(3) Jia Lal Teachers' Training College, Ajmer and (4) Gandhi Shikshan Teachers' Training College, Gulabpura, Ajmer District.

The following Table shows the names of the Secondary and Higher Secondary Schools and the respective number of teachers taken from each specialisation. With a view to evaluate experimental findings and to emphasize psychological differences between the inservice teachers and the student teachers in the three subject specialisation areas, equating the groups was not considered a possibility, only because a perfect equating is an impossibility. Ackoff (1953) has made a right observation that, "the variables used should be such as will be useful in the specific research. In many psychological and social research situations manipulation of all the variables is not possible."

Table I

Distribution of Inservice Teachers According to Schools and Subject Specializations

S. No.	Name of the schools	Science	Arts	Commerce	Total
1.	Government Monia Higher Secondary School, Ajmer	7	6	6	19
2.	Government Mahatama Gandhi Higher Secondary School, Arya Nagar, Ajmer	-	5	-	05
3.	Government Tikam Chand Higher Secondary School, Ajmer	4	3	6	13
4.	Government Oswal Higher Secondary School, Naya Bazar, Ajmer	4	6	7	17
5.	Government Rajendra Secondary School, Chandbawri, Ajmer	2	3	2	07
6.	Government Secondary School, Delhi Gate, Ajmer	2	3	2	07

S. No.	Name of the schools	Science	Arts	Commerce	Total
7.	Husband Memorial Higher Secondary School, Ajmer	3	4	-	07
8.	Aggrawal Higher Secondary School, Ajmer	1	3	2	06
9.	Dayananda Secondary School, Ajmer	4	3	4	11
10.	Gujrati Secondary School, Hathi Bhata, Ajmer	3	3	2	08
11.	D.A.V.Higher Secondary School, Ajmer	7	3	3	13
12.	Gautam Secondary School,Ajmer	2	2	1	05
13.	Virjananda Secondary School, Ajmer	3	3	2	08
14.	Adarsh Higher Secondary School, Ajmer	5	3	3	11
15.	Government Higher Secondary School, Pushkar, Ajmer	4	3	4	11
16.	Government Vyaparik Higher Secondary School, Nasirabad Ajmer	4	3	7	14
17.	Government Higher Secondary School, Kishangarh, Ajmer	-	2	6	08
18.	K.D.Jain Higher Secondary School, Kishangarh, Ajmer	5	2	3	10
	Total	60	60	60	180

The following Table shows the Names of Teachers Training College and respective number of student teachers taken from each specialisation.

Contd.

Table II

Distribution of Student Teachers According to Training Colleges and Subject Specialisation

S. No.	Name of Teachers' College	Science	Arts	Commerce	Total
1.	Regional College of Education, Ajmer	45	31	36	112
2.	Jia Lal College of Education, Ajmer	-	15	-	15
3.	Government Teachers Training College, Ajmer	15	14	12	41
4.	Gandhi Shikshak Mahavidalaya, Gulabpura, Ajmer	-	-	12	12
	Total	60	60	60	180

Geographical Location

All the three groups of inservice teachers and student teachers were drawn from the same geographical location in the sense that all of them are situated in the Ajmer District itself.

Sex

All the inservice teachers and student teachers were males only. Female students and female inservice teachers have not been included in the sample because there is enough research evidence that personality characteristics of females is likely to differ widely from those of males. Hence the two sexes need separate study.

Age

The ages of the total inservice sample teachers covers age ranges from 23-52 years in all the subject specialisation areas. The following Table indicates the Means and Standard Deviations of the ages of inservice teachers.

Table III

Means and Standard Deviations
of Ages of Inservice Teachers

S.No.	Groups	Mean	S.D.
1.	Inservice Science Teachers	34.99	5.40
2.	Inservice Arts Teachers	39.34	6.10
3.	Inservice Commerce Teachers	37.33	5.40
4.	Total	37.22	5.63

The ages of the total sample student teachers covers age ranges from 19-37 years in all the subject specialisation areas. The following Table indicates the Means and Standard Deviations of the ages of the student teachers.

Table IV

Means and Standard Deviations
of Ages of Student Teachers

S.No.	Groups	Mean	S.D.
1.	Science Student Teachers	24.11	2.88
2.	Arts Student Teachers	28.35	3.72
3.	Commerce Student Teachers	25.31	3.36
4.	Total	25.92	3.32

Teaching Experience

The following Table indicates the Means and Standard Deviations of the teaching-experience of the inservice teachers.

Table V

Means and Standard Deviations of the Teaching Experience of Inservice Teachers

S.No.	Groups	Mean	S.D.
1.	Inservice Science Teachers	9.76	2.00
2.	Inservice Arts Teachers	13.30	3.12
3.	Inservice Commerce Teachers	10.55	1.88
4.	Total	11.20	2.33

The following Table indicates the Means and Standard Deviations of the teaching-experience of student teachers.

Table VI

Means and Standard Deviations of the Teaching Experience of Student Teachers

S.No.	Groups	Mean	S.D.
1.	Science Student Teachers	1.83	1.10
2.	Arts Student Teachers	5.16	1.04
3.	Commerce Student Teachers	2.20	1.04
4.	Total	3.06	1.06

Educational Qualifications

The following two Tables indicate the educational qualifications of the inservice teachers and student teachers-specialisation-wise : Science, Arts and Commerce.

Table VII

Educational Qualifications of Inservice Teachers

S.No.	Inservice Teachers		N	Percentage
1.	Science	B.Sc. B.Ed.	38	63.33
		M.Sc. B.Ed.	22	36.67
		Total	60	100.00
2.	Arts	B.A. B.Ed.	15	25.00
		M.A. B.Ed.	45	75.00
		Total	60	100.00
3.	Commerce	B.Com. B.Ed.	42	70.00
		M.Com. B.Ed.	18	30.00
		Total	60	100.00

The following Table indicates the educational qualification of the student teachers specialisation wise : Science, Arts and Commerce.

Table VIII

Educational Qualification of Student Teachers

S.No.	Student Teachers		N	Percentage
1.	Science	B.Sc.	28	46.67
		M.Sc.	32	53.33
		Total	60	100.00
2.	Arts	B.A.	23	38.33
		M.A.	37	61.67
		Total	60	100.00
3.	Commerce	B.Com.	26	43.33
		M.Com.	34	56.67
		Total	60	100.00

B. Tools and Techniques

16 P.F. (Cattell, 1970)

One of the three instruments used in this study is the well known multi-dimensional set of Sixteen Questionnaire Scales, arranged in omnibus form, for the sake of brevity called as the 16 PF test. It is designed to make available, in a practicable testing time, information about an individuals standing on the factors measured by this test. The 16 PF covers, in addition to 16 primaries, some eight derivatives therefrom as second-stratum, higher-order, broader secondaries. The whole design of this test, is different from that of some questionnaires concerned with arbitrary or subjective definitions "neuroticism", "adjustment", "self-this-or that", or even "job efficiency". It is different also from "multi-phasic tests" aimed at surface-traits (syndromes). The PF measures as already remarked source traits. By source traits, one means the main "simple structure" factors found by thirty years or more of research on unitary traits. The primaries, and the secondaries derived from them, constitute central concepts in personality theory, and many predict equations and "natural history" laws have begun to accumulate about them.

At present, the 16 PF has six parallel forms (5 published, 1 experimental, each measuring the same 16 personality dimensions, including intelligence). The present study has been made with the use of form A - Hindi Version (Kapoor,1970) of the Sixteen Personality Questionnaire, henceforward referred

to as 16 PF. The questionnaire was developed by Cattell, Eber and Tatsuoka.

The Special Usefulness of the 16 PF Tests

The Sixteen Personality Factor Questionnaire (The 16 PF) is an objectively-scorable test devised by basic research in psychology to give the most complete coverage of personality possible in a brief time. Planned for the age seventeen through the mature adult age range, its reading level varies for different forms. Forms A and B, are two out of six possible forms (A, B, C, D, E, and F) and are most appropriate for the fully literate person, the person whose educational level is equivalent to that of the normal high school graduate. The test can be machine scored, although traditional methods of machine scoring tend to be more cumbersome than hand scoring unless a very large number of answer sheets are to be scored.

What the Test measures

The personality factors measured are not just peculiar to the 16 PF Test. They have been established as unitary, psychologically-meaningful entities in many researches in various life situations. They enter into general psychological theory (Cattell, 1970) and into tests used at other ages and in other cultures.

The sixteen dimensions or scales are essentially independent, that is to say, the correlation between one and another is usually quite small. Therefore, having a certain

position on one does not prevent the person's having any position whatever on any other. Thus, each of the sixteen scale brings an entirely new piece of information about the person, a condition not found in many alleged multi-dimensional scales. The psychological reality of the scale enables more knowledgeable predictions to be made from them than from merely statistical scales.

In addition to the sixteen primary factors, the test can be used as measure of four (sometimes more) secondary dimensions which, are broader traits, scorable from the component primary factors. In the case of these broader "secondary" traits, just as in the case of sixteen "primaries", the proof of their functional unity and the availability of psychological knowledge regarding their nature make possible a much more sophiscated and effective use. One can proceed to more kinds of individual analysis and prediction than are possible with empirical scales which are merely item-homogeneous, but otherwise arbitrary composities.

Design and Construction of the Test

(i) Arrangement of Questions : Twenty to twenty-six questions (items) in toto are provided for each of the sixteen factors. This means there are ten to thirteen items for each factor in each of the forms, A and B. The questions are arranged in a roughly cyclic order determined by a plan to give maximum convenience in scoring by stencil and to insure variety and interest for the examinee.

(ii) Method of Answering : Three alternative answers are provided for each of the questions, since the two-alternative "forced-choice" situation, forbidding any "middle of the road" compromise, tendes to force a distorted distribution and may produce aversion to test on the part of examinee. This is particularly the case with the person of average or higher intelligence for whom Forms A and B are designed.

Test Scale Consistencies

The consistencies of the 16 PF scales are given in all possible ways, namely as (1) reliabilities (dependability, i.e. short term test-retest correlations and also stability, i.e., retest after a longer interval); as (2) homogeneities (internal); and as (3) equivalence coefficients (between forms). The exact definitions of these coefficients are given, along with that of stability and validity, in the Handbook (Cattell, 1970).

Table IX

16 PF Dependability Coefficients :
Test-Retest After Six Days

Factor	A	B	C	E	F	G	H	I
Forms A + B	.89	-*	.87	.88	.90	.88	.93	.89
Form A	.81	-	.78	.80	.79	.81	.83	.77
Form B	.75	-	.74	.80	.81	.77	.89	.79

Factor	L	M	N	O	Q_1	Q_2	Q_3	Q_4
Forms A + B	.87	.82	.76	.89	.83	.85	.78	.91
Form A	.75	.70	.61	.79	.73	.73	.62	.81
Form B	.77	.70	.60	.81	.70	.75	.62	.87

* The intelligence test cannot meaningfully be repeated after a short interval. N = 146 for the other fifteen factors. Stability Coefficients on 132 students after a lapse of two-months are shown in Table X. It should be recognized that the comparison of Table X with Table IX brings evidence on the stability of the trait, not the test.

Table X

16 PF Trait Stability Coefficients :
Test-Retest After Two Months

Factor	A	B	C	E	F	G	H	I
Forms A + B	.85	.63	.75	.85	.78	.84	.88	.87

Factor	L	M	N	O	Q_1	Q_2	Q_3	Q_4
Forms A + B	.76	.71	.74	.77	.83	.81	.70	.78

N = 132

Table X throws light on "function fluctuation" and we know that some traits, like F (Surgency), M (Imaginative), Q_3 (Self-discipline), and Q_4 (Drive-tension) can change over a few months with circumstances. Homogeneity coefficients are shown in Table XI. By design (Cattell and Tsujioka, 1964) these are kept at moderate values, reducing the correlations with the factor, in order to give maximum breadth to the measured personality factor manifestations.

TABLE XI

16 PF Homogeneities of Individual Scales

Factor	A	C	E	F	G	H	I	L
Form A Spearman-Brown	.56	.43	.61	.64	.55	.78	.56	.25
Cronback's	.56	.42	.60	.63	.57	.78	.58	.23

Factor	M	N	O	Q_1	Q_2	Q_3	Q_4
Form A Spearman-Brown	.10	.21	.48	.06	.48	.40	.70
Cronback's	.10	.20	.47	.07	.48	.40	.70

Factor	A	C	E	F	G	H	I	L
Form B Spearman-Brown	.62	.55	.50	.56	.32	.81	.46	.33
Cronback's	.63	.56	.50	.56	.32	.80	.45	.32

Factor	M	N	O	Q_1	Q_2	Q_3	Q_4
Form B Spearman-Brown	.37	.12	.66	.29	.16	.22	.54
Cronback's	.38	.08	.66	.32	.18	.22	.54

N = 218 College students

Scales M, N and Q_1 are lower in homogeneity and H, F, and Q_4 are high, but whether this is due to difference in breadth of the traits or to be the need for further items in the M, N and Q_1 scales is a matter of further research.

The Equivalence Coefficients, between A and B forms are given in Table XII.

Table XII

16 PF Equivalence Coefficients of A and B Forms

Factor	A	B	C	E	F	G	H	I
Form A with B	.59	.38	.50	.44	.56	.40	.76	.50

Factor	L	M	N	O	Q_1	Q_2	Q_3	Q_4
Form A with B	.40	.34	.35	.56	.44	.38	.34	.57

N = 230 male college students.

The lower value of B (intelligence) may be due to restriction of range in the college group. Since four successive researches have raised the equivalence coefficients of M, N, and Q_3 very little, it seems probable that the nature of these factors is such that they need longer than ten-to-thirteen-item scales for their measurement. Since it is unusual to measure any single factor, such as intelligence, by only ten to thirteen items, this is what we are doing when using only one form. To get the most precise definition, Forms A and B be given, and that Forms C and D be added when even higher equivalences are needed.

Validities

The items in these final forms are the survivors from several thousands of items originally tried, and constitute

only those which continue to have significant validity against the factors after three successive factor analyses (Cattell, 1970) on different samples. These analyses have both verified the existence and natural structure of the sixteen factors, and cross-validated the test-items in their correlation with the factors on different adult population samples.

The validity of the test itself is meant to be a concept (or "construct") validity. That is to say, the test questions (or items), are chosen as being good measures of the personality factors, as these factors are represented in research analysis. The mean correlation of all single items with the factors they represent is about +.37 and, assuming a mean inter-correlation of the items of +.10, the mean correlation of each group of items with the factor it represents, i.e., the concept validity turns out to be about +.85, which is an acceptable performance for so brief a test.

The direct validities are calculated (Cattell, 1970) on the assumption that the correlation of the A and B forms (equivalence, Table XII) is contributed to equally by the common factor in both and nothing else. In other words, it is an average of validity of A and B forms. The direct validities (A + B) are derived from the single-form values by the Spearman-Brown formula (Table XIII).

The circumstantial validities, also shown in Table XIII are computed as rank-difference correlations between corresponding theoretical and actual correlations of the factor with all fifteen other factors.

Table XIII

16 PF Validity Coefficients of Individual Scales

Factor	A	B	C	E	F	G	H	I
Direct Validities (A + B)	.86	.75	.82	.75	.84	.74	.92	.82
Direct Validities (A or B alone)	.77	.62	.71	.66	.75	.63	.87	.71
Circumstantial Validities (A or B alone)	.84	.42	.94	.63	.78	.66	.96	.74

Factor	L	M	N	O	Q_1	Q_2	Q_3	Q_4
Direct Validities (A + B)	.78	.74	.77	.85	.86	.76	.83	.83
Direct Validities (A or B alone)	.63	.58	.59	.75	.66	.62	.58	.75
Circumstantial Validities (A or B alone)	.96	.77	.93	.89	.88	.77	.81	.99

Concrete, "particular" validity (correlation with any specific outside criterion) cannot meaningfully be calculated with a multiple-purpose test, since such a test is capable of being related to great numbers of different criteria. However, numerous illustrations of substantial relations of factors to criteria are given in the main Handbook (Cattell, 1970) for all forms of 16 PF. Additionally, the IPAT Information Bulletin Series and Literature in American, Australian, and European

journals contain researches not yet referenced in the Handbook showing that the factor scores typically predict for a wide variety of real-life situations.

Kapoor (1965) in his cross-validiation study of 16 PF Test (both the form KA and KHA of VKK) has attempted to compare the original norms with the norms obtained from a fresh sample of similar groups of college students ranging in age 16-20 years.

For this purpose, the means and the standard deviations for all the 16 factors, obtained earlier by Jalota (1958) on a sample of 200 college students for Form KA and also 200 for Form KHA, have been compared with the fresh data, obtained by Kapoor (1963) on a sample of 300 college students for each of the forms KA and KHA, to test the homogeneity of the two groups, if any.

The statistical tests of significance in the Tables presented in the article show that the differences between the respective factor means of the present and the earlier studies on form KA are significant only on Factors C and M. It is interesting to note that these differences are below the .01 level of significance (CR value are 2.37 and 2.56). Similarly, on Form KHA, the differences have been found only on Factors G, H, and N, which are significant beyond or above .01 level of confidence.

In general, out of the 32 differences between the factor means, 27 of them have been found as insignificant; 2 differences significant at 5%, 2 at 1%, and 1 beyond 1% (CR is more than 4) level of confidence. It is interesting to note

that those 5 factors - C, G, H, M and N on which the mean scores have been found statistically significant, are not common to the two forms. So, it can be fairly assumed that A + B scores for the two groups on Forms KA and KHA are similar to a great extent, which in turn suggest the cross validity of the questionnaire in which the original norms have maintained their validity even after a gap of five years.

Similarly, the results obtained in the studies of Jalota (1957), Rao (1960), and Bhagoliwal (1960) have shown that this test is a valid tool for assessing the individuals personality.

Kapoor (1958) had collected data on 300 cases of college going population on Form KA and 300 cases of on Form KHA of the revised Hindi version of the 16 PF Questionnaire (VKKJ). Earlier Jalota (1958) had also obtained data on 200 cases for Forms KA and KHA. A comparison of the two sets of the data by Jalota and Kapoor showed that the groups were largely similar. As such the data of the two groups have been pooled up and a fresh total means and standard deviations worked out by Kapoor (1965). In the paper under reference a fresh sten norms have been suggested on the basis of the pooled data. An attempt has also been made in this study to show how the sten scores may be computed.

Mishra (1962) in a short critique of the 16 PF test Form A and B has made certain observations regarding Factor B (Intelligence). He observes that many tests of intelligence report split-half realibilities as high as .97 and .98 and even then they have found to admit a large component of error

variance (i) In the particular test the split-half realibility of Factor B is .86 while equivalence has gone down to .38. According to the author it indicated that it would be extremely hazardous to say anything about an individual's intelligence on the basis of his/her performance on Factor B. (ii) Regarding the validity the author observes that empirical validiation alone can confirm or deny the adequacy of the interpretations. (iii) Again it has been observed that a lot of further supportive research is needed to establish the tests efficacy as an effective measure of such a large number of important personality traits as the authors consider it potentially capable of.

The investigator of this study may however point out that the critique by Mishra was written before 1962 but since than massive evidence of empirical validity and factorial or construct validity has been reported in the Handbook (Cattell, 1970) and a number of other studies in this country and abroad.

Instructions for Administration

Simple and clear instructions are printed for the examinee on the cover page of the test booklet. Although the test can be virtually self-administered, it is always important to establish good "rapport" with the examinees, whether tested individually or in groups. Further it is good to reinforce the instructions by orally reiterating that the examinee will, in the long run, be doing himself most good by being frank and honest in describing himself.

Answers are always made on a separate answer sheet, never on the re-usable test booklet. The examinee are asked to enter their names, etc., at the top of the answer sheet, and then are asked to read the instructions on the cover of the test booklet, and then to work the four examples. It is desirable to read the instructions aloud to examinees, or to discuss certain points. About five minutes were allowed for reading the instructions and working the examples.

The test is untimed, but it is good to remind examinees that they should not delay, but should give immediate answers and move along. Educated readers usually take forty-five to sixty minutes per form. The investigator went around and corrected improper ways of indicating answers that would have later caused difficulty in scoring. It was made sure that names etc., were filled by examinees before collecting answer sheets, and especially that one, and only one, answer is given for every question on the test.

Content and Scoring

The test includes 187 items of which the first two and the last one are not to be scored. So, the number of functional items is 184. Each item is covered by one factor and provides three alternatives (forced choice triads) of which the examinee has to record to which alternative he identifies himself.

Distribution of the functional items over the factors is as follows :

Factor	No. of items	Factor	No. of items
A	10	L	10
B	13	M	13
C	13	N	10
E	13	O	13
F	13	Q_1	10
G	10	Q_2	10
H	13	Q_3	10
I	10	Q_4	13

Total = 184

The three alternatives present three levels of intensity (high, middle, low). They are scored 2, 1 and 0 (zero) respectively. Thus maximum score for each item is 2 and minimum is zero. There are no right or wrong responses (except Factor B which pertains to general intelligence) and each response is scored in terms of intensity of the factor.

Scores on the one factor are totalled and it gives the total score on the particular scale. Hand scoring of the answer sheets was done as suggested by the Cattell, 1972, in Manual of 16 PF Questionnaire.

Interpretation of the Primary Factors

Predictions of scores on various criteria, and assignment of individuals to various diagnostic clinical groups, can be carried out accurately, by computation from standard scores, using methods discussed in detail in the Handbook and elsewhere.

Where no correlations with criteria are known, knowledge of the psychological nature of the factors must guide initial prediction until empirical studies can be done in a particular situation. Moreover, even where correlational, actual evidence about a certain criterion is available, it is desirable to add psychological judgement to immediate statistical computations to allow for changes of personality with learning, maturation, etc., or for anticipated changes in life situation.

The definitions and interpretations of the factors, as given below, are short, non-technical, and, of course, less exact than the more intensive discussion available in the Handbook and elsewhere.

Capsule Descriptions of the Sixteen
Primary Personality Factors

Low Score Direction		High Score Direction
FACTOR A		
Reserved, Detached, Critical, Cool (Sizothymia, previously Schizothymia)	Vs.	Outgoing, Warmhearted, Easy-going, Participating (Affectothymia, previously Cyclothymia)
The person who scores low (sten of 1 to 3) on Factor A tends to be stiff, cool, skeptical, and aloof. He likes things rather than people, working alone, and avoiding compromises of viewpoints. He is likely to be precise and 'rigid' in his way of doing things and in personal standards, and in many occupations these are desirable traits. He		The person who scores high (sten of 8 to 10 on Factor A tends to be good-natured, easy-going, emotionally expressive (hence naturally Affectothymia), ready to cooperate, attentive to people, softhearted, kindly, adaptable. He likes occupations dealing with people and socially-impressive situations.

may tend, at times, to be critical, obstructive, or hard.

He readily forms active groups. He is generous in personal relations, less afraid of criticism, better able to remember names of people.

Factor B

Less Intelligent, Concrete-thinking (Lower scholastic mental capacity) Vs. More Intelligent, Abstract-thinking, Bright (Higher scholastic mental capacity)

The person scoring low on Factor B tends to be slow to learn and grasp, dull, given to concrete and literal interpretation. His dullness may be simply a reflection of low intelligence, or it may represent poor functioning due to psychopathology.

The person who scores high on Factor B tends to be quick to grasp ideas, a fast learner, intelligent. There is some correlation with level of culture, and some with alertness. High scores contraindicate deterioration of mental functions in pathological conditions.

Factor C

Affected by Feelings, Emotionally Less Stable, Easily Upset (Lower ego strength) Vs. Emotionally Stable, Faces Reality, Calm, Mature (Higher ego strength)

The person who scores low on Factor C tends to be low in frustration tolerance for unsatisfactory conditions, changeable and plastic, evading necessary reality demands, neurotically fatigued, fretful, easily emotional and annoyed,

The person who scores high on Factor C tends to be emotionally mature, stable, realistic about life, unruffled, possessing ego strength, better able to maintain solid group morale. Sometimes he may be a person

active in dissatisfaction, having neurotic symptoms (phobias, sleep disturbances, psychosomatic complaints, etc.). Low Factor C score is common to almost all forms of neurotic and some psychotic disorders.

making a resigned adjustment to unsolved emotional problems.

Factor E

Humble, Mild, Accommodating, Conforming (Submissiveness) Vs. Assertive, Independent, Aggressive, Stubborn (Dominance)

The person who scores low on Factor E tends to give way to others, to be docile, and to conform. He is often dependent, confessing, anxious for obsessional correctness. This passivity is part of many neurotic syndromes.

The person who scores high on Factor E is assertive, self-assured, and independent-mind. He tends to be austere, a law to himself, hostile or extrapunitive, authoritarian (Managing others), and disregards authority.

Factor F

Sober, Prudent, Serious, Taciturn (Desurgency) Vs. Happy-go-lucky, Impulsively Lively, Gay, Enthusiastic (Surgency)

The person who scores low on Factor F tends to be restrained, reticent, introspective. He is sometimes dour, pessimistic, unduly deliberate, and considered smug and primly correct by observers. He tends to be a sober, dependable person.

The person who scores high on this trait tends to be cheerful, active, talkative, frank, expressive, effervescent, carefree. He is frequently chosen as an elected leader. He may be impulsive and mercurial.

Factor G

Expedient, Evades Rules, Feels Few Obligations (Weaker superego strength) Vs. Conscientious, Persevering, Staid, Rule-bound (Stronger superego strength)

The person who scores low on Factor G tends to be unsteady in purpose. He is often casual and lacking in effort for group undertakings and cultural demands. His freedom from group influence may lead to anti-social acts, but at times makes him more effective, while his refusal to be bound by rules causes him to have less somatic upset from stress.

The person who scores high on Factor G tends to be exacting in character, dominated by a sense of duty, persevering, responsible, planful, "fills the unforgiving minute". He is usually conscientious and moralistic, and he prefers hard-working people to witty companions. The inner Ecategorical imperative" of this essential superego (in the psychoanalytic sense) should be distinguished from the superficially similar "social ideal self" of Q_3+.

Factor H

Shy, Restrained, Diffident, Timid (Threctia) Vs. Venturesome, Socially-bold, Uninhibited, Spontaneous (Parmia)

The person who scores low on this trait tends to be shy, withdrawing, cautious, retiring, a "wallflower". He usually has inferiority feelings. He tends to be slow and impeded in speech and in expressing himself, dislikes occupations with personal contacts, prefers one or two close friends to large groups, and is not given to keeping in contact

The person who scores high on Factor H is sociable, bold, ready to try new things, spontaneous, and abundant in emotional response. His "thick-skinnedness" enables him to face wear and tear in dealing with people and grueling emotional situations, without fatigue. However, he can be careless of detail,

with all that is going on around him.

ignore danger signals, and consume much time talking. He tends to be "pushy" and actively interested in the opposite sex.

Factor I

Tough-minded, Self-reliant, Realistic No-nonsense(Harria) Vs. Tender-minded, Dependent, Over-protected, Sensitive (Premsia)

The person who scores low on Factor I tends to be practical, realistic, masculine, independent, responsible, but skeptical of subjective, cultural elaborations. He is sometimes unmoved, hard, cynical, smug. He tends to keep a group operating on a practical and realistic "no-nonsense" basis.

The person who scores high on Factor I tends to be tender-minded, day-dreaming, artistic, fastidious, feminine. He is sometimes demanding of attention and help, impatient, dependent, impractical. He dislikes crude people and rough occupations. He tends to slow up group performance, and to upset group morale by unrealistic fussiness.

Factor L

Trusting, Adaptable, Free of Jealousy, Easy to Get on with (Alaxia) Vs. Suspicious, Self-opinionated, Hard to Fool (Protension)

The person who scores low on Factor L tends to be free of jealous tendencies, adaptable, cheerful, uncompetitive, concerned about other people, a good team worker.

The person who scores high on Factor L tends to be mistrusting in his own ego, is self-opinionated, and interested in internal, mental life. He is usually deliberate in his actions, unconcerned about other people, a poor team member.

Factor M

Practical, Careful, Conventional, Regulated by External Realities, Proper(Praxernia)	Vs.	Imaginative, Wrapped up in Inner Urgencies, Careless of Practical Matters Bohemian (Autia)
The person who scores low on Factor M tends to be anxious to do the right things, attentive to practical matters, and subject to the dictation of what is obviously possible. He is concerned over detail, able to keep his head in emergencies, but sometimes unimaginative.		The person who scores high on Factor M tends to be unconventional, unconcerned over everyday matters, Bohemian, self-motivated, imaginatively-creative, concerned with "essentials", and oblivious of particular people and physical realities. His inner-directed interests sometimes lead to unrealistic situations accompanied by expressive outbursts. His individuality tends to cause him to be rejected in group activities.

Factor N

Forthright, Natural, Artless, Sentimental (Artlessness)	Vs.	Shrewd, Calculating, Worldly, Penetrating (Shrewdness)
The person who scores low on Factor N tends to be unsophisticated, sentimental, and simple. He is sometimes crude and awakward, but easily pleased and content with what comes, and is natural and spontaneous.		The person who scores high on Factor N tends to be polished, experienced, worldly, shrewd. He is often hardheaded and analytical. He has an intellectual, unsentimental approach to situations, an approach akin to cynicism.

Factor O

Placid, Self-assured, Confident, Serene (Untroubled Adequacy) Vs. Apprehensive, Worrying, Depressive, Troubled (Guilt proneness)

The person who scores low on Factor O tends to be placid, with unshakable nerve. He has a mature, unanxious confidence in himself and his capacity to deal with things. He is resilient and secure, but to the point of being insensitive of when a group is not going along with him, so that he may evoke antipathies and distrust.

The person who scores high on Factor O tends to be depressed, moody, worrier, full of foreboding, and brooding. He has a childlike tendency to anxiety in difficulties. He does not feel accepted in groups or free to participate. High Factor O score is very common in clinical groups of all types (see Handbook).

Factor Q_1

Conservative, Respecting Established Ideas, Tolerant of Traditional Difficulties (Conservatism) Vs. Experimenting, Critical, Liberal, Analytical, Free-thinking (Radicalism)

The person who scores low on Factor Q_1 is confident in what he has been taught to believe, and accepts the "tried and true", despite inconsistencies, when something else might be better. He is cautious and compromising in regard to new ideas. Thus, he tends to oppose and postpone change, is inclined to go along with tradition, is more conservative in religion and politics, and tends not to be interested in analytical "intellectual" thought.

The person who scores high on Factor Q_1 tends to be interested in intellectual matters and has doubts on fundamental issues. He is skeptical and inquiring regarding ideas, either old or new. He tends to be more well informed, less inclined to moralize, more inclined to experiment in life generally, and more tolerant of inconvenience and change.

Factor Q_2

Group-dependent, A 'Joiner' and Sound Follower (Group adherence) Vs.

The person who scores low on Factor Q_2 prefers to work and make decisions with other people, likes and depends on social approval and admiration. He tends to go along with the group and may be lacking in individual resolution. He is not necessarily gregarious by choice; rather he needs group support.

Self-sufficient, Prefers Own Decisions, Resourceful (Self-sufficiency)

The person who scores high on Factor Q_2 is temperamentally independent, accustomed to going his own way, making decisions and taking action on his own. He discounts public opinion, but is not necessarily dominant in his relations with others (see Factor E). He does not dislike people but simply does not need their agreement or support.

Factor Q_3

Undisciplined, Self-conflict, Careless of Protocol, Follows Own Urges (Low integration) Vs.

The person who scores low on Factor Q_3 will not be bothered with will control and regard for social demands. He is not overly considerate, careful, or painstaking. He may feel maladjusted, and many maladjustments (especially the effective, but not the paranoid) show Q_3.

Controlled, Socially-precise, Following Self-image (high self-concept control)

The person who scores high on Factor Q_3 tends to have strong control of his emotions and general behaviour, is inclined to be socially aware and careful, and evidences what is commonly termed "self-respect" and regard for social-reputation. He sometimes tends, however, to be obstinate. Effective leaders, and some paranoids, are high on Q_3.

Factor Q_4

Relaxed, Tranquil, Torpid, Unfrustrated (Low ergic tension)	Vs.	Tense, Frustrated, Driven, Overwrought (High ergic tension)
The person who scores low on Factor Q_4 tends to be sedate, relaxed, composed, and satisfied (not frustrated). In some situations, his over-satisfaction can lead to laziness and low performance, in the sense that low motivation produces little trial and error. Conversely, high tension level may disrupt school and work performance.		The person who scores high on Factor Q_4 tends to be tense, excitable, restless, fretful, impatient. He is often fatigued, but unable to remain inactive. In groups he takes a poor view of the degree of unity, orderliness, and leadership. His frustration represents an excess of stimulated, but undischarged, drive.

Minnesota Teacher Attitude Inventory (MTAI)
(Cook, Leeds, Callis, 1951)

The most popular instrument for the measurement of teacher attitudes is the Minnesota Teacher Attitude Inventory (MTAI). More than 50 research studies using this instrument are reported in the literature. The MTAI was developed at the University of Minnesota, and the Manual published in 1951 states:

> Investigations carried on by the authors over the past ten years indicate that the attitudes of teachers toward children and school work can be measured with high reliability, and that they are significantly correlated with the teacher-pupil relations found in the teachers classrooms. The Minnesota Teacher Attitude Inventory has emerged from these researches. It is designed to

> measure those attitudes of a teacher which predict how well he will get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation.

It is assumed that a teacher ranking at the high end of the scale should be able to maintain a state of harmonious relations with his pupils characterized by mutual affection and sympathetic understanding. The pupils would like the teacher and enjoy school work. The teacher would like the children and enjoy teaching. Situations requiring disciplinary action would rarely occur.

At the other extreme of the scale is the teacher who attempts to dominate the classroom. He may be successful amd rule with an iron hand, creating an atmosphere of tension, fear and submission, or he may be unsuccessful and become nervous, fearful and distraught in a classroom characterized by frustration, restlessness, inattention, lack of respect, and numerous disciplinary problems. In either case both teacher and pupils dislike school work; there is a feeling of mutual distrust and hostility.

Items in the Inventory discriminate sharply between teachers who have and those who do not have good rapport with pupils; examination of these items indicates that inferior teachers are essentially insecure socially.

Administration

The Minnesota Teacher Attitude Inventory consists of 150 statements which constitute Form A of the MTAI. Before administering the Inventory, the investigator made himself thoroughly familiar with the directions for answering the Inventory and also with the nature of items. While administering the Inventory to student teachers, seating arrangement was made such that students could not discuss or compare their answers. The inventory was administered to Inservice-teachers individually.

The Minnesota Teacher Attitude Inventory is practically self-administering. The subject reads the directions given on the front page of the booklet and then proceeds to answer each of the 150 items. There is no time limit, but the subject is to be encouraged to work rapidly and indicate his first impression rather than to deliberate over any one item very long. It usually takes 20 to 30 minutes to complete the inventory.

The administration of the Inventory was done according to detailed directions given in the Inventory.

Scoring

Before scoring, each answer sheet it was made certain that the response marks were heavy enough to be seen clearly. The scoring was done by hand.

There are no "right" or "wrong" answers with the MTAI. There are, rather, agreement or disagreement with specific attitude statements. Even though, the scoring keys have been given the commonly used "rights" and "wrong" labels; no

implication of correctness or incorrectness of answers is intended.

The possible range of scores on the MTAI is from plus 150 to minus 150. Each response scored "right" has a value of plus one, and each response scored "wrong" has a value of minus one.

The scoring was done with the use of scoring key and the procedure was followed as given in the Manual of MTAI (Cook, Leeds, Callis, 1951).

Norms

Extensive norms have been reported in the Manual for High School seniors, University freshmen, Early childhood education, Elementary education and Secondary education junior and Senior groups. Besides these the norms for Graduate students, college of Education and Experienced Teachers are also reported. A brief summary of these norms is as follows :

(i) Length of teaching experience was not significantly related to teacher attitudes in any of the analyses, indicating that the elimination of items negatively correlated with experience.

(ii) Amount of post-high school education was significantly and positively related to teacher attitudes in graded elementary schools and high schools but not in one room rural schools.

(iii) Size of the school system was significantly and positively related to teacher attitudes in graded elementary schools.

(iv) The subject taught was significantly related to teacher attitudes at the high school level. Teachers of academic subjects scored higher in general than teachers of special fields such as music, art, business, and physical education. However, teachers of vocational agriculture scored highest of all the high school groups.

Construction and Validiation of MTAI, Form A

In the selection of the 150 items for Factor A, the authors of the Inventory have considered following six factors :

1. The discriminating power of the item,
2. The extent to which item responses are influenced by professional education courses,
3. The extent to which item responses are influenced by teaching experience,
4. The extent to which the content of the item duplicates that of another item,
5. The clearness of the statement, and
6. The consistency of the response patterns of the superior and inferior teachers.

Of the 150 items in Form A, 129 were taken from Form X-164 which had already been validiated, giving a validity coefficient of .60 when correlated with three outside criteria of teacher-pupil rapport. The other 21 items were taken from Form X-239.

Two important validiation studies were carried by the authors of the Inventory and they were : (i) South Carolina in 1951 and (ii) in Missouri in 1951. The original validiation study in 1946 had been carried out in the schools of northwestern Pennsylvania and northeastern Ohio.

(i) The South Carolina Validiation Study of MTAI :

In this study the Form A of the inventory was administered to a random selection of 100 teachers of grade 4-6 inclusive. These teachers were then rated by at least 25 of their pupils, their principal, and an expert in the field of teacher-pupil rapport. Zero-order and multiple correlations were computed between the scores of teachers on Form A of the MTAI and the three outside criteria of ratings of the teachers. The results are given in the Table XIV.

Table XIV

Intercorrelations, Mean Scores and Standard Deviations of Three Scoring Methods (MTAI, Form A), Three Criteria and a combined Criterion for a group of 100 Unselected Teachers in Fourth, Fifth and Sixth Grades

	Y_2	Y_3	X_1	X_2	X_3	X_4	Ry_{123}	M	SD	R
Y_1	.966*	.992	.461	.566	.305	.589	.626	45.32	37.18	.93
Y_2		.973	.438	.565	.294	.576	.615	85.32	16.84	.88
Y_3			.436	.566	.303	.578	.617	40.66	31.27	.93
X_1				.428	.387	.808		50.06	9.96	
X_2					.217	.726		50.02	10.01	
X_3						.715		50.01	10.04	
X_4								50.07	7.52	

* All correlations in the table are significant at five per cent level.

Y_1, Y_2, Y_3 = three scoring methods
X_1 = Principal's Ratings, T-score
X_2 = Expert's Ratings, T-score
X_3 = Pupil's Ratings, T-score

X_4 = Combined T-score (average of X_1, X_2, X_3)

Ry_{123} = Multiple Correlations between Y's and X_1, X_2, X_3

R = Reliability (Split-half, Spearman-Brown)

Two validity coefficients were computed for Form A, MTAI, as scored by the Y_1 method : when correlated with the T-score average of the three criteria, r = .59; when using a multiple correlation combining the three criteria, R = .63.

(ii) The Missouri Validiation Study of MTAI :

In this study the subjects were 77 public school teachers, grades 4 through 10, in four school systems of central Missouri. The pupils ratings as well as Principals ratings were secured. The expert's ratings were secured but two observers did the rating independently and their scores were averaged to give a mean score. The correlation between the two raters was only .33. The intercorrelations of this study are presented in Table XV.

Table XV

Intercorrelations of the Predictor, MTAI, Form A, and the Various Criteria

	Pupils Ratings	Principals Ratings	MTAI Form A
1. Observers' Mean Ratings	.29	.12	.40
2. Pupils Ratings		.46	.49
3. Principals Ratings			.19
4. Composite of (1),(2),(3)			.46
5. Composite of (1),(2)			.50

In this study the pupils' ratings of the teacher correlated with the MTAI scores somewhat higher than in the two previous studies (.49 as contrasted with .46 and .31). The observer's mean ratings correlated with the MTAI scores somewhat lower (.40 as contrasted with experts .49 and .56). The principal's ratings correlated with the MTAI scores much lower than in the previous studies (.19 as contrasted with .45 and .46). The failure of the principals' ratings to correlate higher with the MTAI score is responsible for the lowest validity coefficient yet obtained with a composite criterion (.46 as contrasted with .60, .63 and .59), The MTAI was validiated against Principal's judgements of Teacher Attitude towards pupils, observer rating, and against "My Teacher". (Cook and Leeds, 1951). The validity of the MTAI is argued in large part on the basis of correlation, .45 (Leeds, 1947) and .49 (Callis, 1953) between teacher MTAI scores and their pupils' scores on "My Teacher". The observed correlation is the evidence for the validity of the MTAI if the hypothesis is true. Button and Iannaccone (1964) in his study has reported correlates of MTAI validiation instrument. He has reported a coefficient of correlation of .71 and .65 when administered on two samples of 117 and 142 pupils of each of two social studies teachers in a suburban junior school. The pupils had been directed to rate the teacher on each instrument.

McDaniel (1964) had undertaken a study in which he tried to disguise the MTAI by linking it to Picture Identification Test (PIT) developed by Chambers (1957). The PIT in some

respects resembles the Szondi Test, which has been explored by Clinicians in the diagnosing of various Psychopathological conditions. The administered conventional MTAI and the disguised MTAI (utilizing the PIT materials) to 210 students at the beginning of an introductory education course. The two instruments were administered one week apart. The results indicated that the pre-course correlation coefficients between the MTAI and the disguised MTAI were .45 and .44 for groups I and II respectively. The post-course correlation coefficient between the two instruments was .27 for 184 students tested. As predicted, the post-course MTAI-PIT course correlations were lower than the pre-course correlations between these two variables. This, according to investigator, is congruent with the assumptions that MTAI is fakable and that their exists a greater tendency to fake the MTAI at the end of the course when the student has become aware of the child-centered attitude of his educational environment. However, the question of which instrument is the better measure of the 'true' underlined attitude is still open to speculations.

Summers, Shuster and Shuster (1969) reported a study validating Minnesota Teacher Attitude Inventory with Counselor-Camper Interactions. The comparison was undertaken with the assumption that the type of camp atmosphere is as important to the achievement of camp objectives as is the classroom atmosphere to school objectives. Thus, the rationale for the predictive validity of the MTAI in teacher-pupil interactions is equally applicable to counselor-camper interactions.

The sample of this study consisted of 22 counselors in the three camps during the year. In addition to counselor's MTAI responses several external criterion measures were obtained.

The MTAI responses were found to be significantly related to observations of counselor's democratic and authoritarian leadership styles in all the three camps. In the third camp significant relations were found between MTAI and camp Directors ratings of Counselor's performance and Camper's satisfaction measures. These finding lead investigators to conclude that the MTAI does have predictive validity in the counselor-camper interaction situation as well as in teacher-pupil interactions.

Raina (1972) reports a study in which he investigated the relationship between the Authoritarian Personality structure of an individual and his expressed attitudes regarding the teacher-pupil relationship in the classroom setting as measured by the Minnessota Teacher Attitude Inventory (MTAI). The coefficient of correlation between the F-scale - an instrument measuring anti-democratic potential varied from -.66 to -.71 for a total sample of male student teacher numbering 150 of a teachers' college in Rajasthan.

This suggests a sort of indirect validiation of Minnessota Teacher Attitude Inventory.

Factor Analytic Study of MTAI

Horn and Morrison (1965) conducted a study on Dimensions of Teacher Attitudes. The Minnessota Teacher Attitude Inventory was designed by Cook, Leeds, and Callis (1951) to measure a

single teacher attribute. The attribute is variously labeled and described, but the test authors and users usually imply that it is unifactor attitude involving, at one extreme, a belief in, and preference for, "democratic" values (and, it is further implied, a tendency to use democratic teaching methods) versus, at the other extreme, a belied in, etc. "autocratic" values. One of the test authors (Callis) notes that "the MTAI was constructed by a purely empirical item analysis to select items that would most efficiently predict the combined criteria of ratings by the pupils, principals, and observers. This type of construction results in a single score... (but) it does not give us much information as to what is actually being measured (Callis and Ferguson, 1953).

One can seriously question the implicit assumption that all of the 150 items of the MTAI scale do in fact measure a single unitary trait. At a purely theoretical level it is to be expected that more than one dimension is necessary to describe the way in which teachers orient to a classroom situation.

Therefore the investigators have factor-analysed the MTAI employing responses of 306 college students enrolled in education courses. The results indicated that there were five factors instead of one as suggested by the authors of MTAI. Factor I appeared to reflect the modern attitude towards classroom control as contrasted with pre- Deweyian or "traditionalistic" attitude. Factor II suggested an optimism - favourable Vs. pessimism - unfavourable dimensions of opinions about pupils. Factor III seemed to represent a permissive lack of concern Vs.

punitive concern about "smart", "rebellious" behaviour. Factor IV reflected rejection of pupils, but a rejection stemming from the bewilderment rather than from dislike or punitiveness. Factor V seems to indicate a desire to maintain a control over children Vs. an inclination to let them "run free."

Something About Myself (Khatena, 1971)

The use of the autobiographical instrument as a screening device for the highly gifted has found support in the opinion and research of many in the field of creativity. Instruments in the form of checklists, questionnaires, and inventories calling for biographical data have been found to be one efficient way of identifying creative talent in general and creative scientific talent in particular (e.g. Taylor, 1958; Roe, 1963). More recent studies using the biographical inventory technique to predict success in artistic, literary and scientific creativity confirm this view (e.g. Schaefer and Anastasi, 1968; Taylor, Ellison and Tucker, 1969). The author's interest in self-reports as a means of predicting future behaviour led him to construct a creativity checklist entitled Something About Myself (Khatena, 1970), based upon the rationale that creativity is reflected in the personality characteristics of the individual, in the kind of thinking strategies he employs, and in the products that emerge as a result of his creative strivings.

Procedures

Subjects

544 adolescents (males and 319 females) from three schools in West Virginia and 814 college adults (224 males and 590 females) from five colleges in West Virginia, Indiana, Florida, North Carolina and Maryland served as subjects.

Item Selection

The selection of items for the biographical self-report was based on previous research findings of other investigators and hypotheses relative to correlates of creativity (e.g. MacKinnon, 1961, 1962; Taylor, 1964; Torrance and Khatena, 1970ab; Khatena, 1969ab), 100 items were identified in these three areas and later reduced to 74. These items were then administered to 180 college adults of Marshall University and intercorrelated. When items were found to correlate .30 or better, or if one item appeared to provide the same information as another, they were put together to make single items. In this way 74 items were reduced to 50 of the final form of the checklist, such that items included represented three categories of creative functioning, namely, personality traits, use of creative thinking strategies, and creative productions. The order of appearance of these items was determined by reference to a table of random numbers. Six sample items are given as follows :

- I was an imaginative person, a dreamer or visionary.
- When I think of an idea I like adding to it to make it more interesting.

- I have improvised in dance, song or instrumental music.
- I like making guesses, testing them, and if I am proved wrong will make new guesses.
- I am not afraid to take risks should a need arise.
- I have invented a new product.

As a check on the appropriateness of these items each of the 50 items were correlated with the total score by the point biserial method using the responses of 773 male and female adults and 304 male and female adolescents. The correlation indices for all 50 items obtained from the adult responses ranged from .11 to .54 ($p < .01$), and for the children's responses ranged from .12 to .45 where 47 of the items were significant at the .01 level and 3 at the .05 level.

Administration

The checklist can be easily administered to groups and individuals. Each subject is handed a copy of the checklist and an answer sheet. The examiner then reads the instructions given above the test which tells the subject to blacken the spaces appropriate to the choice made. At a signal by the examiner, the subject begins. There is no set time limit but most subjects complete the checklist in 10 to 15 minutes.

Scoring

The test can be rapidly scored by counting the number of affirmative responses and giving each of the responses a credit of 1. The total possible credit that can be obtained by a subject is 50.

Reliability

The test format ensures a very high degree of objectivity in the scoring, and interscorer reliability was found to be very high. The responses of 100 adult and adolescent subjects selected at random were independently scored by two student assistants and a Person r of .99 ($p < .01$) was found. Internal consistency of the test was determined by the split-half and equivalence methods. The responses of 60 adolescent and 60 college adult subjects were used and the odd and even items were correlated and corrected by the Spearman-Brown prophecy formula to give rs of .92, .95, and .94 for adolescent and adult groups, and the two groups combined. When the responses of 773 adult and 304 adolescent subjects were analysed by the equivalence method to determine further the internal consistency of the checklist rs of .85, .79 and .68 were found for the adult and adolescent groups and the two groups combined. Test-retest reliability coefficients were also computed using the responses of 38 and 43 adult subjects with a varying time interval of one day and four weeks and rs of .98 and .77 were obtained respectively ($p < .01$). These results are consistent with findings on the What Kind of Person Are You? Test (Torrance and Khatena, 1970ab) and are related to problems relative to measurement of creative behaviour (Khatena, 1971a).

Raina (1975) in her study found the test-retest coefficient of correlation ($N = 35$) after an interval of four weeks was 0.94 and after an interval of one week ($N = 39$) it was 0.97. The product moment coefficient of correlation for odd-even items

was 0.96, corrected by the Spearman-Brown prophecy formula.

Validity

The validation of tests of creativity presents unique problems which have also been discussed at length elsewhere (Khatena, 1971a). One such problem hinges on finding construct validity and this has been approached in several ways which include comparison of personality characteristics of high and low achievers on tests of creativity, relationship between intelligence and creativity, attitudinal rigidity and creativity, sociometric analyses, psychiatric diagnoses, observation of classroom behaviour, observation of job performance, and child-parent relations.

Construct validity for Something About Myself was obtained on the basis of the hypothesis that subjects who report themselves as high creatives on the checklist would also produce more original responses than their less creative peers as measured by two tests of verbal originality using either sound or onomatopoeic word stimuli (Cunnington and Torrance, 1965; Torrance and Khatena, 1969; Khatena, 1969). The responses of 52 and 102 subjects on the checklist and the two measures of originality were analysed as follows. Originality scores of 52 subjects were available on Form 1 of the Adult Version of Sounds and Images and Onomatopoeia and Images. These subjects were divided into two groups of equal number, namely High and Low Creatives according to their self-reports on Something About Myself. The mean originality score of the High group on Sounds

and Images was found to be significantly superior to those of the Low group (M = 32.61, SD = 6.93; M = 28.92, SD = 8.07). This was also found to be the case with Onomatopoeia and Images (M = 90.57, SD = 21.79; M = 81.69, SD = 21.22). The mean differences on both tests of originality were found to be significant ($t = 2.19$, $p < .05$, $t = 2.15$, $p < .05$). Analysing the self-reports and originality scores of 102 adult subjects on Form 11 of the Adult Version of Onomatopoeia and Images by the planned comparison method (Hays, 1966) where these subjects were divided into three groups of equal number according to their scores on Something About Myself, namely High, Moderate and Low Creative Groups, it was found that the High Creatives showed a mean originality score superior to the Moderate and Low Creatives (M = 102.00, SD = 26.25; M = 90.70, SD = 25.70; M = 94.91, SD = 23.49) with the Low Creatives somewhat superior to the Moderate Creatives ($F = 4.55$, $df = 2/99$, $p < .05$).

The problem of determining content validity hinges upon the appropriate sampling of stimuli from the universe of stimuli: this applies to tests of creativity as it does to other tests (Torrance, 1966; Khatena, 1971a). In the case of Something About Myself, the selection of items as has been stated earlier was guided by earlier research. In addition, the 50 items of the checklist were correlated with originality scores of Form 1 of the Children's and adult Versions of Sounds and Images (Cunnington and Torrance, 1965) and Onomatopoeia and Images (Khatena, 1969, 1971b) using the responses of form 48 to 120 adults, and 83 to 159 adolescents. It was found that

confidence in matching talents in competitive circumstances, playfulness and regression in the act of production, eccentricity, using the strategy of reconstructing, playing the lead role, directing or producing a play or musical evening correlated significantly with verbal originality as measured by Sounds and Images with rs ranging from .20 to .39 ($p < .05$). In addition, it was found that versatility of talent, productivity that is recognized by exhibition or aWard, willingness to take risks, resourcefulness, ability to identify the source of a problem and define it, playfulness and regression in the act of production, desire to excel, the production of a new formula, willingness to review judgements made in the event of fresh evidence, eccentricity, planning and executing experiments, complete task absorption, invention, experiments in cooking and making new recipes, insightful thinking, and sensitivity to problems correlated with verbal originality as measured by Onomatopoeia and Images with rs ranging from .15 to .34 ($p < .05$).

5 criteria were chosen to provide evidence of concurrent validity for the checklist: these took the form of three verbal originality measures, a test of self-perceptions and creative self-ratings. Using the total score of Something About Myself as a creative index, the scores of 144 subjects were correlated with verbal originality scores on Form 11 of the Children's Version of Sounds and Images as criterion to give an r of .18 ($p < .05$). When the scores of 159 and 144 subjects on the checklist were correlated with Forms 1 and 11 of the Children's

Version of Onomatopoeia and Images as the second criterion, rs of .22 ($p < .05$) and .15 ($p < .05$) were found. Scores of 47 adult subjects on Something About myself were correlated with originality scores on the Imaginative Story (Torrance,1962) to give an r of .39 ($p < .01$). The What Kind of Person Are You? Test (Torrance and Khatena, 1970ab) is an instrument requiring subjects to express their self-perceptions served as the fourth criterion. The scores of 405 adult and adolescent subjects on both checklists were correlated and an $r = .46$ ($p < .01$) was obtained. Correlating the responses of another group of 162 adult subjects on both checklists, an r of .60 ($p < .01$) was found. Further, the same group of 162 adult subjects had their self-ratings as creative persons correlated with their scores on Something About Myself to give an r of .49 ($p < .01$).

Raina (1975) in her study determined the validity of Something About Myself by correlating the scores on this checklist with Personal-Social Motivation Test (Torrance,1963). The product-moment coefficient of correlation came upto 0.760 ($N = 105$). The checklist Something About Myself discriminated statistically significantly at beyond 0.01 level of significance. between High, Average and Low Creative Student-teachers.

Normative Data

Preliminary normative data derived from the Self-reports of 1358 (449 males and 909 females) adolescent and adult subjects showed means and standard deviations to be nearly

identical for males, females and the two groups combined (M = 28.67, SD = 7.84; M = 28.46; SD = 7.49; M = 28.55, SD = 7.55).

Factor Analytic Study of Something About Myself

Information on construction, reliability and validity data of Something About Myself (Khatena, 1970), a 50-item creativity checklist based upon the rationale that creativity is reflected in the personality characteristics, thinking strategies, and products of an individual have been reported in several papers (Khatena, 1971, 1972). This rationale together with previous research findings and hypotheses relative to correlates of creativity (e.g., MacKinnon, 1961, 1962; Taylor, 1964; Torrance and Khatena, 1970; Khatena, 1969a, 1969b) provided at first the basis for identification of 100 items. Based on the results of intercorrelational analysis of items, the items were reduced to 50 of the final form of the checklist (Khatena, 1971). The responses of 773 male and female adults and 304 male and female adolescents to each item were correlated with the total score, giving rs of from .11 to .54 ($p < .01$) for adults, and from .12 to .45 (where 47 of the items were significant at the .01 level and 3 at the .05 level) for adolescents. The present study attempted to categorise items into several creative orientations or factors and to provide additional support for the construct validity of the measure.

The test was administered to 672 college men and women and high school boys and girls from colleges in West Virginia, Florida, North Carolina, and Maryland, and three high schools in West Virginia. No time limit was set but most Ss completed the checklist in 10 to 15 minutes. They gridded their responses on IBM cards. Scoring was achieved by counting the number of affirmative responses giving each response a credit of 1, with a total possible score of 50.

A factor analysis was conducted with data input in the form of dichotomous responses. The program performed a principal component solution and an orthogonal varimax rotation of the factor matrix. The Scree Method (Cattell, 1966) was used to examine the slopes associated with the decreasing eigen values.

The analysis gave 16 factors with eigenvalues greater than 1,00, accounting for 52.7% of the total variance. Plotting on Cartesian coordinates suggested that a six-factor solution was appropriate.

The 43 items making up the six factors have communalities between .30 to .61. Only 7 items failed to load as high as .30. Interpretive names for the six factors were given as follows : Environmental Sensitivity, Initiative, Self-Strength, Intellectuality, Individuality, and Artistry. The rotated factors are briefly described and interpreted below :

Factor I : Environmental Sensitivity

The variables with high loadings are openness to ideas of others; relating ideas to what can be seen, touched, or

heard; interest in beautiful and humorous aspects of experiences; and sensitivity to meaningful relations.

Factor II : Initiative

The most important variables in this factor are directing, producing, and/or playing leads in dramatic and musical productions; producing new formulas or new products; and bringing about changes in procedures or organization.

Factor III : Self-Strength

Highest loadings in this factor indicate self-confidence in matching talents against others; resourcefulness; versatility; willingness to take risks; desire to excel; and organizational ability.

Factor IV : Intellectuality

Variables loading on this factor are intellectual curiosity; enjoyment of challenging tasks; imagination; preference for adventure over routine; liking for reconstruction of things and ideas to form something different; and dislike for doing things in a prescribed routine.

Factor V : Individuality

Among variables specific for this factor are preference for working by one-self rather than in a group; seeing oneself as a self-starter and somewhat eccentric; critical of others' work; thinking for oneself; working for long periods without getting tired.

Factor VI : Artistry

The variables loading on this factor stress production of objects, models, painting, carvings; musical compositions; awarding of prizes or having exhibits; production of stories; plays, poems, and other literary pieces.

The results provide substantial evidence for the construct validity of this measure. The study is a step in the development of profiles which may reveal several creative dimensions of an individual. The authors believe that use of Something About Myself can make important contributions to the teacher's understanding of his students and their education. Further research may yield distinctive profiles for boys and girls (or men and women) at varying ages or grades on the identified factors.

C. The Collection of Data

The inservice teachers and the student teachers, as already mentioned were taken from schools and teachers training colleges respectively from Ajmer District - Rajasthan. The names of the institutions from which the samples were drawn have already been mentioned. The Principals / Headmasters of the various institutions were requested to help the investigator. It was explained to them that the project would provide certain insights calculated to bring out some information which could be the basis of educational reform. The investigator met the inservice teachers individually and requested them to fill the

Information Schedule and the other three psychometric tests. In the case of the student teachers the Information Schedule and tests were administered in small groups in their respective colleges on the date and time fixed by the Principal for this purpose. One or two senior staff members of the respective colleges helped the investigator in the administration of the tests. The inservice teachers and the student teachers were requested to answer the questions truthfully. They were also assured that their responses would be kept strictly confidently. The tests were scored and analyzed as per instructions given in the respective manuals.

Information Schedule

For collecting relevant information on some background factors the investigator prepared an Information Schedule (Appendix G) which provided data regarding Name, Sex, Class, Name of Institution, Age, Educational Qualification and Teaching Experience, if any.

D. Statistical Procedures

The following statistical procedures were adopted for the analyses of data :

1. The raw scores of all the inservice and student teachers on Sixteen Personality Factor (Cattell), Minnesota Teacher Attitude Inventory (Cook, et al) and Something About Myself (Khatena), were tabulated separately into frequency distribu-

tions and mean and standard devistions were calculated according to the usual formulae.

2. To determine the agreement between the rankings of various factors of 16PF and six factors of Something About Myself between different groups, Rank Order Correlation (Rho) was calculated according to the usual formula.

3. The Analysis of Variance was used to compare the personality structures of the three groups of Science, Arts, and Commerce teachers and student teachers by the usual formula. But a significant F tells that there are non-chance variations among the means somewhere in the list of sets, it is not known how many or which ones are significantly different. Therefore, t test was used to test the significance of the difference between any two groups on each personality factor (in all the tests) which indicated significant F ratios.

4. Comparisons between different groups, where the F test indicated significant differences in the psychometric tests, were made on the basis of t tests. In calculating the t the following formula given by Guilford (1956) to find the differences between uncorrelated means in two samples of equal size, i.e. $N_1 = N_2$ was applied :

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\Sigma x_1^2 + \Sigma x_2^2}{N_i (N_i - 1)}}}$$

Where N_i = Size of either sample.

To test the significance of t value the following levels of confidence were established :

(i) Not significant at the 0.05 level or merely not significant if t value was 1.97 or less.

(ii) Significant at the 0.05 level or merely significant if the t value was between 1.98 and 2.61.

(iii) Significant at the 0.01 level or highly significant when the t ratio was 2.62 or larger.

5. In the analysis of scores on the three psychometric tests, variances were compared for homogeneity before obtaining the value of t. The following formula was used :

$$F = \frac{\text{Larger Variance}}{\text{Smaller Variance}} \quad \text{or} \quad \frac{S_1^2}{S_2^2} \quad \text{or} \quad \frac{S_2^2}{S_1^2}$$

In case where significant difference were found in the variances the application of t test was modified as suggested by Edwards (1956) i.e., the Table of t was entered with one half the usual number of degrees of freedom.

6. The following twenty-four variables were involved in the factor-analysis. It may be however pointed out that the analysis of variance and factor analysis were done on the computor.

16 PF

1. Reserved Vs. Outgoing (A)
2. Less Intelligent Vs. More Intelligent (B)
3. Less Stable Vs. More Stable (C)
4. Submissive Vs. Dominance (E)
5. Sober Vs. Happy-Go-Lucky (F)
6. Expedient Vs. Conscientious (G)

7. Shy Vs. Venturesome (H)
8. Toughminded Vs. Tender-minded (I)
9. Trusting Vs. Suspicious (L)
10. Practical Vs. Imaginative (M)
11. Forthright Vs. Shrewd (N)
12. Placid Vs. Insecure (O)
13. Conservative Vs. Experimenting (Q_1)
14. Group Dependent Vs. Self Sufficient (Q_2)
15. Uncontrolled Vs. Controlled (Q_3)
16. Relaxed Vs. Tense (Q_4)

Something About Myself (SAM)

17. Environmental Sensitivity
18. Initiative
19. Self Strength
20. Intellectuality
21. Individuality
22. Artistry
23. Creativity

Attitude Towards Teaching

24. Minnessota Teacher Attitude Inventory (MTAI)