?
55. c) Do you cross the road to avoid meeting a certain individual?
56. d) Are you unhappy because of inferiority feeling?
57. e) Is it difficult for you to write notes in the class?
58. a) Do you understrand that your parents are of old ideas?

59. b) Are you sometimes affected with skin disease?
60. d) Do you worry about expected problems to be come?
61. e) Do you know how to get ready for examination?
62. b) Are you always worried because of Physical morbidity?
63. c) Do you make friends easily?
64. d) Do you feel perplexed that people on the road are looking at you only?
65. e) Do you feel sleepy in class even after you have had enough of sleep during the night?
66. a) Do you feel that you are a burden to your parents?
67. b) Does your health always trouble you?
68. d) Do you get much disturbed because of criticism?
69. e) Do you think of leaving the college sometimes?
70. a) Are you satisfied with the behaviour of your brothers and sisters?
71. b) Does the idea of being infected with a contagious diseases often terrify (Frighten) you?

72. c) Do you get confounded (or baffled) very much when a teacher comes to your home suddenly?
73. e) Do you have any doubts on the value of things you read?
74. c) do you have difficulty starting up a conversation with a stranger?
75. d) Do you get bewildered easily?
76. c) Do you like to take part in celebrating festivals or other entertainment programmes?
77. c) Do you hesitate in coming from your room into a room where there are some people sitting and talking among themselves?
78. d) Does your emotional (or sentimental) being rise or fall without any existing facts?
79. e) Is it difficult for you to express your ideas in writing?
80. c) Do you often experience loneliness?
81. d) Do you get frightened in the darkness when you are alone?
82. e) Do you think that you get encouragement from your teachers?

83. c) Are you careful in speaking something that hurts others?
84. d) Does praise please you more than the work knowledge?
85. c) Do you disregard others sentiments to achieve any important goal (or object)?
86. e) Do you think that your teachers have no interest in you?
87. d) Do people take advantage of you sometimes?
88. e) Does it worry you that your teachers think of you less than you really are?
89. c) Do you come forward and bring life into a dead party or function?
90. d) Does your mind sometimes wonder or get confused so much that you forget the order of the work that you are doing?
91. c) Do you like to work in groups?
92. c) Do you get sometimes pleasing and sad thoughts one after the other without any reason?
93. e) Do you think that you have chosen subjects that are most appropriate for you?

94. e) Is it difficult for you to keep up with the progress in class?
95. d) Do you think that after you have finished studying you will not get the kind of job you like?
96. d) Do you sometimes feel that you should not have been born?
97. c) Do you have many friends in college in whom you trust?
98. d) Do you sometimes do some things unknowingly?
99. c) Do you quarrel with your classmates over little things?
100. a) Do you have to be often out to have peace at home?
101. d) Doesn't it grieve you when a teacher praises any student?
102. d) Are you often lost so much in thinking that you do not know what is happening around you?

SCORING KEY

Emotional Adjustment		Social Adjustment		Educational Adjustment		Home Adjustment		Health Adjustment	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
2	99	5	18	3	48	1	45	4	
8	101	12	25	9	61	6	70	7	
11		32	63	14	82	10		16	
13		39	76	23	93	15		21	
19		51	85	30		17		24	
22		55	89	37		20		28	
26		72	91	41		27		35	
29		74	97	44		34		36	
31		77		53		38		42	
33		80		57		49		46	
40		83		65		54		50	
43				69		58		59	
47				73		66		62	
52				79		100		67	
56				86				71	
60				88					
64				94					
68									
75									
78									
81									
84									
87									
90									
92									
95									
96									
98									
102									

One score is allotted for each of the answers for which the number are indicated above.

## KEY FOR RATINGS FOR ADJUSTMENT

### EMOTIONAL

0	-	1	Excellent
2	-	7	Good
8	-	14	Average
15	-	21	Unsatisfactory
22 and above - v unsatisfactory			

### SOCIAL

0	-	3	Excellent
4	-	6	Good
7	-	9	Average
10	-	12	Unsatisfactory
13 and above v. unsatisfactory			

### EDUCATIONAL

0	-	1	Excellent
2	-	4	Good
5	-	8	Average
9	-	12	Unsatisfactory
13 & above V. unsatisfactory			

HOME

0 - 1      Excellent  
2 - 3      Good  
4 - 5      Average  
6 - 8      Unsatisfactory  
9 and above V. unsatisfactory.

HEALTH

0              Excellant  
1 - 2      Good  
3 - 6      Average  
7 - 9      Unsatisfactory  
10 & above V. Unsatisfactory.

OVERALL

12 & above Excellent  
13 - 27      Good  
28 - 42      Average  
43 - 57      Unsatisfactory  
58 and above V. Unsatisfactory.

ANNEXURE VII

CORRELATION BETWEEN CREATIVITY AND ACADEMIC ACHIEVEMENT

		$dy = \frac{y - 16}{20}$	-2	-1	0	1					
		Mid Y	30	50	70	90					
$dx = \frac{x - 20}{40}$	Mid X	Academic Achievement Creativity	20-40	40-60	60-80	80-100	Total	fdx	fdx <sup>2</sup>	fdx dy	
-2	40	20 - 60	6 24	12 24	16 0	5 -5	39	-78	156	43	
-1	80	60 - 100	7 2	18 18	20 0	8 -8	53	-53	53	12	
0	120	100 - 140	2 0	12 0	19 0	5 0	38	0	0	0	
1	160	140 - 180	0 -2	3 -1	3 0	4 4	10	10	10	1	
Total			15	45	58	22	140	-121	219	56	
fdy			-30	-45	0	22					
fdy <sup>2</sup>			60	45	0	22					
fdx dy			24	41	0	-9					

$$\begin{aligned}
 r &= \frac{56 - \frac{(-21)(-53)}{140}}{\frac{219 - \frac{(-121)^2}{140}}{219 - 104.5} \quad \frac{127 - \frac{(-53)^2}{140}}{127 - 20.06}} \\
 &= \frac{56 - 45.80}{219 - 104.5 \quad 127 - 20.06} \\
 &= \frac{10.2}{10.70 \times 10.34} \\
 &= \frac{10.2}{110.68} = 0.0921
 \end{aligned}$$

### ANNEXURE VIII

't' TEST TO STUDY THE RELATIONSHIP BETWEEN CREATIVITY AND EMOTIONAL ADJUSTMENT AMONG HIGH AND LOW CREATIVES.

Ho: There is no difference between high and low creativities in emotional adjustment.

Applying to test

$$t = \frac{X_1 - X_2}{S} \times \frac{n_1 n_2}{n_1 + n_2}$$

$$S = \frac{(X_1 - X_1)^2 + (X_2 - X_2)^2}{n_1 + n_2 - 2}$$

Calculating the required values

High creatives			Low creatives		
Scores	Deviations	$(X_1 - X_1)^2$	Scores	Deviation from mean $(X_2 - X_2)^2$	$(X_2 - X_2)^2$
13	-2	4	20	3	9
6	-9	81	18	1	1
25	10	100	21	4	16
11	-4	16	25	8	64
9	-6	36	17	-1	1
25	10	100	13	-4	16
22	7	49	6	-11	-121
22	7	49	25	-8	-64
24	9	81	14	-3	9
14	-1	1	16	-1	1
15	0	0	17	0	0
17	2	4	10	-7	49
9	-6	36	17	0	0
11	-4	16	15	-2	4
12	-3	-9	18	-1	1
19	-3	-9	10	-7	49
17	4	16	21	4	16
10	2	4	13	5	16
11	-5	25	22	1	25
12	-4	16	18	-	1
25	-3	9	15	-2	4
21	10	100	--	--	--
	6	38			
26	11	121			
$X_1 =$	$X_1 - X_1$	$(X_1 - X_1)^2$	$X_2$	$(X_2 - X_2)$	$(X_2 - X_2)^2$
376	=0	=909	=351	=0	=467

Mean difference in scores between 23 high creatives.

$$\bar{X}_1 = \frac{X_1}{n_1} = 376/23 = 16.34$$

Mean difference in scores between 21 low creatives

$$\bar{X}_2 = \frac{X_2}{n_2} = 351/21 = 16.71$$

$$S = \frac{(X_1 - \bar{X}_1)^2 + (X_2 - \bar{X}_2)^2}{n_1 + n_2 - 2}$$

$$= \frac{909 + 467}{23 + 21 - 2}$$

$$= 1376/2 = 688 \quad 32.76 \quad = 5.723$$

$$\bar{X}_1 = 16.34 \quad \bar{X}_2 = 16.71 \quad n_1 = 23 \quad n_2 = 21$$

Substituting the values in the formulae

$$t = \frac{16.34 - 16.71}{5.72} \times \frac{23 \times 21}{23 + 21}$$

$$= \frac{-0.37}{5.72} \times \frac{483}{44}$$

$$= 0.0646 \times 3.313 = 0.2140$$

$$v = n_1 + n_2 - 2$$

$$= 23 + 21 - 2 = 42$$

For  $V = 42$ , the value of  $t$  is 1.960 at 5 per cent level. The calculated value is less than the table value and hence there is no reason to doubt the hypothesis. We, therefore conclude that there is no difference between high and low creatives in emotional adjustment.