CHAPTER VI

C H A P T E R VI

THE CORRELATIONAL AND FACTOR ANALYSIS APPROACH

6.0.0 Introduction

In order to have an overall view, it was thought that a multivariate approach of analysis might be carried on. Since one of the purposes of the present investigation was to explain the structure of factor implicit in creative thinking, it was considered desirable to include the co-efficient of correlation relating to various components of the Passi Tests of Creativity (Verbal Form) and the Torrance Tests of Creative Thinking (Figural Form A and Verbal Form B). All of the eighteen criterion variables of creative thinking were included alongwith socio-economic status in the correlation matrix. The correlation matrix (19 x 19) for Indian (Lower Half) and Thai (Upper Half) Samples was presented in Table 6.1. It may be mentioned again that all the eighteen criterion variables of creative thinking and socio-economic status have been described in terms of their raw scores.

Principal components method of Hotelling (1933) was employed to extract factors from the table of inter-correlations. The details of extraction of factors based on original - correlation matrix is presented in original principal component factor matrix in Table 6.2. The discussion of the results would be done on the basis of varimax rotated factor matrix.

As regards, Kaiser (1950) the table of factor loadings that emerges from extraction is rarely useful unless additional transformation of the factor matrix has been done. The - varimax factor matrix has also been given in Table 6.3. The discussion of the results would be reported into two main parts i.e. correlational approach and factor analysis approach in the following captions.

TABLE 6.1 COMPARATIVE CORRELATION MATRIX (19x19) (LOWER AND HIGHER WITHOUT DIAGONAL) OF INDIAN (N_1 = 300) AND THAI (N_2=300) STUDENTS

Sr. No.		INDIAN SP	UF	UX	UO	UC	CF	CO	CC	CY	THAI FF	FX	FO	FE	FC	VF	VX	VO	VC	SES	
1	SP		487**	343**	419**	060	494**	194**	494**	679**	066	236**	204**	-023	115*	091	072	129*	-044	413**	SP
2	UF	664**		768**	878**	493**	355**	250**	302**	820**	176**	189**	221**	246**	314**	121*	164**	092	188**	554**	UF
3	UX	600**	795**		710**	364**	289**	160**	-55*	676**	173**	184**	230**	160**	251**	131*	160**	106	123*	481**	UX
4	UO	464**	732**	749**		562**	347**	327**	306**	821**	253**	199**	242**	315**	372**	096	166**	077	236**	532**	UO
5	UC	433**	384**	622**	631**		220**	723**	087	537**	489**	046	147*	895**	746**	-048	230**	135*	724**	481**	UC
6	CF	569 659**	572**	551**	529**	476**		664**	968**	684**	219**	239**	216**	199**	292**	069	118*	081	132*	453**	CF
7	CO	617**	484**	507**	478**	554*	708**		624**	570**	482**	163**	222**	728**	667**	0-024	210**	085	574	462**	CO
8	CC	599**	546**	542**	508**	507**	815**	869**		646**	167**	256**	228**	075	201**	083	095	107	031	397**	CC
9	CY	734**	751**	755**	665**	633**	678**	605**	667**		329**	298**	323**	365**	461**	127*	215**	108	282**	655**	CY
10	FF	492**	657**	626**	605**	485**	401**	412**	439**	601**		774**	645**	572**	790**	361**	485**	294**	624**	294**	FF
11	FX	319**	541**	391**	398**	081	241**	212**	239**	351**	788**		761**	140*	524**	449**	431**	412**	261**	262**	FX
12	FO	438**	563**	552**	564**	504**	346**	381**	397**	544**	895**	698**		245**	601**	315**	331**	296**	254**	175**	FO
13	FE	329**	231**	464**	483**	940**	369**	489**	427**	520**	535**	146*	569**		881**	-042	241**	-121*	729**	388**	FE
14	FC	436**	484**	585**	607**	755**	411**	495**	473**	606**	859**	546**	856**	869**		169**	387**	092	697**	414**	FC
15	VF	396**	524**	414**	508**	259**	287**	271**	309**	448**	744**	671**	668**	294**	595**		920**	903**	562**	024	VF
16	VX	386**	500**	388**	505**	250**	268**	268**	300**	427**	719**	648**	648**	288**	580**	983**		858**	783**	126*	VX
17	VO	406**	501**	452**	548**	399**	323**	341**	361**	492**	748**	687**	687**	438**	679**	957**	957**		477**	007	VO
18	VC	493**	397**	523**	589**	818**	405**	484**	456**	586**	692**	679**	679**	843**	855**	724**	722**	820**		269**	VC
19	SES	645**	575**	675**	648**	807**	661**	717**	686**	771**	554**	525**	525**	717**	687**	353**	346**	440**	697**		SES

NB Decimals have been omitted

* Significant at .05 level
** Significant at .01 level

TABLE 6.2 ORIGINAL PRINCIPAL COMPONENT FACTOR MATRIX FOR INDIAN (N_1 = 300) AND THAI (N_2 =300) SAMPLES.

Sr. No.	VARIABLES	INDIAN SAMPLE				THAI SAMPLE					
		Factor I	Factor II	Factor III	Factor IV	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
1	SP	68[illegible]	- 251	- 341	- 051	443	- 369	- 499	107	019	536
2	UF	75[illegible]	- 039	- 485	300	667	- 404	- 259	- 467	111	- 072
3	UX	782	- 197	- 184	386	564	- 334	- 288	461	160	- 274
4	UO	784	- 078	- 036	269	691	- 378	- 164	- 433	115	- 127
5	UC	744	373	511	106	721	127	598	262	111	000
6	CF	66[illegible]	- 445	- 303	- 234	602	- 369	- 261	534	- 299	- 156
7	CO	682	- 469	- 135	- 352	724	- 175	392	367	- 309	- 081
8	CC	700	- 446	- 248	- 359	532	- 361	- 354	587	- 278	- 184
9	CY	824	- 282	- 188	114	836	- 429	- 248	- 066	- 029	028
10	FF	857	345	- 013	168	700	438	208	206	330	019
11	FX	587	546	- 290	143	542	418	- 263	297	534	017
12	FO	807	320	098	182	548	317	- 138	258	588	- 102
13	FF	703	- 218	659	025	663	042	710	- 029	- 053	059
14	FC	871	111	379	105	803	199	442	105	210	031
15	VF	7[illegible]5	599	099	238	366	724	467	150	242	018
16	VX	7.0	602	087	265	532	716	231	166	315	007
17	VO	7[illegible]8	513	036	259	308	687	540	121	247	008
18	VC	850	129	43	183	675	518	343	167	336	051
19	SES	820	406	118	012	653	344	024	076	022	330
EIGEN VALUE (Latent Root)		5.743	1.467	92	502	3.892	1.818	1.424	934	761	303
Percent Variation		57.431	14.666	9.230	5.016	38.922	18.185	14.235	9.341	7.608	3.034
Cumulative Percent Variation		57.431	71.597	80.826	85.842	38.922	57.107	71.342	80.683	88.290	91.325

NB : Decimals have been omitted

Loadings beyond $\pm$ .400 are considered significant.

TABLE 6.3 VARIMAX ROTATION OF ORIGINAL FACTOR MATRIX FOR INDIAN (N_1= 300) AND THAI (N_2=300) SAMPLES

Sr. No.	VARIABLES	INDIAN				THAI					
		Factor I	Factor II	Factor III	Factor IV	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
1	SP	2243	6541	1139	4073	-1187	3198	0496	3184	1097	8053
2	UP	3378	4448	0225	7659	1425	9096	0584	1049	0579	2129
3	UX	1767	3887	3283	7366	0358	8951	0672	0936	0974	- 0025
4	UO	2937	3403	3714	5987	2269	8814	0364	1207	0862	1409
5	UC	0393	3399	8917	2314	9058	3897	- 0371	0260	- 0142	0197
6	CP	1079	8294	1530	2418	1241	2059	0328	9317	0955	1758
7	CO	1194	8475	2945	0917	7394	0763	0300	6205	0701	0498
8	CC	1530	8812	2059	1531	0020	1724	0381	9608	1187	1597
9	CY	2124	5975	3340	5410	2634	7079	0623	4693	1425	3687
10	PP	6896	1532	3653	4988	5378	0328	2457	0622	7223	0312
11	PX	7315	0206	- 0472	4587	0342	0762	2798	1083	8936	1253
12	PC	6293	0918	4388	4465	1046	1526	1400	0989	8821	0081
13	PE	1483	2113	9508	0827	9578	1079	0511	0377	1371	0082
14	PC	4983	1746	7413	3135	7862	1585	0762	0973	5243	0547
15	VP	9418	1755	- 1265	1338	- 0284	0571	9562	0117	1976	0046
16	VY	9419	1748	1254	1005	2684	0669	9320	0284	1698	0044
17	VO	8972	2099	2812	0922	- 1201	0383	9406	0344	1758	0440
18	VC	5796	2760	7393	0492	7868	0470	5977	- 0014	0765	- 0239
19	SES	1336 (1236)	6110	5977	5247	3695	4398	0213	2224	0645	5257
EIGEN VALUE		2.625	2.216	2.166	1.578	2.221	1.848	1.691	1.379	1.359	636
Percent Variation		26.247	22.158	21.656	15.779	22.205	18.476	16.908	13.793	13.588	6.356
Cumulative Percent Variation		26.247	48.405	70.06	85.840	22.205	40.681	57.589	71.382	84.970	91.326

All decimal points have been omitted in factor loadings.

6.1.0 Correlational Approach :

The product - moment coefficients of correlation were worked out from the original ungrouped raw scores of eighteen criterion variables of creative thinking and socio-economic status for Indian (N = 300) and Thai Samples (N = 300). The results of correlation matrix (19 x 19), original principle components and varimax rotated factors have been given in Tables 6.1 to 6.3.

In the Table 6.1 the correlation matrix (19 x 19) indicated relationship between all the components of creative thinking and socio-economic status of the Indian students at Baroda City (Lower Part) and the Thai students at Bangkok City (Upper Part). The correlation matrix (19 x 19) has been sub-divided into different parts, namely, a, b, c and d.

6.1.1 Results Related to Indian Sample (Lower Half of Correlation Matrix) :

Lower part of the correlation matrix (19 x 19) included the coefficients of correlation among all components of creative thinking and socio-economic status of the Indian students (Baroda). As already mentioned the interpretations

would have been done according to different parts, namely, a, b, c and d.

Part (a) of Table 6.1 (Lower Half) includes intercorrelations among all the components of creativity assessed by the Passi Tests of Creativity (Verbal Form). All the thirty six coefficients of correlation were found to be significantly correlated at .01 level. The coefficients of correlation range from 0.384 to 0.869. The highest correlation in the part (a) was found by the coefficient of correlation of Consequences Originality (CO) and Consequences Creativity (CC) which has obtained r = 0.869 for df = 298. The lowest one was found between Unusual Uses Fluency and Unusual Uses Creativity.

Part (b) of the Table 6.1 (Lower Half) - contains coefficients of correlation among the components of figural creative thinking measured by the TTCT (Figural Form A), and all components of creativity of the PTC. The coefficients range from .081 to .940, out of which fifty four coefficients are significant at .01 level, and one is not significant. The highest correlation in the part (b) was found between Figural Elaboration (FE) and Unusual Uses Creativity (UC) (r = 0.940) and the lowest one was found between Figural Flexibility (FX) and

Unusual Uses Creativity (UC) (r = .081).

Part (c) of the correlation matrix (19 x 19) includes the intercorrelations among various components of verbal creative thinking as measured by the TTCT (Verbal Form B), the components of creativity of the PTC and as well as components of figural creative thinking (TTCT; Figural Form A). The coefficients of correlation range from .250 to .983. All of fifty eight coefficients of correlation are positively and significantly correlated at .01 level. The highest correlation was found between Verbal Fluency (VF) and Verbal Flexibility (r = 0.983) and the lowest one was between Verbal Flexibility (VX) with Unusual Uses Creativity (r = 0.250).

Part (d) of the correlation matrix (19 x 19) of Indian students includes the coefficients of correlation of socio-economic status with all eighteen criterion variables of creative thinking. The socio-economic status was found to be positively and significantly correlated at .01 level with all the eighteen dimensions of creative thinking. The coefficients of correlation range from 0.346 to 0.807. The highest correlation was found between socio-economic status and Unusual Uses Creativity (UC) and the lowest one was between socio-economic status and Verbal Flexibility (VX).

6.1.2 Results Related to Thai Sample (Upper Half of Correlation Matrix) :

Upper part of the correlation matrix (19 x 19) includes the coefficients of correlation among all components of creative thinking and socio-economic status of the Thai students (Bangkok). The interpretation and discussion of the results would be presented in different parts of a, b, c and d as the Indian Sample.

Part (a) of the correlation matrix (19 x 19) includes the coefficients of correlation of all components of creativity as assessed by the PTC (Verbal Form). They range from .060 to .968. Out of thirty six coefficients of correlation, thirty four are positively and significantly at .01 level and two are not significant. The highest correlation in the part (a) of the Thai sample was found by Consequences Fluency (CF) and Consequences Creativity (CC) and the lowest one was found between Seeing Problems (SP) and Unusual Uses Creativity (UC).

Part (b) of the Table 6.1 (Upper Half) - includes intercorrelations among the components of figural creative thinking as measured by the TTCT (Figural Form A) and all components of creative of the PTC. The values range from - .023 to 0.895. There are forty nine coefficients of correlation positive and significant at .01 level, five are not

significant and one is significant at .05 level. The highest correlation was found between Unusual Uses Creativity (UC) and Figural Elaboration (r = 0.895) and the lowest one was Figural Elaboration (FE) and Seeing Problems (r = - .023).

Part (c) contains correlation matrix of different components of verbal creative thinking as measured by the TTCT (Verbal Form B), various components of the PTC as well as the components of figural creative - thinking (The TTCT : Figural Form A). The coefficients of correlation range from - .135 to 0.920. Out of which thirty one are positively significant at .01 level, eight, at .05 level and nineteen are not significant. The highest correlation was found between Verbal Flexibility (VX) and Verbal Fluency (VF) and the lowest one was between the coefficient of correlation for Verbal Originality and Unusual Uses Creativity.

Part (d) of the correlation matrix (19 x 19) includes the intercorrelations among socio-economic status and all the eighteen criterion variables of creative thinking in the present study. They range from 0.007 to 0.655. Out of eighteen coefficients of correlation, sixteen are positive and significant at .01 level. The remaining two coefficients of correlation were found to be not significant. The

highest correlation was found between socio-economic status (SES) and Creativity Total (CY) which yields the value of 0.655 and the lowest one was found between socio-economic status (SES) and Verbal Originality (VO) by coefficient of .007.

To summarize the results related to correlation matrix (19 x 19) for Indian (N = 300) and Thai (N = 300) samples, it may be said that in the case of Indian sample each dimension of creative thinking as measured by the PTC (Verbal Form) and the TTCT (Figural Form A and Verbal Form B) is correlated with the others. In other words, the abilities measured by Passi Tests of Creativity (Verbal Form) and Torrance Tests of Creative Thinking (Figural Form A and Verbal Form B) have been measured to some extent the same function of mental ability. In the Thai sample, this happens to be the same.

It is interesting to note here that regarding to the Thai sample, the following dimensions of figural creative thinking and verbal creative thinking as assessed by the Torrance Tests of creative thinking were found to have no significant correlation with some components of creativity of the PTC viz., Figural Fluency (FF) : Seeing Problems (SP); Figural Flexibility (FX) : Unusual Uses Creativity (UC); Figural Elaboration (FE) : Seeing Problems (SP); Figural -

Elaboration (FE) : Consequences Creativity (CC); Figural Creativity (FC) : Seeing Problems (SP); Verbal Fluency (VF) : Unusual Uses Creativity (UC); Verbal Fluency (VF) : Consequences Originality (CO); Verbal Originality (VO) : Unusual Uses Creativity (UC); Verbal Originality (VO) : Consequences Originality (CO); and Verbal Creativity (VC) : Seeing Problems (SP).

Referring to the socio-economic status, its relationship with the criterion variable of creative thinking is positive and significantly high in both the cases of Indian and Thai.

6.2.0 Results of Factor Analysis :

As already mentioned the discussion of results has been based on the varimax rotated factor matrix. The rotation of factors to the orthogonal normal varimax solution developed by Kaiser (1956) has been adopted. Since, rotated factor loadings are more psychological, meaningful and interpretable because of the simple structure and positive manifold.

Thurstone (1957) proposed that "No matter what method of factoring is used, it is safe rule to continue the factoring until one is sure that the factoring has gone far enough. Too many factors can do no harm, but too few factors are sure to cause trouble in identifying the structure. If too

many factors are determined in the factor matrix before rotation of axes, then the residual factors appear in the rotation of axes, and they are left without interpretation." He further stated that the configuration must be rotated before the factors can be even expected to have psychological meaning. The discussion would be sequenced as Indian and Thai results. The interpretation of varimax factors has been centred around only those variables which had loadings greater than absolute value of .400. This criterion has been adapted by Thurstone (1957) when he said that "A projection or a factor loading of .20 accounts for only 4 percent of the total variance of a test. We have not regarded a projection as significant in naming a factor unless it is as large as .40."

The serial number of the variable as given in the correlation matrix, the variable with abbreviate code and the rotated varimax factor loadings are given right in the beginning of the discussion of each factor. The rotated varimax factor loadings are also arranged in descending order of magnitude for the sake of convenience. An attempt is made to name these factors and interpretation are done accordingly.

6.2.1 Indian Sample :

(a) Varimax Factor I (Indian) :

The significant loadings of varimax factor I, arranged in descending order are given in Table 6.4. This factor is characterized by significant loadings for eight variables out of nineteen variables across the domains of criterion variable of creative thinking and variable of socio-economic status.

TABLE 6.4 VARIMAX FACTOR I OF INDIAN SAMPLE (N=300)

Sr. No. as is given in the correlation matrix	Variable	Code	Loading
16	Verbal Flexibility	VX	.9419*
15	Verbal Fluency	VF	.9418*
17	Verbal Originality	VO	.8972*
1	Figural Flexibility	FX	.7315*
10	Figural Fluency	FF	.6896*
12	Figural Originality	FO	.6293*
18	Verbal Creativity	VC	.5796*
14	Figural Creativity	FC	.4983*

*Asterisks indicate the highest loadings for test in question.

The first factor is sharing 26.247 percent of the total variance. All the factor loadings are found to be positive. The significant loadings were shared by Verbal Flexibility (0.9419), Verbal Fluency

(0.9418), Verbal Originality (0.8972), Figural Flexibility (0.7315), Figural Fluency (0.6896), Figural Originality (0.6293), Verbal Creativity (0.5796) and Figural Creativity (0.4983). It is interested to note that the highest loadings are shared by the dimensions of creative thinking as assessed by the Torrance Tests of Creative Thinking (Figural Form A and Verbal Form B). The mental functions - measured through these variables are the combination of verbal ability and non-verbal ability which based on the definition of creative thinking as a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on ; identifying the difficulty ; searching for solutions, making guess, or formulating hypotheses about the deficiencies ; testing and retesting these hypotheses and possibly modifying and retesting them ; and finally communicating the results.

Thus, this factor can be named as ' General Creative Process. '

(b) Varimax Factor II (Indian) :

The significant loading of the second varimax factor are being summarised in Table 6.5.

TABLE 6.5 VARIMAX FACTOR II OF INDIAN SAMPLE (N=300)

Sr. No. as is given in the correlation matrix	Variable	Code	Loading
8	Consequences Creativity	CC	.8812*
7	Consequences Originality	CO	.8475*
6	Consequences Fluency	CF	.8294*
1	Seeing Problems	SP	.6541*
19	Socio-Economic Status	SES	.6110*
9	Creativity Total	CY	.5975*
2	Unusual Uses Fluency	UF	.4448*

*Asterisks indicate the highest loadings for test in question.

The varimax factor II is characterised by significant loadings for seven variables, out of nineteen variables. This factor is sharing 22.158 percent of total variance (Vide Table 6.3). The highest loading of this varimax factor is on the variable - Consequences Creativity (CC). The significant loadings were shared by Consequences Creativity (0.8812), Consequences Originality (0.8475), Consequences Fluency (0.8294), Seeing Problems (0.6541), Socio-Economic Status (0.6110), Creativity Total (0.5975) and Unusual Uses Fluency (0.4448). Most of the highest factor loadings are related to the -

dimensions of Consequences Test. The mental functions represented through these variables are : the indirect and remote consequences due to these impossible situations, represents originality in novel situation and the capacity to think and report relevant consequences due to the sudden occurence of certain hypothetical impossible situations.

This factor, therefore, can be named as the group factor of "Consequences Creativity."

(c) Varimax Factor III (Indian) :

The significant loading of varimax factor III arranged in descending order are given in Table 6.6.

TABLE 6.6 VARIMAX FACTOR III OF INDIAN SAMPLE (N=300)

Sr. No. as is given in the correlation matrix	Variable	Code	Loading
13	Figural Elaboration	FE	.9508*
5	Unusual Uses Creativity	UC	.8917*
14	Figural Creativity	FC	.7413*
18	Verbal Creativity	VC	.7393*
19	Socio-Economic Status	SES	.5977*
12	Figural Originality	FO	.4388*

*Asterisks indicate the highest loadings for test in question.

This factor includes significant loadings for

six variables. It covers 21.656 per cent of total variance. The factor loadings of all the six variables are positive. The significant loadings were shared by Figural Elaboration (0.9508), Unusual Uses Creativity (0.8917), Figural Creativity (0.7413), Verbal Creativity (0.7393), Socio-Economic Status (0.5977) and Figural Originality (0.4388). The Figural Elaboration has highest positive loading to the corresponding variables. Since the factor is mostly dominated by high significant loadings on the dimensions of Figural Creativity and the highest loading has fallen on the dimension of Figural Elaboration.

Thus, this factor can be named as "Figural Elaboration."

(d) Varimax Factor IV (Indian) :

The fourth varimax factor has been summarised in Table 6.7.

TABLE 6.7 VARIMAX FACTOR IV OF INDIAN SAMPLE (N=300)

Sr. No. as is given in the correlation matrix	Variable	Code	Loading
2	Unusual Uses Fluency	UF	.7659*
3	Unusual Uses Flexibility	UX	.7366*
4	Unusual Uses Originality	UO	.5987*
9	Creativity Total	CY	.5410*

TABLE 5.7 (Contd.)

Sr. No. as is given in the correlation matrix	Variable	Code	Loading
10	Figural Fluency	FF	.4988*
11	Figural Flexibility	FX	.4587*
12	Figural Originality	FO	.4465*
1	Seeing Problems	SP	.4073*

*Asterisks indicate the highest loadings for test in question.

This factor includes positive, the highest and significant loadings for eight variables namely, Unusual Uses Fluency (0.7659), Unusual Uses Flexibility (0.7366), Unusual Uses Originality (0.5987), Creativity Total (0.5410), Figural Fluency (0.4988), Figural Flexibility (0.4587), Figural Originality (0.4465) and Seeing Problems (0.4073). The percent total variance covered by this factor is 15.779. Since three variables of Unusual Uses Test of Creativity are highest among the eight varimax factors of the corresponding variables, this factor can be called "Unusual Uses Fluency."

6.2.2 Thai Sample :

(a) Varimax Factor I (Thai) :

TABLE 6.8 VARIMAX FACTOR I OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
13	Figural Elaboration	FE	.9578*
5	Unusual Uses Creativity	UC	.9058*
18	Verbal Creativity	VC	.7868*
14	Figural Creativity	FC	.7862*
7	Consequences Originality	CO	.7394*
10	Figural Fluency	FF	.5378*

*Asterisks indicate the highest loadings for test in question.

Table 6.8 shows that this factor includes significant loadings on only six variables, namely, Figural Elaboration (0.9578), Unusual Uses Creativity (0.9058), Verbal Creativity (0.7868), Figural Creativity (0.7862), Consequences Originality (0.7394), and Figural Fluency (0.5378). The percent total variance covered by this factor was 22.205. It is interesting that this factor has similar highest loadings with the Varimax Factor III (Indian). All the factor loadings are found to be positive. The Figural Elaboration shared most of its common variance to the other variables in this factor. Therefore, this factor can be named as "Figural Elaboration."

(b) Varimax Factor II (Thai) :

The second varimax factor of the Thai students has been summarised in Table 6.9.

TABLE 6.9 VARIMAX FACTOR II OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
2	Unusual Uses Fluency	UF	.9096*
3	Unusual Uses Flexibility	UX	.8951*
4	Unusual Uses Originality	UO	.8814*
9	Creativity Total	CY	.7079*
19	Socio-Economic Status	SES	.4398*

*Asterisks indicate the highest loadings for test in question.

This factor is characterized by significant positive loadings on Unusual Uses Fluency (0.9096), Unusual Uses Flexibility (0.8951), Unusual Uses Originality (0.8814), Creativity Total (0.7079) and Socio-Economic Status (0.4398). The percent total variance covered by this factor is 18.476. Most of these factor loadings are related to components of Unusual Uses Tests. Moreover, this factor of the Thai sample is more or less similar to the Varimax Factor IV (Indian). Therefore, this factor can be named as "Unusual Uses Fluency."

(c) Varimax Factor III (Thai) :

TABLE 6.10 VARIMAX FACTOR III OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
15	Verbal Fluency	VF	.9562*
17	Verbal Originality	VO	.9406*
16	Verbal Flexibility	VX	.9320*
18	Verbal Creativity	VC	.5977*

*Asterisks indicate the highest loadings for test in question.

Table 6.10 indicated that the third varimax factor was having significant loading with four variables out of nineteen variables. This factor covers 16.908 percent of total variance. The factor includes the variables, namely, Verbal Fluency (0.9562), Verbal Originality (0.9406), Verbal Flexibility (0.9320) and Verbal Creativity (0.5977). Since the present varimax factor comes under the domain of verbal creative thinking measured by the Torrance Tests of Creative Thinking, the varimax factor III of Thai students can be named as "Verbal Creativity."

These findings are almost similar to those of Dacey, Madaus and Allen (1969) who found the group factor of "Verbal Creativity". In their study, there

did not emerge separate factors for fluency, flexibility, and originality. They themselves presented an explanation that this might be the results of there being fewer than three tests for each of the constructs.

(d) Varimax Factor IV (Thai) :

The significant loadings of the fourth varimax factor are being summarized in Table 6.11

TABLE 6.11 VARIMAX FACTOR IV OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
8	Consequences Creativity	CC	.9608*
6	Consequences Fluency	CF	.9317*
7	Consequences Originality	CO	.6205*
9	Creativity Total	CY	.4693*

*Asterisks indicate the highest loadings for test in question.

This varimax factor is characterized by significant loadings for four variables out of nineteen variables in the domain of creative thinking and socio-economic status. The percent total variance covered by this factor is 13.793. The significant loadings were shared by Consequences Creativity (0.9608), Consequences Fluency (0.9317), Consequences Originality

(0.6205), and Creativity Total (0.4693). Out of all four significant factors loadings, three variables of Consequences Test dominate in this factor, therefore, it can be named to this factor as "Consequences - Creativity." This factor of the Thai sample is - again similar to that of Varimax Factor II (Indian).

(e) Varimax Factor V (Thai) :

TABLE 6.12 VARIMAX FACTOR V OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
11	Figural Flexibility	FX	.8936*
12	Figural Originality	FO	.8821*
10	Figural Fluency	FF	.7223*
14	Figural Creativity	FC	.5243*

*Asterisks indicate the highest loadings for test in question.

Table 6.12 shows that there are only four variables in this factor. This factor is characterised by significant positive loadings on Figural Flexibility (0.8936), Figural Originality (0.8821), Figural Fluency (0.7223) and Figural Creativity (0.5243). The percent total variance covered by this factor was 13.588. The factor loadings of all the four variables are positive. Since this factor is dominated by dimensions of Figural

Test of the TTCT, this factor can be easily named as the group factor of "Non-verbal Creativity." The emergence of a group factor of Non-verbal Creativity has also been observed by Dacey, Madaus and Allen (1969) and Anderson (1964). Guilford's (1956 b) "Structure of Intellect" when classified on the basis of content dimension would indirectly support the existence of such factor.

(f) Varimax Factor VI (Thai) :

TABLE 6.13 VARIMAX FACTOR VI OF THAI SAMPLE (N=300)

Sr. No. as is given in correlation matrix	Variable	Code	Loading
1	Seeing Problems	SP	.8053*
19	Socio-Economic Status	SES	.5257*

*Asterisks indicate the highest loadings for test in question.

This factors contains significant loading for two variables out of nineteen variables. The total variance shared by this factor is 6.356 percent. The factor includes the variables, namely, Seeing Problems (0.8053) and Socio-Economic Status (0.5257). The highest factor loading of this factor was dominated by Seeing Problems (SP) which is the ability to see problems and defects existing in the day to day objects.

Therefore, this factor can be named as "Sentivity to Problems."

6.3.0 Summarised Results of Factor Analysis :

To summarize, the varimax factor matrix (Vide Table 6.3) comprising four and six rotated varimax factors of Indian and Thai samples respectively - explains the correlation matrix (19 x 19, Vide Table 6.1). The four varimax factors of Indian sample explain 85.840 percent of the total variance. The six varimax factors of Thai sample described 91.326 percent of the total variance.

Out of the four factors emerging in Indian sample, the factor of "General Creative Process" has covered 26.247 percent of the total variance and it has been the most dominating factor. The percent total variance covered by the factor "Unusual Uses Fluency" was only 15.779 and it was the least dominating factor. According to the rotated varimax factor matrix and the percent total variance, the following was the order of the importance of the four named factors : (i) General Creative Process; (ii) Consequences Creativity; (iii) Figural Elaboration and (iv) Unusual Uses Fluency.

With reference to the Thai sample, out of the six varimax factors, the factor of "Figural Elaboration"

has covered 22.205 percent of total variance and it has the most dominating factor. The percent total variance shared by the factor of "Sensitivity to Problems" was only 6.356 and it was the least dominating factor. As regards the rotated varimax factor matrix and the percent total variance, the following was the order of the importance of the six named factors : (i) Figural Elaboration; (ii) Unusual Uses Fluency; (iii) Verbal Creativity; (iv) Consequences Creativity; (v) Nonverbal Creativity and (vi) Sensitivity to Problems.

Differences in the nurturing, influences of the cultures involved help to explain in having - different number of factors. Torrance (1962) has found that children in India perform disproportionately better on verbal than on figural tests of - creativity. Children in Western Samoa, Negro - children in Georgia and lower class children in Pittsburgh, Pennsylvania performed better on figural than on verbal tests. It is difficult to believe that children in India are born better in verbal than figural creative thinking abilities and that the reverse is true in Western Samoa, among lower-class children in Pittsburgh. It is also difficult to believe that in the U.S. girls are born superior to boys in verbal creativity and that the reverse is true in India.

In Thai cities like Bangkok where data were collected, the affective domain and psycho-motor domain have been emphasized alongwith the cognitive domain in the schools but this is not so in Baroda schools.

This may be the probable reason for having different number of factors in Indian and Thai - Samples.

It is interesting to note here that the - factors of "Consequences Creativity"; "Figural - Elaboration"; and "Unusual Uses Fluency" have been found in the samples of both the countries - Thai and Indian.

In the light of the factor analysis results (Passi, 1971), he has accepted the hypotheses that "Creativity is a multiple factor construct having both verbal and nonverbal types of factors."

Analysing a similar correlation matrix Basu and Jawa (1973) investigated the Torrance Tests of Creative Thinking measure some combination of non-verbal ability and verbal ability. The first factor has appreciable high loading for figural flexibility, originality and elaboration. This factor has been labelled as "Figural Creative Ideational Ability." An analysis of these four factors revealed that they did involve production of ideas in one form or the

other which largely depended on some nonverbal ability. The second factor had high loading for verbal fluency, flexibility, originality and elaboration. This factor has been called as "Verbal Creative Ideational Ability."

Lalithamma (1973) has also found the existence of 'Verbal Creativity' factor. She has further stated that the factor of 'Verbal Creativity' measured by the PTC seems to be a stable factor from culture to culture and from time to time.

Vullope (1976) has reported that the variables related to Total Verbal Creativity and its sub-scores could be explained in terms of the two factors. The two factors have been named as "Unusual Uses Originality" and "Originality of Consequences" respectively. These two factors have been found in the samples of both countries - Thai and Indian.

Based upon the results of the present study, it is clear the abilities as measured by the PTC (Verbal Form) and the TTCT (Figural Form A and Verbal Form B) have been measured different creative abilities.

It is also clear that the verbal and figural tests of creative thinking (the TTCT) did not measure of the same creative ability. Therefore, in order to get a fair and objective picture of creativity as defined by Passi (1971) and Torrance (1964) both of the Tests should be used.