

## CHAPTER III

### METHODOLOGY OF THE INVESTIGATION

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#### 3.0 INTRODUCTION

As expounded earlier, the investigation aims to study the gifted children with respect to their creativity and some personality traits. With this view the following procedure was designed to identify intellectually gifted high school students and to collect and analyse the data with respect to their various characteristics and conditions.

#### 3.1 SAMPLE

To have the maximally wide and representative sample, the subjects from the following secondary schools available and most representative of the main cities of six districts of Gujarat State, namely, Ahmedabad, Baroda, Broach, Kaira, Panchmahal and Surat, were selected.

##### A : Boys' High Schools :

1. Shree D.N. High School, Anand, Dist. Kaira
2. Shree Sayaji Boys' High School, Baroda, Dist. Baroda.
3. M.Y. High School, Dohad, Dist. Panchmahal.

4. Shree N.M.Zaveri Union High School, Surat, Dist. Surat.

B : Girls' High Schools :

1. New Era Girls' High School, Baroda, Dist. Baroda.
2. Maharani Girls' High School, Baroda, Dist. Baroda.
3. Shrimati Motlabai Wadia Parsee Girls' High School, Broach, Dist. Broach.
4. Navjeevan Girls' High School, Dohad, Dist. Panchmahal.
5. Swastik Girls' High School, Ahmedabad, Dist. Ahmedabad.
6. Prakash Girls' High School, Ahmedabad, Dist. Ahmedabad.

C : Co-Educational Schools :

1. Saraswati Mandir High School, Ahmedabad, Dist. Ahmedabad.
2. Preyas High School, Ahmedabad, Dist. Ahmedabad.
3. Vidyanagar High School, Ahmedabad, Dist. Ahmedabad.
4. Gujarat Law Society High School, Ahmedabad, Dist. Ahmedabad.
5. Shree A.G. High School, Ahmedabad, Dist. Ahmedabad.
6. Alembic Vidyalaya, Baroda, Dist. Baroda.
7. Experimental School, Baroda, Dist. Baroda.
8. Jeevan Sadhna, Baroda, Dist. Baroda.
9. Rosary School, Baroda, Dist. Baroda.
10. Shree D.H. Pareekh Model High School, Baroda, Dist. Baroda.
11. B.E.S. Union High School, Broach, Dist. Broach.
12. Jeevan Bharti, Surat, Dist. Surat.
13. U.E.S.H.M. Dave High School, Umreth, Dist. Kaira.

The pupils were randomly obtained from Stds. VII to XI with age ranging from 12 to 19 years ( mostly from 13 to 17 ) from these 23 secondary schools of main cities of six districts of Gujarat State.

The school-wise population of pupils in classes selected for the study has been given in the Table 3.1.

Table 3.1 : Showing the Total Number of Pupils ( Class-wise and School-wise )

Sr. No.	Name of the School	Std. VII		Std. VIII		Std. IX		Std. X		Std. XI		Total
		No. of Div.	No. of Pupils	No. of Div.	No. of Pupils	No. of Div.	No. of Pupils	No. of Div.	No. of Pupils	No. of Div.	No. of Pupils	
1.	Swastik Girls' H.S.	-	-	3	134	-	-	5	209	-	-	343
2.	Prakash Girls' H.S.	-	-	3	136	-	-	5	218	-	-	354
3.	Saraswati Mandir H.S.	-	-	2	108	2	98	2	99	-	-	305
4.	Preyas High School	-	-	-	-	5	233	4	204	-	-	437
5.	Vidyanagar H.S.	-	-	1	47	-	-	5	219	-	-	266
6.	Gujarat Law Society H.S.	-	-	1	49	2	97	1	52	-	-	198
7.	A.G. High School	-	-	2	96	-	-	2	95	-	-	191
8.	Shreed.N. High School	-	-	4	199	4	198	4	197	-	-	594
9.	Shree Sayaji Boys' H.S.	4	198	-	-	-	-	6	307	-	-	505
10.	New Era Girls' H.S.	-	-	3	134	5	210	5	225	3	164	733
11.	Maharani Girls' H.S.	-	-	3	149	-	-	-	-	-	-	149
12.	Alenbic Vidyalaya	3	138	3	143	3	146	3	147	-	-	574
13.	Experimental School	1	46	1	48	1	49	1	51	-	-	194
14.	Jeevan Sadhna H.S.	-	-	2	90	2	92	2	95	-	-	277
15.	Rosary School	-	-	1	53	1	52	1	56	-	-	161
16.	D.H. Parikh Model H.S.	-	-	2	96	-	-	-	-	-	-	96
17.	M.W.P. Girls' H.S.	-	-	2	84	2	85	1	43	-	-	212
18.	B.E.S. Union H.S.	-	-	-	-	5	230	5	224	-	-	454
19.	M.Y. High School	-	-	4	166	5	224	4	179	-	-	569
20.	Navjeevan Girls' H.S.	-	-	6	252	6	248	5	208	-	-	708
21.	N.M. Zaveri Union H.S.	-	-	-	-	6	285	6	292	-	-	577
22.	Jeevan Bharati	-	-	1	52	1	53	1	55	-	-	160
23.	U.E.S.H.M. Dave H.S.	-	-	1	55	1	53	1	51	-	-	159
Grand Total :		8	382	45	2091	51	2353	69	3226	3	164	8216

The Intelligence Test was administered to pupils in these schools ( Table 3.1 ) as follows :

- \* Intelligence Test was administered to all the pupils of the divisions who were present.
- \*\* Intelligence Test was given to only those who passed at the last annual examination.
- \*\*\* Intelligence Test was administered to only those who passed and failed at the last annual examination.

From the above total population, the pupils were selected according to administrative convenience and a number of other factors for the purpose of test administration. Thus, out of available population of 8216, the pupils who were actually administered the Group Test of Intelligence for the study numbered 3503. These pupils were administered the Group Test of Intelligence standardized in Gujarati by Dr. K.G. Desai and Dr.C.L.Bhatt. The responses of these subjects were scored as per key prepared by the author of the test. On the basis of their I.Q. scores, these 3503 pupils were classified and their distribution schoolwise and sexwise is shown in the Table 3.2.

Table 3.2 : Classification of the Pupils according to their Intelligence Quotient (Schoolwise and Sexwise)

Sr. No.	Name of the School	Intelligence Levels (I.Q.s.)																Total		Grand Total
		Above 140		130 to 139		120 to 129		110 to 109		90 to 90		Below 90								
		B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G			
1.	Swastik Girls' H.S.	-	0	-	5	-	18	-	12	-	29	-	0	-	64	-	64	64		
2.	Prakash Girls' H.S.	-	2	-	21	-	21	-	2	-	35	-	0	-	81	-	81	81		
*3.	Saraswati Mandir H.S.	0	0	2	1	5	7	4	3	72	54	30	17	113	82	195	195	195		
4.	Preyas High School	0	0	1	0	4	9	1	3	34	7	3	0	43	19	62	62	62		
5.	Vidyanagar High School	1	6	3	2	13	6	2	1	34	20	0	0	53	35	88	88	88		
6.	Gujarat Law Society H.S.	1	9	10	10	25	11	4	2	3	2	0	0	43	34	77	77	77		
7.	Shree A.G. High School	3	2	14	11	14	7	3	1	2	0	0	0	36	21	57	57	57		
8.	Shree D.N. High School	2	-	14	-	81	-	20	-	279	-	162	-	558	-	558	-	558		
9.	Shree Sayaji Boys' H.S.	0	-	5	-	25	-	3	-	52	-	7	-	92	-	92	-	92		
10.	New Era Girls' High School	-	2	-	29	-	69	-	12	-	110	-	14	-	236	-	236	236		
*11.	Maharani Girls' High School	0	-	-	1	-	13	-	8	-	80	-	5	-	107	-	107	107		
12.	Alembic Vidyalaya	2	5	3	9	26	28	20	13	149	99	10	9	210	163	373	373	373		
13.	Experimental School	3	5	11	14	30	27	1	1	48	32	0	0	93	79	172	172	172		
*14.	Jeevan Sadhana	2	0	11	7	36	19	9	6	97	58	14	8	169	98	267	267	267		
15.	Rosary School	1	1	3	1	15	1	7	5	102	4	0	0	128	12	140	140	140		
*16.	Shri D.H.Parikh Model H.S.	0	0	0	0	2	0	0	0	39	19	17	1	58	20	78	78	78		
17.	Smt. M.W.P.Girls' H.S.	-	2	-	9	-	26	-	3	-	1	-	0	-	41	-	41	41		
18.	B.E.S. Union High School	0	0	2	4	14	9	8	4	30	13	4	2	58	32	90	90	90		
19.	M.Y. High School	2	-	8	-	31	-	5	-	103	-	32	-	181	-	181	-	181		
20.	Navjeevan Girls' H.S.	-	2	-	29	-	51	-	8	-	75	-	2	-	167	-	167	167		
21.	Shree N.M. Zaveri Union H.S.	0	-	5	-	22	-	14	-	83	-	9	-	133	-	133	-	133		
22.	Jeevan Bharati	0	1	5	3	11	15	10	4	47	18	3	1	76	42	118	118	118		
23.	U.E.S.H.M. Dave H.S.	0	0	0	0	1	3	3	0	38	65	6	10	48	78	126	126	126		

B = Boys ; G = Girls ; Total = 3503

\*Please see Footnote on Page 99

Table 3.3 : Showing Number of Pupils (I.Q.wise, Agewise and Sexwise)

Intelligence Levels (I.Q.)	Age in Years																		Gr. Total
	12		13		14		15		16		17		18		19		Total		
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G	
Above 140	1	0	3	7	6	15	15	13	2	2	0	0	0	0	0	0	17	37	54
130 to 139	4	6	29	24	27	49	27	58	8	12	2	7	0	0	0	0	97	156	253
120 to 129	28	27	45	59	95	80	95	88	57	54	33	29	1	2	1	1	355	340	695
Total	33	33	77	90	128	144	127	159	67	68	35	36	1	2	1	1	469	533	1002
110 to 119	3	5	18	20	30	36	29	15	23	8	8	2	2	1	1	1	114	88	202
90 to 109	70	44	224	127	299	205	268	196	204	89	125	51	18	6	4	3	1212	721	1933
Total	73	49	242	147	329	241	297	211	227	97	133	53	20	7	5	4	1326	809	2135
Below 90	15	4	68	12	59	16	38	14	58	9	48	11	10	2	1	1	297	69	366
Grand Total	121	86	387	249	516	401	462	384	352	174	216	100	31	11	7	6	2092	1411	3503

The break-up of the sample of 3503 pupils according to sex their I.Q. and age has been presented in Table 3.3.

### 3.2 ACTUAL SAMPLE FOR THE STUDY

Now, according to the operational definition of giftedness accepted by the investigator, as described in the first chapter, an intellectually gifted child is one who possesses intelligent quotient of 120 or above as measured by the standard intelligence test. According to this definition, out of 3503 pupils given the intelligence test during first session, 1002 pupils ( Table 3.3 ) were found to have I.Q. of 120 and above ( capably gifted ). The Creativity and Personality Tests were administered to these 1002 pupils in the next two sessions as described earlier and at the end only 935 pupils remained after some drop-outs. Thus, the actual sample for the main study consisted of 935 pupils.

Next, the performance of these 935 pupils in different school subjects particularly Gujarati, Hindi, English, Mathematics, Science and in some cases where available in Physical Education and Drawing, at the last annual examination, were also taken into account, to study the nature of relation between achievement and creativity. The break-up of these 935 pupils according to their I.Q. has been presented in Table 3.4.

Table 3.4 : Showing Actual Sample for the Main study  
(935 capably gifted pupils)

Intelligence Level	Boys	Girls	Total
Extraordinary : I.Q. 140 and above	15	36	51
Very Superior : From I.Q. 130 to 139	76	145	221
Superior : From I.Q. 120 to 129	334	329	663
Total	425	510	935

Also, for the purpose of studying the role of age, besides giftedness and sex, the records of these 935 subjects were rearranged age-wise ( for ages 13, 14 and 15 where sufficient number for analysis purpose was available ), and this consideration gave a sample of 683 gifted pupils distributed I.Q.wise, sexwise and age-wise as shown in Table 3.5. Here the categories of those with I.Q. 140 or more and those with I.Q. 130 to 139 were combined to have sufficient number for analysis. The data of this sample of these 683 subjects, on creativity and personality traits, have also been separately studied with respect to role of I.Q., sex and age.

Table 3.5 : Classification of Pupils according to  
I.Q., Sex and Age

Intelligence Level	Age in Years			Total
	13	14	15	
<u>Boys :</u>				
Extraordinary and very superior (I.Q. 130 and above)	31	32	32	95
Superior : ( From I.Q. 120 to 129 )	39	85	85	209
<u>Girls :</u>				
Extraordinary and very superior (I.Q. 130 and above)	30	64	71	165
Superior : ( From I.Q. 120 to 129 )	56	75	83	214
<u>Total :</u>				
Extraordinary and very superior (I.Q. 130 and above)	61	96	103	260
Superior : ( From I.Q. 120 to 129 )	95	160	168	423
Total	156	256	271	683

The functionally manifesting gifted child, according to the present author, is the one who has an I.Q. of 120 or above and who is at the same time a high achiever. The high achiever in the present case is operationally the one who secured 60 per cent or more marks in each of these school subjects, or the one who secured 60 per cent or more marks in each of all school subjects except one, but who obtains

60 per cent or more marks in the aggregate. These considerations gave the investigator a clear sample of 325 functionally gifted pupils out of 935 pupils for the purpose of further detailed study. This sample is broken up I.Q.wise and sex-wise as shown in Table 3.6.

Table 3.6 : Showing functionally Gifted Pupils (Intellectually gifted and High Achiever )

Intelligence Level	Boys	Girls	Total
Extraordinary : I.Q. 140 and above	10	19	29
Very Superior : From I.Q. 130 to 139	49	51	100
Superior : From I.Q. 120 to 129	106	90	196
Total	165	160	325

Both these samples of 935 and 325 pupils were separately studied for more exact information, with respect to creativity and personality traits, as measured by Torrance's Creativity Test and Cattell's 16 Personality Factor Test respectively, as described later.

Finally, for the purpose of comparison of highly gifted ( with I.Q. 140 and above ) and non-gifted\* ( with I.Q.

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\* For the data of these non-gifted pupils on creativity and personality traits, the pupils of the schools marked the sign \* (Table 3.2) whose I.Q. were 90 and below were also given Torrance's Test of Creative Thinking and Cattell's 16 P.F. Test.

:100:

90 and below ) on creativity and personality traits, the data of a separate sample of these two groups was also studied. The distribution of this sample is given in Table 3.7.

Table 3.7 : Showing Highly Gifted and Non-Gifted Pupils

Intelligence Level	Boys	Girls	Total
Extraordinary : I.Q. 140 and above	15	36	51
Low average and very backward : I.Q. 90 and below	61	31	92
Total	76	67	143

In short, the main sample for study consisted of 935 pupils as shown in Table 3.4, in addition a few more samples as shown in Tables 3.5, 3.6 and 3.7 were taken out from the same main sample for purpose of more specific information. The data of all these samples were analysed and the results have been discussed in next chapters.

### 3.3 TOOLS

In this study the following tools were used to collect data on the different samples mentioned above :

1. Standardized Tests
2. Interviews
3. School Achievement Records

### 3.4 STANDARDIZED TESTS

The special standardized tests were used to find out the I.Q., creative abilities and some personality traits of the children under study. The tests used for the data collection in the present case were as under :

1. Desai-Bhatt Group Test of Intelligence  
( By Dr. K.G. Desai and Dr. Champa L. Bhatt)
2. Torrance Test of Creative Thinking ( Verbal Form A )  
( By E. Paul Torrance )
3. Torrance Test of Creative Thinking (Figural Form B )  
( By E. Paul Torrance )
4. Cattell's Sixteen Personality Factor Test  
( By R.B. Cattell )

Test No. 1 is already standardized in Gujarati with reliability coefficient and validity coefficient. (Appendix I)

Tests No. 2 to 4 were adapted in Gujarati by the investigator and their reliability ( test-retest ) as well as validity ( compared with the original in English ) were found on separate sample to be satisfactory. It was assumed and also observed that such adaptation for children in our area would not affect the results on the original tests, being mostly culture free and pictorial type. ( These tests have been given in the Appendices 2, 3 and 4 ).

Desai-Bhatt Group Test of Intelligence :

This is a standardized Test which has been constructed in Gujarati to measure the intelligence of students ( 12 to 18 years of age ) studying in grades VIII to XI of secondary schools all over Gujarat. The test comprises of 100 items which include the following types of sub-tests :

1. Following directions
2. Opposites
3. Disarranged sentences
4. Classification
5. Meaning of proverbs
6. Number sequence
7. Analogies
8. Differentiation
9. Arithmetical reasoning
10. Verbal reasoning

In the beginning of the test 10 items have been given for illustration and practice. There is a separate answer sheet to answer the test. The time limit for this test is 40 minutes. The author has given complete and detailed instructions for administering the test and the scoring procedure in the manual of the test and a table for boys and girls (age-wise) has been given to find out the I.Q. of the student from his correct responses. The classification of the I.Q. has been given to understand the meaning.

Torrance Test of Creative Thinking ( Verbal Form A ) :

This verbal test is adequate for use from the fourth grade through graduate school in groups and as an individual test from kindergarten through grade 3. There is also an alternate Verbal Test Form B. This verbal test measures the creative abilities of the children. It measures the creative abilities in terms of fluency, flexibility and originality. The test comprises seven different activities. Activities Nos. 1 to 5 and 7 are scored for fluency, flexibility and originality, while activity No.6 is scored only for fluency and originality.

The time limit for each activity of the test is shown below :

No.	Name of the Activity	Time (in minutes)
1.	Ask	5
2.	Guess causes	5
3.	Guess consequences	5
4.	Product improvement	10
5.	Unusual uses of cardboard boxes	10
6.	Unusual questions about cardboard boxes	5
7.	Just suppose	5

The total working time for this test is 45 minutes. The first three activities are based on a picture. For activity No.4, the small stuffed toy elephant is supplied and for activity No.7, an improbable situation - one that will probably never happen - has been given. There is no separate answer-sheet for this test. The children have to write for the responses in the space given in the test. Torrance<sup>(118)</sup> has given separate, complete and detailed preliminary instructions to pupils, specific instructions for administering all the seven test activities and also procedure for scoring fluency, flexibility and originality in the manual of the test.

Torrance Test of Creative Thinking ( Figural Form B ) :

This figural form is supposed to be for use from kindergarten through graduate school. The figural form requires responses that are mainly drawing or pictorial in nature. This figural test measures the creative abilities of the subjects tested. It measures the creative abilities in terms of fluency, flexibility, originality and elaboration. There is also an alternate Figural Test Form A. The test comprises of three types of activities. The activities Nos. 2 and 3 are scored for fluency, flexibility, originality and elaboration, while the activity No.1 is scored for only

originality and elaboration. The time limit for each activity is shown below :

<u>No.</u>	<u>Name of the Activity</u>	<u>Time (in minutes)</u>
1.	Picture Construction	10
2.	Picture Completion	10
3.	Circles	10

The total working time for this test is 30 minutes. In this test also there is no separate answersheet. In the activity No.1, a piece of coloured paper in the form of curved shape is given to each subject. Torrance<sup>(119)</sup> has given separate complete and detailed preliminary instructions to pupils, specific instructions for administering all the three test activities and also procedure for scoring fluency, flexibility, originality and elaboration in the manual of the test.

Sixteen Personality Factor Test - By R.B. Cattell :

The investigator has adopted this test in Gujarati from the original 16 Personality Factor Test standardized in English by R.B. Cattell<sup>(12,13)</sup>. Form A and Form B of the original test were translated into Gujarati. 240 statements were selected out of 374 translated statements of both the forms A and B by a group of experts. The test formed by these 240 items was administered to 370 students from standards VII to XI in secondary schools. From these data difficulty indices and validity indices were computed. From these 240 statements, 160 statements were selected

for the final form on the basis of above indices. The validity ( compared with original in English ) and even reliability ( test - retest method ) of this adapted test were examined on a separate small sample of 100, these values were 0.56 and 0.81 respectively. There are 16 factors in the test and for each factor there are ten statements. There is a separate answersheet for the test. The time limit for this test is one hour. The final form was used to get data on personality of the intellectually gifted students. This test measures sixteen different personality factors. All the sixteen factors comprise of certain traits. Cattell<sup>(14,15)</sup> has given separate, complete and detailed description of the sixteen personality factors, instructions for administering the test and also procedure for scoring in the manual of the test. The detailed information regarding all sixteen factors and their traits is given in the next pages.

FACTOR A

Cyclothymia A+	Vs.	Schizothymia A-
(warm, sociable)		(aloof, stiff)

This factor constitutes the following traits.

- |                             |                                    |
|-----------------------------|------------------------------------|
| 1. Good natured, Easy going | Vs. Aggressive, Grasping, Critical |
| 2. Ready to co-operate      | Vs. Obstructive                    |
| 3. Attentive to people      | Vs. Cool, Aloof                    |
| 4. Soft hearted, Kindly     | Vs. Hard, Precise                  |
| 5. Trustful                 | Vs. Suspicious                     |
| 6. Adaptable                | Vs. Rigid                          |
| 7. Warm hearted             | Vs. Cold                           |

FACTOR B

General Intelligence B+ Vs Mental Defect B-  
(bright) (dull)

The measurement of intelligence has been shown to carry with it as a factor in the personality realm some of the following ratings :

- |                              |    |                 |
|------------------------------|----|-----------------|
| 1. Conscientious             | Vs | Of lower morale |
| 2. Persevering               | Vs | Quitting        |
| 3. Intellectual,<br>Cultured | Vs | Boorish         |

FACTOR C

Emotional Stability Vs Dissatisfied Emotionality C-  
or Ego Strength C+ (emotional, immature, unstable)  
(mature, calm)

This factor loads to the following traits :

- |                                   |    |   |
|-----------------------------------|----|---|
| 1. Emotionally mature             | Vs | Lacking in frustration Tolerance                                  |
| 2. Emotionally stable             | Vs | Changeable (in attitudes)   |
| 3. Calm, Phlegmatic               | Vs | Showing general emotionality                                      |
| 4. Realistic about life           | Vs | Evasive ( on awkward issues and<br>in facing personal decisions ) |
| 5. Absence of neurotic<br>fatigue | Vs | Neurotically fatigued   |
| 6. Placid                         | Vs | Worrying  |

FACTOR E

Dominance or Ascendence E+ Vs Submission E-  
(aggressive, competitive) (milk-toast-mild)

This factor has been found to load the following traits :

- |                            |                          |
|----------------------------|--------------------------|
| 1. Assertive, Self assured | Vs. Submissive           |
| 2. Independent minded      | Vs. Dependent            |
| 3. Hard, Stern             | Vs. Kindly, Soft hearted |
| 4. Solemn                  | Vs. Expressive           |
| 5. Unconventional          | Vs. Conventional         |
| 6. Tough                   | Vs. Easily upset         |
| 7. Attention getting       | Vs. Self sufficient      |

FACTOR F

Surgency F + Vs. Desurgency F -  
(enthusiastic, happy-go-lucky) (glum, sober, serious)

This factor included the following traits :

- |                           |                           |
|---------------------------|---------------------------|
| 1. Talkative              | Vs. Silent, Introspective |
| 2. Cheerful               | Vs. Depressed             |
| 3. Serene, Happy-go-lucky | Vs. Concerned, Brooding   |
| 4. Frank, Expressive      | Vs. Incommunicative, Smug |
| 5. Quick and alert        | Vs. Languid, Slow         |

FACTOR G

Character or Superego	Vs.	Lack of Rigid Internal	
Strength	G+	Standards	G-
(conscientious, persistent)		(casual, undependable)	

The following traits are in this factor :

- |                            |                          |
|----------------------------|--------------------------|
| 1. Persevering, Determined | Vs. Quitting, Fickle     |
| 2. Responsible             | Vs. Frivolous            |
| 3. Emotionally mature      | Vs. Demanding, Impatient |
| 4. Consistently ordered    | Vs. Relaxed, Indolent    |
| 5. Conscientious           | Vs. Undependable         |
| 6. Attentive to people     | Vs. Obstructive          |

FACTOR H

Parmia H+	Vs.	Threctia H-
(adventurous, thick-skinned)		(shy, timid)

This factor includes the following traits:

- |   |  |
|---|--|
| 1. Adventurous, Likes meeting people      | Vs. Shy, Withdrawn                             |
| 2. Active, overt interest in opposite sex | Vs. Retiring in face of opposite sex           |
| 3. Responsive, Genial                     | Vs. Aloof, Cold, Self contained                |
| 4. Friendly                               | Vs. Apt to be embittered                       |
| 5. Impulsive and frivolous                | Vs. Restrained, Conscientious                  |
| 6. Emotional and artistic interests       | Vs. Restricted interests                       |
| 7. Carefree, Does not see danger signals  | Vs. Careful, Considerate, Quick to see dangers |

FACTOR I

Premia I+ Vs. Harria I-  
(sensitive, effeminate) (tough, realistic)

The following traits are included in this factor :

1. Demanding, Impatient, Vs. Realistic, Expects little  
Subjective
2. Dependent, Seeking Vs. Self reliant, Taking respon-  
help sibility
3. Kindly, Gentle Vs. Hard ( to a point of cynicism)
4. Artistically fastidious, Vs. Few artistic responses  
Affected (but not lacking taste)
5. Imaginative in inner life Vs. Unaffected by fancies  
and in conversation
6. Acts on sensitive insti- Vs. Acts on practical, logical  
tution evidence
7. Attention seeking, Frivo- Vs. Self sufficient  
lous
8. Hypochondriacal, Anxious Vs. Unaware of physical disabilities

FACTOR L

Protension (paranoid tendency) L+ Vs. Relaxed Security L-  
(suspecting, jealous) (accepting, adaptable)

This factor includes the following traits :

1. Jealous Vs. Accepting
2. Self-sufficient Vs. Outgoing
3. Suspicious Vs. Trustful
4. Withdrawn, Brooding Vs. Open, Ready to take a chance
5. Tyrannical Vs. Understanding and permissive,  
Tolerant
6. Hard Vs. Soft-hearted
7. Irritable Vs. Composed and cheerful

FACTOR M

Autia M+ Vs. Praxernia M-  
(bohemian, introverted, (practical, concerned with facts)  
absent minded)

This factor includes the following traits :

1. Unconventional, Self Vs. Conventional, Alert to  
absorbed practical needs
2. Interested in art, theory, Vs. Interests narrowed to  
basic beliefs immediate issues
3. Imaginative, Creative Vs. No spontaneous creativity
4. Frivolous, Immature in Vs. Sound, Realistic, Dependable,  
practical judgment Practical judgment
5. Generally cheerful, but Vs. Earnest, Concerned or worried  
occasional hysterical but very steady  
swings of 'giving up'

FACTOR N

Shrewdness N + Vs. Naivete N-  
(sophisticated, polished) (simple, unpretentious)

The following traits are included in this factor :

1. Polished, Socially alert Vs. Socially clumsy and natural
2. Exct, Calculating mind Vs. Vague and sentimental mind
3. Aloof, Emotionally dis- Vs. Warm, Gregarious, Spontaneous  
ciplined
4. Esthetically fastidious Vs. Simple tastes
5. Insightful regarding self Vs. Lacking self insight
6. Insightful regarding others Vs. Unskilled in analyzing  
motives
7. Ambitious, Possibly insecure Vs. 'Content with what comes
8. Expedient, 'cuts corners' Vs. Trusts in accepted values

FACTOR O

Guilt proneness O + Vs. Confident adequacy O-  
(timid, insecure) (confident, self-secure)

This factor includes the following traits :

1. Worrying, Anxious Vs. Self confident
2. Depressed Vs. Cheerful, Resilient
3. Sensitive, Tender, Vs. Tough, Placid  
Easily upset
4. Strong sense of duty Vs. Expedient
5. Exacting, Fussy Vs. Does not care
6. Hypochondriacal Vs. Rudely vigorous
7. Phobic symptoms Vs. No fears
8. Moody, Lonely, Brooding Vs. Given to simple action

FACTOR Q<sub>1</sub>

Radicalism Q<sub>1</sub>+ Vs. Conservatism of Temperament Q<sub>1</sub>-

FACTOR Q<sub>2</sub>

Self-Sufficiency Q<sub>2</sub>+ Vs. Group Dependency Q<sub>2</sub>-  
(self sufficient, resourceful) (sociably group dependent)

FACTOR Q<sub>3</sub>

High Self Sentiment Vs. Poor Self Sentiment  
Formation Q<sub>3</sub>+ Formation Q<sub>3</sub>-  
(controlled, exacting (uncontrolled, lax)  
will power)

FACTOR Q<sub>4</sub>

High Ergic Tension Q<sub>4</sub>+ Vs. Low Ergic Tension Q<sub>4</sub>-  
(tense, excitable) (phlegmatic, composed)

### 3.5 INTERVIEWS

The interview method was also used to get clarification on certain data as needed and also to collect data which were not available through the above tools. This method was also used to understand the difficulties in the progress of the children. The parents and teachers were also interviewed whenever necessary.

### 3.6. SCHOOL ACHIEVEMENT RECORDS

The records of school performance or achievement of the students at the last annual examination in different school subjects were also collected to study its relation with other factors. The subjectwise last annual examination marks were taken into account for this purpose.

### 3.7. PROCEDURE

The data collection extended over three sessions, viz. (1) for I.Q. study, (2) creativity study and (3) personality study respectively.

#### First Session :

After the students were seated in a separate room of each class, attempt was made to develop nontest atmosphere by using adequate language. It is advisable to create a rapport through a game, like, thinking and problem-solving atmosphere. Stimulating climate both preceding and during the

use of the tests is essential. The investigator had sufficient number of test booklets and some pencils. The pupils were allowed to keep pen, pencil and eraser with them. After giving them preliminary instructions, the answer-sheets for Desai-Bhatt Group Test of Intelligence were distributed. They were asked to fill up the information in the space provided on the top of the answer-sheet. They were told to read the instructions given on the answer-sheet. After seeing that the instructions were grasped clearly, they were instructed clearly and in detail, how to give answer. Then, the booklet of Intelligence Test was given to the pupils. In the beginning, they were allowed to write the answers to the illustrating questions given on the first page. After one minute, they were asked to stop the work. Then, the investigator read all the illustrations one by one and explained them why a particular answer was correct. In this way, he explained all the ten illustrations one by one. After that they were allowed to write the answers to the proper test items, from item No. 11 to 110, on a separate answer-sheet. They were also told not to write anything on the test booklet. The total working time of 40 minutes was allowed. After 20 minutes they were told that half the time was over. When they completed the test, the test booklets were collected.

This test was administered in groups to total sample of 3503 school pupils out of a population of 8216.

From the correct responses and the age, the I.Q. of the students were calculated for purpose of selection of the final sample under study, as described earlier.

On the basis of these I.Q. scores, a sample of 1002 gifted school pupils with I.Q. above 120 was selected for further testing.

Second Session :

During the second session, the pupils selected on the basis of their I.Q. and achievement for the purpose of the study, were seated in groups in separate rooms for the administration of Torrance's Creativity Test. The students were allowed to keep with them only pen, pencil and eraser. On this day, after giving them preliminary information and instructions as meant by the author of the Creative Test, the verbal form A and figural form B of Torrance Test of Creative Thinking, were administered to the sample of 1002 pupils described earlier. The students were asked to fill up the information in the space given in the test booklets on the cover page. All the seven activities of the verbal form, were given one by one according to the instructions laid down by the author for each activity. The

time to work on each activity was allowed as shown in the manual of the test. There were specific instructions for each activity. Before starting the activity, the instructions were read by the investigator.

After seeing that they had understood the instructions, they were allowed to start the activity. The same procedure was followed for the remaining six activities of the verbal form A and three activities of the figural form B of Torrance Test of Creative Thinking, according to time limit given by the author. Both the test booklets were collected after completion. ( Their responses on each factor, were scored later on).

#### Third Session :

During the third session, the same sample of selected 1002 pupils were seated in groups in separate rooms for the administration of Cattell's Personality Test. All the general instructions were given to them as it they were given during the previous sessions. After that the separate answer-sheets for Cattell's Sixteen Personality Test were distributed. They were told to fill in the information on the answer-sheet. Then, the test booklet was given. The investigator read the instructions given on the test booklet. The pupils were also allowed to read the instructions of

the test. After fully understanding the instructions, they were allowed to give answers to the test items. The specified time was allowed. ( Their responses on each factor were scored later on ). Moreover, wherever needed or felt so, persons concerned were interviewed for some information.

However, only the objective data collected from standard tests as well as data on school achievement were used for analysis in the study.

At a later stage the school achievement of only the pupils useful for the study was also noted down from the school records. Scoring on creativity and personality factors as prescribed by the authors was strictly followed. All these scores of different sizes of samples for the study were separately analysed with the help of adequate statistical techniques and the results have been discussed in the following chapters. It should be noted that the data of the sample consisting of 935 gifted pupils were primarily analysed for the main study. The data for other samples of 325, 683 and 143 were drawn from the same sample of 935 for special analysis for additional study of other variables.

### 3.8 STATISTICAL TECHNIQUES

The following statistical techniques were used to

analyse the data collected :

1. The items for Cattell's Personality Test ( as adapted in Gujarati) were selected after computing difficulty indices and validity indices.
2. The scores on creativity were converted into T-scores.
3. The technique of Analysis of Variance (F-test) was used to study the role of intelligence ( giftedness ), sex and age in creativity and personality.
4. Techniques of L.S.D.<sup>\*</sup> test for further analysis to study differences between the two means in each pair of variables.
5. Techniques of correlation ( Product-Moment Method ) to study correlation between different variables viz., intelligence, creativity, achievement, personality.

The chapters that follow now describe and discuss the results obtained.

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\* L.S.D. = Least Significance Difference