CHAPTER II

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* * * REVIEW OF THE RELATED STUDIES

The earliest ideas relating to creativity have been attributed to Plato's dictum that man is uniquely rational. The dictum conveys that such a uniquely rational being could be creative. Later, Darwin's theory of "survival of the fittest" led psychologists to make an attempt to find out the factors that help an organism to survive. Similarly, Galton's thesis of individual differences led psychologists to identify the individual differences and develop instruments to measure them. This theory provoked a prolonged controversy with regard to heredity and environment. It was the researches and discussions with regard to this that concepts like intelligence, aptitude and later creativity, emerged.

INTELLIGENCE AND CREATIVITY

Of these, the concept of intelligence developed earlier. The first important contribution to the development of intelligence was by Binet. His work was followed by Simon, Teyman, Merrill and others. Sir Cyril Burt, Weschler, Thurstone, Spearman and others tried to develop a complete picture of the concept of

intelligence. By the end of the 19th century intelligence tests were so much in fashion that these were used for all kinds of educational and vocational selections, and IQ was considered to be the only indicator of a person's success in any field. A person with a high I.Q. was considered to prove successful in all fields. That a person was intelligent also meant that he was creative. But soon psychologists noted that some people with a high I.Q. were not very original in their ideas and that they did not contribute much to the growth of their field, though they could manage it well.

This controversy led to a series of investigations and researches in the late 19th century. "Dearbon (1898) studied imaginative response to a series of ink blots. In discussing his results he commented that two of the poorest records were made by 'students of intellectual type'." [1]

This started a spate of studies and the results, checked or confirmed with every new study, made it almost certain that intelligence and ceativity are not identical. Colvin studied inventiveness in English composition of grade school children. Two of his scoring categories were 'logical power' and

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1 Getzels, J.W. & Jackson, P.: Creativity and Intelligence: Exploration with Gifted Students, John, Wiley and Sons Inc., N.Y., 1963, P.4.

'spontaniety' (the one referring to organizational ability). Colvin concluded, "Logical power varies largely with the extent of the composition, but does not seem to accompany any particular element of spontaniety."[1] In 1916, Laura Chassel studied a number of tests ranging from tests of word building and coding to those requiring unusual and original responses to novel situation. The former tasks were quite similar to those included in many present tests of intelligence, the latter, quite similar to many present tests of "divergent thinking" or Creativity. Chassel found that performance on the IQ tests bore relatively little relations to performance on the creativity tasks.[2]

By 1920 the intelligence tests in the standard form were very much in use. But the effectiveness of the IQ as a comprehensive measure of cognitive functioning was challanged by a number of people. R.M.Simpson wrote: "Intelligence tests have no element in them to extract from the mind of the individual his powers of creative productivity and his tendencies toward originality. If his creative ability is expressed in many of these tests, the methods of scoring have failed to take it into consideration. It is evident that we need test designs to give us more direct and dependable information upon the essential

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1 . Ibid, P.6.

2 Ibid, P.4-5.

element of progress creative imagination."[1] He went on to develop a number of tests of creativity and to try them out on several samples of school children. He concluded that such creative tests should be given as a supplement to tests of general intelligence if we wished to obtain "a more accurate statement of the worth of the individual."[2]

These early statements of belief and tentative empirical observations were followed in due course by more direct studies comparing the performance on tests of imagination (e.g. originality of reactions to visual stimuli) and administered them to a sample of pre-school children. In 1931, McCloy and Meier administered to 79 school children, a test of 're-creative imagination', requiring the subjects to respond to the symbolism in abstract paintings.'[3] In 1946, Welch administered to 48 college students, a test requiring reconstruction of ideas into new and original ones, thus showing that giftedness in intelligence and giftedness in creativity were by no means synonymous.[4]

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1 Ibid, P.4-5.

2 Ibid, P.5.

3 Getzels, J.W. & Jackson, P.: Creativity and Intelligence Exploration with gifted students. John Wiley & Sons INC N.Y. 1963, P.5.

4 Ibid

At the university of Chicago, J.W. Getzels and P.W. Jackson (1958) studied the relations between aptitude for creativity and the traditional variable of intelligence as measured by IQ, and the place of scholastic achievement and the values in high IQ group and high creativity group. To achieve this they administered a number of tests to measure intelligence, creativity, scholastic achievement and values. Teachers and self-rating scales were also used. Creativity tests were based on Guilford's tests. Their main findings havebeen :

(1) That there is a relatively low relationship between the IQ and measures of creativity.

(2) That there is equal superiority of the high IQ and high creativity groups in scholastic performance.

(3) That high IQ group stands out as being more desirable than high creativity group, by teachers.[1]

Wallach and Kogan worked extensively on the relationship of intelligence and creativity. They published their work in the book "Modes of Thinking in Young Children"[2] in 1965. The aim of their research was two fold. First, they wanted to determine whether solid evidence could be found that would support the validity of a distinction between intelligence and creativity as modes of cognitive activity. Second, if

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1 Ibid.

2 Wallach,M.A. & Kogan: Modes of Thinking in Young Children, Holt, Rinehart & Winston, 1965, P.286.

a distinction between these concepts could be given acceptable empirical support, they thought to investigate the possible psychological correlates of individual differences in creativity and intelligence, when variations along these two dimensions were considered jointly. Their results showed that "there was no evidence for arguing that the creativity instruments were any more strongly related to one another than they were related to general intelligence. The inevitable conclusion was that little warrant existed here for talking about creativity and intelligence as if these terms referred to concepts at the same level of abstraction. The creativity indicators measured nothing in common that was distinct from general intelligence."[1]

INDEPENDENT WORK ON CREATIVITY

While some psychologists were struggling to conduct research into relationship of intelligence and creativity, some others began to work on creativity as an independent factor.

In 1930, Wallas[2] constructed a model for describing steps which he regarded as creative process. This model was subjected to some experimental examination by Catherine Patrick[3] in the late 1930. Rossman, S.J.[4] provided a similar model after

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1 Ibid, P.288.

2 Guilford,J.P.: Creativity Retrospect and Rrospect. The Journal of Creative Behaviour Vol.4,No.3,Summer 1970,P.149.

3 Ibid.

4 Ibid.

studying the reported performance of a large number of American inventors. Along the way, a number of psychometric psychologists had devised a few tests of ingenuity and originality and they had found such tests correlated very low with tests that went into scales for assessment of intelligence. Another route of investigation was taken up by Harvey C. Lehman, who studied the biographies of productive people in many fields of activity in order to determine the relations of both quality and quantity of creative output to age during adult years.[1]

The work done by these psychologists prepared ground for deeper research into creativity. In fact many centres got established for this purpose. One of these centres is the University of Southern California. This centre conducted research on " Aptitude Research Project " . The main aim of the project[2] was to understand human intelligence in general, including the thinking process of individuals, when they are in the act of creative production.

Guilford by this time had discovered the components of intelligence by means of the experimental application of the method of factor analysis. According to him, "an intellectual component or factor is a unique ability that is needed to do

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1 Ibid.

2 Guilford,J.P.: Creativity: Retrospect and Prospect. The Journal of Creative Behaviour. Vol.4,No.3,Summer 1970,P.150.

well in a certain class of tasks of tests."[1] This project led Guilford to a re-examination and reformulation of these components into a model which he called "structure of intellect". Accepting the fact that intelligence is complex, Guilford anticipated identification of more than 120 distinct intellectual abilities. He tried to give a unified theory of human intellect, which organizes the known, unique or primary intellectual abilities into a simple system called "the structure of intellect".[2]

"Although each factor is sufficiently distinct to be detected by factor analysis, it is apparent that the factors themselve can be classified because they resemble one another in certain ways. One basis of classification is according to the basic kinds of process in operations performed. This kind of classification gives five major groups of intellectual abilities; factor of cognition, memory, convergent thinking, divergent thinking and evaluation."[3]

Cognition means discovery or rediscovery or recognition. Memory means retention of what is cognized. Two kinds of

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1 Guilford, J.P.: Three Faces of Intellect. The Discovery of Talent Edited by Deal Woyle. Harward University Press, 1969, P.9.

2 Anastasi,A.: Individual Differences. John Wiley and Sons INC, N.Y., 1965, P.88.

3 Ibid, P.88.k

productive thinking operations generate new information from known information and remembered information. In divergent thinking operations we think in different directions sometimes searching, sometimes seeking variety. In convergent thinking the information leads to one right answer or to a recognized best or conventional answer. In evaluation we reach decisions as to goodness, correctness, suitability of adequacy of what we produce in productive thinking.

The second basis of classifying intellectual factors is according to the kind of material or content involved. The factors known thus far involve three kinds of material or content. The content may be figural, symbolic or semantic. Figural content is concrete material such as is perceived through the senses. Visual material has properties such as size, form, colour, location or texture. Things we hear or feel provide other examples of figural material. Symbolic content is composed of letters, digits and other conventional sizes, usually organized in general systems such as alphabet or the number system. Semantic content is the form of verbal meaning or ideas. The third basis of classification is in terms of the product. As many as six general kinds of product may be evolved: units, classes, relations, system, transformations and implications.[1]

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1 Guilford,J.P.: Three Faces of Intellect. Individual Differences by Anstasi A. John Wiley & Sons Inc, N.Y., 1965, Pp.95-99.

According to this structure of intellect, divergent thinking (an essential quality of a creative person) can be measured by figural, symbolic or semmatic content and in terms of units, classes, relations, systems, transformations and implications. A divergent thinker or a creative person has the ability to give numerous solutions to a problem. This ability he termed as fluency.[1] He identified four kinds of fluency:

1. Word fluency
2. Ideational fluency
3. Expressional fluency
4. Associational fluency

A creative person has the ability to shift form one class of ideas to another. This ability he termed as flexibility.[2] He identified two types of flexibility :

1. Adaptive flexibility
2. Spontaneous flexibility

He constructed numerous tests to measure these abilities. Much work has been done, since then, on the concepts put forth by him.

Another centre at the Institute of Personality Research Assessment at the University of California, Berkeley, adopted a different approach. The investigators, Mackinnon Barron and

others, extensively assessed creative persons in the field of writing, architecture, administration and mathematics. The result was a list of personality characteristics manifested by creative persons.[1]

Still one more centre at the Pennsylvania State University, under the leadership of Victor Lowenfeld, Head of the Department of Art Education, discovered through factor-analytic procedures essentially the same factors in visual art as Guilford and his associates had found in other fields.[2]

The work of various psychologists in the field of creativity had by now generated a lot of curiosity and posed a number of problems. A need was felt to call a conference of the workers in the field. Accordingly, the first conference on Creative Scientific Talent was called at the University of Utah in 1955 to exchange views, sense problems and chalk out proper approaches for future researches. "Inspiration stemming from these conferences

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1 Macknnon, D.W.: Nature and Nature of Creative Talent. The Discovery of Talent Edited by Dael Wolfre. Harward University Press, 1969, P.187.

2 Torrence, E.Paul: Education and Creativity. Creativity: Progress and Poteulit Edited by C.W.Taylor, 1964, P.61.

bore fruit in many places. Five books were published as a result. Taylor and his associates developed a biographical inventory for indicating creative promise of the scientists."[1]

An allied event in the development of the concept and literature of creativity has been the work of Alex.F.Osborn. He wrote a book on 'Applied Imagination' (1957), which is considered to have produced a great impact. He also established two institutions namely the Creative Education Foundation and the Creative Problem Solving Institute. One of the institutes viz. the Foundation, is doing commendable work by publishing the Journal of Creative Behaviour, the only periodical devoted exclusively to creativity.[2]

At the University of Illinois, James Gallagher and Mary Jane Aschner studied the productive thinking of gifted children in the classroom and J. Richard Suchman developed techniques for teaching children inquiry skills.

Casson McGuire, E. Hindsman, F.J.King and E. Jennings at the University of Texas have reported factor analytic studies in various kinds of talented behaviour among high school students.[3]

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1 Guilford,J.P.: Creativity: Retrospect and Prospect. The Journal of Creative Behaviour. Vol 4, No.3, Summer 1970, P.151.

2 Ibid

3 Torrance, E. Paul: Education and Creativity. Creativity: Progress and Potential. Edited by Calvin W. Taylor, McGraw Hill, 1964, P.63.

TEST FOR CREATIVITY MEASUREMENT

A variety of methods (instruments) have been used in attempting to assess the creative products and creative processes of young children as well as of adults. Typical of the many of the early efforts was Kirkpatrics (1900) work with four inkbolts. Colvin (1902) used composition giving attention to such factors as invention, sense of humour, imaginative power and perceptive power. In 1916, Laura Chassell reported rather detailed data concerning a battery of twelve tests of originality. The battery includes 'Word building, picture writing, analogues, original analogues, chain puzzle, triangle puzzle, royce's ring, completion test, economic prophencies, code test, invention sheet for music and novel situations.[1]

Simpson (1922) used 50 sets of four small round dots, representing the four corners of squares as stimuli for construction. Fluency, originality and flexibility were then assessed.[2]

For young children, McCarthy (1924) used drawing. Abrahamso (1927) used responses to inkblots asking the subjects (children upto grade six) to enumerate objects

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1 Torrance, E.P.: Education and Creativity. Creativity: Progress and Potential. Edited by Calvin W. Taylor McGraw Hill, 1964, P.118.

2 Ibid, P.82.

after 20 minutes exposure. Andrews (1930) used a veriety of methods and observations, attempting to study several types of imaginative or creative activity. Three of Andrew's tests were presented tachistoscopically with the task of forming new products (transformations). The following kinds of observations were made of the imaginative play of children from two to six: Imitation, experimentation, transformation of objects, transformation of animals, acts of sympathy, dramatizations, imaginary playmates, fanciful explanations, fantastic stories, new uses of stories, construction, new games, extensions of languagge, appropriate quotations, leadership with plan and aesthetic appreciation.[1]

Hargreaves (1927) described and presented data concerning twelve tasks which he scored for fluency and originality. The tasks were Word Building and Composition, Ebbinghaus Test, Invention of Stories, Indeterminate Picture Completion, Unfinished Pictures, Inkblots, Indeterminate language Completion, Unfinished Stories, Writing Words, Probable Situations and Imaginary Situations.[1]

Markey (1935) employed observational methods of children

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1 Ibid, P.72-73.

2 Ibid, P.119.

to evaluate performance on a variety of standardized situations and tasks such as a Housekeeping game, the Fanciful naming of Visual Stimuli, Leadership in Imaginative games, Block Building and the like.[1]

Harms (1939) employed a test requiring the representation of words (mostly names of various actions) by single lines in grades one to twelve.[2]

Wetch (1946) made several interesting contributions of the assessment of Creativity. His tasks included: Block Construction, Sentence Construction, Letter Construction and Short Story Construction.[3]

Owens and his associates (1957) developed a series of tasks to assess creativity on machine design. These include: Power Source Apparatus Test, Design a Machine Test, Three Dimensional Space Relations Test and Figure Matrices Test. This battery is supplemented by a Personal Inventory and a Personal History form.[4]

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1 Torrance,E.P.: Education and Creativity. Creativity: Progress and Potential Edited by C.W.Taylor, McGraw Hill, 1964, P.~~113~~ 73.

2 Ibid, P.82

3 Ibid, P.120

4 Ibid, P.120.

Getzels and Jackson (1958) used four adapted tasks (Word Association, Uses for Things, Hidden Shapes, and Fables) and constructed one of their own (Make-up-problems).[1]

Harris (1960) developed two forms of a 20 item test of creativity in engineering.[2] 'Uses' and 'What is it" tests were used. Scores for fluency, flexibility and originality were computed.

With seventh-grade subjects, McGuire, Mindsman, King and Jennings (1961) used the following Guilford tests: Rhymes, Unusual Uses, Consequences, Common Situation, Seeing Problems, Mutilated Words and Gestalt Completion.[3]

Buhl (1961) and others used the AC (sparkplug) tests of creative ability to study creative thinking among engineering students.[4]

Barron (1963) and his associates at the University of California developed a battery of tasks for answering originality among college students and adults. Among the tasks

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1 Ibid,

2 Ibid, P.111

3 Ibid, P.111

4 Ibid, P.120

described in the literature are: Mosaic Construction, Anagram Test, Drawing Completion (Franck), Figure Preference Test (Welsh) and Ink Blot Test (Uncommon responses).[1]

Other instruments that have been used with college subjects include the following :

Flanagan's (1958) Ingenious Solutions to Problems: This is onen of the few attempts to assess creative thinking through multiple-choice items. Frederiksen's (1959) Formulating Hypothesis Tests: it attempts to elicit creative type responses and transfer them to machine scorable answer sheets by having subjects code their own responses. Burkhrt's (1962) Divergent Questions Test: this requires subjects to ask questions about a given object such as an apple or a paper clip.[2]

Mednick's (1961) Remote Associates Tests appear to be a device of special promise.[3] Wallach and Kogan (1965) constructed the following tests for assessing creativity: Instances, Alternate Uses, Similarities, Pattern Meaning and Line Meaning.[4] In the University of Minnesota, School of Education, E.P.Torrance[5] conducted a vigorous programme of

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1 Ibid, P.120.

2 Ibid, P.120

3 Taylor,C.W.: Predictors of Creative Performance in Creativity: Progress and Potential Edited by C.W.Taylor. McGraw Hill, 1964, P.120.

4 Wallach,M.A. & Kogan, N.: Modes of Thinking in Young Children, Holt, Rinehart & Winston Inc. 1965, P.29-38.

5 Torrance,P.E. : The Minnesota Studies of Creativity.P.269.

research on creative qualities and creative performances. He developed a battery of tests for general research use. Torrance Tests of Creative Thinking, as these are called, represent rather a sharp departure from the factor type tests developed by Guilford and his associates. Originally known as Minnesota Tests of Creative Thinking, these tests have attained there latest shape in two forms, verbal and figural. The verbal tests contain seven activities, viz. Ask Questions, Guess Causes, Guess Consequences, Product Improvement, Unusual Uses, Unusual Questions and Just Suppose Test. The figural test contains three activities, viz. Picture Construction, Picture Completion and Parallel Lines. Torrance scored the items for fluency, flexibility, originality and elaboration. Both verbal and figural tests are available in two equivalent terms A and B.

The studies conducted by Torrance are unique in four major ways. First, the study has been concerned with the development of instruments for identifying creative talent from kindergarten through graduate school. Second, there has been emphasis on the genetic development of various creative thinking abilities, peer pressure against the most highly creative members of a group, and other forces which interfere with the development and utilization of creative talent. Third, emphasis has been placed on class-room factors,

evaluation procedures and activities which influence the development of the various creative thinking abilities. Fourth, the Minnesota studies are characterized by their diversity. In addition, a number of studies in different fields like mathematics in the pre-school and early school work, elementary school teaching and research work, mental breakdown, college teaching, industrial design and counsellor training have been conducted.

USES OF THE TESTS ON CREATIVITY

We have so far been concerned with the development of studies and tests by the accredited innovators and researchers in the field. These tests, indeed, establish the factor of creativity as an important factor in the growth of personality of a person. We shall now turn our attention to extensive use of these and other tests that were made in the various fields. Joseph M. McPherson[1] paid much attention to studying of climate that is conducive to creative output in an industrial environment. He actually worked at Dow Chemical Company. The Richardson Foundation of Green Ville N.C. has supported research on creativity and it established the Richardson Creativity Award, which is administered by the American Psychological Association. The Foundation has taken

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1 Guilford,J.P.: Creativity: Retrospect and Prospect. The Journal of Creative Behaviour, Vol.4,No.3, Summer 1970, P.152.

seriously Torrance's dictum that if you want creative behaviour, you must reward it.

Of the consequences of the work on creativity, those in connection with education will undoubtedly have the greatest and the most enduring social impact. In accordance with the objectives of the Creative Education Foundation, educators are taking the initiative to find ways in which to teach more creatively and to see that learners have opportunities to develop their creative talent.

The first, extensive organized effort of this kind was done by the Creative Problem - Solving Institute in Buffalo,[1] Sidney J. Parnes also gave longer courses in the State University and in high school. He did the obviously needed experiments for determining whether the students had gained in creative thinking abilities incident to the special instruction. The results were clearly positive.[2]

A living Arts Programme under the direction of Jack A. Develbiss in the Dayton, Ohio Schools has been conducted as an extra-curricular activity for children of different ages, with the aim of giving them first hand creative experiences in the arts, and also personal contacts with

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1 Guilford,J.P.: Creativity: Retrospect and Prospect. The Journal of Creative Behaviour, Vol.4,No.3, Summer 1970 P.152.

2 Ibid.

some well-known creative producers in the arts. The activity is said to have had favourable country-wide effects.[1]

One of the longer standing examples of special teacher training efforts designed to arouse enthusiasm for teaching for development of productive thinking in an annual workshop or institute was held at the University of Utah under the direction of Calvin W. Taylor.[2]

The Creativity and National Schools Project at Macalester College works under the direction of Frank E. Williams. The way it functioned is similar to the way in which the training school, at the school in E.T. Cajon, California, functioned. Here the elementary school teachers joined in a new kind of programme of instruction. Williams has developed a model containing a list of strategies for teaching so as to exercise creative thinking skills.[3]

In higher education, two noteworthy developments aimed at establishment of creative colleges are in progress. One is under the leadership of Gerald H. Skinn at Wilmington College in North Carolina and the other is at Buffalo,

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1 Ibid.

2 Ibid.

3 Ibid.

New York State University College. The later is already underway on an experimental basis.[1] The results are awaited.

Considering quantitative aspects of research and development with respect to the field of Creative behaviour; J.P. Guilford counted the number of abstracts brought out on the subject starting with 1930.[2] The Following table prepared by him shows the number.

Table 1: Showing the Number of Abstracts Published from 1930 to 1965.

Mid Year	Total Number	On Creativity	Percent on Creativity
1930	24,067	29	0.12
1935	30,494	240	0.13
1940	30,043	62	0.26
1945	21,392	34	0.16
1950	34,324	43	0.13
1955	43,931	53	0.12
1960	41,317	177	0.43
1965	66,314	474	0.71

Account of 1969 shows the rate exceeeds one percent (1.4%). This gives a reason to be optimistic about the future

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1 Guilford,J.P.: Creativity: Retrospect and Prospect. The Journal of Creative Behaviour, Vol.4,No.3, Summer 1970,P.154.

2 Ibid.

of the study on creativity.

WORK ON CREATIVITY IN INDIA

We have so far given a brief review of the studies and researches conducted on creativity outside India. We shall now give a brief review of the work done in India. We know that the field of creativity is of recent origin and the literature produced is, in comparison to other fields of psychology, very scanty. This is much more true of India. Creativity in India attracted attention only recently and some work is being carried out in different universities, mainly as investigations by university students.

Research and development concerning creative functioning is comparatively quite elementary and fragmentary in India. There is hardly anything that may be regarded as a serious attempt to understand the creative process or the act of creation or its various ramifications.

Not much of the work being conducted is printed and published with the result that it is comparatively difficult to know about the people and investigations that are being carried out. The effort, therefore, to collect all the materials produced is highly difficult inspite of the best efforts that might be put in. The present investigator, however,ha

tried her best to get to know about as many investigations as possible. There is every possibility that there might be some more which have not come to her notice.

One of the earliest studies was conducted by Phatak.[1] She used as subjects the University Experimental School Children of Baroda who were administered Minnesota Tests of Creative Thinking, and found that creativity is significantly associated with intelligence quotient, but unrealated to school achievement.

Lalitha[2] made an attempt to study the development of imiagination in children between the ages of 8 to 11. She found that there was no significant relationship between age and content of imagination in the age group 10, and that as age advanced there was tendency to be more imaginative.

Das[3] studied the students of higher forms, 4th, 5th and 6th of the four high schools in Madras City. He used Rorschach as a measure of imagination. He found that there was no salient and significant difference in imagination fertility in the age between 13 to 16. There were slight sex differences in imaginative content in the age range 13 to 16 years.

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1 Phatak,P: Exploratory Study of Creativity and Intelligence and Scholastic Achievement, Psychological Studies, Vol.7,P.1-9.

2 Lalitha,M.S.: A Study of the Development of Imagination in Children, J. Psychological Research, 1957, Vol.2, P.30-48.

3 Das,R.: A Study of Imagination in High School Students, J. of Education, 1959, Vol.3, P.18-33.

Raina[1] designed his doctoral dissertation to compare significant differences between high and low creative groups on selected measures of cognition, personality and socio-economic status. Based on scores achieved on the criterion measure, The Minnesota Tests of Creative Thinking was administered to a population of 500 students of Rajasthan; the results of one hundred scoring high and one hundred scoring low, were analysed. Analysis of the results of the investigation revealed significant differences between the I.Q.'s of the two groups, difference being in favour of high creative. No significant dissimilarity was found in male and female high creative persons.

Pareek[2] made an investigation to study the development of creative thinking at different age levels. He found high correlation of 0.81 between I.Q. and creative thinking score and 0.50 between teacher rating and creative thinking.

Mishra[3] wanted to find the relationship of pre-adolscent creative expression in Art and Hindi at different age levels with other relevant factors. He found low

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1 Raina, M.K.: Research on Creative Functioning in India. A Review. Indian Psychological Review, Vol.6, No.2, July 1971, Pp.263-264.

2 Ibid. P.265.

3 Ibid. P.265.

Correlation between Hindi story and creative expression.

Sumania[1] attempted to study creativity among science and arts students of X Class. The investigator concluded that contrary to the popular belief, arts and science students were not found to differ significantly. In the creative abilities, relationship of all the factors of creativity was found to be negligible with achievement in science subjects. This meant that "to be highly creative did not necessarily imply to be a high achiever." He also found that almost all factors of creativity were found to be negatively related to the achievement in art subjects.

There are other studies conducted by Chandodkar, Manjunathaiah, Pathak, Sharma, Raman, Paramesh and Patel, most of which have dealt with the relationship between various dimensions of creativity and other correlates. Most recently, Patel and Ramachandran[2] have reviewed literature, defining meaning of creativity and describing attempts to measure it.

Goyal[3] made a study of some personality traits of

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1 Ibid. P.265.

2 Patel,A.S. & K.Ramchandran: Creativity-Its Meaning and Measurement. Edu.& Psy.Review,Vol XI,No.2&3,1971, Baroda.

3 Raina, M.K.: Research on Creative Functioning in India, A Review, Indian Educational Review, Vol.6, 1971, P.265-66

creative children at the middle school stage of Patiala District, in Punjab. Using his own tests of creativity developed on the lines of Torrance, he concluded that "Creative pupils at the middle school stage possessed a higher level of energy, rejected repression and suppression for the controls of impulses, were more of introverts, were more independent in both thought and action, had open minds, could tolerate ambiguity and entertain opposing values."

Paramesh[1] tried to study the value orientation of creative persons. He concluded that "The high moderate and low creative groups differed among themselves only with reference to economic value." Recently, Paramesh[2] adopted the Wallach and Kogan's Test of Creativity to suit Indian conditions. He administered this test to students of Madras High Schools. The results showed that "Creativity and intelligence had no relationship".[3]

Singh made a cross-cultural study of creative abilityes of Indian and American children. He concluded that there was significant difference in measures of the components of creativity between advantaged and disadvantaged children, regardless of culture.

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1 Ibid, P.266.

2 Paramesh, C.R.: Adaptation of Wallach & Kogan Creativity Instruments and the Relationship Between Creativity and Intelligence. Indian J. of Psy., 1971, 46, Pp.1-11.

Mention may be made of a number of studies conducted by Raina, Raina and Raina and Raina and Pathak on teacher perception and teacher creativity, mainly using Torrance's Tests.[1]

Raychoudhari and Ganguli[2] studied the phenomena of creativity in the field of music. They made use of a battery of Projective Personality Measures, the Rorschach, T.A.T., Szondi Test and Welsch Figure Preference Test. The investigators found that the personality structures of the creative musicians were strikingly different from those of the non-musical control subjects. The difference was statistically significant.

Ron Maduri[3] worked on the nature of creativity, attributes of a creative person, factors fostering or inhibiting development of the creative process. His findings are: "The more creative artists have a higher self-image; they are not as stereotyped with respect to religion and social taboos as non-creative."

Finally, a mention should be made of the work undertaken at Baroda University where a number of doctoral theses and

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1 Ibid, P.271

2 Ibid, P.271

3 Ibid, P.272

research works have been undertaken to construct tests on creativity and to study creativity in relation to other variables. The attempts by doctoral students R.J.Joshi, K. Ramchandran, and the present one by Bimla Kaul are noteworthy.

To encourage the work on creativity and to keep abreast with the latest works done in the field, a seminar on Creativity and Science Education was held at Aligarh Muslim University, Department of Physics, in February 1972. One of the results achieved was a journal called 'Creativity News Letter' published by the editor, is Rais Ahmed. from Department of Physics, Aligarh Muslim University, Aligarh. This is the only journal that is fully devoted to creativity and reports research and developments in the field of creativity in India. This publication gives an optimistic view about the work that is being done on creativity in India.

This completes the review of relevant studies usefully referred to by the author, who will now describe in the next chapters, her own attempt to construct a test on creativity.