A PILOT IDENTIFICATION AND DESCRIPTION OF THE ACADEMICALLY TALENTED CREATIVE ADOLESCENT

> Thesis for the Degree of Ph. D. MICHIGAN STATE UNIVERSITY William Harry Crawford 1964





This is to certify that the

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# ABSTRACT

# A PILOT IDENTIFICATION AND DESCRIPTION OF THE ACADEMICALLY TALENTED CREATIVE ADOLESCENT

by William Harry Crawford

# A. The Problem

The purpose of the main study in this thesis was twofold: (1) to identify, within a group of academically talented adolescents, those students who perform consistently in an original or creative way; and (2) to establish the relationship between a composite originality score and a variety of personality, achievement, intellectual, and personal characteristics in order to find a way to describe the more original in contrast to the less original academically talented adolescent. Sex differences were accounted for throughout the study.

Two sub-studies were performed to compare: (1) the student who scored above the mean on originality but below the mean on intelligence with those who scored above the mean on intelligence but below the mean on originality; and (2) the extremes of the group who scored very high and very low on originality.

## B. The Method

The sample consisted of 125 academically talented adolescents (average Stanford Binet IQ's were 133.46) from the public schools of Lansing, Michigan. The group included 42 boys and 83 girls who had been selected two years earlier by Dr. Elizabeth Drews for a special program which was part of a larger study of student abilities and grouping.\* All data except for the Guilford tests was collected for and used in this study that had been funded by Cooperative Research.

The criterion of originality in this study was a composite score derived from four measures, which were changed to standard scores and added for the composite score. The four components of the composite score were the ratings for cleverness, remoteness, and uncommonness of response on a story of a fictional person the student would like to be; the ratings from Guilford's Consequences; the ratings on Guilford's Plot Titles tests; and a rating on originality from a sociometric device.

The composite originality score was correlated with a number of measures including IQ, achievement test scores, personality test scores, and personal history items, and was also related to a number of responses from two questionnaires.

C. Results

The principal hypothesis in this study was that the consistently original student could be identified and that he would differ in a number of characteristics from the consistently non-original student. This did not prove to be the case as there were not significant correlations among the four main factors in the composite originality

<sup>\*</sup>Elizabeth Monroe Drews, <u>Student Abilities</u>, <u>Grouping Patterns</u>, <u>and Classroom Interaction</u>. Office of Research and Publications, Michigan State University. East Lansing, Michigan. December, 1963. (Cooperative Research Grant #608.)

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score. Since this hypothesis was not met, the study gives equivocal results which are difficult to interpret and the interpretations can be seen only as possible explanations of the data. The results raise questions as to the adequacy of the instruments used to determine originality and of the worth of combining them into a composite score.

The more original boy, as selected by this composite score, seems to achieve better in school in terms of grades and scores higher on standardized achievement tests, and tends more often to select a theoretical scientific vocation than does the less original boy. No personality description which would differentiate the more original boy can be given since the few significant correlations which appeared could be accounted for by chance.

Results which discriminate the more original girl from the less original girl were even more scant. There was a pattern which suggests that these 15 year old girls of both groups are already conforming to the stereotyped feminine role of being interested in social life, of becoming the typical wife and mother, and of having a primary desire for a happy home life.

The sub-studies have implications for future research in that those students who scored high on the composite originality score also tended to score high on all of its components. A comparison of those above the mean on originality but below the mean on IQ with those below the mean on originality but above the mean on IQ seemed to select out the "social leaders". Contrasting those very high on originality with those who were very low on originality seemed to select out the "good students" who were high aspiring and high achieving. It is

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believed that a more complex and diverse definition of originality needs to be used in research with adolescents and that the primarily verbal nature of the originality instruments used in this thesis identified more the good student than the highly original student who was being sought. A PILOT IDENTIFICATION AND DESCRIPTION OF THE ACADEMICALLY TALENTED CREATIVE ADOLESCENT

By

William Harry Crawford

#### A THESIS

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### Chapter I

# The Problem

One of the current emphases in American education is directed toward the identification and proper training of scientific and creative talent. Within the past decade the nation has become increasingly aware of the need for experimentation in the field of creativity in order to preserve its world power and leadership position. Technological advancements are far in advance of the general comprehension within the behavioral sciences. Many hypothesize this in itself has been a contributing factor in our society's resultant development of insecurity. The complexity of our society has led to a highly structured socialization process which in turn has condoned conformity and inhibited creativity. Social scientists are now seeking a remedy for this unfortunate turn of events.

Psychologists and educators have a twofold purpose in mind in studying creativity. First of all, there is full recognition of the necessity of identifying and developing creative talent with an eye toward national security. Secondly, these same groups are always interested in development of the potential of the individual. It is hoped that through the study of creativity, understanding will develop which will lead to the fostering and teaching of creativity to help man develop more fully as a human being. From this eventually will come a society of beings more closely approaching self-actualization and having more emotional security. Behavioral scientists are interested not only in the creative scientist but in the creative person in all fields in hopes of bringing the study of man to the point of understanding that the world has in the technological fields. For it is the unity of knowledge that can bring peace to man and mankind.

The study presented on the following pages was an attempt to identify and describe the more original students in a select group of academically talented adolescents. The theoretical basis for such an attempt was derived from a statement in Frank Barron's writings on creativity. "Original responses, it would seem, recur regularly with some persons, while there are other individuals who do not ever depart from the stereotyped and the conventional in their thinking. If, then, some persons are regularly original while others are regularly unoriginal, it must be the case that certain patterns of relatively enduring traits either facilitate or impede the production of original acts." (3)

It must be noted here that this study was designed and the data collected four years ago. Since that time research has been published on creativity and originality which in merit far exceeds the attempt made in this thesis, and as is frequently the case, makes an earlier study such as this was look more feeble than it would have a few years back. The design is weak because there was no outside criterion of originality available for this adolescent age group. Two of Guilford's tests of originality were used because at the time they were the only available ones with prior research done on them.

#### Purpose of the Study

The purpose of the main study in this thesis was twofold: (1) to identify, within a group of academically talented adolescents, those students who perform consistently in a relatively original or creative

way; and (2) to establish the relationship between a composite originality score and a variety of personality, achievement, intellectual, and personal characteristics in order to find a way to describe the original in contrast to the less original academically talented adolescent. Sex differences were accounted for throughout the study.

Two sub-studies were performed to compare: (1) the student who scored above the mean on originality but below the mean on intelligence with those who scored above the mean on intelligence but below the mean on originality; and (2) the extremes of the group who scored very high and very low on originality.

# Hypotheses:

The principle hypothesis in this study is that the consistently original or creative student can be identified and that he will differ in a number of characteristics from the consistently less original or non-creative student.

1. The more original students will score higher on intelligence than the less original students.

2. The more original students will more often be high achievers, both as to achievement test scores and grade point averages, than the less original students.

3. The more original students will have a personality profile on Cattell's High School Personality Questionnaire which is different from the profile of the less original students. This profile will in large part be similar to those found in previous studies for creative adults.

4. The more original students will have a more positive self concept of themselves as learners than the less original students.

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 The more original students will be less rigid and less dogmatic on the Rokeach scales than the less original students.

 The more original students will not differ from the less original students in socioeconomic status or parent's education. Hypotheses for Sub-studies

 Sex Differences - The more original male students will differ from the more original female students but the direction of these differences cannot be hypothesized.

 Effects of Intelligence - The more original students, low on intelligence, when compared to the less original students, high on intelligence, will be different, but the direction of these differences cannot be hypothesized.

 Extremely High versus Extremely Low on Originality - Using the extremes of the group, differences are expected to emerge, but their direction cannot be hypothesized.

#### Overview of the Thesis

The study used 125 academically talented students from the Lansing, Michigan public schools who had been previously identified for their schools' gifted programs. The study included h2 boys and 83 girls. They were tested at the end of the ninth and beginning of the tenth grades. The sample had a mean Stanford-Binet I.Q. of 133.h6.

Four measures of originality were used: Guilford's Plot Titles, Guilford's Consequences test, a short projective test asking the student to write a story of a fictional person he would like to be, and a sociometric rating of creativity. The Plot Titles test was scored for cleverness of response, the Consequences test for remoteness of response,

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and the Projective Story for cleverness, remoteness, and uncommonness of response. Scoring categories were defined by two raters, and these can be found in the appendix of the thesis.

The six scores from these originality measures were changed to standard scores and summated for a composite score. The composite originality score was then correlated with personality test scores, personal history items, achievement and intelligence test scores. Sex differences were always accounted for.

Using extreme groups within the sample, two sub-studies were performed to see how the students high on originality but low on intelligence compared to those who were low on originality but high on intelligence; and to see how those who scored extremely high on originality compared to those who scored very low on originality.

# Chapter II

The Method

The purpose of this study was to determine the relationships of the responses of a gifted group of students on four measures proposed to be tapping originality when related to a variety of achievement tests, personality traits, and personal history items.

# Sample

The sample consisted of 125 academically talented adolescents from the public schools of Lansing, Michigan. The group included 42 boys and 83 girls. The students were a part of a larger sample comprised of all levels of intelligence who had been tested previously by Elizabeth M. Drews for her research contract with the United States Office of Education, Department of Health, Education and Welfare. This project number 608 was entitled, "The Effectiveness of (A) Homogeneous and (B) Heterogeneous Ability Grouping in Ninth Grade English Classes with Slow, Average, and Superior Students." For research on the effects of groupings, these students were grouped into three categories of mental ability by the use of individual intelligence tests, reading tests, and teacher recommendations. Information had been collected on this group of students and since it was an ongoing research project, additional instruments could be added for this study. It would have been implausible to obtain similar date on other groups of varying mental ability.

The tests used in this study were given to the students at the end of the ninth grade (Spring, 1959), except for the originality tests which were administered at the beginning of the tenth grade (Fall, 1959).

This group of superior or academically talented students was comprised primarily of students who had Stanford-Binet IQ's of 120 and

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above and whose reading and language skills were two years above their age group. A few were included with IQ's slightly below 120 but had reading scores two years above their grade placement level, who had been recommended by their teachers for the gifted classes on their knowledge of the students' grades and classroom behavior.

### Measures

A. Criterion of Originality. The criterion of originality was a composite score derived from four measures. The methods of rating these originality variables are included in the appendix. These measures were changed to standard scores and summed for the composite score. The four components of the criterion of originality were as follows:

- 1. Guilford's Plot Titles Test. In this test a story plot was presented, and the subject was asked to write as many clever titles as he could for the plot.
- 2. Guilford's Consequences Test. The subject was to write what would happen if certain changes were to take place. He was to list as many consequences or results of these changes as he could to two different situations.
- 3. The A-E Test. This was a short projective device on which the student was asked to write a personal history of a completely fictitious person whom he would like to be.
- 4. Sociometric Rating of Creativity. On a sociometric questionnaire filled out by the students in their classrooms, one question was designed to determine which students were seen as most creative by their peers. This question was:
  "When your English Class is asked for original (new) ideas, who has the most good ideas?" Each student listed three persons as to first, second, and third choice.

Scoring was accomplished in the following manner. The first three

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components of the composite originality score required subjective judgments. These were done by two raters, and the subject's resultant score was the average of the scores assigned by the two raters. The actual scoring techniques for these three measures are presented in the appendix and are being kept separate because of the complexity of the rating.

The score the student received on the Sociometric Rating of Creativity was the sum total of times his name was listed by a peer as one of the most creative members of the class. The weighting system, as determined by first, second, and third choice, could not be hypothesized because of the inability of the experimenter to determine what real differences existed between the choices in the minds of the students doing the ratings.

The six scores derived from these four measures were changed to standard scores and added together for the composite originality score. The six scores were the remoteness, uncommonness, and cleverness scores on the fictional person story, the cleverness score on Guilford's Plot Titles, the remoteness score on the Consequences test, and the sociometric rating of creativity. Since there was no outside criterion of originality each measure of necessity had to be considered equal. That there was no method of weighting the different components of the composite originality score was a basic weakness in the design of this study, but no such criterion was available for the group. Usually ratings of eminence in a particular field or productivity are used as a criterion but no such indices were available or could be for young adolescents.

B. Personality Measures. The personality measures included the Rokeach Dogmatism and Rigidity Scales, the Attitude Toward Self-as-School-Learner, and Cattell's High School Personality Questionnaire.

The Rokeach Dogmatism and Rigidity Scales. The primary purpose of the Dogmatism Scale is to measure individual differences in openness or closedness of belief systems. Dogmatism refers to the total cognitive organization of ideas and beliefs into relatively closed ideological systems; rigidity is defined in terms of the way a person attacks, solves, or learns specific tasks and problems. The subject responded to a number of statements devised to measure the concepts of dogmatism and rigidity on a six-point scale ranging from, "I agree very much" to "I disagree very much."

Attitude Toward Self-as-School-Learner. This checklist was devised by Drews and Boroughs based primarily on the results of the latter's M.A. thesis, <u>Indices of Self and Attitude Toward Environment in</u> the Prediction of Achievement. In this thesis nineteen words appeared on a semantic differential test and on the Bill's Adjective Checklist, which significantly discriminated between high-achieving and lowachieving students of superior ability. For this checklist, to determine the student's attitude toward self-as-learner, items were formed using the significant words which discriminated between high and low achievers on this previous study. Each item on the checklist is scored either positively or negatively depending upon its relation to high achievers (plus) or low achievers (minus) in the original study. The subtraction of these two total scores, one being a positive self concept and the other a negative self concept, yields a score called the attitude toward self-as-learner.

Five other items (8, 12, 20, 22, and 23) were added for individual analysis attempting to get rough measures of what each student felt of his own ability to be creative, to be a critical thinker, and to be open-minded. The creativity score was obtained from subtracting the score on item 12 ("I have lots of new ideas") from item 23 ("I never seem to have a new idea"). The open-mindedness score was the number gotten by subtracting item 8 ("I like to hear other people's ideas") from item 22 ("I hate to admit someone else is right"). The critical thinking score was the score on item 20 ("I can think critically and sort good ideas from poor ones"). To each item on the attitude checklist the student responded on a four-point continuum from "just like me" to "not like me." The scores on these above-mentioned five items were not included in the total concept of self-as-learner score. This instrument has not been cross-validated, but the original study was performed with this same sample.

Cattell's High School Personality Questionnaire. This is a relatively short personality questionnaire which can be completed in one classroom period. The test is based on factor analytic studies and yields scores on fourteen personality dimensions.

- A. Schizothymia versus Cyclothymia Stiff, Aloof versus Warm, Sociable
- B. Mental Defect versus General Intelligence Dull versus Bright
- C. Dissatisfied Emotional Instability versus Ego Strength Emotional, Immature, Unstable versus Mature, Calm
- D. Phlegmatic Temperament versus Excitability Stodgy versus Unrestrained
- E. Submissiveness versus Dominance Mild versus Aggressive
- F. Desurgency versus Surgency Sober, serious versus Enthusiastic, Happy-go-lucky
- G. Lack of Rigid Internal Standards versus Super-Ego Strength Casual, Undependable versus Conscientious, Persistent
- H. Threctia versus Parmia Shy, Sensitive versus Adventurous, Thick-Skinned
- I. Harria versus Premsia Tough, Realistic versus Esthetically Sensitive
- J. Dynamic Simplicity versus Neurasthenic Self-Critical Tendency Liking Group Action versus Fastidiously Individualistic
- 0. Confident Adequacy versus Guilt Proneness Confident versus Insecure
- Q2. Group Dependency versus Self-Sufficiency Group Dependent versus Individually Resourceful
- Q3. Poor Self-Sentiment Formation versus High Strength of Self-Sentiment Uncontrolled, Lax versus Controlled, Showing Will Power
- Q4. Low Ergic Tension versus High Ergic Tension Relaxed Composure versus Tense, Excitableness

C. Achievement Measures. The achievement measures included the ACE Critical Thinking Test and parts of the California Achievement Test and the grade-point average.

<u>ACE Critical Thinking Test</u>. A measure of how well a student can think through or reason out a problem. The students took the college level form (form G) of this test.

California Achievement Test. The students were given the reading and language parts of the California Achievement Test, Advanced Form AA, for grade levels 9 through l. The reading score is a measure of reading comprehension; the reading vocabulary subtest was not administered. The total language test score is composed of subtest scores in spelling and mechanics of English grammar.

Grade Point Average. The GPA was determined by using the student's solid course grades only and such courses as physical education and shop were not included for the three years of Junior High School.

D. Personal History Items. A large number of personal history items were collected by means of a questionnaire and an English Class Survey. The questionnaire used was developed by Elizabeth Drews. It is a copyrighted instrument entitled. Student Interest Survey II and was developed from the original Student Interest Survey used in Drews! study of grouping, which was a pilot study for the research project, "A Study of Non-intellectual Factors in Superior, Average, and Slow High School Students." USOE/E-2. The interest survey items attempting to tap creativity developed from a study of the literature of creative adults and college students. The Survey of Interests yielded relevant information on parents' occupation and level of education. the students' interests and values for future life, their occupational aspirations, expectations and hopes for further education, their ordinal status in the family, their ratings of their own ability, what they feel their parents expect of them in school and in future life, and the way they see themselves in relationship to descriptive profiles.

Social class status in this study was determined by rating the fathers' occupations by the Warner, Meeker, Eels Index of Status Characteristics. The students' own occupational aspirations were rated similarly. Frequency charts were tabulated on the various personal history items, and then the numbers were changed to percentages for descriptive purposes.

E. <u>Sociometric Measures</u>. The sociometric measures in this study were on the first page of the <u>English Class Survey</u> given to these students. They were asked to list their first, second, and third choices of persons in their English class with whom they would like to do various things or in accord with the way they saw various members of the class participating. There were six questions in all, of which the second and fifth yielded the measure of social choices, and the first, third, fourth, and sixth yielded the measure of intellectual choices. The total number of times a given person's name was listed as first, second, or third choice on items 2 and 5 was his score on social choices, and the number of times his name was written in on items 1, 3, 4, and 6 was his score on intellectual choices.

The social choices were not differentiated any further, but each of the four items making up the intellectual choices were also treated separately. This was done because of the way the scale was evolved. The two items getting at the social interaction in the group were (2) "What people in this class would you have most fun with on a picnic?", and (5) "What people would you like to go with from this class to a dance?" The items making up the intellectual choices were differentiated further as to four separate things: (1) Intellectual - "If your English class were to have groups working together on a project to be presented orally, whom would you choose to work with so that your project would be the best one?"; (3) Creativity - "When your English class is asked for original (new) ideas, who has the most good ideas?"; (4) Open-mindedness - "In a class discussion, who is most willing to listen to other people's ideas and from this to change their own ideas

if it appears the idea is wrong?"; and (6) Critical Thinking - "Who do you think is most likely to disagree (question, challenge) with what someone else has said? (Who is the skeptic?)".

#### Statistics

The first statistical procedure was changing the six scores on the various measures of originality to standard scores and summing them into a composite originality score. The composite score was then correlated with the other variables for the entire sample, for boys and for girls, using Pearson Product Moment Correlations. This was the main body of the thesis.

Two sub-studies were run using extremities of the sample. The first sub-study compared those above the median on originality but below the median on intelligence with those above the median on intelligence but below the median on originality by use of Fisher " $\pm$ "-tests. The second sub-study was to compare those students who scored extremely high on originality with those who scored extremely low on originality. In this study the Mann-Whitney U Test was used because it estimates " $\pm$ " quite well and was more appropriate to the data because many of the variables were ordinal rather than interval scales.

All the statistics were run either on the 704 or the 7090 computer at the University of California, Berkeley. The five percent level of confidence was used as the level of significance throughout the study unless otherwise stated.

#### Further Description of the Sample

The mean Stanford-Binet IQ for the entire sample was 133,46; for the girls it was 133,48 and for the boys 133,43. In the group there

were 4 boys and 10 girls with IQ's below 120; however, these students were all achieving well in school and were reading at least two years in advance of their grade level, and as will be shown later, 8 of these 14 scored above the median composite originality score.

The sample was administered the California Achievement Test, Advanced Form AA, for grade levels 9 through 14. The battery includes tests in the areas of reading, language, and mathematics. Only the reading comprehension sub-test was administered under the reading section, and the entire sample had a mean of 43.46, giving a grade placement level of 13. The total language test composed of sub-test scores in spelling and mechanics of English and grammar was given, and the total sample had a mean of 83.10, giving a grade placement level of 12.7. There were no sex discrepancies on the reading scores. The mean language score for girls of 85.63 gives them a grade placement of 13.1, and the mean of 78.10 for the boys gives them a grade placement level of 12.1; this is a significant difference.

The mean score on the ACE Critical Thinking Test for the group was 33.18. The mean score for college freshmen at Michigan State University on this test was 29 at the time this data was collected. These measures of achievement showed the subjects for this study were achieving well above their grade level and in line with their superior ability. The sample does not fit into the usual definitions of giftedness, and they can best be described as being academically talented and of superior mental ability. Gifted groups most frequently use an IQ cut off score of 130. The grade point average for the sample is 3.43 on a h-point system. The girls excelled in terms of grades, with an average

Variable	B o Mean	ys S.D.	Gi: Mean	rls S.D.	Tot Mean	; a l S.D.
IQ (Stanford- Binet)	133.43	10.74	133.48	12.04	133.46	11.61
California Reading	43.14	4.07	43.61	L.08	43.46	<b>4</b> ∙08
California Language	78.10	8.81	85.63	8.15	83.10	9.10
C <b>ritical</b> Thinking	32.02	6.21	33•76	5.89	33.18	6.05
Rokeach Dogmatism	158.21	18.84	152.98	21.38	154•74	20.71
Rokeach Rigidity	92.95	13 <b>.7</b> 0	94•29	13.34	93.84	13.48
Grade-Point- Average	3.21	0.11	3.54	0.41	3.43	0.45
Socioeconomic Status	3.19	1.55	3.22	1.65	3.21	1.61
Father's Education	13.38	3.80	13.70	3.27	13.59	3.46
Mother's Education	12.67	2.04	13.11	2.20	12.96	2.16
Occupational Aspiration Rating	1.31	0.77	<b>1</b> •94	0.66	1.73	0.76
Self Rating of Ability	2.69	0.46	2.65	0.50	2.66	0.49

Table 1Means and Standard Deviations of IQs,Achievement Measures, and Personal and Social Variables,<br/>for the Males, Females and Total Sample.

of 3.54 in contrast to the boys' average of 3.21; here, again, the difference is significant.

#### Family Environment

The majority of the students studied listed their religious preference as Protestant. Within the group only h did not list a religious preference, h stated they were Catholic, 5 were Jewish and 112 were Protestant. Most of the group would be called assimilated American. The social status of their families were rated on their fathers' occupations by the Warner, Meeker, Eels Index of Status Characteristics. This scale runs from professional occupations (1) to manual labor (7). In the group the lowest rating of social status (7) was not applicable. The group was divided fairly evenly with 55 percent of the sample in the top three categories and h5 percent in the lower three categories. Table 3 shows the distribution was similar for boys and girls.

On the Cattell HSPQ the sample differed from the norm groups on several factors. The academically talented boys differed from the norm group on factors B, I, O, and Q2. The higher score on B (general intelligence) was to be expected and was evident for both sexes. They were lower on factor I (harria versus premsia), or were more tough and realistic, as opposed to being esthetically sensitive. They were lower on Factor O, which shows that they tend to be more confident and self-secure than the norm group. They were higher than the norm group on factor Q2, indicating that they tend to be more self-sufficient and resourceful as opposed to being socially group dependent.

The girls scored higher than the norm group on factors B, C, and H. Therefore, as a group they tend to be higher on ego strength, are more mature and calm, and are more adventurous as opposed to being shy and timid.

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Table 2Frequency Distribution of Social StatusAccording to Categories on the Index of Status Characteristics

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So C	cial Status ategories	В	oys	G	irls	То	tal
l	(Highest) Professional	6	(山%)	15	(18%)	21	(17%)
2	Managerial	12	(28%)	19	<b>(</b> 23%)	31	(25%)
3	Sub Managerial and Small Independent Businessmen	4	(10%)	13	(16%)	17	(13%)
4	Skilled Workers	13	(31%)	16	<b>(</b> 19%)	25	(23%)
5	Apprentice to Skilled	2	(5%)	9	(11%)	11	( 9%)
6	(Lowest) Semi-Skilled	5	(12%)	ш	(13%)	16	(13%)
N		42		83		125	

Table 3Frequency Distribution of Religious Preference

Religious Preference	Воуз	Girls	Total
Methodist	17	28	45
Presbyterian	8	11	27
Congregational	4	10	זלד דר
Lutheran	3	4	7
Baptist	2	11	13
Episcopal	3	3	6
Jewish	0	5	5
Catholic	1	3	4
Other	<u>1</u> 4	8	12
N	42	83	125

		Вс	ys			Gi	rls	
Factor	M. Norm	S.D. Group	M. Present	S.D. Sample	M. Norm	S.D. Group	M. Present	S.D. Sample
A	4.9	1.7	5.10	2.17	4.5	1.7	5.94	1.47
в	6.7	1.9	8.93	0.86	6.9	1.8	8.84	1.04
С	5.4	1.9	6.21	1.85	5.2	1.9	4.22	1.67
D	5.0	1.7	4.76	1.43	5.0	1.7	4.23	1.70
E	5.0	1.9	5.55	1.58	4.4	1.8	4.04	1.67
F	5.4	1.7	5.86	1.93	5.6	1.6	6.18	1.62
G	6.0	1.8	6.05	1.46	6.5	1.7	6.30	1.50
н	4.7	2.1	5.60	2.12	4.4	1.9	5.72	1.97
I	4.2	2.1	2.83	1.57	5.8	1.9	5.35	1.75
J	5.1	1.6	5.88	1.58	5.5	1.6	5.50	1.52
0	5.0	1.8	3.93	1.65	5.4	1.8	4.69	1.91
Q2	5.5	1.8	6.55	1.37	5.0	1.6	4.77	1.32
Q3	4.9	1.7	4.10	1.67	5.1	1.7	4.20	1.43
04	4.5	1.7	4.07	1.71	4.9	1.5	4.60	1.55

Table 4 Means and Standard Deviations for Norm Groups and for the Present Sample on the Cattell HSPQ Factors\*

\* A description of these factors on the Cattell High School Personality Questionnaire can be found on page 10.

#### Summary

The purpose of this study was to determine the relationships between a composite originality score and a variety of achievement tests, personality traits, and personal history items.

The sample consisted of 125 academically talented adolescents from the public schools of Lansing, Michigan. There were h2 boys and 83 girls in the group. They were tested at the end of the ninth grade and the beginning of the tenth grade. The average Stanford-Binet I.Q. for the group was 133.h6. These students placed at grade level 13 on Reading Comprehension and were predominantly high achievers in grades with a 3.5 average for the girls and a 3.2 for the boys on a h.O system.

The criterion of originality was a composite score derived from four measures: Guilford's Plot Titles test, Guilford's Consequences Test, a projective story of a fictional person the student would like to be, and a sociometric rating of creativity. The first three tests were rated by two raters and the rating procedures are in the appendix. The six scores were changed to standard scores and summated for the composite score.

The composite score was related to personality measures including the Rokeach Dogmatism and Rigidity Scales, the Attitude Toward Self as Learner Checklist, and Cattell's High School Personality Questionnaire; to achievement measures including the MSU Critical Thinking test, the California Achievement Test and grade point average; and to a number of personal history items.

Correlations were run for the entire sample for boys and for girls on all these variables. Two sub-studies were run to see the difference

between those scoring extremely high and low on originality and between those high on originality but low on intelligence with those high on intelligence but low on originality.

### Chapter III

## Survey of Literature

Studies of creativity are similar in that they take into account some novel thought, idea, or product, and may be concerned with what determines original responses through an analytical or a synthetic approach. The analytical approach is commonly seen as viewing creativity as a process, a thought process the individual goes through to produce a novel response. The synthetic approach begins with an original response, such as eminence in a field as viewed by professional colleagues, or by original responses to an experimental situation devised to tap creative responses. The synthetic approach is called the product approach to studying creativity. Product research usually involves a description of the creative person whereas process research involves a description of the problem solving method in reaching a novel response. The type of research design to be followed is frequently inherent in the author's definition of creativity.

### Process Definitions

Torrance (51) defines creative thinking as process when he says "I have chosen to define creative thinking as the process of sensing gaps or disturbing missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses." Torrance feels that he has subsumed under his definition the major features of most definitions of creativity. Unlike most researchers in this field, he has given a process definition and then proceeded to experiment in the field in a product method, measuring creativity by test responses. This

approach is more the current modus operandi because it permits a more global approach to studying creativity and is not as restricted in terms of seeing creativity as a discrest or pure factor.

The creative process is usually described as having four main steps: preparation, incubation, illumination, and revision. The preparation step is the defining of the problem, the reading, studying, and collection of relevant information and the forming of alternate hypotheses; the incubation period is when the mind is somewhat dormant but the testing of the hypotheses is going on unconsciously; the illumination period is when the answer, solution, or novel product emerges with a flash of insight; the revision period is when the response is evaluated, ramified and perfected. In the literature there is much agreement on the process but only limited research in actual experimentation to assess if it is correct and how it might be implemented, due to difficulties in measuring thought processes. Results on the process most frequently are gained through introspection.

Rogers gives another process type definition of creativity which stems from his thinking and research on client-centered therapy and it would allow him to pursue the study of creativity along the same lines as he has approached other behavioral principles. Rogers says, "My definition, then, of the creative process is that it is the emergence in action of a novel relational product, growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life on the other." (42) The process definitions have inherent in them a global approach seeing creativity ability both as a general and as specific factors.

# Product Definitions

Product definitions see creativity as a more specific ability or specific abilities which can be measured by tests. Many types of tests have been or are now being designed to measure creative or original responses. These tests include measurement of clever, uncommon, or remote responses, samples of writing and their content, divergent or convergent thinking, flexibility, and ideational fluency, to cite but a few examples.

Guilford's product type definition of originality is at the opposite extreme of the continuum when compared to Rogers' open-ended definition, being completely operational and limited to a specific criterion of creative accomplishment. "Three definitions and corresponding methods of measuring originality were finally adopted and applied to specially constructed tests. The methods are based upon: (A) uncommonness of response; (B) the production of remote, unusual, or unconventional associations; and (C) cleverness of responses." (53)

Drevdahl gives one of the most complex and lengthy operational or product definitions of creativity which involves the analysis of the entire behavior of the person. "Creativity is the capacity of persons to produce compositions, products, or ideas of any sort which are essentially new or novel, and previously unknown to the producer. It can be imaginative activity, or thought synthesis, where the product is not a mere summation. It may involve the forming of new patterns and combinations of information derived from past experience, and the transplanting of old relationships to new situations and may involve the generation of new correlates. It must be purposeful or goal directed, not mere idle fantasy - although, it need not have immediate practical

application or be a perfect and complete product. It may take the form of an artistic, literary, or scientific production or may be of a procedural or methodological nature."(14)

The most apparent thing in all these definitions is that they are each worded to fit a specific experimental approach or approaches, and further, that the nature of the criterion to be used in determining creativity in the study is often inherent in the structure of the investigator's definition of creativity. It is inherent in Guilford's definition that he is going to use factor analysis because he is looking for the specific factors contributing to creativity. Rogers' statement with its emphasis on environmental and individual features is directed toward observation of individual and group problem solving techniques. The multitude of ramifications in Drevdahl's and Torrance's definitions have inherent within them the multiplicity of their approaches in their studies to determine the characteristics of the creative person. The Criterion Problem

In designing creativity research another problem which the experimenter in the area meets is that of a choice of a criterion or criteria once he has defined the concept. The most frequent criticism leveled at studies of creativity is that the criteria are determined in a subjective manner. Even Guilford's factor analytic tests have no specific answers but, rather, must be rated by the scorer.

The types of criteria that have been used to judge creativity have been grouped and categorized in several ways. Johnson used a three-way division for the criteria of creative accomplishment: (1) the criteria of eminence - in the pages of history, the eyes of one's peers, or by

by counts of productivity; (2) critical incidents; (3) and work samples the laboratory or experimental criterion of creativity.(17) Drevdahl breaks this down somewhat differently. "There have been three general approaches to the study of creativity: the historical-anecdotal approach, best illustrated by Kretschmer, the introspective personal report approach, exemplified in Patrick's studies, and the test approach, used by Terman and Roe."(14)

Stein has developed the most elaborate system of categorizing creativity criteria. He used six groups: (1) by the definition group; (2) the statistical or test criterion group; (3) the qualified or expert judgment criterion; (4) products group; (5) the ultimate criterion group; and (6) the individualized criterion group. (47)

A recent description of criteria used for studying creativity was synthesized by Crutchfield(32), who lists five methods. (1) Identify noteworthy creative products and study how they came into being. (2) Elicit and study creative performances under standard conditions of doservation. (3) Analyze creative capacity into its assumed components and how they interrelate. (4) Test particular hypotheses about details of the creative process. This is the approach of the experimental psychologist. (5) The newest approach is the simulation of creative processes on the high speed electronic computer. This is to design computer programs which will as closely as possible simulate the behavior of people when they are actually engaged in creative problem solving and thinking, and then to gain insight into the underlying processes. Crutchfield finds each approach has merit and that they all tend to supplement one another.

For quite a time the test products or factor analytic approach was being used the most extensively. Currently, as is implicit in Crutchfield's grouping, a multiple criteria approach is being used in the large and extensive creativity projects.

# Definition of Originality in This Product Study

Originality in this study will be defined as the ability to produce responses which are clever, remote, or uncommon in contrast to the given population and to be seen as original by one's peers. The cleverness, remoteness, or uncommonness will be subjectively rated by two persons after close definition of the categories. Guilford's tests of plot titles and consequences will be used, plus determining similar ratings on a projective story of a fictional person whom the subject would like to be. Along with these product scores will be a rating of eminence by peers. Since Guilford's ideas will be used in this thesis, his research will now be discussed.

## Guilford's Research

In 1952, Guilford devised a battery of tests covering eight abilities hypothesized as being important in creative thinking as performed particularly by scientists, engineers, and inventors. These were administered to 410 air cadets and student officers. By use of factor analysis nine previously identified factors were found: verbal comprehension, numerical facility, perceptual speed, visualization, general reasoning, word fluency, associational fluency, ideational fluency, and a factor combining Thurstone's closure I and II. "Five new factors were identified: (1) originality, a bipolar factor with ability to produce uncommon, clever, or remote responses on the positive side; (2) redefinition, ability to shift the function of objects and use them in a new way; (3) adaptive flexibility, ability to change set to meet new requirements imposed by changing problems; (4) spontaneous flexibility, ability to change set in a situation in which the direction of set change is unrestricted; (5) sensitivity to problems, ability to recognize practical problems."(22)

In 1959, another study was published by Guilford in which he repeated his factor analytic study across the domains of reasoning, creativity, and evaluation. The factors restudied from the creativity investigation were: sensitivity to problems, associational fluency, originality, and redefinition.

As was mentioned before, Guilford scored the tests hypothesized to measure originality in three ways: for cleverness, for uncommonness or unconventionality of response, or for remoteness of association. It was suspected that originality might be three factors instead of one, and this is why it was investigated again. He concluded that, "It was expected that this factor might be replaced by two or three factors if given the chance. Such apparently is not the case. Thus it seems that all three properties should be included in the definition of the factor."(29)

In both studies, the Plot Titles (cleverness score), Consequences (remoteness score), and the Unusual Uses Tests were found to have significant loadings. In the 1952 study the highest loading was on the Plot Titles Test. In the 1959 study the highest originality loading was on the Cartoons Test (not used in the 1952 study), and Plot Titles was second. Guilford is currently using his originality tests on a group of minth graders but the results have not yet been published.

Piers, Daniels, and Quackenbush used seven of Guilford's tests loaded on originality and ideational fluency with 114 seventh and eighth grade students of above average intelligence and achievement. They found comparable reliabilities with Guilford's work with Air Force cadets and significant relationships with teachers' ratings of creativity. They concluded, "It would seem, therefore, that the tests, even in their present experimental form, are appropriate for research with bright junior high school students."(37)

# Studies Using Guilford's Tests

Drevdahl studied a group of graduate and undergraduate science and arts students at the University of Nebraska. They were each rated on creativity on a seven-point scale by two faculty members who were in close contact with them. On the basis of this, they were divided into creative and non-creative groups. Further subgrouping was done by dividing science and arts students. The subjects were given Cattell's 16 P.F. Test (personality), Thurstone's P.M.A. Test (intelligence), and nine of Guilford's tests. "The creative group scored significantly higher than the noncreative group on the factor of originality, and although the difference between the groups on the factors of word fluency and adaptive flexibility were not significant at the .05 level, there appears to be a low, although significant relationship between creativity and higher scores on these two factors. The science group scored significantly higher than did the arts group on the factor redefinition, but there were no other significant differences between the arts and science groups on Guilford's tests." (15) This study used a small sample (N 64), and the author felt that the original data may be minimal estimates of true differences.

In 1955 Barron published a study on "The Disposition Toward Creativity." Using 100 USAF captains as subjects, the research was aimed at identifying individuals who perform in a relatively more or relatively less original way. "Originality was defined in terms of uncommonness of response to eight tests which could be scored objectively or rated reliably. To be called original, a response had to be uncommon in the sample under study, and at the same time be adequate to the realistic demands of the problem situation. For the most part, the eight tests proved to be significantly correlated with one another and with an over-all staff rating of originality based on observation of the subjects through three days of social interaction." (3) In this study Barron used three of Guilford's tests of originality, the Unusual Uses Test, the Consequences Test, and the Plot Titles Test. Inter-correlations between the three tests ranged from .36 to .46, which were higher than inter-correlations found between any other originality measures employed. The composite test score of originality correlated .55 with the ratings on originality. The individual originality scores correlated from .07 to .45 with the ratings.

In 1957, Barron reported a similar study, "Originality in Relation to Personality and Intellect." He again used 100 USAF captains as subjects and the same eight originality measures. "A composite score on the test variable originality was derived from this test battery, and psychological descriptions of high-scoring subjects were compared with descriptions of low-scoring subjects. The contrasting pictures which thus emerged seemed to indicate considerable validity in the originality composite, but they also raised some question concerning the way in

which verbal intelligence alone might have determined some of the observed differences."(4) The relationship of creativity and intelligence will be discussed below.

Getzels and Jackson have studied the highly intelligent versus the highly creative adolescent. Creativity was determined by a composite score on five creativity measures taken or adapted from Guilford and Cattell or constructed especially for the study. These were tests of word association, uses for things, hidden shapes, fables, and make-up problems. They found these measures sufficiently useful to form two experimental groups (the highly creative and the highly intelligent). The five measures of creativity correlated with one another from .159 to .h20 for the boys and from .153 to .h88 for the girls. The high creative group was composed of subjects scoring above the twentieth percentile on creativity measures, but below the top 20% on IQ. The high intelligence group was in the top 20% on IQ measures but below the top 20% on creativity measures.

The general impression gained from these studies is that Guilford's test measures of originality have been found to differentiate original from non-original groups with some degree of validity in relationship to the outside criterion of ratings. And further, that the separate tests themselves have sufficient inter-correlation to warrant the use of a composite test score of originality for sounder predictions of characteristics of the creative individual.

### Use of Sociometric Data as a Measure of Originality

The most current research using sociometric devices as measures of originality with adolescents is to be found in the work of Paul Torrance.

Torrance gave a group of 459 high school students a series of sociometric or peer nominations aimed at tapping five different dimensions of creative thinking ability. "The questions and the hypothesized dimensions are as follows: (1) Who in your class comes up with the most ideas? (Fluency) (2) Who has the most original or unusual ideas? (Originality) (3) If the situation changed or if a solution to a problem wouldn't work, who in your class would be the first to find a new way of meeting the problem? (Flexibility) (4) Who in your class does the most inventing and developing new ideas, gadgets, and such? (Inventiveness) (5) Who in your class is best at thinking of all the details involved in working out a new idea and thinking of all the consequences? (Elaboration)" "Scores were available only for Fluency, Flexibility, and Inventiveness. Raw scores were correlated with the frequency counts of nominations. Rather consistently the results for the eighth, ninth, and tenth grades were significant." (51) "Although the coefficients of correlation are statistically significant but not very high (around .24 for the total group of 459 subjects), considering the nature of the data, the results are encouraging." No sex differences were reported on these high school students, but Torrance did comment on another study with elementary school children using sociometric ratings to get at creativity, that he found the most creative boys had a far greater impact on their classmates than did the most creative girls and the most creative boys were noted for their wild ideas.

Another study using teacher ratings and sociometric data was done by Rivlin, who had teachers rate 126 tenth and eleventh grade students

on the creativity dimension and compared the creative and the noncreative as to sociability, self-attitudes, and background. "The results indicated that the student selected as creative emerged as a rather sociable individual evaluating himself as more confident in his relationships with people, more popular and creative as viewed by his peers than his non-creative counterpart."(hl) She concluded that with high school students the creative ones seem to be socially confident and come from homes of higher educational background. The aspect of sociability is unaccounted for in many studies, but does not jell with the personality attributes found descriptive of creative adolescents by experimenters such as Cattell and Getzels.

In essence, sociometric ratings for adolescents in response to questions as used above by Torrance are similar to peer ratings among professional groups of men or women. The former are judgments made by adolescents on their peers based on class and known out of class behavior. The latter ratings are considered more valid because the judgments are formed on what a professional peer knows about a colleague's productivity.

Peer ratings in adolescence on judgments of creativity as well as teacher ratings of adolescents on creativity are at this time difficult to evaluate, but have not been found to be very valid.

More research needs to be done to determine if more refined sociometric devices can produce valid originality measures among adolescents and teachers of adolescents.

# Uses of Projective Devices as Measures of Originality

Research using verbal fantasy material rated for originality is negligible other than for judgments of literary creativeness and for

such things as Guilford's tests where verbal responses are all short answer products. A good deal of research has been done judging creativity by the Rorshach and TAT but these give a restricted stimulus set to any response. The use of stimulus-free and less restricted storytelling products have been used relatively little in research on creativity.

One measure in Getzels and Jackson's study was McClelland's need: achievement measure. The McClelland instrument consists of six pictures to which the students responded by writing short stories. Getzels and Jackson first scored the stories for the presence or absence of achievement and then analyzed them as total stories of verbal fantasy content. They found, "The high creative adolescents were significantly higher than the high IQ adolescents in stimulus-free themes, unexpected endings, humor, incongruities, and playfulness, and showed a marked tendency toward more violence in their stories."(19) To check the validity of this measure they sorted "blind" 47 protocols written by the previously identified creative and non-creative groups and had only seven misplacements.

"On the basis of these findings, Getzels and Jackson have suggested that an essential difference between the two groups is the creative adolescents' ability to produce new forms and to risk joining together elements usually seen as independent and dissimilar. They also suggested that the creative adolescent seems to enjoy the risk and uncertainty of the unknown. The high IQ adolescent prefers the anxieties and delights of 'safety' to the anxieties and delights of growth. These differences are reflected in the occupational choices of the two groups.

Sixty-two percent of the creatives chose unconventional occupations, such as adventurer, inventor, writer, and the like. Only 16 percent of the highly intelligent subjects chose such occupations; 84 percent of them chose 'conventional' occupations, such as doctor, lawyer, engineer."(51) Since the originality scores in this study are to be related to IQ and personality measures, relevant research will now be discussed under these headings.

### Relationship of Intelligence and Creativity

Drevdahl found that a creative group scored significantly higher than a non-creative group on the factor of verbal meaning on Thurstone's Primary Mental Abilities Test. No other significant differences were found between the groups on intelligence measures. "Also of interest is the finding that, for the most part, the creative artist possesses the same intellectual characteristics as the creative scientist."(14)

Barron, as mentioned earlier, raised the question that verbal intelligence might well have influenced some of the observed differences in his study between original and non-original Air Force captains. "Verbal intelligence (Concept Mastery Test) was therefore partialled out from the correlations between the originality composite and other test performances and ratings."(4) The correlation between the Concept Mastery Test and the originality composite was .33 and was significant at the .01 level of confidence.

In a further study, reported in the same article, Barron studied 343 officers to investigate the characteristics of the extreme groups in intelligence and originality. "When one compares the self-descriptions (adjective checklists) with the staff descriptions of subjects

who are both original and intelligent, it appears that intelligence represents the operation of the reality principle in behavior, and is responsible for such characteristics as the appropriate delay of impulseexpression and the effective organization of instinctual energy for the attainment of goals in the world as it is."(4)

If intelligence does act as a reality principle in creativity, then there is some doubt cast on the effect of partialling it out in research studies, or in not taking the two factors into consideration in any methods of teaching geared toward enhancing creative accomplishment. The highly intelligent and creative individual may well be the greater source of talent to our nation than the highly original person with relatively low intelligence who has difficulty containing his impulsivity.

Getzels and Jackson found correlations ranging from .0 to .56 between their creativity measures and IQ. Their project was devised to seek differences between highly creative and highly intelligent groups of adolescents. The high creativity group were 26 subjects (15 boys, ll girls) in the top 20 percent in IQ (mean 150), but below the top 20 percent on the creativity measures. "Despite the similarity in IQ between the highly creative and the school population, and the 23 point difference in mean IQ between the high creatives and high IQ's, the achievement scores of the two experimental groups were equally superior to the achievement scores of the school population as a whole." (18) This finding with adolescents is in conflict with the finding of Barron with Air Force captains. If intelligence is the reality principle in creative accomplishment, as Barron suggests, how then does the high creative group achieve at the same level in scholastic achievement. A

criticism, however, at this point is that Getzels and Jackson did not check for the correlation with grade-point averages. Another possible solution is that past a certain level of ability or intelligence such as in these restricted samples, correlations between IQ and creativity scores are negligible, whereas they would not be in the normal population.

Meer and Stein performed a study with 64 research chemists in a large industrial organization to investigate relationships between intelligence and creativity scores. Supervisors' ratings of creativity and scores on the WAIS and MAT were obtained on each subject. "The consolidated results revealed a significant relation between intelligence and creativity. However, further analysis showed that when education was held constant the relationship no longer held true for subjects with Ph.D. degrees. It was therefore hypothesized that where equal opportunity is available, higher IQ scores beyond a certain point, (approximately 95th percentile) have relatively little significance for creative work as compared to personality and social factors."(33)

These studies all report significant relationships between intelligence and creativity. Within the upper limits of intelligence it would seem there is less significance (Meer and Stein). Within a gifted adolescent population in a public high school setting it appears achievement can be equally superior when one is either highly creative or highly intelligent (Getzels and Jackson). With an above average adult group (military officers) the relationship apparently acts as a reality principle in behavior (Barron). With college students both creative science majors and creative arts majors were found to be equally intelligent, and both were found to be higher scorers on verbal meaning than

non-creative college students (Drevdahl). There is certainly a need for more evidence in the relationship to intelligence, personality, and achievement characteristics. Sex differences went unaccounted for in all these studies, and no other studies were found in which boys and girls were studied separately on this variable.

Frank Barron (32) recently summarized the research on the relationship between IQ and creativity in this way. "A generalization which I would suggest, based not only on my own studies and those of my colleagues at the Institute, but upon a number of other researchers during the past three years at the University of Minnesota, the University of Chicago, and the National Merit Scholarship Corporation is this: Over the total range of intelligence and creativity, a low positive correlation, probably in the neighborhood of .h0 obtains; beyond an IQ of about 120, however, measured intelligence is a negligible factor in creativity, and the motivational and stylistic variables upon which our own research has laid such stress are the major determiners of creativity." Creativity and Personality

Guilford's research on creativity thus far has been most oriented towards the reliability of his measures and is only a segment of his broader topic on the structure of intellect. He has done only limited research on relating the originality variables to personality traits. By the use of self-inventory scores he has found some relationships between personality and originality, fluency, and flexibility factors. "From the results we may conclude that individuals who do well in tests of associational fluency tend to have a stronger need for adventure and they are more tolerant of ambiguity." -- "Individuals who are high on

scores for ideational fluency are inclined to be more impulsive, more ascendant, and more confident, and to have a stronger appreciation of creativity." -- "Those who score higher on tests of expressional fluency are inclined to be more impulsive, to appreciate aesthetic expression, and to like reflective thinking." -- "Measures of originality show relationships to a number of nonaptitude traits, but none very strong, so far as our results go. The original person tends to be more confident and tolerant of ambiguity and to like reflective and divergent thinking and aesthetic expression. The unoriginal person is inclined to be more meticulous and to feel a need for discipline. There is no indication that the original person is necessarily less inclined towards cultural conformity, which includes moral aspects. The hypothesis that originality rests upon an attitude of unconventionality is not supported."(1)

The personality measure to be used in this study is the Cattell High School Personality Questionnaire (HSPQ). This is the high school form of Cattell's 16 Personality Factor Test (16 P.F.). Studies which have used Cattell's instruments are, therefore, of more concern and bear more direct relation to this survey. A description of the personality factors measured by the Cattell H.S.P.Q. are on page 10.

Drevdahl, using the 16 P.F. Test, found that at a college level a creative group scored higher than a non-creative group on the factors of radicalism versus conservatism, self-sufficiency versus lack of resolution, and lower on the factors of cyclothymia versus schizothymia, and surgency versus desurgency. He felt that these might be expressions of minimal estimates of differences as the entire sample

was used by splitting them into halves. In his summary he makes the following statements: "(1) Creative persons in this group appear to be superior to non-creative persons in their verbal facility, fluency, flexibility, and in their originality; (2) Creative persons in this group appear to be considerably more withdrawn and quiescent than noncreative persons; Creative artists (liberal arts majors) were somewhat more radical and self-sufficient than creative scientists (science majors) or non-creative persons in either the sciences or the arts; (3) Apart from its classification as creative or non-creative, the art group was more sensitive emotionally, more Bohemian; (14) Individuality or non-conformity appear to be desirable for creativity."(114)

Drevdahl and Cattell published a study, "Personality and Creativity in Artists and Writers," in 1958. The subjects were selected by their activeness and productiveness in their respective field by committees of university art faculties, librarians, and editors. Of those contacted, 153 subjects completed and returned the test materials (16 P.F. Test). In comparison to the normal population (standardization group), the creative artists and writers were more intelligent, emotionally mature (ego strength), dominant, adventurous, emotionally sensitive, Bohemian, radical, self-sufficient, and of a higher ergic tension level. They were also less cyclothymic, surgent and subject to group standards and control. This group of writers and artists was similar to a creative scientist population reported in another study in 10 of the 16 factors measured by the 16 P.F. Test.(15)

A study was performed by Cattell and Drevdahl in 1955, and their purpose was to compare personality profiles on the 16 P.F. Test of

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eminent researchers, eminent teachers and administrators in comparison with the general population. These outstanding professional groups differed from the general population at beyond the .Ol level in the personality factors referred to as general intelligence, ego strength or stability, dominance, desurgency, lack of group super-ego standards, adventurousness, sensitive emotionality, lack of paranoid trends, lack of free-floating anxiety, and compulsive superego (or will control). Except for administrators, they are at the same significantly higher level in radicalism and self-sufficiency. Administrators alone differ at the .Ol level in showing lower somatic anxiety.(10)

"Researchers, relative to teachers and administrators, are at the .Ol level of certainty more schizothyme, self-sufficient, emotionally unstable, Bohemianly unconcerned, and radical. They are also significantly, but less uniformly, more dominant, paranoid, withdrawn schizothyme and lower on compulsive super-ego (will control)."(10)

Within the literature surveyed, Cattell's paper and pencil personality test, which measures 16 isolated personality factors as established by factor analysis, is unique in its contribution to the study of creativity in relationship to personality. Between Cattell and Drevdahl, they have studied these variables in relation to different age groups and with different types of creative people. Further breakdowns within these professional occupations are now being studied and will soon be published. Probably the most interesting aspect of these studies is the consistency of some factors in the various creative groups. Cattell hopes to ultimately be able to select and encourage creative persons in certain directions by means of personality profiles.

The personality factors which seem to be found throughout these studies to define the creative person are: intelligence, ego strength, dominance, adventurousness, emotional sensitivity, Bohemianism, radicalness, self-sufficiency, and high ergic tension. On the negative side they seem to be less cyclothymic, surgent and subject to group standards and control. As Cattell points out, these are not the usual characteristics of the "pleasant person." If these are the attributes of the truly creative and original contributor to society's welfare, education and psychology's emphasis on adjustment and society's demand for conformity are in need of revampment. Further research needs to be done on how these creative people see themselves and how others see them to determine how much these characteristics are covert or overt behavior.

As in most research on creativity, sex differences were neglected. Creativity research has been almost exclusively performed with male subjects.

Reid, King and Wickmore (39) studied 24 creative versus 24 noncreative seventh grade students selected by sociometric ratings by peers on who had good imaginations. They found creative children to be less anxious, more cyclothymic than schizothymic, with no evidence that creative children were more desurgent. These results disagree with Cattell's findings, but the adequacy of the criterion used is questioned. This study did separate boys and girls, but there was no apparent sex differences.

Getzels and Jackson found somewhat similar differences in their study of highly creative versus highly intelligent adolescents by use

of the Outstanding Traits Test. "The instrument contained descriptions of 13 children, each of the 13 exemplifying some desirable personal quality or trait. The subjects ranked each description in three ways: (1) on the degree to which they would like to be like them; (2) on the degree to which they believed teachers would like them; (3) on the degree to which they believed people with these various qualities would succeed in adult life. The high IQ's ranked the qualities in which they would like to be outstanding in the following order: (1) character, (2) emotional stability, (3) goal-directedness, (4) creativity, (5) wide range of interests, (6) high marks, (7) IQ, (8) sense of humor. The high creatives ranked the qualities in the following order: (1) emotional stability, (2) sense of humor, (3) character, (4.5) wide range of interests, (4.5) goal-directedness, (6) creativity, (7) high marks, (8) IQ. Most noteworthy is the creativity group giving sense of humor such a high ranking."(18) The rankings also offer some evidence in a difference in value structure when comparing the adolescent and the adult mind. Getzels and Jackson used small samples. There was an N of 26 in the high creative group and an N of 28 in the high intelligence group. The groups were of mixed sexes but sex differences were not reported.

An even more noteworthy finding of Getzels and Jackson's using the Outstanding Traits Test was that the high IQ adolescent rates and wants the qualities he believes make for adult success and the qualities that are similar to those he believes his teachers like. The high creative adolescent favors personal qualities having no relationship to those he believes make for adult success and are in some ways the

reverse of those he believes his teachers favor. This finding is somewhat consistent with Cattell's work in that the creative person does not really desire to be the pleasant person or to live up to others' expectations of his behavior. If we can judge from these studies, the creative adolescent seeks individuality and non-conformity, is emotionally sensitive, and somehow feels he can fight group standards and controls.

Barron (2) has done research on the personality dimension of complexity-simplicity. In a study of this bipolar factor in perceptual preferences (preference for perceiving and dealing with complexity versus preference for perceiving and dealing with simplicity) he found when both preferences were present at the same time, there were positive significant correlations with ratings on originality, good taste, artistic expression, non-conformity, independence of judgment, expression of impulse, verbal fluency and negatively to rigidity. In comparison with personality attributes of creative persons in Drevdahl's and Cattell's research, it would seem that complexity certainly fits as another characteristic and explains in part the apparent paradoxes seen in these individuals.

Barron investigated originality more specifically in his 1955 publication. This study arose out of his previously mentioned research on independence of judgment and of the preference for complexity as opposed to simplicity. "In this study with 100 Air Force captains, originality was found to be correlated significantly with independence of judgment, to personal complexity, and to the preference for complexity in phenomena, to self-assertion and dominance, and finally to the

rejection of suppression as a mechanism for the control of impulse."(3)

In his 1957 study when Barron partialled out intelligence (Concept Mastery Test) from his originality composite score, the significant relationships which remained were: (1) disposition toward integration of diverse stimuli; (2) energy, fluent output, involvement; (3) personal dominance and self-assertion; (4) responsiveness to impuse and emotion; (5) expressed femininity of interests; (6) general effectiveness of performance.(4)

"In a larger sample, consisting of 3h3 officers, the self-descriptions of subjects relatively high on originality but relatively low on intelligence were compared with self-descriptions of officers low on originality but high on intelligence. The former group characterized themselves by adjectives which suggested undercontrol of impulse, while the latter group described themselves as unusually well controlled."(h) The original group used the adjectives: affected, aggressive, demanding, dependent, dominant, forceful, impatient, initiative, outspoken, sarcastic, strong, suggestible. The high intelligence group checked: mild, optimistic, pleasant, quiet, unselfish. The adjectives checked for the creative group in a previous study without intelligence partialled out are far more in line with the usual research (clever, imaginative, determined, initiative, resourceful, reflective, energetic, etc.). The discrepancy here is outstanding and may be partially accounted for by the selection of the sample.

At present one of the most important creativity projects is being carried on by the Institute for Personality and Assessment Research at the University of California, Berkeley, under the direction of
Donald W. MacKinnon; to date this research is largely unpublished. Some of MacKinnon's, Gough's, and Helson's findings on personality and creativity relationships were reported and later published from a conference at Lake Tahoe in 1961.

MacKinnon (32) studied a group of 12h eminent architects and concluded, "But if I were to summarize what is most generally characteristic of the creative architect as we have seen him, it is his high level of effective intelligence, his openness to experience, his freedom from petty restraints and impoverishing inhibitions, his aesthetic sensitivity, his cognitive flexibility, his independence in thought and action, his high level of energy, his unquestioning commitment to creative endeavor, and his unceasing striving for creative solutions to the ever more difficult architectural problems which he constantly sets for himself."

Helson (32) studied hh creative female mathematicians, and this sample included virtually all of the productive women in this field in the United States and Canada. She found that, "Personal history findings certainly suggest that the creative woman mathematician as a child tended to learn and adopt the attitudes and expectations of the male professional in our society. The most creative woman mathematicians tended to be only children or to come from families of girls, had home backgrounds higher in education and probably occupational status and had fathers who were professional men, most commonly engineers, physicians, or teachers."

Gough (32) studied 45 creative research scientists and found: "(1) The research scientist is an intellectually able person, both in

general and within his field of technical specialization. (2) His values are primarily theoretical and aesthetic, and one would expect his work to reflect this orientation. (3) He is psychiatrically stable, and with respect to interpersonal behavior is an effective individual. (4) His achievement drives are strong, particularly along lines of independent, autonomous effort. (5) He has an intraceptive, cognitively open, empathic mode of sensing and perceiving others."

Gough studied 45 research scientists (physicists, mathematicians, and engineers) with The Research Scientists Q-Sort Deck (RSQD), which was composed of 56 short assertions, each referring to an aspect of scientific research or to modes of approach to research. By factor analysis he identified eight components, and the one most related to the originality criterion was the component labeled "the zealot." Gough described this type as follows: "This man is indefatigable, dedicated to research activity, he sees himself as a driving researcher, with exceptional mathematical skills and a lively sense of curiosity. He is seen by others as tolerant, serious-minded, and conscientious, but as not getting along easily with others and as not being able to 'fit in' readily with others."(32)

Gough then did another study testing this finding with a different age group. He gave the RSQD to 300 engineering students and had each one described by observers on the Gough Adjective Checklist. The students identified as zealots were described as opportunistic, argumentative, excitable, hard-headed, ambitious, energetic, industrious, and self-confident.

By checking out a finding on eminent adults with a different age

group, Gough has shown both similarity and difference in the same finding. Many of the same personality labels run through the various studies reviewed, but depending on the age level of the subjects, their degree of eminence, their field of endeavor, and the instruments used to measure such variables, many differences occur. The work being done at IPAR certainly demonstrates the complexity of working in the area of creativity and how little psychologists yet know of this phenomenon. No work in this field to date has done more than scratch the surface in comprehending the phenomenon of creativity, but the huge projects which have begun at research centers across the nation are already demonstrating great promise.

### Summary

Definitions of creativity can be divided into two groups: those dealing with process and those dealing with products. Process definitions view creativity as a process of thinking and product definitions treat creativity as measurable by tests. All types of studies see creativity as the production of a novel response, but the theoretical differences are whether to study only the responses, only the thinking which culminated in the responses, or both.

Criteria of creative accomplishment are becoming more diversified as more is learned about this ability. The historical anecdotal approach and introspective personal reports were the first used criteria. More recently, peer and teacher ratings, by definition of productivity groups, expert judgment groups, and groups who score high on constructed originality and creativity tests groups have been used as criteria. The number and types of tests getting at creativity are expanding rapidly and many seem promising.

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Originality in this study is defined as the ability to produce responses which are clever, remote, or uncommon in contrast to the given group and to be seen as original by one's peers. Two of Guilford's tests, Plot Titles scored for cleverness, Consequences scored for remoteness, fictional story scored for cleverness, remoteness, and uncommonness, and a sociometric rating for originality are used as measures of originality. In Guilford's factor analytic research on creativity he found the factor of originality was measured in three ways: cleverness of response, remoteness of response, and uncommonness of response. His tests measuring originality have been found to be reliable in his own research and valid measures of originality in Barron's, Drevdahl's, and Getzels and Jackson's research.

Using sociometric devices for measuring originality is debatable at present, but the research tends to show such measures and teacher ratings of creativity are not valid or show only slight positive relationships with measures known to be more valid. The use of verbal fantasy material to unstructured or relatively unstructured stimuli is beginning to be used more in research as a valid and useful measure to get at creativity.

The various measures of originality in this study were related to IQ, personality test scores, and personal history items, so that the literature was surveyed dealing with these relationships. It seems there is a low positive correlation between intelligence and creativity, but beyond an IQ of 120 intelligence seems to become a negligible factor and motivation and personality seem to be the more important determinate.

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The personality traits of the creative person differ in studies, yet all have a general theme. Cattell and Drevdahl generally find the creative person in all their studies to be intelligent, dominant, adventurous, sensitive, Bohemian, radical, self-sufficient, to have a high energy level and good ego strength, and less subject to group standards and controls. MacKinnon found his creative architects to have a high level of effective intelligence, an openness to experience, freedom from petty restraints and inhibitions, aesthetically sensitive, to have independence in thought and action, to be flexible, to have a high energy level, and to be committed to creative endeavor.

Although different techniques of measurement were used in the above cited research, many similarities can be seen in descriptive terms. Most of the research sees the creative person as one who uses his intelligence effectively, is theoretically oriented and aesthetically sensitive, has a lot of energy and commitment to being creative, is flexible and not subject to the norms of society, and who is independent, self-sufficient, and emotionally stable.

#### Chapter IV

### Results and Discussion

The results of the thesis will follow. As each aspect of the study is covered there will first be a presentation of the data for the total sample, then for the males and females separately. The general form of presentation will be to discuss the results on the criterion of originality first and then to present the findings for each hypothesis as stated in the first chapter of the thesis. Following the results will be a discussion section.

### Criterion of Originality

The composite originality score was a combination of six scores: three scores for remoteness, uncommonness, and cleverness on the story of a fictional person the student would like to be, Guilford's Consequences and Plot Titles test scores, and the sociometric rating of creativity. All of the measures were changed to standard scores and summated. It would have been much better if some weighting system could have been devised for the composite score, but no outside criterion of originality was available for the sample, so that this could not be accomplished.

The intercorrelations of the originality variables shown in Table 5 indicate that these variables are all essentially measuring different aspects. There are significant correlations among the three scores on the A-E test (remoteness, cleverness and uncommonness), but there are no significant relationships between the four main measures (the A-E test, the Plot Titles test, the Consequences test, and the sociometric creative choice). These were all previously used measures of

Table 5

Intercorrelations of Originality Measures For Combined and Separate Males and Females

		AE Uncom- monness	AE Clever- ness	AE Total	Plot Titles	Conse- quences	Socio- metric	Comp <b>osite</b> Originality
AE	Remot <b>eness</b> Boy <del>s</del> Girls Total	•535 <del>**</del> •537** •5Ц1**	.064 .121 .113	•677** •745** •729**	025 .111 .065	.100 072 021	059 .034 .007	•600** •553** •560**
AE	Uncommonness Boys Girls Total		•309* •145** •401**	•845** •869** •863**	043 .062 .018	009 038 030	130 .117 .033	•613** •675** •647**
AE	Cleverness Boys Girls Total			•667** •664** •667**	069 .038 004	.130 .067 .088	139 .243* .107	•475** •607** •557**
AE	Total Boys Girls Total				064 .093 .034	.098 027 .012	155 .170 .066	•763** •800** •778**
Pla Cla	ot Titles everness Score Boys Girls Total					108 .189 .101	•177 •050 •085	•342* •461** •428**
Cor Ren	nsequences noteness Score Boys Girls Total						050 .036 .007	•390** •377** •379**
Soc	iometric Boys Girls Total							.293 .470** .418**

Total N	125
Boys	42
Girls	83

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creativity, but none were validated in the present study because an outside criterion could not be obtained. It must also be noted that peer ratings of creativity by children may be yielding a different measure than peer ratings by eminent adults and could be confounded by sex, popularity, and less objectivity of the immature rater.

It was hypothesized that the A-E cleverness score would correlate positively with the Plot Titles score (scored on cleverness) and that the A-E remoteness score would correlate positively with the Consequences test (scored on remoteness). These results were expected because of the theoretical method of doing the subjective scoring of the A-E test, which provided in a different way measures of the same components of creativity as those defined by Guilford. In scoring the A-E stories for the three factors of remoteness, cleverness, and uncommonness, it was found that remoteness and cleverness were unrelated, but remoteness and uncommonness and cleverness and uncommonness were significantly correlated for both boys and girls.

As shown in Table 6, there were no significant sex differences. The tests on the differences between means on the various components were not significant between males and females and there was no significant difference between their mean composite originality scores.

Because there was no outside criterion with which the supposed measures of creativity might be correlated, their validity as measures of originality was necessarily assumed on the basis of validity in past research, and that raters would compare with raters in other studies. Of secondary support was the fact that the subjective ratings were very carefully done. The correlations between rater judgments are presented in Table 7.

Table 6	Means and	Standard	Deviations	of Originality
	Measures	for Boys,	, Girls, and	Total Sample

	Во	y s	Gi	rls	Total	
AE Remoteness	Mean 30.95	S.D. 10.42	Mean 27 <b>.71</b>	S.D. 12.74	Mean 28.80	S.D. 12.11
AE Uncommonness	31.43	13.20	27.83	12.66	29.04	12.96
AE Cleverness	29•40	13.33	26.93	11.82	27 <b>•7</b> 6	12.40
AE Total	91.79	27.10	82 <b>•35</b>	28.23	85.52	28.21
Plot Titles	82.86	43.19	92.95	55.18	89 <b>•5</b> 6	51.69
Consequences	<b>15</b> 4.29	73.89	157.05	69.46	156.12	70.99
Sociometric	4.17	5.67	4.24	5•95	4.22	5.86
Composite	299.43	27.18	299.45	31.38	299.44	30.03

Total N	125
Boys	42
Girls	83

Table 7		Reliabil	Lity	Between	Two	Raters
	on	Ratings	of	Original	ity ]	Measures

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Originality Measure	Correlations Between 2 Raters
AE Remoteness	•929
AE Uncommonness	(rated together)
AE Cleverness	•948
Consequences	•996
Plot Titles	•992



The hypotheses of this study will now be discussed in light of the results. The quantifiable relationships are expressed in Pearson Product Moment Correlations. In treating nonquantifiable data the more original students are defined as those scoring above the median composite originality score and the less original students as those scoring below the median composite originality score. When discussing either boys or girls separately, the sex group median was used rather than the median for the total group.

### Main Hypothesis

The principal hypothesis in this study was that the consistently original or creative student could be identified. This hypothesis was not substantiated because of the lack of relationships between the various components of the composite originality score. Because the main tenet was not proven, interpretation of the following results must of necessity be only tentative and seen as possible explanations or results and indications for further research.

### Originality Versus Intelligence

Hypothesis 1. It was hypothesized that more original students score higher on intelligence tests than the less original students. In Table 8, the correlations between the various measures of originality and the Stanford-Binet IQs of the students, however, indicated no significant relationships. That is, within the relatively homogeneous group of bright students in the present study, there seemed to be no correlation between their ability to demonstrate original responses on the tests used for measurement of originality and their IQs. This finding suggests that the measures of creativity and intelligence were not measuring

Table 8	Correlations Between each Originality Measure
	and Stanford-Binet IQs for Boys, Girls,
	and the Total Sample

	Boys	Girls	Total
AE Remoteness	•075	076	035
AE Uncommonness	•093	022	.015
AE Cleverness	•210	087	•012
AE Total	•177	073	•003
Plot Titles	302	030	100
Consequences	•128	043	•012
Sociometric Choice	022	•124	•080
Composite	•068	042	012
Total N	42	83	125

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the same type of abilities for the particular group studied. It does not suggest that intelligence and originality are unrelated in more heterogeneous populations, but, rather, that with both boys and girls of superior ability, intelligence is not a factor in the ability to produce original responses.

### Originality Versus Achievement

Hypothesis 2. It was hypothesized that more original students are more often high achievers, both on achievement test scores and grade point averages, than less original students. As indicated in Table 9, there was a decided sex difference in the results related to this hypothesis. For the boys, three of the four achievement measures (California Language, ACE Critical Thinking and grade point average) were related significantly to the composite originality scores. None of these four achievement measures was related to the composite originality scores for the girls. Because of the proportion of girls to boys in the sample, there were no significant results when the total group was combined except for grades.

The relationships between the four variables included in the originality composite and the achievement test scores and grade point averages indicated that the boys' abilities to be original and to achieve both on tests and in school were correlated, whereas the same relationships were not demonstrated for the girls. The single exception for the girls was the significant relationship between the number of times they were chosen by their classmates as being creative (sociometric creative choice) and the achievement measures (ACE Critical Thinking, California Reading, and grade point average). From the correlations

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				Origin	ality Me	easures		
	AE Remote- ness	AE Uncom- monness	AE Clever- ness	AE Total	Plot Titles	Conse- quences	Socio- metric Choice	Compos- ite Score
Achievem	ent							
Calif. Reading Boys Girls Total	•137 042 •003	•205 •004 •065	•074 -•037 -•002	.189 030 .032	034 146 108	•068 -•054 -•011	•280 •2142* •2514**	.268 .042 .074
Calif. Language Boys Girls Total	•328* 038 .017	•208 -•078 -•028	•231 048 •016	•339* •.068 •004	172 099 074	•086 •098 •093	.203 .108 .131	•324* •016 •085
ACE Crit Thinking Boys Girls Total	• •103 •023 •029	الدر. 050 009	.180 .001 .055	.184 005 .036	086 137 107	•218 •032 •101	•291 •346** •325**	.302* .070 .142
GPA Boys Girls Total	.026 047 067	•077 038 042	•465** •158 •223*	•276 •031 •051	123 002 003	.469** 101 .107	•177 •385** •296**	•401** •114 •192*
Total N Boys Girls	125 142 83							
* Signi: ** Signi:	ficant a ficant a	at .05 le at .01 le	vel vel					

### Table 9Correlations Between Achievement Variables and Measures<br/>of Originality for Boys, Girls, and Total Sample

for both boys and girls, it seemed that one factor influencing sociometric choices of creative students was their ability to achieve good grades and to give evidence of an ability to think critically.

In Table 10, the achievement test scores and grade point averages were significantly correlated with the Stanford-Binet IQs for the entire sample. With the exception of grade point averages, there were also significant correlations of these measures with the S-B IQs when the boys and girls were considered separately.

### Personality Versus Originality

Hypothesis 3. It was hypothesized that more original students have a personality profile on the Cattell HSPQ which is different from the profile of the less-original students, and that the profile is similar to those found in previous studies for creative adults. On the Cattell HSPQ the only factor which correlated significantly with originality for the whole sample was the H factor, threctia (adventurous, thick-skinned) versus parmia (threat-sensitive, shy). This factor correlated significantly with the composite originality score (.252) and with the A-E uncommonness (.227), A-E cleverness (.224), and total A-E (.233) scores. It must be noted here that more correlations could have been significant by chance than occurred in the data, which makes the following interpretation tentative.

The students who score high on the H factor are described as being adventurous and thick-skinned versus the other extremity of the continuum of students described as shy, timid, and threat-sensitive. These students are described as adventurous, liking to meet people, active, responsive, friendly, having emotional and artistic interests, being carefree, as opposed to noticing danger signals, being impulsive and

Table 10	Correlations	Between	Stanfo	ord-Bin	et IQs	and Ac	hieve-
	ment Measu	res for	Boys,	Girls a	and To	tal Sam	p <b>le</b>

Achievement Measures	Boys	Gi <b>rls</b>	Total
Calif. Reading	•351*	•550*	•487**
Calif, Language	•478 <del>**</del>	•329**	•3l+7**
ACE Critical Thinking	•312*	•588**	•493**
G <b>rade-Point-</b> Average	•252	•160	<b>.</b> 178*

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

### Table 11Correlations Between Personality Factors on the CattellHSPQ and Measures of Originality for the Total Group Studied

Measures of Originality

Cattell HSPQ* Factors	AE Remote- ness	AE Uncom- monness	AE Clever- ness	AE Total	Plot Titles	Conse- quences	Socio- metric Choice	Compos- ite Score	
A	038	094	•043	038	.124	092	•054	.019	
В	•088	•082	•088	•117	039	•038	•109	•118	
С	.108	•058	·145	•J70	051	045	060	•01)t	
D	012	065	089	077	•032	•123	•033	.004	
E	•034	024	106	045	066	050	052	114	
F	•008	.021	.109	.061	•076	•035	•126	•127	
G	.094	012	028	.019	.018	098	•074	•021	
Н	•073	•227**	•22 <b>4</b> **	•233*	₩.081	•034	·148	•252**	
I	056	137	146	156	•071	•050	001	037	
J	011	•082	.116	•083	.004	018	033	.041	
0	037	152	167	163	<b></b> 056	•022	097	149	
Q2	•090	014	•036	•05 <b>2</b>	048	022	031	034	
Q3	054	•000	.109	•0 <b>25</b>	•049	001	•023	•036	
QL	.018	022	094	050	•034	•057	047	007	

Factors described on page 10
Significant at 1% level

frivolous, and having an overt interest in the opposite sex. In contrast, "The H-individual reports himself to be intensely shy, slow, and impeded in expressing himself, disliking occupations with personal contacts, prefering one or two close friends to crowds, avoiding large parties or open competition, fearful of new situations, somewhat spiteful and distrustful, but very considerate of other's sensitivities, and not feeling able to keep in contact with all that is going on around him." (HSPQ Manual, p. 32.)

For the girls, the only factor on the Cattell HSPQ which correlated significantly with originality measures was the H factor, threetia versus parmia, just as were the results for the whole sample. Again, more correlations could have been significant by chance than were found. However, there was the difference that the H factor correlated significantly with the total A-E score (.221) and with the composite originality score (.275), but, also, additionally with the creative choice question on the sociometric survey (.230). This finding suggested that the students considered their female classmates who were overtly venturesome and competitive in the classroom setting as being the most creative, and indeed they were the girls who wrote the stories of fictional persons they would like to be in less of a stereotyped manner.

For the boys, those students considered most original by their classmates on the basis of ability to produce the most new ideas in class also scored high (.352) on factor D, phlegmatic temperament versus excitability. The excitable students are described in the test manual as being demanding, impatient, attention-getting, excitable,

Table 12 Correlations Between Personality Factors on the Cattell HSPQand Measures of Originality for the Eighty-three Girls Studied

Measures of Originality

Cattell HSPQ+ Factors	AE Remote- ness	AE Uncom- monness	AE Clever- ness	AE To <b>tal</b>	Plot Titles	Conse- quences	Socio- metric Choice	Comp <mark>os-</mark> ite Sco <b>re</b>
A	001	001	.017	.012	•094	079	•028	•018
В	•082	•011	.010	•050	040	•059	.118	•077
С	•080	049	•140	•076	008	018	046	•032
D	098	013	082	089	•023	.127	093	042
Е	127	116	104	158	.011	•028	108	132
F	•1] <sup>4</sup> 8	•092	•136	<b>•1</b> 66	•059	031	•093	•158
G	•212	•094	•028	•145	001	129	.106	.101
Н	•153	.162	.192	•221*	•177	048	•230 <del>*</del>	•275**
I	•025	045	201	099	•155	077	•000	045
J	090	•060	•060	.010	019	064	.005	015
0	•010	100	112	092	043	.067	100	088
Q2	038	091	.013	047	013	068	173	119
$Q_{\downarrow}$	•119	•137	073	•075	•056	<b>.1</b> 59	145	•082

Description of factors on page 10
Significant at 5% level of confidence
Significant at 1% level of confidence

Cattell HSPQ+ Factors	AE Remote- ness	AE Uncom- monness	AE Clever- ness	AE Total	<b>Plot</b> Titles	Conse- guences	Socio- metric Choice	Compos- ite Score
A	025	154	.125	023	•J]12	126	•094	•022
В	•088	.230	•247	•267	020	005	.091	•232
С	.002	•071	•073	.071	009	079	099	016
D	•159	254	158	<b>-•1</b> ]10	•119	.129	•352*	•130
Е	•258	020	256	037	<b></b> 145	195	.064	107
F	241	062	•094	077	•092	•134	.187	•073
G	159	188	108	206	•043	046	•005	167
H	090	•357*	.287	<b>.</b> 280	<b>-</b> .149	•173	010	•207
I	.010	143	.058	038	<b>-</b> •352*	•308*	018	048
J	•123	•083	•184	.178	•096	•068	107	•166
0	079	197	240	244	169	084	100	322*
Q2	.181	116	067	020	•038	•083	•246	•134
Q3	292	.021	•דית	033	061	073	.013	095
QL	137	242	092	216	062	120	.134	193

Measures of Originality

Correlations Between Personality Factors on the Cattell HSPQ and Measures of Originality for the Forty-two Boys Studied

+ Factors described on page 10

Table 13

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overactive, prone to jealousy, self-assertive, egotistical, distractible and undependable. "This factor (D) is differentiated from the instability versus ego strength factor (C) by the more immediate temperamental quality of the excitability, by mind-wandering distractibility; by a quality of insecurity, and by an irrepressible, positive assertive emphasis in the emotionality." (HSPQ Manual, p. 28.)

"The high D child reports that he is a restless sleeper, easily distracted from work by noise or intrinsic difficulty, is hurt and angry if not given important positions, or whenever he is restricted or punished, and so on. This factor has sometimes failed to appear with adults, but it shows as a really substantial dimension in children." (HSPQ Manual, p. 28.)

Some of the descriptive elements of factor D create difficulty in comprehending why students would choose boys described in such a manner as being more creative. In reviewing the actual test questions, however, it becomes apparent that the most important descriptive elements appearing are the general excitability expressed through assertiveness, and this is consistent with the traits of being talkative and competitive in a classroom, of not liking to be disturbed by noise when working, and of verbally disagreeing when things go wrong.

Three other factors on the Cattell HSPQ also bore significant relationships with the originality measures for boys. These were factor H, threctia versus parmia (timid, shy, threat-sensitive versus venturesome, thick-skinned), factor I, Harria versus premsia (practical, tough-minded versus tender-minded, sensitive, protected), and factor 0, confident adequacy versus guilt proneness (secure, resilient,

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confident versus discouraged, self-reproaching, worrying).

For the boys the only originality measure with which factor H correlated significantly was the A-E uncommonness score (.357), which suggests that the boys who could write the most uncommon stories were the more adventurous in personality. Although factor H did not correlate significantly with the other personality measures which were significantly correlated for the girls, the correlations for the boys pointed toward the same trends.

Factor I, harria versus premsia (practical, tough-minded versus tender-minded, sensitive, protected) correlated significantly with the Plot Titles test (-.352) and with the Consequences test (.308). This continuum is differentiated between the low I student who might be described as tough, realistic, self-reliant, and responsible as contrasted with the student described as more esthetically sensitive, dependent, demanding, artistically fastidious, and having an imaginative inner life and conversation. That this factor correlated positively with the Consequences test is difficult to comprehend, but in that the test requires the student to give as many alternative events as possible that could occur in a given situation, it may be tapping an ability which requires practical thinking as well as imagination. The negative correlation between factor I and the Plot Titles score showed that the more realistic, tough, self-reliant type of student who had fewer artistic responses was less likely to be able to respond in an esthetically sensitive way to writing clever and catchy titles to a story.

Factor 0, confident adequacy versus guilt proneness, was the only personality factor significantly correlated with the composite score of

originality (-.322) for the boys. This finding indicates that the more creative boys tended to be confident, self-secure, and resilient in contrast to those who are described as timid, insecure, worrying, anxious, and depressed.

In summary, the factor-analytically determined personality attributes of the Cattell HSPQ seemed to yield a better description of the boys in the study than of the girls. The most original girls were described as being adventurous and thick-skinned. On the other hand, creative boys showed this quality of adventurousness, as well as being esthetically sensitive, excitable and unrestrained, secure, confident, and resilient. These results are similar, although not as extensively descriptive, as other studies using the Cattell 16 PF Test for adult males cited earlier.

### Originality Versus Concept-of-Self-as-School-Learner

Hypothesis 4. It was hypothesized that more original students have a more positive self-concept of themselves as school learners than the less original students.

The intercorrelations between the measures of the total Conceptof-Self-as-School-Learner score, the creativity, critical thinking, and open-mindedness questions included on the checklist and the total positive and negative Concept-of-Self-as-School-Learner scores were all significantly related for the entire sample. Those students who had a high concept of themselves as school learners also checked themselves high on being creative, being open-minded, and being able to think critically. In relation to measures of originality, the concept

	Doyby diriby and rotar bampio							
<b>.</b>	Creative	Open- Minded- ness	Critical Think- ing	Positive Self Concept	Negative Self Concept	Self Concept		
Creative Boys Girls		•437** •084	•278 •297**	•224 •335**	488** 105	•417** •280*		
Total		•174*	•289* <del>*</del>	•270 <del>**</del>	228**	•300**		
Open Minded- ness Boys Girls Total			•096 •319** •266**	017 .214 .186*	277 151 195*	•127 •211 •220*		
Critical Thinking Boys Girls Total				•243 •470** •391**	•083 160 090	•143 •402** •326**		
Positive Self Concept Boys Girls Total					216 432** 365**	•869** •906** •902**		
Negative Self Concept Boys Girls Total						671** 759** 722**		
Self Concept Boys Girls Total								
* Significant	; at .0	5 level						

Table 14Intercorrelations of Attitude Checklist for<br/>Boys, Girls, and Total Sample

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

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Table	15
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Correlations between Attitude Checklist Items and Measures of Originality for Boys, Girls, and Total Sample

Measures of Originality AE Uncommon-ness AE Clever-ness A<u>F</u> Remotequences Compos-Plot Titles Socio-metric Choice Conse-AE Total ness ite Creative -.168 .178 .188 .042 .045 •149 Boys .114 .126 -.081 .070 -.045 •089 Girls **.**165 .064 -.071 .039 Total .072 .107 .020 .089 -.001 .075 -.032 .072 Open Mindedness -.261 .200 Bovs -.347\* .021 -.250 .024 .163 -.075 .018 .046 -.049 .010 Girls .095 .079 -.063 .030 -.060 Total .031 .023 .024 -.033 .052 -.035 .003 Critical Thinking .136 .268 -.131 .118 .150 .009 •293 .267 Boys **.**1/12 .083 .053 .123 .010 ·239\* Girls -.203 .103 Total .135 .133 -.009 .115 .047 -.136 ·254\*\* •九7 Positive Self Concept •**1**/10 -.088 .003 Boys -.172 -.041 .169 .121 .062 .060 .149 Girls •<u>1</u> .150 -.004 -.178 .331\*\* .160 Total .008 ·070 •030 .031 .028 -.048 .251\*\* .123 Negative Self Concept Boys .181 -.058 -.161 -.038 .072 -.073 .129 •033 Girls -.151 .042 -.040 -.074 .043 .243\* -.087 .015 Total -•0hh .018 -.076 -.049 ·013 .131 .020 -.017 Self Concept Boys -.222 .136 .015 -.012 -.034 .165 .026 .031 Girls .171 .042 .129 .150 -.017 -.25L\* .303\*\* .119 Total .026 .034 •060 .052 •005 -.106 .212\* .090

\* Significant at .05 level

\*\* Significant at .01 level

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of self-as-school-learner and the critical thinking self-attitude were positively related to their scores of creativity on the sociometric device. This finding indicated that the more positive a student in the group felt about himself as a school learner and as a thinker, the more likely he was to express these things and to be seen in a similar way by his peers. The positive relationship was largely attributable to the girls, however, because the same findings were not apparent for the boys. It did appear that the degree to which a boy considered himself creative was related to his concept of himself as a school learner, although not to his self-concept with regard to being open-minded and to be able to think critically.

In Table 16 there are two significant correlations which are difficult to explain. For the girls there was a significant negative correlation (-.254) between the Consequences test and self-concept scores on the attitude checklist, which seems to indicate that the lower the girls' attitudes toward themselves as school learners, the more able they were at postulating consequences to different events. Because the Consequences test scores correlated significantly with so few of the variables, no explanation for this finding was apparent. It may be related to the original difficulty in rating the responses to the Consequences test. There was also a significant negative relationship (-.347) between the boys' remoteness scores on the A-E tests and their attitudes toward themselves on open-mindedness. Interpretations are presented in the discussion section.

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### Originality Versus Dogmatism and Rigidity

Hypothesis 5. It was hypothesized that more original students would

Table 16	Correlations between Measures of Originality and Ro	okeach
	Scales for Boys, Girls, and Total Sample	

Measures of	Dogmatism				Rigidity		
originality	Boys	Girls	Total	Boys	Girls	Total	
AE Remoteness	124	073	070	063	<b>1</b> 48	127	
AE Uncommonness	•036	070	020	0L3	090	079	
AE Cleverness	202	035	078	129	•023	038	
AE Total	129	082	<b></b> 0 <b>7</b> 5	109	103	111	
Plot Titles	•054	065	045	•005	052	030	
Consequences	093	063	074	.005	141	088	
Sociometric Choice	319*	071	145	•074	077	026	
Composite	237	121	153	053	155	123	

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\* Significant at .05 level

be less rigid and less dogmatic on the Rokeach Scales than the less original students.

The correlations between the measures of originality and the dimentions of the Rokeach Scale are shown in Table 17. Of these correlations, there was only one of significance - the negative relationship for boys between dogmatism and the number of times selected on the sociometric as a creative person in the classroom.

The dogmatism and rigidity scales were significantly related for the boys (.357) and for the girls (.433), indicating that within the group those who tended to be dogmatic also tended to be rigid. One apparent sex difference was that dogmatism correlated significantly with grade point average for both boys and girls, but it had a negative relationship to grades for the boys (-.303) and a positive one for the girls (.277). Rigidity was negatively correlated to Stanford-Binet IQs for both boys and girls.

### Originality Versus Personal History Items

Hypothesis 6. It was hypothesized that more original students do not differ from less original students on socioeconomic status, parents; education, or other personal data items.

For the entire group the data indicated that the students who were able to write the most original stories about a fictional person they would like to be were also those students who were aspiring to the highest level occupations. The total A-E score was significant at the .Ol level when correlated with the students' occupational level of aspiration. This was true whether the stories were being scored for remoteness, uncommonness, or cleverness.
Correlations between S-B IQs and Achievement Measures Table 17 and Rokeach Scales for Boys, Girls, and Total Sample

Achievement Measures	Dogm	atism	Rigi	Rigidity		
	Boys	Girls	Boys	Girls		
Stanford-Binet IQ	203	033	450**	354**		
California Reading	205	•005	051	215*		
C <b>alifornia Lang</b> uage	271	•110	168	124		
ACE Critical Thinking	226	023	100	251*		
Grade-Point-Average	303*	•277*	198	.117		

Significant at .05 level Significant at .01 level ¥ \*\*

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Table	18
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Correlations between Measures of Originality and Personal History Items for Boys, Girls, and Total Sample

Measures of Originality

Personal History Items	AE Remote- ness	AE Uncom- monness	AE C <b>lever-</b> ness	AE Total	Plot Titles	Conse- quences	Socio- metric Choice	Compos- ite
Father's Occupation Boys Girls Total	•048 •110 •090	066 .103 .046	260 .071 045	142 .118 .035	•243 •125 •157	049 .171 .097	194 264* 242**	103 .101 .0141
Father's Education Boys Girls Total	111 083 096	•217 •.089 •022	.296 022 .100	-209 084 .014	096 175 11;2	•130 -•171 -•055	.039 +.318** .217*	.174 072 .011
Mother's Occupation Boys Girls Total	185 .007 071	•186 •055 •094	.077 044 003	.057 .000 .010	129 .0114 0214	.022 133 073	.086 104 096	045 069 060
Mother's Education Boys Girls Total	198 107 143	221 110 157	082 024 053	224 098 150	065 179 137	•421** -•183 •020	•062 •283** •215*	030 102 081
Ordinal Status Boys Girls Total	069 043 043	.012 .026 .029	036 .100 .055	038 .028 .015	.045 .111 .085	179 .070 020	273 194 220*	184 .022 041
Occupational Aspiration Boys Girls Total	185 114 191*	207 130 196*	156 269* 242**	249 236* :280**	•281 002 •115	157 060 014	.228 155 014	973 203 145

Significant at .05 level Significant at .01 level ¥

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Another significant finding for the entire sample was that those students who were selected as being most creative by their peers on the sociometric survey were those whose fathers were in high-level positions and whose parents had high-level educations, and that they tended to be the first-born in their families.

There was one significant relationship in the data for the boys. The boys who scored higher on the Consequences test had mothers with higher level educations. No explanation for this finding was apparent. There was a trend showing the relationship between occupational aspiration and scores on the A-E test and between ordinal status and being chosen by peers as creative, but there were no others. The data for the girls were similar to those for the entire group in that there were significant relationships between the more original A-E scores and highlevel occupational aspirations and between being chosen as creative and familial environment in terms of their fathers' high occupational status and high level of parental educational background. No significant relationships existed between ordinal status and originality scores.

Originality and Future Life. To determine whether those students above the median on originality would choose different things from those students below the median, their future life choices were compared with their composite originality scores. These comparisons are shown in Tables 19 and 20.

For the entire group of boys, the items most often chosen were as follows:

- (1) I want to have a happy life. (Item 3)
- (2) I want to make lots of money. (Item 2)
- (3) I want to be a respected, hard-working citizen. (Item 9)
  (4) I want to be an important executive. head of an organi-
- (4) I want to be an important executive, head of an organization. (Item 1)

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0	9	0	0	0	9	ħ	6	28	v	3rd Choice	ality Me	lected a
0	8	0	v	N	6	6	24	61	6	Total	dian	s First,



I want to live my own life and make my own rules.	I want to live a well-ordered life and play by the rules.	I want to work in science or in the arts or in some scholarly field.	I want to be conscientious, persevering, and dependable in my work.	I want to be an intellectualcultured and individualistic, to follow my own inclin- ations even at the expense of friends, fame and fortune.	Future Life Choice		
0	0	v	0	0	lst Choice	Below	Table ]
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v	9	0	보	0	3rd Choice	lity Med	nued)
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\* The Student Interest Survey II was developed by E. Drews and copyrighted for use in her Cooperative Research Project: USOE / E-2.

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• Whatever I do, I don't want to school.	• I want to be a respected, hard- citizen.	• I want to live a quiet, ordinar	• I want to be creative and originary haps discover something new.	• I want to be a social leader.	• I want to do exciting and dange things, to live dangerously	• I want to help others all I can	. I want to have a happy home lif	• I want to make lots of money.	• I want to be an important execu head of an organization.	Future Life Choice		able 20 Number of Times (Express Second,
go to 0	working 0	y life. 0	nal, per- 0	0	rous 2	. 10	e. 74	0	tive, 0	lst Choice	Below	ed in Percentages) Each or Third Choice by Girl
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	Future Life Choice	11. I want to be an intellectualcultured and individualistic, to follow my own inclinations even at the expense of friends, fame and fortune.	12. I want to be conscientious, persevering, and dependable in my work.	13. I want to work in science or in the arts or in some scholarly field.		ll. I want to live a well-ordered life and play by the rules.
Below (	lst uture Life Choice (	to be an intellectualcultured vidualistic, to follow my own vions even at the expense of fame and fortune.	w be conscientious, persevering, ndable in my work.		o work in science or in the arts me scholarly field.	o work in science or in the arts me scholarly field. to live a well-ordered life and the rules.
Origina	2nd Choice	0	7	•	vi ·	ον
lity Med	3rd Choice	0		29	29 7	° 7 29
ian	Total	0	<b>1</b> 6		4	3 F
Above	lst Choice	N	OT	v		2
Origina	2nd Choice	N	51	v	N	
lity Med	3rd Choice	v	22	10	v	
lian	Total	N	<b>J</b> 6	v	ω	

\* The Student Interest Survey II was developed by E. Drews and copyrighted for use in her Cooperative Research Project: USOE / E-2.

Although the ranks were determined by summing the number of times each item was mentioned as first, second, or third choice, the same order was apparent when considering only the first choice of the group. However, for the boys scoring below the median on originality, 62 percent chose wanting to have a happy home life as first choice, whereas only 28 percent of the boys above the median on originality selected this as their first choice. The second choice for the more original group was the 24 percent selection of wanting to make lots of money. The boys below the median on originality ranked the top four items similar to the entire sample, but those above the median ranked their choices somewhat differently. Their selections were as follows:

- (1) I want to have a happy home life. (Item 3)
- (2) I want to make lots of money. (Item 2)
- (3) I want to work in science or in the arts or in some scholarly field. (Item 13)
- (4) I want to be a respected, hard-working citizen. (Item 9)

The results for the total group of girls, those both above and below the median on originality, were the same for the four most chosen items. Their selections were as follows:

- I want to have a happy home life. (Item 3) I want to help others all I can. (Item 4) (1)
- (2)
- (3) I want to be conscientious, persevering, and dependable in my work. (Item 12)
- (4) I want to be a respected, hard-working citizen. (Item 9)

There was no significant discrepancy in these results in first choices for the girls, probably because of the fact that such a large number of girls in both groups selected wanting a happy home life as the most important factor in their future life.

Although there were fifteen items from which the students could select aspects important to their future life, 74 percent of the choices



were included in the four-top-ranked items for the girls and 61 percent for the boys. This precluded making any further interpretation of the data beyond the four most chosen items because the numbers became so small as to be negligible in comparison.

Items related to the subject of future life and aspiration level on the Survey of Interests were as follows: "How much longer do you plan to go to school? (Expect?) (Hope?)," "What do your parents expect you to accomplish in life?" and, "What do your parents expect of you in school?"

There were no real differences among the girls in the number of years of school they expected to complete, whether they were above or below the median on originality. However, 91 percent of the girls above the median on originality hoped to complete four years of college or more, as contrasted with 71 percent of the girls below the median. It seems significant that the more creative girls have higher "hopes." On the item regarding the parents' expectations for life accomplishments, 88 percent of the girls below the median on originality and 93 percent of those above the median said their parents expect them to be moderately or very successful. Of the girls in both groups, 88 percent indicated that their parents expect them to get very good grades (A's and B's). These academically talented girls realized that their parents expect them to do well in school, but they did not transfer this expectation to being very successful in life. Even those who were more original saw doing graduate work as something they hope for or dream about, rather than as a reality.

The da ta for the boys again support their high aspiration level.



Ninety-five percent of the boys above the median on originality and 86 percent of the boys below the median <u>hoped</u> to complete college or do graduate work. These "hopes" were more consistent with what the boys <u>expected</u> to accomplish than were the girls' hopes; 72 percent of the boys above the median on originality and 71 percent below the median <u>expected</u> to complete college or do some graduate work.

There were no real differences between the boys who were higher or lower on originality on these items. Ninety percent of both groups stated that their parents expect them to get very good grades in school (A's and B's), and 52 percent of the boys above the median on originality and 43 percent of those below the median stated that their parents expect them to be very successful in life.

One of the most important findings emerging from analysis of these items seems to be that more creative girls do <u>hope</u> to do graduate work, suggesting a hidden motivation on their part to be even more successful than they think their parents expect them to be. Yet, in selecting things important in their future life, they tend to follow the female role in choosing the more typical choice for a happy home life, thus channeling other creative aspirations along nurturant or humanitarian goals.

## Originality Versus Interests

Table 22 shows the students' primary interests during the school year in relation to their originality scores. The interests specified were as follows: (1) extracurricular activities, (2) recreation (3) friends, (4) learning, (5) an outside job, and (6) school subjects. Within the entire sample the rank order of the number of times each

interest was chosen first, second, or third was as follows:

- (1) Friends, 29 percent
- (2) Learning, 22 percent
- (3) School subjects, 18 percent
- (4) Extracurricular activities, 13 percent
- (5) Recreation, 13 percent
- (6) An outside job, 3 percent

Girls, both above and below the median of originality, chose friends as their primary interest. Boys below the median similarly chose friends most often, but boys above the median selected extracurricular activities as their first interest during the school year. Girls above the median on originality chose extracurricular interests as the third most important interest. This interest ranked fifth for both boys and girls who were less original. Recreation was chosen second by the less original boys and fourth by the less original girls; however, recreation was the fifth choice for both the more original boys and girls. This seems to indicate that more original students like to be active participants in school groups and activities, whereas less original students are more interested in pursuing individual recreation.

In considering only the first-chosen interest for the entire group, the rank order is as follows:

- (1) Learning, 38 percent
- (2) School subjects, 30 percent
- (3) Friends, 23 percent
- (4) Recreation, 5 percent
- (5) Extracurricular activities, 3 percent
- (6) An outside job, 1 percent

With this more detailed analysis of the data, there is a different picture of the students' choices. Overall, the adole scents studied chose friends as the most important single interest, this interest having



Table	21	Number	of	Respor	ises	(Expr	ressed	in	Percent	s)	by
		Boys a	and	Girls	to	Three	Intere	st	Survey	Ite	ms

• -

Item: How	long do	you p	<b>lan to</b> g	o to s	chool? Ez	mect?	Hope?	
School Level	Below O Boy Expect	rigina s Hope	lity Med Girls Expect	ian Hope	Above ( Boy Expect	)rigin 7 <b>s</b> Hope	ality Me Gir] Expect	edian . <b>s</b> Hope
Finish High School	0	5	17	5	$\mathfrak{D}^{\mathfrak{l}}$	0	2	0
l or More Yrs. College	29	9	33	24	$\mathfrak{D}^{\mathfrak{t}}$	5	32	5
Graduate College	62	38	43	45	38	38	56	54
Graduate Work	9	48	7	26	34	57	10	41

Item: What do your parents expect you to accomplish in life?

Expectations	Below Origin Boys	ality Median Girls	Above Origin: Boys	ality Median G <b>irls</b>
Very Successful	43	24	52	27
Moderate Success	52	64	43	66
Not Expect Much	0	0	0	0
Don't Know	5	12	5	5

Item: What do your parents expect of you in school?

	Below Origin	ality Median	Above Originality Media			
Grades Expected	Boys	Girls	Boys	Girls		
A's and B's	90	88	90	88		
C's and B's	10	12	10	10		
Not Care	0	0	0	2		



Table 22Percentage of Interest Choices for Boys and<br/>Girls Above and Below the Median for Originality

Tnterest.	Above Originality Median Boys Girls									
	lst	2nd	3rd	Total	lst	2nd	3rd	Total		
Extra-Curricular Activities	5	19	48	24	2	17	34	18		
Recreation	10	5	24	13	0	5	27	10		
Friends	19	29	גע	21	22	46	27	32		
Learning	24	33	0	19	49	15	5	23		
Outside Job	5	5	10	6	0	5	0	2		
School Subjects	38	10	5	17	27	12	7	15		

Interest	Below Originality Median							
111001000	lst	2nd	3rd	Total	lst	2nd	3rd	Total
Extra-Curricular Activities	5	5	19	9	2	0	26	9
Recreation	24	21	29	22	0	5	26	10
Friends	5	38	29	24	36	36	26	33
Learning	24	24	10	19	40	29	5	25
Outside Job	0	10	5	5	0	2	5	2
School Subjects	43	10	10	21	21	29	12	21

been the first, second, or third choice of 108 of the 125 students. It seems more important to note, however, that in their first chosen interest, 38 percent of the group selected learning as their first interest. There was no significant discrepancy in this choice between the more or less creative students, but there was an apparent sex difference; i.e., the most often chosen interest for the original boys was school subjects, and for the original girls the most often chosen interest was learning. The order on these two interests was reversed for the sexes, but the two together accounted for 76 percent of the first choices for the girls and 62 percent of the first choices for the boys.

## Originality Versus Profiles

Table 23 shows the relationship between descriptive profiles chosen by the students and their originality scores. The descriptive profiles were developed by Elizabeth Drews for her Cooperative Research Grant #608, "The Effectiveness of (A) Homogeneous and (B) Heterogeneous Ability Grouping in Ninth Grade English Classes with Slow, Average, and Superior Students." The descriptions of types of people might be categorized as follows: (1) the good student, (2) the creative intellectual, (3) the rebel, and (4) the social type. Fifty-nine percent of the students identified themselves as good students, 21 percent chose the social type profile, 18 percent chose the creative intellectual profile, and 2 percent chose the rebel profile. No girls selected the rebel category, and the 2 boys who selected this type were in the less original group.



Table 23Percent of Students Above and Below the Median on<br/>the Composite Originality Score and Total Group<br/>Choosing Each of Four Descriptive Profile Types

Profile Type	Below Or Med	iginality ian	Above Originality Median		Total
	Boys	Girls	Boys	Girls	
The Good Student	57	57	43	71	59
The Creative Intellectual	ית:	19	24	17	18
The Rebel	10	0	0	0	2
The Social Type	19	24	33	12	21

Total N	125
Boys	42
Girls	83

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The less original boys and the more original girls more often chose the good student profile. The more original boys more often chose the social type and the creative intellectual type; they selected the good student profile type less often than either the less original boys and both groups of girls. This seems to point out more different and more evenly divided types of original boys; i.e., those who channel it into social pursuits and extracurricular activities, and those who stress school subjects. The more original girls showed the most consistent choice of profile, with 71 percent choosing the good student profile; they were also the only group who had more creative intellectual profile choices than choices of the social type profile.

## Originality Versus Occupational Aspiration

In tabulating the occupations the students indicated that they hoped to enter, it was found that the majority chose vocations commonly known and usually thought of for males and females. Seventy-nine percent of the boys' choices were included in the following five fields: engineering, science, medicine, law, and the armed services. Sixtyfive percent of the girls' choices were included in the following three occupations: teaching, nursing, and secretarial work.

Even within the restricted range of vocational choices of the group, important discrepancies appeared for both the boys and the girls when they were divided on their originality scores. Engineering and science were the two most popular choices for the boys, but there was a reversal between the order of choices, the more original boys more often selecting science and the less original boys more often selecting engineering. This seems to suggest a difference between applied and



	Above Median on Originality	Below Median on Originality
Engineer	4	11
Scientist	6	4
Foreign Service	1	
Medical Doctor	2	1
Pilot	1	
Lawyer	2	l
Naval Officer	1	l
Journalist	1	
Music	1	
P.E. Teacher	1	
Dentist	1	
Missionary		1
Mechanic		2

Table 24 Occupational Choices for the Forty-two Boys Studied



Table 25	Occupational	Choices fo	r the	: Eighty-th	ree Girls	Studied
----------	--------------	------------	-------	-------------	-----------	---------

	Above Median on Originality	Below Median on Originality
Teacher	18	17
Nurse	3	8
Secretary	2	6
Journalist	2	
Scientist	5	
Medical Doctor	1	3
Engineer	l	
Architect	1	
Commercial Art	1	2
Social Worker	2	
Physical Therapy	1	
Occupational Therapy	l	
Librarian	1	
Paleontology	l	
Veterinarian	l	
Model		2
Airline Hostess		2
Psychiatry		l
Dress Designer		1
theoretical interests, with more creative boys tending toward theoretical occupations and less creative boys tending toward applied occupations.

The same trend was apparent in the data for the girls. The less original girls tended to select the more applied occupations, such as nursing and secretarial work, much more frequently than did the more original girls. In scientific areas, 3 of the less original girls indicated an interest in the medical field, whereas among the more original girls there were 5 choices for careers in theoretical science and 7 in other science-related fields. As shown in Table 26, the discrepancy in occupational aspirations among the girls was far more dramatic than for the boys when related to originality scores.

#### Originality Versus Sociometric Measures

The intercorrelations of the various sociometric measures for the entire sample were all significantly related. These results occurred, however, because of the proportion of females to males. In the data for the boys the social and intellectual choices were not significantly related at any point although the trend was positive.

Analysis of the data to delineate the sorts of things that are related to the intellectual choices revealed that many more variables were significantly related for the girls than for the boys. The girls' intellectual sociometric ratings were significantly correlated with the California Reading scores (.242), the ACE Critical Thinking scores (.353), higher status homes in terms of the father's occupation (.315), the father's education (.370), the mother's education (.347), higher grade point average (.428), higher Concept of Self-as-School-Learner (.313), and self assessment of critical thinking ability (.219).



Socio-	Measures of Originality								
metric Measures	AF Remote- ness	AE Uncom- monness	AE Clever- ness	AE Total	Plot Titles	Conse- guences	Socio- metric Choice	Compos- ite	
Social Boys Girls Total	128 .042 .014	343* .140 034	097 .111 .040	264 .130 .009	•186 •002 •038	006 225* 122	•189 •353** •260**	076 .134 .044	
Intell- ectual Boys Girls Total	021 .010 .003	037 .100 .053	067 .213 .109	059 .1140 .075	•155 •079 •098	086 004 034	•905** •940** •927**	•310* •425** •387**	
Creative Boys Girls Total	059 .034 .007	130 .117 .033	139 .243* .107	155 .170 .066	•177 •050 •085	050 .036 .007		293 .470** .418**	
Open Minded Boys Girls Total	099 041 071	018 .0l43 .007	134 .104 .011	113 .047 021	.006 .209 .165	085 010 032	•808** •669** •706**	•175 •309** •268**	
Critical Thinking Boys Girls Total	•085 ••075 ••000	•136 029 .056	053 .109 .058	•073 •000 •052	•227 079 •004	109 057 079	•530** •577** •548**	•300 •141 •191	

Table 26Correlations between Measures of Originality and SociometricMeasures for Boys, Girls, and Total Sample

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

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	Social	Intell- ectual	Creative	Open Minded	Critical Thinking
Social Boys Girls Total		•256 •436** •338**	•189 •353** •260**	•174 •426** •257**	•238 •190 •247**
Intellectual Boys Girls Total			•905** •940** •927**	•826** •770** •778**	•759** •643** •681**
Creative Boys Girls Total				•808 <del>**</del> •669** •706**	•530** •577** •548**
Open Minded Boys Girls Total					•403** •170 •225*
Critical Thinking Boys Girls Total					

¥	Significant	at	•05	level
**	Significant	at	.01	level

Table 27	Intercorrelations of Sociometric Measures
	for Boys, Girls, and Total Sample

• • •

For the boys the only variables significantly related to their number of intellectual choices on the sociometric questionnaire were their own self ratings as being above average. There were positive trends, however, showing some relationships between being chosen as intellectuals and reading ability, language and critical thinking achievment test scores and self assessment of critical thinking ability.

The questions on the sociometric from which the intellectual scores were derived required the students to evaluate their peers as to creativity, intellectuality, open-mindedness, and ability to think critically. Therefore, the significant correlations between the sociometric and the self assessment scores (self-concept and ability to think critically) and standardized tests (critical thinking and reading) indicated that the students' ratings of the four questions were also highly intercorrelated is comprehensible in that many of the same type qualities have been found to be interrelated on other measures.

The two primary differences which stood out were that the girls who were seen as intellectual in the group were also chosen as the most social and had good grade point averages, whereas these two findings did not hold for the boys. It seems, therefore, that intellectual boys do not tend to be considered as social as intellectual girls, and that intellectual boys do not necessarily have to gain recognition by having high grade point averages. It almost seems as though boys can be recognized by their peers as intellectual, but that a girl must be popular plus get high grades to be seen as an intellectual. Substantiation of this hypothesis would require analysis of classroom behavior and interaction. Drews found in her research in analyzing discussion



typescripts that the creative intellectuals talked the least, and social leaders the most.

### Originality Versus Ordinal Status

Hypothesis 7. It was hypothesized that the more original students are more frequently the first-born children in their family than the less original students.

Of the sample of academically talented students in the present study, 46 percent were first-born or only children, 30 percent were the youngest child in the family, and 24 percent were middle-born. These percentages were similar for both boys and girls. The mean number of children in the families of these students was 2.9, with a mean of 3.2 for the boys' families and 2.8 for the girls' families.

Table 28 shows the relationship between originality and ordinal status; the percentages of first-born, middle-born and youngest children were very much the same as for the whole sample for combined totals of boys and girls above and below the median composite originality score. Consideration of the boys and girls separately, however, revealed one significant finding: 8 of the 10 middle-born boys were below the median on originality, and 14 of the 20 middle-born girls were above the median.

For the total group ordinal status related significantly to the California Language Test (.223), the ACE Critical Thinking Test (.220), the concept of self-as-learner (.173), and the H factor (adventurous and thick-skinned) on the Cattell HSPQ (.198). The first-born children, then, tended to do better on achievement tests in language and thinking, were more adventurous, and thought well of themselves as students.



Table 28Ordinal Status of Boys, Girls and Total Group Above<br/>and Below Median on Originality and Total Group

Ordinal Status	Above Median		B <b>elo</b> w Nedian		Total Group		
	Boys	Girls	Boys	Girls	Boys	Girls	Total
First and Only Child	52%	141%	3 <b>3</b> %	53%	43%	48%	46%
Middle- born	10%	34%	38%	IJ₁%	24%	24%	24%
Youngest Child	38%	22%	29%	3 <b>3</b> %	33%	28%	30%



For the first-born boys the correlations of the achievement measures were significant (.351 with California Language and .313 with ACE Critical Thinking Test) but there were only trends in the data for the girls. The first-born girls scored significantly higher on the G and H factors on the Cattell HSPQ, indicating qualities of adventurousness and super-ego strength (i.e., conscientiousness and persistence).

Results of the present study indicate a need for further study of role differentiation on school performance and personality as related to birth position in the family.

## Summary

The criterion of originality in this study was a composite score composed of six scores: the ratings for cleverness, uncommonness and remoteness on the fictional story of a person the student would like to be, the scores on Guilford's Consequences and Plot Titles tests, and the score on the sociometric rating of creativity. There were no significant correlations between the four measures of originality, which indicates the four measures are independent or measuring different aspects of the same ability. Since there was no outside criterion to validate the use of these instruments, the results must be viewed with caution.

It was hypothesized that the more original students would score higher on intelligence, but such was not the case with this gifted sample.

It was hypothesized that the more original students would be high achievers. The more original boys did score significantly higher on achievement tests, but the girls did not.



On the Cattell High School Personality Questionnaire factor H, threatia versus parmia, or adventurous, thick-skinned versus shy, timid, threat sensitive, was the only factor related to originality variables for the whole sample and for the girls, showing the more original student to be more adventurous. The more original boys tended to be more adventurous, more confident and secure, more esthetically sensitive and more excitable and unrestrained.

It was hypothesized that the more original student would have a higher Concept of Self as School Learner on an adjective checklist developed by Drews and Boroughs. Such was not the case except that girls who were chosen by their peers on the sociometric as more creative did show higher concepts of themselves as school learners.

It was hypothesized that the more original students would be less rigid and less dogmatic on the Rokeach scales than the non-original student, but the hypothesis was not upheld by the results except on one measure: dogmatic boys were not chosen by their peers as creative on the sociometric device.

The originality scores were related to a number of personal history items and Student Interest Survey II responses. On birth order no differences occurred when the students were split above and below the median for originality, except that 14 out of 20 middle-born girls were above the median for originality and 8 out 10 middle-born boys were below it. The data provided no clarification for this paradoxical finding.

On the Student Interest Survey II, the students were asked to select from a list of fifteen the three most important things to them in



future life. The most popular choices for the boys were: (1) I want to have a happy home life; (2) I want to make lots of money; (3) I want to be a respected, hard-working citizen; (4) I want to be an important executive, head of an organization. The more original boys had the same choices, except the third choice above was their fourth choice and their third choice was, "I want to work in science or in the arts or in some scholarly field." No differences occurred between the girls when divided on the originality scores. They selected as their first four choices: (1) I want to have a happy home life; (2) I want to help others all I can; (3) I want to be conscientious, persevering, and dependable in my work; (4) I want to be a respected, hardworking citizen.

To the question "How much longer do you plan to go to school? Expect? Hope?" 95 percent of the more original girls hope to complete college or do graduate work - but only 66 percent expect to do so; in contrast 71 percent of the less original girls hope to finish college, and only 50 percent expect to do so. The boys' hopes were much more in line with their expectations.

Each student was asked to check one of four descriptive profiles which he felt best described him: (1) the good student, (2) the creative intellectual, (3) the rebel, and (4) the social type. The majority saw themselves as good students and there were no essential differences between the boys and the girls as the more or less originals

In choosing future occupations, one important distinction occurred. Both more original boys and girls tended to select more occupations involving some use of theory, while less original boys and girls selected more applied occupations.



The sociometric device was designed to yield both a social score and an intellectual score. The more intellectual girls were also seen as the most social; this was not true for the boys.

# Discussion

For the main part, the hypotheses set forth in this thesis were not substantiated. Although the techniques to measure originality had been used in other research and found to be related, they were not found to be correlated in this study. In the following discussion some interpretations are given as an explanation as to why the results did not occur as had been hypothesized.

The composite originality score was made up of the scores from the ratings for cleverness, uncommonness, and remoteness on the fictional story of a person the student would like to be, the cleverness score on the Plot Titles Test, the remoteness score on the Consequences Test, and the sociometric rating on creativity. No significant correlations were found between the four main measures of originality. The difficulty most likely lay in the way the ratings of these instruments were done.

It was hypothesized that the cleverness rating on the A-E and the cleverness score on the Flot Titles would correlate and that the remoteness score on the A-E and on the Consequences test would correlate. Such was not the case for the entire sample, although the trend was apparent for the extremes of the group.

#### Remoteness

In the ratings of the Consequences test the main aim was to rate the responses on how remote they were from the situation as defined.



In retrospect, the concept of using specificity versus generalization of response as a major differentiation of rating may have introduced severe limitations. It may be that the students on Consequence One who gave a generalized economic response to the Consequence "What would happen if pills were developed which would substitute for food?" such as "a lot more unemployment" actually were seeing more far-reaching or remote consequences than the student giving a more specific response such as "space travel would be developed quicker." Guilford himself uses only an either-or scoring technique and stretching it to a three point scale may have confounded the results. Also in reviewing these ratings it is somewhat apparent that the raters might still have been strongly affected by literary style although they tried not to be. For example, in Consequence Two, "What would happen if everyone would always tell the truth about everything?" an example of a response rated two was "More faith or trust in people" and an example of a response rated three was "No threat of surprise attacks;" these really seem equal in terms of remoteness but the latter is more specified and so got a higher rating. It might be hypothesized that if better worded statements did generally get higher ratings the result that the original students had higher grade point averages is explainable in that students who express themselves well verbally usually get high grades.

These hindsight speculations may in large part explain why the A-E remoteness and the Consequences remoteness ratings did not correlate as was hypothesized, in that using specificity of response confounded the judgments on the Consequences test whereas remoteness on the A-E was clearly defined only on a time dimension.



## Cleverness

The ratings for cleverness on the A-E and on the Plot Titles test did not correlate as hypothesized. The raters on both sets of ratings considered literary style, arousal of interest, and complexity of thought in making the discriminations. It is quite plausible that the two different tasks required different expressions of cleverness. Rating the literary style of a story and of captions for a story may be incomparable because the Plot Titles test calls for a kind of Madison Avenue Advertising Man type of glibness whereas the A-E calls for a more prolonged and extensive literary cleverness. Since the two tasks required somewhat different types of products, the assumption that they could be rated on the same dimension may have been incorrect. Together with this the actual story used on the Plot Titles test may have been an unfortunate choice in that it was rather silly and might not really stimulate the imagination of even a creative tenth grader.

In general, it appears that extending the categories beyond those which Guilford used on his instruments may well have led the raters to introduce unconscious biases to select out the "good student" rather than the "creative intellectual." Some support for this interpretation is seen in the students' judgments of their own personalities where the majority designated themselves as "good students" on the descriptive profiles.

# Peer Ratings of Creativity

A question may also be raised on using peer rating of creativity by adolescents in that the ratings may well be biased by popularity, social status, and grades so that they may well not be as valid as ratings by eminent adults.



## Originality Versus Achievement and Personal History Items

Below will be given some interpretations and discussions of the results trying to keep in view the thema of the "good student" bias which seemed to influence the ratings of the originality measures. Originality Versus Achievement

There were significant relationships between three of the achievement variables (California Languages, ACE Critical Thinking and Grade Point Averages) and the composite originality scores for the boys but none of these correlated for the girls. These relationships might suggest that boys achieve in school as an expression of originality, and that girls may develop their creative potential in different situations. Knowledge of original self-initiated projects are much needed at this point, but the information was not available.

In the content of the stories on the A-E of the girls and boys given the highest ratings, it was quite noticeable that the boys' stories were more achievement-oriented in occupations, whereas the girls' stories tended to be more stereotyped in accordance with the usual female role in our society of marriage and child rearing. However, the more original girls' stories tended to deal with the typical female role in a more clever, or humorous, or adventurous method.

One finding indicated that the girls' originality scores were not related to achievement tests or grades in school, whereas there was a significant relationship between originality and aspiration to highlevel occupations. That there was no significant relationship in this area for the boys is comprehensible in that almost all of the boys chose



top level aspirations, precluding a range of aspiration level necessary for correlational purposes. An explanation of the relative lack of achievement orientation in terms of school is more difficult. It should be remembered, however, that the data are supporting the idea that the more original students, both boys and girls, do tend to want to achieve more in life. The difference seems to be that boys relate this sense of achievement more directly and immediately to the school setting than do girls. Another explanation might be that girls tend to conform more in terms of accepting the achievement of good grades as the natural thing, so that the real need for achievement is reflected more in their occupational aspirations. The cleverness score on the A-E total score contributed most of the significance of the correlation for the girls and gives part of the answer. That is, being clever in social, interpersonal, and more artistic pursuits, they are probably satisfying the same need for creativity that the boys feel in achieving in an academic setting. The social needs of these girls were quite strong. The most important feature at this point, however, seems to be that the talented and original students in the present study all demonstrated a strong need for future achievement.

It was also found in studying the sociometric results that the girls who were selected most often as intellectuals were also selected most often as social choices and had high grade point averages; such was not the case for the boys. Thus it seems boys can be seen by their peers as intellectuals without high grades or being socially adept and this presents an interesting hypothesis for further research through analysis of classroom behavior and interaction.

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The relationship between achievement and originality whether on standardized measures or aspiration indicates the original students in this study have a great deal of achievement motivation. The same finding is frequently a descriptive element of the "good student" personality.

#### Originality Versus Interests

When originality composite scores were related to the interests of the students, the first choices for boys and girls were for school subjects and learning, respectively and secondly for friends. The results show the importance the academically talented group placed on learning and school, as well as on their desire for friends and social interaction. Yet, even with their apparent desire to develop in both areas, it seemed they differentiated the interests as to importance. It is interesting to note that 66 percent of the boys chose the interest in friends for one of their three choices but 96 percent of the girls selected friends as their first choice. This almost unanimous selection by the girls may in part explain why the sociometric ratings for social and intellectual choices were significantly correlated for the girls and only showed a positive trend for the boys. Again, with the particular group studied, there seemed to be a double role image whereby the girls perceived themselves as being able to accomplish both intellectual and social roles, whereas the boys perceived the two roles as less compatible and did not attempt to fulfill the dual self-image. From the data, it appeared that the self-images of these boys and girls were consistent with the classroom peer ratings. Thus, not only do the sexes differ as to the role they most want to live, but they are also



already achieving that role, at least in part.

These results show a real interest in academic achievement for the entire sample of gifted students; for differences to appear between the more original and the less original students a more extensive list of interests would seem to be needed.

The Concept-of-Self-as-School-Learner score was significantly correlated for the entire sample with a multitude of variables, including grade point average, self ratings, parents' expectations for success, the students' future plans for education, sociometric scores for sociability, intellectuality, creativeness, open-mindedness, critical thinking, parents' levels of education, and a host of personality measures on the Cattell HSPQ. However, the concept of self-as-schoollearner was not related to any of the measures of originality other than the sociometric device. For the group of superior students comprising the population for the present study, therefore, actually producing original responses was not necessarily related either to their concepts of themselves as being creative persons or their being considered by others as being creative. On some types of originality measures, such as the Consequences test, not having a high regard for self-as-schoollearner may even have been an asset. In essence, this may suggest that a student who has a high concept of self-as-school-learner may influence what other people think of him in terms of being open-minded, creative, or having the capacity for critical thinking, but it does not necessarily follow that he is this sort of person at this age. On the other hand, how well a student judges himself as being able to learn seems to affect his grades and his desire for success, and it appears that this



concept is built on family environment and attitudes communicated to the child in the home.

## Originality Versus Dogmatism and Rigidity

One sex difference which appeared in studying this hypothesis was that dognatism correlated significantly with grade point average for both boys and girls, but it had a negative relationship to grades for the boys (-.303) and a positive one for the girls (.277). The negative correlation for the boys might be explained in terms of the relationship between dogmatism and the personality characteristics on the Cattell HSPQ. Boys who were more dogmatic scored lower on the general intelligence factor (-.325), were more submissive than aggressive (-.303), and more fastidiously individualistic than liking group action (-.338). The more dogmatic boy was shown as less bright and was prone to be less active in class, which might account for the fact that the more dogmatic boys were not selected by their peers as being creative in the classroom. There was no apparent explanation for the fact that the more dogmatic girls tended to get good grades. It may be that girls who see things in black or white are more accepted in the classroom and thus get better grades.

Rigidity correlated negatively with IQ scores for both boys (-.450)and girls (-.354). It also correlated negatively with the general intelligence factor on the Cattell HSPQ for the boys (-.341), and with the California Reading Test (-.215) and the ACE Critical Thinking Test (-.251) for the girls.

It seemed that the boys who were dogmatic or rigid were less bright and did less well on achievement tests and got lower grades. On the



other hand, girls who were dogmatic or rigid also tended to be less intelligent, did less well on standardized tests, but did better in terms of making good grades. It seemed, therefore, that the personality attributes considered affected boys more than girls in terms of achieving grades, and this seemed to be related to their being more submissive and less oriented toward being an active group member.

For the entire group dogmatism and rigidity both were positively correlated with the students' judgments of parental expectations for success in life. The more dogmatic and rigid they were, the more they indicated that their parents expected them to be "very successful." Originality and Future Life

It had been expected that the more creative students would select more often such items as "I want to do exciting, adventurous things, to live dangerously;" "I want to be an intellectual--cultured and individualistic, to follow my own inclinations even at the expense of friends, fame and fortune;" "I want to be creative and original, perhaps discover something new." However, such aspirations apparently were not as important to this age group as achieving happiness in the home, respect and prestige in the community, and satisfaction in the job. Table 20 shows a slight trend for the more original girls to select these items, as compared with the less original girls, but there was no such trend for the boys. The most significant sex difference is the nurturant, humanitarian aspect of the girls' second choice ("I want to help others all I can."), in contrast to the materialistic pursuit of the boys' second choice ("I want to make lots of money.").


divided on the composite originality measure, it was significant that the creative boys chose as important the aspiration to work in science, or in the arts, or in some scholarly field. There is further support to this inference in the occupational aspirations of the boys in the present study. Thirty-five of these boys aspired to occupations classified on the Warner, Meeker, Eels Index of Status Characteristics as having a score of 1; i.e., the highest professional rating. Of the seven boys who did not aspire this highly, five were below the median on the composite originality score. Additional substantiation was seen on the Survey of Interests on which the students were asked how much longer they planned to go to school; 34 percent of the boys above the median on originality expected to go on for graduate work, as compared with only 9 percent of the less creative boys. Only 19 of the 83 girls studied aspired to the highest level occupations, and of these 19 girls, 13 were above the median on originality.

## Summary

In reviewing the rating procedures it seemed that extending the scoring categories on the Guilford instruments using specificity of response as the method of extension may well have introduced a bias to give higher ratings to better worded responses, which in turn may have caused the raters to select out the "good students" more so than the "creative intellectuals." There is quite a bit of evidence to support this interpretation. First of all the original students see themselves as "good students" when choosing descriptive profiles. They are as a group strongly achievement oriented both in terms of getting good grades and aspiring to high level occupations. Their



primary interests are in learning and in school subjects. Their choices of things important to them in their future life are essentially of a conforming nature, wanting a happy home life, to make money, be respected, be hard working and in general the form is to want to be a "good citizen."

Some of these aspects are also descriptive of creative people, but it seems that the method of rating the responses may well have confused the issue so that too many students who excel in written expression were included in the original group.



#### Sub-Study:

The Highly Original Versus the Highly Intelligent

The purpose of the sub-study was to differentiate students who scored high on creativity tests and relatively low on intelligence from those who scored high on intelligence and relatively low on measures of creativity.

#### Sample

To determine the sample of students for the sub-study from the sample of the main study, graphs were made for boys and girls by plotting originality composite scores and IQ scores. The mean lines for originality and IQ were drawn, and the extreme quadrants yielded the students who were to comprise the sample. The highly original students were those who scored above the mean composite originality score but below the mean IQ score. The high IQ students were those who scored above the mean Score for originality.

The distribution of students, both boys and girls, was random in the four quadrants. There were 9 high-IQ boys and 11 high-original boys, 22 high-IQ girls and 20 high-original girls. The high-IQ group had a mean IQ of 142.81, and the high-original group had a mean IQ of 123.97. The high-original group had a mean originality composite score of 323.42, and the high-IQ group had a mean originality composite score of 274.19. "t" tests revealed no significant sex differences. <u>Method</u>

The "t" test for significance of differences between means was computed on all variables for the combined and separate male and female



samples between scores of the high-IQ group and scores of the high-original group.

## Results

In Table 30 the variables comprising the composite originality score differentiate the students. Although not all the "t" tests were significant, there is a consistent trend for those above the median originality score to score higher on all the components despite the fact they are not all significantly correlated with each other. These findings give some additional support for the use of the instruments to measure originality even though no outside criterion was available.

Achievement. For the entire sample, as seen in Table 30, the high-IQ group scored significantly higher on standardized achievement measures than did the high-original group; this was indicated by scores on the California Reading, the California Language, and the ACE Critical Thinking tests. However, there was no significant difference between the grade-point-averages of the two groups. In viewing the sexes, this finding was descriptive of the girls but not of the boys. No significant differences appeared between the high-IQ and the high-original boys on either achievement tests or grades. These results confirm the findings of Getzel and Jackson (18) as far as males are concerned, but suggests a different trend for the girls. It seems that the high-IQ and high-original girls both get high grades, but that the high-IQ girls are more oriented toward learning and retaining facts.

Personality. For the entire sample, as seen in Table 31, the highoriginal group scored significantly higher on the Rokeach Rigidity scale and on the Cattell factors A (schizothymia versus cyclothymia)



Variable	High-IQ Mean S.D.		High-Or Mean	"t" Test	
AE Remoteness	22.258	10,383	34.194	12.385	4.045**
AE Uncommonness	19.839	9•460	33.387	11.940	4•871**
AE Cleverness	19.839	8.180	33.206	11.469	5 <b>.</b> 205**
AE Total	61.935	17•583	100.484	24.736	6 <b>•957**</b>
Plot Titles	68.871	48.389	845•811	55.521	3.695**
IQ	142.806	7.945	123.968	6.775	9 <b>.</b> 882**
California Reading	44.645	3.915	4 <b>⊥</b> •484	3•509	3.293**
California Language	85.194	7•994	80.581	9•435	2.043*
ACE Critical Thinking	35.419	6.738	30.839	5.513	2.882**
Father's Education	14.548	3•749	12.710	3.225	2.037*
Rokeach Rigidity	89.516	12,508	97•968	10.294	2 <b>.858**</b>
Factor A - Schizothymia vs. Cyclothymia	5.000	1.545	5.968	1.787	2•5777×
Factor E - Submissive vs. Dominant	5.290	1.817	4.032	1.534	2.897**
Factor H - Threctia vs. Parmia	4•774	1.879	5.903	1.729	2 <b>.422</b> *
Plot Titles Raw Score	4.065	1.950	6.774	2.136	5.132**
Consequences Raw Score	4.710	1.726	6.548	2•746	3.105**
Composite Originality Score	274.194	16.922	323.419	17.063	11.220**
Total N = 62 DF = 60	High-IQ N	= 31	Hig	n-Original	N = 31

Table 29Means, Standard Deviations and "t" Tests onSignificant Variables for High-IQ and High-Original Groups

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

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Table 30	Means,	Standard	Deviatio	ons and	"t" Tests	; on	
	Significant	Variables	for High	h-IQ and	l High-Ori	ginal Boy	3

	Hig	h-IQ	High-Or	iginal			
Variable	Mean	S.D.	Mean	S.D.	"t" Test		
AE Uncommonness	22.778	9 <b>•75</b> 0	32.727	9.621	2.170*		
AE Total	71.667	15.456	97•273	25.881	2.477*		
Plot Titles	57.222	34.730	113.636	44 <b>.</b> 827	2•933**		
IQ	140.111	4.677	122.455	7.228	6.000**		
Rokeach Rigidity	84.000	D1+•922	107.818	8.430	3.008**		
Factor E - Submissive vs. Dominant	6.667	1.155	5.000	1.206	2 <b>.</b> 973**		
Plot Titles Raw Score	4.000	1.764	6.182	2.328	2.200*		
Composite Originality	278.000	16.647	317.273	14.505	5•346**		

N 20 DF 18

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Significant at .05 level Significant at .01 level XX



Variable	Hig Mean	h <b>-IQ</b> S₀D₀	High-Oı Mean	rigin <b>al</b> S.D.	"t" Test
AE Remoteness	19•545	9.282	34.000	13.565	3.963**
AE Uncommonness	18.636	9.068	33.750	13.026	4 <b>.</b> 289**
AE Cleverness	19.773	8.591	35.00	9.874	5•214**
AE Total	57•955	16.832	102.250	23.900	6.824 <del>**</del>
Plot Titles	73.636	52.227	121.250	60.433	2 <b>.</b> 672 <del>**</del>
IQ	143.909	8.707	124.800	6.361	7 <b>.</b> 860 <del>**</del>
California Reading	45.364	3.699	42.350	3.198	3.654**
ACE Critical Thinking	37.136	5.388	31.550	5.094	3.361**
Father's Occupation	2.545	1.499	<b>3.60</b> 0	1.562	2.178**
Factor E - Submissive vs. Dominant	4•727	1.737	3.500	1.432	2.425*
Factor Q3 - Poor vs. High Self-Sentiment	3.636	1.400	4.550	1.2կկ	2 <b>.</b> 174*
Plot Titles Raw Score	4.091	2.021	7.100	1.947	4•78 <del>6**</del>
Consequences Raw Score	4.727	1.572	6.950	2.559	3.342**
Composite Originality	272.636	16.786	326.800	17.417	10.011**

Table 31Means, Standard Deviations and "t" Tests onSignificant Variables for High-IQ and High-Original Girls

N 42 DF = 40

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

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and H (threctia versus parmia), and significantly lower on the Cattell E factor (submissive versus dominant). Thus, the highly original student seemed to be more rigid in his belief systems, warmer and more sociable, more adventurous and thick-skinned, and more submissive. Both the original boys and girls showed these same tendencies or significancies in the data. The original girls also scored significantly higher on the Q3 factor (poor self-sentiment versus high self-sentiment). "The loaded response items show the child high in Q3 as self-controlled, striving to accept approved ethical standards, ambitious to do well, considerate of others, foresighted, disposed to reduce and control expressions of emotions, and conscientious." (HSPQ Manual, p. 37.)

That all the original students seemed to be submissive rather than dominant indicates less of a need to be aggressive and competitive, and at least for the girls there seemed to be a high self-sentiment, regarding themselves as being warm, sociable, and adventurous. Since original and creative people are generally found to be flexible rather than rigid, the failure to demonstrate this quality in the present sample suggests a need for further research. In the main study, rigidity correlated negatively with IQ, so that the selection of the sample itself predetermined this result.

Family Background. The high-IQ group's parents tended to have higher levels of education than the high-original group's. The father's education was significantly higher for the entire sample of the high-IQ students, but not for boys and girls separately although the trends were apparent in both. For the girls, the father's occupation or social status was significantly higher for the high-original group, and this



same trend was found in the boys' data. This implies a certain degree of originality and self-actualization in the fathers of the high-original group in that they achieved higher occupational status with less educational training.

Future Life Goals. On the questionnaire filled out by the students, the boys selected most often the following things important for their future life:

I want to make lots of money.
 I want to have a happy home life.
 I want to be an important executive, head of an organization.
 I want to be a respected, hard working citizen.

For the girls the choices were as follows:

 I want to have a happy family life.
 I want to help others all I can.
 I want to be a respected, hard working citizen.
 I want to be a respected, hard working citizen.

These are the same items mentioned in the main study. There were differences in rankings between the high-IQ and the high-original students, but none that was really significant with this small sample.

Interests. The students ranked the three most important interests during the school year of the six interests listed. Again, the overall most often first-ranked interest was "friends," this interest being chosen by both the high-IQ and high-original groups. The only real difference between the rankings of the groups was that the highoriginal boys and girls both selected "extra-curricular activities" much more often than did the high-IQ groups; this interest ranked as second choice for the high-original students and fifth for the high-IQ students who selected "school subjects" as their second most important interest.



Table 32	Percentages of	Interest Choices for High-Original
	and	High-IQ Girls and Boys
		- , ,

	High-Original Girls					High-IQ Girls			
Interest	lst	2nd	3rd	Total N=20	lst	2nd	3rd	Total N=20	
Extra-Curricular Activities	0	20	35	18	4	0	18	8	
Recreation	0	5	25	10	0	4	36	<b>1</b> /1	
Friends	10	55	35	33	<u>4</u> 2	<u>ل</u> م	18	33	
Learning	60	10	5	25	<u>4</u> д	23	0	21	
Outside Job	0	0	0	0	0	4	9	4	
School Subjects	<b>3</b> 0	10	0	13	과	27	18	20	

Interest	High 1st	n-Orig 2nd	inal 3rd	Boys Total N=ll	Hig lst	h-IQ 2nd	Boys 3rd	Total N=9
Extra-Curricular Activities	9	9	54	24	0	ш	ш	11
Recreation	18	18	9	15	33	ш	11	22
Friends	27	36	18	27	0	33	33	22
Learning	9	18	0	9	11	33	n	19
Outside Job	0	18	9	9	ο	0	0	0
School Subjects	36	0	9	15	55	11	11	26

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Interest Survey Items. The replies to the question "How long do you plan to go to school? Expect? Hope?", illustrated that both the high-original students and the high-IQ students had high educational aspirations. Even with a very significant difference in IQ, it seems the students who were high on originality but below the mean for this talented group on IQ were both able to achieve well in school in terms of grades and had the same desires educationally as the high-IQ group. Table 35 also shows that these students operated on similar parental expectations. Practically all students in both groups, boys and girls, thought their parents expected A and B grades from them in school. The high-original boys even felt their parents expected them to be very successful in life more often than did the high-IQ boys. These parental expectations and the high occupational and educational aspirations of the original students below the mean on intelligence for the group could in a large part explain the two groups' indisparate levels of achievement in school.

Descriptive Profiles. The students were asked to select one of four descriptive profiles which they considered most descriptive of themselves. The vast majority of this group saw themselves as "the Good Student." The one significant finding was that 7 of the 11 highoriginal boys saw themselves as "The Social Type." It was apparent in the main study that the most original boys tended to spread their choices over more types of profiles than the other groups. It seems that the original boys below the median in IQ tended to direct their originality in a social manner since these same boys were higher on the Cattell factor A which describes them as warm and sociable. The most

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	High-C	)rigin <b>al</b>	High-IQ		
Descriptive Profile	Boys N=11	Girls N=20	Boys N=9	Gi <b>rls</b> N=22	
Good Student	27	70	56	54	
Intellectual	9	15	11	23	
Rebel	0	0	22	0	
Social Type	64	15	11	23	

Table 33Percentages of Descriptive Profile Choices for<br/>High-Original and High-IQ Boys and Girls

Table 34Ordinal Status of High-Original and High-IQBoys and Girls Expressed in Percentages

	High-C	)riginal	High-IQ		
Ordinal Status	Boys N=11	Girls N=20	Boys N=9	Gir <b>ls</b> N=22	
Firstborn or Only Child	36	35	1414	54	
Middleborn Child	36	45	22	л <sup>і</sup>	
Youngest Child	27	20	33	32	



Table	35	Percent	age	s of	Responses	s to	Various	Inter	rest	
		Survey Items	by	High-	-Original	and	High-IQ	Boys	and	Girls

Item: "How lo	mg do yo	u plan	to go to	school	1? Expec	t? Ho	pe?		
		High-	Original			Hig	h-IQ		
Educational Expectation	Bo N=	Boys N=11		G <b>irls</b> N=20		Boys N=9		Girls N=22	
-	Expect	Hope	Expect	Hope	Expect	Hope	Expect	Hope	
Finish High School	9	9	5	0	22	0	18	5	
l or More Years College	27	9	25	0	22	. 22	23	과	
Graduate College	55	55	60	60	<u>1</u> 44	<u>44</u>	45	36	
Graduate Work	9	27	10	40	ш	33	<b>1</b> ]†	45	

Item: "What do your parents expect you to accomplish in life?"

Parental	High-	Original	High-IQ		
Expectation	Boys N=11	Girls N=20	Boys N=9	Girls N=22	
Very Successful	64	25	33	32	
Moderate Success	36	65	56	59	
Not Expect Much	0	5	0	0	
Don't Know	0	5	ш	9	

Item: "What do your parents expect of you in school?"

	High-Original		High-IQ	
Grades Expected	Boys N=11	G <b>irls</b> N=20	Boys N=9	G <b>irls</b> N=22
A's and B's	100	80	89	82
C's and B's	0	15	11	18
Not Care	0	5	0	0

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# Table 36

# Occupational Aspirations of High-Original and High-IQ Girls

Occupation	High-Original	High-IQ
Teacher	8	8
Nurse	3	4
Mechanical Engineer	1	
Veterinarian	l	
Scientist	3	
Secretary		2
Physician (M.D.)		3
Psychiatrist		1
Social Work	1	
Reporter	1	
Librarian	1	
Model		l
Dress Designer		1
Commercial Artist		2
Total N	20	22



Table 37 Occupation Aspirations of High-Original and High-IQ Boys

Occupation	High-Original	High-IQ
Engineer	3	6
Mechanic	1	1
Scientist	1	1
Music	1	
Teacher	2	
Pilot	1	
Naval Officer		l
Journalist	1	
Foreign Service	1	
Total N	11	9



original high-IQ boys seem to describe themselves as intellectuals.

Occupational Aspirations. The high-original boys mentioned twice as many occupations as the high-IQ boys, but engineering was selected most often by both groups; two-thirds of the high-IQ boys selected engineering. From these data and from the main study, it appears that high-original boys who were planning on science careers were both original and had high IQs. Both the high-original and high-IQ girls selected most often to be teachers. No new facts emerged to distinguish the groups in the data for the girls.

Sociometric Choices. "t" tests between the high-original and high-IQ groups on the number of sociometric choices were not significant for either the boys or the girls. There was, however, a definite trend; both high-original boys and girls were given more choices by peers on the social, the intellectual, the creative, the critical thinking, and the open-minded items than were the high-IQ group.

Ordinal Status. With such small samples, little can be inferred from these data. However, a large percentage of the high-original group were middle-born children as compared with the large percentage of first-born children in the high-IQ group. Again, further research is indicated.

### Summary

The sub-study was performed to differentiate those students who scored above the mean on originality but below the mean on intelligence from those who scored above the mean on intelligence but below the mean on originality. The sample was composed of 9 high-IQ and 11



high-original boys, and 22 high-IQ and 20 high-Original girls.

Fisher "t" Tests were computed between the means on all the variables for boys, girls and the total sample. The high-original students tended to score higher on all the components of the originality composite score.

The high-IQ group of girls scored significantly higher on the achievement tests than the high-original girls. No such differences appeared for the boys. There were no differences between the highoriginal or high-IQ groups of boys or girls on grades, concepts of themselves as school learners, or on occupational aspirations.

The high-original students scored higher than the high-IQ students on the Rokeach Rigidity Scale; they appeared on the Cattell HSPQ to be warmer and more sociable, more adventurous, and more submissive. The high-original girls also were higher on self-sentiment.

The high-IQ's parents were more highly educated, but the highoriginal students' parents had higher socioeconomic status which might indicate the high-original students' parents were more self-actualized and creative.

In choosing interests, both high-original boys and girls low on IQ chose extracurricular activities more often than did the high-IQ students. On choosing descriptive profiles, 7 of the ll high-original boys selected the "social type." There appeared somewhat of a thema in this sub-study that the high-original student below the mean on intelligence was channeling his originality in social directions.



### Sub-Study

# The High Original Versus the Low Original

Since the main study yielded so little it was decided to add a sub-study which looked at the extremes of the groups on the different variables to compare those who were very high on each originality component with those who were very low on each originality component. Method

The data was first prepared for the 7090 computer by the GL BC Prep-Data Tape Preparer program written by E. S. Krasnow at the Computer Center at the University of California. The data was then run through the Gh BC "t"-Test - Comparison of two groups via the "t"-Test or U-test program written by E. S. Krasnow on March 2, 1963. It was decided to use the non-parametric Mann-Whitney U-test rather than the "t"-test for this data because many of the variables were ordinal rather than interval data, because the samples were very small and because the U-test is considered more powerful for this type of data. In terms of the power of this test, Siegel says, "If the Mann-Whitney test is applied to data which might properly be analyzed by the most powerful parametric test, the "t"-test, its power efficiency approaches 3h = 95.5% as N increases, and is close to 95% even for moderate sized samples. It is therefore an excellent alternative to the "t"test, and of course it does not have the restrictive assumptions and requirements associated with the "t"-test."(44)

# Sample

Mann-Whitney U-tests were run using the extreme groups on the composite originality score and each of its components for both boys and


girls. The highest 10 scorers on each component and the lowest 10 scorers on each component were compared for the boys. The highest 15 scorers on each component and the lowest 15 scorers on each component were compared for the girls. The results will now be discussed, using each component for boys and for girls and the significant differences found at the .01, .05 and 10 percent levels of confidence. The samples vary slightly from one another because of the computer program's method of breaking ties.

## Results

## A-E Remoteness

Boys. The boys who scored highest on remoteness on the A-E also scored significantly higher on uncommonness and the total A-E score and the composite originality score. They did not tend to be as fluent as the boys low on remoteness on the raw scores of the Consequences test. The boys high on remoteness did not have as high self-concepts of themselves as school learners as did the boys low on remoteness, nor did they rate themselves as being as open-minded. In terms of personality the boys high on remoteness tended to be dominant and individually resourceful. The high boys did not feel their parents expected them to be as successful in life as did the boys who scored lower on remoteness.

Girls. The girls who scored highest on remoteness also scored higher on the other ratings on the A-E test and on the composite originality score. In personality the girls who scored high tended to be high on factor C of the Cattell HSPQ, showing more ego strength, being calm and mature and on factor G being more conscientious and persistent.



## A-E Uncommonness

Boys. Boys who scored highest on uncommonness also scored significantly higher on the remoteness and total score ratings on the A-E test and on the composite originality score. They also tended to be less fluent on the Consequences test and more relaxed and composed than the boys scoring low on uncommonness.

Girls. The girls who scored highest on uncommonness also scored significantly higher on all parts of the A-E ratings and on the composite score. They tended to have higher hopes regarding their level of education than the low girls on uncommonness but they did not score as high on the California language test.

## A-E Cleverness

Boys. The boys who scored highest on cleverness also scored significantly higher on the total A-E score and on the composite originality score. The most clever boys seemed to come from high socioeconomic status homes, had fathers with higher levels of education, made better grades in school and tended to be more confident than boys who scored low on writing clever stories.

Girls. Girls who wrote the most clever stories also wrote more uncommon stories and scored higher on the composite originality score. These girls had higher levels of aspiration and expected to go further in college work than girls who scored low on cleverness. They also tended to have higher concepts of themselves as school learners and as critical thinkers. They made higher grade point averages and were chosen more frequently as the intellectuals by their classmates.



Table 38Significant Mann-Whitney "U"-Tests of High-Original<br/>versus Low-Original Boys and Girls on AE Remoteness

# Boys

	Me	ans	Z-Ratio	U	Level of	
Variable	High	Low			Significance	
A-E Remoteness	41.88	17.5	4.46	0.	•Ol A	
A-E Uncommonness	37.19	22.50	2.67	38.5	.Ol A	
A-E Total	109.38	69.17	3.34	24.0	.Ol A	
HSPQ Submissive vs. Dominant	6.13	5.00	1.88	55.5	.10 A	
HSPQ Group-dependent vs. individually resourceful	6.69	5.75	1.88	55.5	•10 A	
Parents' Success Expectations	3.31	3.58	-1.69	59.5	<b>.1</b> 0 B	
Sociometric Open-Mindedness	5.19	5.92	-1.88	55.5	.10 B	
Consequences Raw Score 1	4.63	6.00	-2.16	49.5	•05 B	
Consequences Raw Score 2	4.31	6.00	-2.07	51.5	•05 B	
Concept of Self as		-	- •	•		
School Learner	16.31	19.67	-1.95	54.0	<b>.1</b> 0 B	
Composite	308.69	275.42	2.83	35.0	.OL A	

High N = 16Low N = 12

# Girls

	Me	ans	Z-Ratio	U	Level of	
Variable	High	Low			Significance	
A-E Remoteness	50.00	10.00	4.34	0.	.01 A	
A-E Uncommonness	35.91	17.50	3.28	21.5	.Ol A	
A-E Cleverness	30.45	23.13	1.82	51.0	.OI A	
A-E Total	116.36	50.63	4.05	6.0	.Ol A	
HSPQ-C, Unstable vs. Mature HSPQ-C, Undependable vs.	5.09	4.12	1.68	54.0	•10 A	
Conscientious	7.09	6.06	1.95	48.5	.10 A	
Composite	326.00	272.63	3.55	16.0	•01 A	

High N = 11 Low N = 16

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ow-Original Boys	and Girls	on	A-E Uncommonness	а. — — — — — — — — — — — — — — — — — — —
	.ow-Original Boys	.ow-Original Boys and Girls	.ow-Original Boys and Girls on	.ow-Original Boys and Girls on A-E Uncommonness

# Boys

Variable	Mea	ans	Z-Ratio	U	Level of
	High	Low			Significance
A-E Remoteness	38.89	15.00	3.18	0.	.Ol A
A-E Uncommonness	49.44	10.83	3.18	0.	.Ol A
A-E Total	118.89	51.67	3.18	0.	•Ol A
HSPQ-Q4, Relaxed vs.					
Tense	3.56	5.50	-1.94	10.5	.10 B
Consequences Raw Score-2	3.44	5.50	-2.30	7.5	<b>₀05</b> B
Composite	316.11	256.33	3.01	1.5	A LO.

# Girls

Variable	Mea	ans	Z-Ratio	υ	Level of
	High	Low			Significance
A-E Remoteness	31.54	13.75	3.33	28.0	.Ol A
A-E Uncommonness	48.84	10.00	4.56	0.0	.Ol A
A-E Cleverness	38.46	22.19	3.18	31.5	.Ol A
A-E Total	118.08	45.94	4.56	0.0	.Ol A
Calif. Language	82.46	87.31	-2.00	58.5	•05 B
Future Plans - Hope	5.69	5.00	2.56	45.5	•05 A
Composite	327.23	267.38	4.12	10.0	.OL A

High N = 13 Low N = 16

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Table 40	Significant Mann-Whitney "U"-Tests on High-Original
	versus Low-Original Boys and Girls on A-E Cleverness

Boys					
	Mea	ans	Z <b>-Rati</b> o	U	Level of
Variable	High	Low			Significance
A-E Cleverness	48.89	11 <b>.11</b>	3•58	0.	•01 A
A-E Total	118.33	71.67	3.13	5.0	.Ol A
Socio-economic Status	2.00	3.56	-2.03	17.5	<b>.10</b> B
Father's Education	15.33	11.56	1.77	20.5	<b>.</b> 10 <b>A</b>
Grade Point Average	3.46	2.89	2.51	12.0	•05 <b>A</b>
HSPQ-0, Confident vs. Insecure	3.56	5.00	-1.94	18.5	.10 B
Composite	317.11	286.89	2.38	13.5	<b>.</b> 05 <b>A</b>
Utah N = C	)				

High N = 9Low N = 9

# Girls

Variable	Means		Z-Ratio	U	Level of
	High	Low			Significance
A-E Uncommonness	38.33	21.07	3.42	36.0	.Ol A
A-E Cleverness	43.89	10.00	4•79	0.	.Ol A
A-E Total	111.67	54.64	4.62	4.5	.Ol A
Occupational Aspiration	1.56	2.14	-2.20	68.0	.05 B
Grade Point Average	3.53	-3.24	1,71	81.0	.10 A
HSPQ-F, Serious vs.	6.61	5.57	1.98	74.0	•05 A
Happy-Go-Lucky				•••	
Intellectual Choices	18.33	5.07	1.69	81.5	.10 A
Future Plans - Expect	4.89	4.21	1.88	76.5	.10 A
Sociometric - Crit. Th.	3.39	0.71	2.18	68.5	.05 A
Plot Titles - Raw Score	6.28	3.86	2.70	55.0	.OI A
Concept of Self as School Learner	22.17	18.21	1.69	81.5	.10 A
Composite	329.11	268.57	4.60	5.0	•01 A

High N = 18 Low N = 14

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In personality they tended to be enthusiastic and happy-go-lucky and more fluent on writing titles to story plots.

## A-E Total

Boys. Boys who scored the highest on the total A-E ratings also scored significantly higher on all three ratings of remoteness, uncommonness, and cleverness and on the composite originality score. They scored higher on the general intelligence factor on the Cattell HSPQ but did not tend to be as fluent on the Consequences test as the boys who scored lowest on the A-E test. An unexplainable significant result here is that the high scorers on the A-E tended to have mothers with less education than the low scorers.

Girls. The girls who scored highest on the total A-E also scored significantly higher on each sub-score of it and on the composite originality score. The only other significant finding was that the highest scoring girls also had higher occupational aspirations. Plot Titles

Boys. Boys who scored the highest on the Plot Titles test also were more fluent in writing titles to the plot and were higher on the composite originality score. These high scorers came from lower status homes than the boys who scored low on Plot Titles and in personality tended to be shy and threat-sensitive rather than adventurous, and to be tough and realistic rather than esthetically sensitive.

Girls. The girls who wrote the most clever plot titles scored higher on the composite originality score, were verbally fluent and also tended to be tough and realistic.



Table 41Significant Mann-Whitney "U"-Tests on High-Original<br/>versus Low-Original Girls and Boys on Total A-E

Boys

Variable	Me	ans	Z-Ratio	υ	Level of
	High	Low			Significance
A-E Remoteness	41.00	21.67	3.46	7.5	•Ol A
A-E Uncommonness	46.00	17.08	3.82	2.0	•Ol A
A-E Cleverness	42.00	20.42	3.23	11.0	.Ol A
A-E Total	129.00	59.17	3.96	0.0	•Ol A
Mother's Education	11 <b>.1</b> 0	13.25	-2.01	29.5	•10 B
HSPQ-B, Dull vs. Bright	9.10	8.33	1.81	32.5	•10 A
Consequences-Raw Score	4.70	5.92	-1.71	34.0	•10 B
Composite	321.70	272.75	3.40	8.5	.01 A

High N = 10Low N = 12

# Girls

Variable	Me	ans	Z-Ratio	U	Level of
	High	Low			Significance
A-E Remoteness	41.67	12.00	4.32	1.5	.01 A
A-E Uncommonness	43.33	12.33	4.39	0.0	•01 A
A-E Cleverness	38.75	16.67	4.25	3.0	.01 A
A-E Total	123.75	41.00	4.39	0.0	.01 A
Occupational Aspiration	1.33	1.87	-1.95	50.0	.10 B
Composite	333.75	263.00	4.29	2.0	

High N = 12Low N = 15

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Table 1:2Significant Mann-Whitney "U"-Tests on High-Original<br/>versus Low-Original Boys and Girls on Plot Titles Test

# Boys

Variable	Mea High	ns Low	Z-Ratio	U	Level of Significance
Plot Titles	137.73	28.89	3•76	0	•01 A
Socio-economic Status	3.82	2.33	2.17	21.0	•05 A
HSPQ-H, Shy vs. Adventurous	4.55	6.11	-1.82	25.0	•10 B
HSPQ-I, Tough vs. Sensitive	2.18	3.78	-2.32	19.0	•05 B
Plots Raw Score	6.00	3.33	2.81	12.5	.Ol A
Composite	312.18	286.11	1 <b>.</b> 78	26.0	A OL.

High N = 11 Low N = 9

# Girls

Variable	Means		<b>Z-Ratio</b>	U	Level of
	High	Low			Significance
Plot Titles	179.29	27.81	4.66	0.	•01 A
EPQ-I, Tough vs. Sensitive	5•79	4•38	2•33	56.0	<b>.</b> 05 <b>A</b>
Plot Titles, Raw Score	6.64	3.44	3.80	20.5	•Ol A
Consequences 1-Raw Score	7.50	5.69	2.04	63.0	<b>.05 </b> ▲
Composite	318.07	281.13	3.26	33•5	A IO.

High  $N = 1l_1$ Low N = 16

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## Consequences

Boys. Boys who scored highest on the Consequences test tended to be first-born children with high grade point averages, and were more sober and serious. They were fluent in writing consequences to the test and were seen by their classmates as good critical thinkers. They had mothers with high-level educations.

Girls. In contrast to the boys, the girls who scored highest on the Consequences test had mothers with a significantly lower number of years of education. There was no apparent explanation for this difference. These girls were fluent in responses to both the Consequences and the Plot Titles tests. They did not have high concepts of themselves as school learners and they were not chosen frequently as social choices by their peers.

## Sociometric

Boys. Boys who were selected as most creative by their peers were also selected most often as being intellectuals, good critical thinkers and as being open-minded. These boys tended to be the firstborn children in the family.

Girls. Girls who were selected most frequently as being creative by their peers were also selected as being the most social, most intellectual, and the best critical thinkers. These girls also rated themselves as being open-minded and good critical thinkers and had a high self-conception of themselves as school learners. In reality the creative girls did have higher grade point averages and higher scores on the language, reading, and critical thinking tests. These girls came from high status homes and had parents with significantly



Table 43 Significant Mann-Whitney "U"-Tests on High-Original versus Low-Original Boys and Girls on Consequences Test

## Boys

Variable	Means		Z-Ratio	U	Level of
	High	Low			Significance
Consequences	261.11	67.00	3.67	0.	•01 A
Mother's Education	13.33	11.30	2.04	20.0	-05 A
Ordinal Status	1.55	2.20	-1.71	24.0	-10 B
Grade Point Average	3.43	2.85	2.19	11.5	-05 A
HSPQ-F, Serious vs. Happy-Go-Lucky	5.78	4.30	1.88	22.0	.10 A
Sociometric - Crit. Th.	5.22	2.60	1.71	24.0	-10 4
Consequences 2-Raw Score	6.56	3.20	3.10	7.0	-01 A
Composite	317.33	286.70	2.12	19.0	.05 A
High N = 9	,				

Low N = 10

### Girls

Variable	Means		Z-Ratio	II	Level of
	High	Low		°,	Significance
Consequences Mothemia Education	266.67	64.29	4.58	0.	.01 A
Sociemetric Control	12.21	13.71	-2.05	58.0	•05 B
Choices	5.07	10.86	-1.90	61.5	•10 B
Consequences 1 - Raw Score	7.80	5.57	2.29	52.5	-05 A
Consequences 2 - Raw Score	8.60	4.50	3.78	18.5	-01 A
Self-Concept as School Learner	20.87	24.71	-2.01	59.0	.05 B
Composite	320.47	287.14	2.68	43.5	.OI A
TT2 . 1. 37 . 3 .					

High N = 15Low N = 14

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Table 14Significant Mann-Whitney "U"-Tests on High-Original<br/>versus Low-Original Boys and Girls on Sociometric

## Boys

Variable	Means		Z-Ratio	U	Level of
	High	Low			Significance
Sociometric - Creative	13.22	0.00	4.08	0.	•Ol A
Ordinal Status	1.56	2.19	-1.82	40.0	•10 B
Sociometric - Intellec-	-	-		•	-
tual Choices	46.00	2.88	4.08	0.0	.Ol A
Sociometric - Open-Minded	6.89	1.25	3.73	6.0	OL A
Sociometric - Critical Th.	8.67	0.94	3.28	IJ₁•0	.OI A
High $N = 9$					

Low N = 16

## Girls

Variable	Means		Z-Ratio	U	Level of
	High	Low			Significance
Calif. Language	33.33	25.47	2.07	149.5	•05 A
Socio - Creative	15.40	0.	5.48	0.	-07 A
Calif. Reading	44.93	42.44	1.85	159.0	-10 A
ACE Critical Thinking	37.60	31.59	3.18	100.5	-07 A
Socio-economic Status	2.53	3.91	-2.77	118.5	-01 B
Father's Education	15.13	12.19	3.63	81.0	.07 4
Mother's Education	14.20	12.25	2.13	146.5	-05 A
Ordinal Status	1.40	2.06	-2.27	1,0.5	-05 B
Grade Point Average	3.81	3.36	3.50	86.5	-07 A
Socio - Intellectual	-				
Choices	<b>Ц1.80</b>	3.22	5.48	0.	.07 A
Socio - Social Choices	10.93	5.63	2,51	130.0	-05 A
Future Plans - Expect	4.80	4.25	2.03	151.0	.05 A
Future Plans - Hope	5.40	L.88	1.85	159.0	-10 A
Attitude - Critical Th.	3.20	2.66	2.03	151.0	-05 A
Attitude - Open-Minded	7.67	2.13	L.30	51.5	
Sociometric - Crit. Th.	8.00	0.11	4.91	25.0	
Concept as School Learner	24.20	18.03	2.76	119.0	
Composite	329.47	292.59	3.61	82.0	.01 A

High N = 15Low N = 32

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higher-level educations. These girls both expected and hoped to go to college and do graduate work. As with the boys, the girls selected as most creative tended to be first-born children in their families. Composite

Boys. The boys having the highest composite originality scores also scored significantly higher on all the originality components except the Guilford Tests of Plot Titles and Consequences. They were chosen significantly more often by their peers as being intellectuals, as being creative, as being open-minded and as being good critical thinkers. They tended to score higher on the ACE Critical Thinking test and to get higher grades than the less original boys.

Girls. The girls scoring highest on the originality composite also scored significantly higher on all the components of the composite score. They were chosen more often as intellectuals by their peers and as better critical thinkers. They tended to be more flexible than the low scoring girls and in personality traits were more enthusiastic and happy-go-lucky and more adventurous. They tended to have good concepts of themselves as school learners and were quite fluent verbally. Summary

In reviewing the significant differences between those who scored high and those who scored low on the different components of the composite originality score, the most noticeable finding was that those who tended to score high did so consistently on all the originality variables. Even though the Guilford Tests were not significantly different for the boys the trend was the same. These results give some face validity that the instruments were tapping the same thing.



# Table 45Significant Mann-Whitney "U"-Tests on High-Original<br/>versus Low-Original Boys and Girls on Composite<br/>Original Score

Boys					
	Means		Z <b>-</b> Ratio	U	Level of
Variable	High	Low			Significance
A-E Remoteness	40.00	22.00	2.91	11.5	.Ol A
A-E Uncommonness	39.50	18.00	3.02	10.0	.Ol A
A-E Cleverness	37.00	21.50	2.31	19.5	.05 A
A-E Total	116,50	61.50	3.29	6.5	OI A
Sociometric-Creative	6.50	1.30	1.85	25.5	.10 A
ACE Critical Thinking	36.60	30.40	2.08	22.5	.05 A
Grade Point Average	3.42	2.97	2.53	16.5	.05 A
Intellectual Choices	22.20	6.10	2.19	21.0	•05 A
Open-Minded Choices	3.80	1.50	2.08	22.5	.05 A
Critical Th. Choices	5.50	1.40	1.81	26.0	.10 A
Composite	331.70	260.60	3.78	0.0	•Ol A

High N = 10Low N = 10

# Girls

	Mea	ans	Z-Ratio	U	Level of
Variable	High	Low			Significance
A-E Remoteness	36.67	15.38	3.92	12.5	•Ol A
A-E Uncommonness	<b>3</b> 5.00	13.85	4.05	9.5	.01 A
A-E Cleverness	35.67	17.69	3.82	11.5	A IQ.
A-E Total	106.67	46.92	L.35	3.0	-07 A
Plot Titles	134.67	48.85	4.49	0.0	-07 A
Consequences	208.67	117.69	2.99	32.5	-01 A
Socio-Creative	10.20	1.31	2.81	36.5	-07 A
Rigidity	90.20	99.15	-2.17	50.5	-05 B
HSPQ-F, Serious vs.					
Happy-Go-Lucky	6.20	5.08	1.75	59.5	-10 A
HSPQ-H, Shy vs.	_	•		// •/	
Adventurous	6.40	2.10	2.33	h7.0	-05 A
Intellectual Choices	28.80	9.08	2.37	16.0	.05 Å
Critical Thinking Choice	s 4.87	2.08	1.93	55 5	
Plots - Raw Score	6.13	3.62	3.29	26.0	.01 A
Consequences 1-Raw Score	7.53	5.62	2.39	15.5	-05 A
Consequences 2-Raw Score	7.20	L_08	3.22	27.5	
Positive Self Concept	37.13	34.00	1.89	56.5	
Composite	344.47	252.31	4.49	0.0	•01 A

High N = 15 Low N = 13 · · · · ·

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The relationships between the originality variables and the other data are equivocal but seem to present something of a theme. The more original boy tended to be the first-born child in his family, came from a high status home and had parents with high-level educations. He was a good critical thinker and was seen by his peers as an intellectual. He got very high grades in school and tended to be enthusiastic and confident. The more original girl was chosen by her peers both as being very social and being very intellectual. She was an adventurous and enthusiastic girl who got very good grades in school and had a high level of aspiration both in educational and vocational pursuits. She had a high concept of herself as a school learner.

The picture of the original student which emerges in this study is quite disparate from what has been found in most research. One gets the flavor from this study that the originality instruments were tapping more the enthusiastic, high achieving, high aspiring students who might most aptly be designated as good students rather than as creative intellectuals.

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#### Chapter V

#### Summary and Conclusions

#### Purposes

The purposes of this study were twofold: (1) to identify within a group of intellectually superior adolescents those students who perform consistently in a relatively original or creative way; and (2) to establish the relationship between a composite originality measure and a variety of personality, achievement, intellectual, and personal characteristics in order to find a way to describe the original in contrast to the less-original adolescent.

Two sub-studies were performed to investigate the differences between those scoring very high and very low on the originality measures, and to contrast those who scored high on originality but low on intelligence with those who scored high on intelligence but low on originality.

#### Hypothesis

The principal hypothesis in this study was that the consistently original or creative student could be identified and that he would differ in a number of characteristics from the consistently non-original student.

#### Sample

The sample consisted of 125 adolescents from the public schools of Lansing, Michigan. The group included 42 boys and 83 girls who were tested at the end of the ninth and beginning of the tenth grades. These students were being studied and the data collected under a Cooperative Research grant by Elizabeth Drews. The mean IQ for the sample was



133.46. The sample can best be described as academically talented rather than gifted because a few were included with IQ's below 120 who were achieving well in school and who were reading two years beyond their grade level. The grade point average for the group was 3.43 on a 4-point system. The distribution as to socio-economic status as rated by the Warner, Meeker, Eels scale was quite diverse, with 55 percent in the top three categories and 45 percent in the lower three categories.

#### Measures

The criterion of originality was a composite score derived from four measures: (1) Guilford Plot Titles Test; (2) Guilford Consequences Test; (3) 3 ratings of a story of a fictional person the student would like to be; and (4) a sociometric rating of creativity. The first three components of the composite originality score were scored subjectively by two raters.

The personality measures were the Rokeach Dogmatism and Rigidity Scales, the Attitude Toward Self-as-School-Learner, and Cattell's High School Personality Questionnaire.

Other measures were the ACE Critical Thinking Test, the California Achievement Test for Reading and Languages, and grade point averages.

A number of personal history items and preferences were obtained by use of two questionnaires, Student Interest Survey I and Student Interest Survey II, both developed and administered by Dr. Drews in her study. Included in one questionnaire was a sociometric device to obtain peer ratings on several measures.



#### Statistical Procedure

The composite originality score was obtained by changing its components to standard scores and summing them. This was done by using the G1-BC-Z CON program on the 704 computer. A matrix of correlations was obtained between all the variables for the entire sample for the boys and for the girls by use of the BC-Cor-Program which computes Pearson Product Moment Correlations on the 704 computer. For the substudy contrasting the highly intelligent students with the highly original students, Fisher "t"-tests were run between the means on each variable. For the sub-study comparing those high versus those low on the different measures of originality the G4 GC "t"-test (U test) program was used on the 7090 computer. The Mann Whitney U-test was used rather than the "t"-test. The five percent level of confidence was used as the level of significance unless otherwise stated.

#### Results

1. Criterion of Originality. When the entire sample was used, there were no significant correlations between the components of the originality composite score (i.e., the three ratings for remoteness, uncommonness, and eleverness of response on the stories each student wrote on a fictional person he would like to be, the number of times a student was selected by his peers on a sociometric device as being creative, and the scores on Guilford's Plot Titles and Consequences Tests). This finding indicated that for the total sample the four measures were independent. However, in the second sub-study, those students with the highest composite scores also scored higher on each of the

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component measures of originality.

2. Originality Versus Intelligence. It was hypothesized that the more original students would score higher on intelligence tests than the less original students. There were no significant correlations for either boys or girls between the originality variables and Stanford-Einet IQ's for this homogeneous sample of bright students.

3. Originality Versus Achievement. It was hypothesized that the more original students would be higher achievers, both in achievement test scores and grade point averages, than less original students. There was a definite sex difference on this result; all the achievement test scores for the boys (California Language, California Reading, and ACE Critical Thinking) were significantly correlated to the composite originality score.

4. Originality Versus Personality. Although a few statistically significant correlations were found, the following results must be considered tentative because the limited number of correlations obtained could have occurred by chance.

On the Cattell HSPQ the only factor significantly related to originality for the entire population studied was the H factor, threctia versus parmia. Those who were more original tended to score high on parmia and could be described as adventurous and thick-skinned as compared to being shy, timid, and threat-sensitive.

For the girls, factor H was the only personality characteristic significantly correlated with any of the originality measures. Since it also related positively to the number of creative choices for the girls on the sociometric device, it appeared that those girls who were most adventurous in their behavior in school were seen by their peers


as being the most creative.

The data for the boys were more descriptive but were equally likely to have occurred by chance. Four factors on the HSPQ had significant relationships to originality measures for the boys. From these relationships the original male academically talented adolescent was described as adventurous, esthetically sensitive, excitable and unrestrained, secure, confident, and resilient.

5. Originality Versus Concept of Self-as-School-Learner. The only originality measure to which the Concept of Self-as-School-Learner was related was the number of peer choices on the creative score of the sociometric for the girls. This finding indicated that the girls who had a high concept of themselves as learners, as being creative, open-minded and good critical thinkers must have demonstrated this in class in a way that convinced their peers it was so.

6. Originality Versus Dogmatism and Rigidity. Although it was hypothesized that the original students would be less rigid and less dogmatic on the Rokeach scales than the non-original students, the correlations did not prove significant with the exception that dogmatic boys were not selected as being creative by their peers.

7. Originality Versus Personal History Items.

Ordinal Status. In this academically talented group, 46 percent were first-born or only children, 24 percent were middle-born, and 30 percent were the youngest children in the family. These results were the same for the boys and girls, and no differences were seen when they were divided above and below the median for originality except



for the middle-born children. No explanation could be offered as to why 14 of the 20 middle-born girls were above the median for originality, and 8 of the 10 middle-born boys were below it.

<u>Future Life Goals</u>. On Student Interest Survey II the students were asked to select from a list of fifteen, the three things most important to them in their future life. The four most popular choices for the boys were these: (1) I want to have a happy home life; (2) I want to make lots of money; (3) I want to be a respected, hard-working citizen; (4) I want to be an important executive, head of an organization. The more original boys differed from the less original boys by choosing "I want to work in science or in the arts or in some scholarly field" as their third choice.

The four most frequently chosen items for the girls were (1) I want to have a happy home life; (2) I want to help others all I can; (3) I want to be conscientious, persevering, and dependable in my work; (4) I want to be a respected, hard-working citizen. No differences occurred between the girls when divided on originality.

An interesting sex difference was the humanitarian-nurturant choice of the girls as opposed to the materialistic one of the boys. For the more original boys the achievement orientation was connected more directly with scholarship and scholarly activities, whereas the more original girls were still conforming in their choices to the stereotyped feminine role.

One important sidelight here appeared in the students' responses to the questions, "How much longer do you plan to go to school



(expect), (hope)?"; and "What do your parents expect you to accomplish in life?"; and "What do your parents expect of you in school?".

Ninety percent of the boys and eighty-eight percent of the girls said their parents expected them to get A's and B's in school. Forty-eight percent of the boys and twenty-five percent of the girls said their parents expected them to be very successful in life, which suggests that the girls follow parental expectation to do well in school, but they do not necessarily transfer their expectations to later life as the boys do. There were no differences on these results when the groups were divided on the originality composite score. The most important fact learned on these questions was that the more original girls differed from the less original girls on how much education they "hoped" to attain, whereas the boys' expectations and hopes were much more in line with each other. Fifty percent of the less original girls "expected" to finish college or do some graduate work, but seventy-one percent "hoped" to do this. Of the more original girls, sixty-six percent "expected" to complete college or do graduate work, but ninety-five percent "hoped" to do this. The implication here is that the academically talented girls hoped for more education than they really expected to get, and that the more creative girls had even stronger hopes than the less creative girls.

Interests. One item on the questionnaire completed by these students concerned their choice of three main interests from a group of six listed. The only difference was a sex difference; the first choice for the girls was "learning", and for the boys "school subjects."



Ninety-six percent of the girls chose "friends" as one of their three choices, but only sixty-six percent of the boys did this. This again pointed out the more generalized social interests of the bright girls in contrast to the boys.

Descriptive Profiles. Each student was to check one of four descriptive profiles which he felt best described himself. The profiles were categorized as follows: (1) the good student; (2) the creative intellectual; (3) the rebel; and (4) the social type. The results were similar for the boys and the girls, regardless of whether they were more or less original. Fifty-nine percent saw themselves as good students, eighteen percent as intellectuals, two percent as rebels, and twenty-one percent as social types. Parallel research by Dr. Elizabeth Drews has found these profiles to yield more rewarding results. Using the selection of the creative intellectual profile as a criterion of creativity, the relationships found between it and the Omnibus Personality Inventory, the Allport-Vernon-Lindzey Study of Values and items on her Student Interest Survey II, yielded a description of creative boys and girls similar to descriptions found in other creativity projects.

<u>Occupational Aspirations</u>. The majority of these talented students chose vocations known and stereotyped as to sex. Seventynine percent of the boys' choices were included in five fields: engineering, science, medicine, law, and military service. Sixty-five percent of the girls chose teaching, nursing, or secretarial work.

The more original boys more often selected a science program, and

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the less original boys more often selected engineering. This seemed to imply more theoretical interests among the more creative boys and more applied interests among the less creative boys. Similarly, the more original girls tended toward more theoretical occupations (science and science-related fields), whereas the less original girls tended toward more applied fields (nursing, and secretarial work).

<u>Sociometric Choices</u>. Two main ratings were derived from the socio-metric device--a social rating and an intellectual rating. The girls who were chosen as most intellectual actually scored higher in achievement tests, had parents with high level educations, had fathers in high level jobs, thought well of themselves as school learners, and got good grades. Another significant result was that the girls who were selected as intellectuals by the group were also selected as the most liked socially. This latter finding was not true for the boys.

# Summary and Results of the Sub-Studies

The Highly Original Versus the Highly Intelligent. This substudy was for the purpose of differentiating those students who scored above the mean on originality but below the mean on intelligence from those who scored above the mean on intelligence but below the mean on originality. The high-IQ group consisted of 31 students (9 boys and 22 girls), and the high-original group consisted of 31 students (11 boys and 20 girls). The mean IQ for the high-IQ group was 142.81 and for the high-original group, 123.97. · · · · · · -

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The high-original group had a mean composite originality score of 323.42, and high-IQ group a mean of 274.19. The differences between the groups on IQ and originality composite scores were significantly different. Based on their discrete groups, Fisher "t"-Tests were computed between the means on all the variables for the groups as a whole and for boys and girls separately.

On all the components of the originality composite score, the high-original students scored higher.

On the achievement tests, the high-IQ group of girls scored significantly higher than did the high-original girls. No differences appeared between the boys. Both groups operated on similar parental expectations as to success in life and achievement of high grades in school. In fact, the high-original boys felt their parents expected them to be even more successful in life than did the high-IQ boys.

On the Rokeach Rigidity Scale high-original students scored significantly higher than the high-IQ students, a finding which contrasted with the trend for the total sample; they appeared warmer and more sociable, were more adventurous and thick-skinned, and were more submissive in terms of the Cattell HSPQ. The high-original girls also scored higher on having a high self-sentiment on the Cattell HSPQ.

In terms of interests the high-original students, both boys arad girls, selected extra-curricular activities more often than did the high-IQ students. As in the main study, most of the students

regarded themselves as "good students" on the descriptive profile choice. However, 7 of the ll high-original boys considered themselves as "the social type". It may be that the highly original boys who were less intelligent tended to direct their originality into social channels. The original boys below the mean on IQ selected a variety of occupational aspirations, some of which were more connected with interpersonal relations, but did not seem to be directed toward straight science programs. The high-IQ group most often chose the more applied science programs. No differences appeared between the girls on occupational aspirations.

The theme running throughout this sub-study is that the student above the mean on originality and below the mean on intelligence seems to be more of a social leader than a creative intellectual.

<u>The High original Versus the Low Original</u>. This sub-study was performed to see how the students who scored the highest on the components of the composite originality score differed from those who scored the lowest on the different measures. The 10 highest scorers among the boys were compared with the 10 lowest scorers on each component and the composite originality score. The 15 highest scorers among the girls were compared with the lowest 15 scorers on each component and the composite originality score. The Mann Whitney U test was used as the statistic to test the differences between the means on the variables.

The most significant finding in this study was that both boys and girls who scored high on any one originality measure tended to

score high on all the others. The only two measures not significant were Guilford's tests for the boys. This gives some face validity to using the instruments.

The A-E Test: On the A-E Remoteness score, boys who scored highest on the remoteness rating tended to be dominant and individually resourceful. The girls who scored highest tended to be calm and mature, conscientious and persistent.

On the A-E Uncommonness score, boys who scored high tended to be relaxed and composed. The girls who wrote the most uncommon stories had very high hopes of doing graduate work.

On the A-E Cleverness score, the boys who wrote the most clever stories came from high socio-economic status homes, had parents with high level educations, made very high grades, and were very confident. The girls writing the most clever stories had high aspirations of expecting to do college level work, made good grades, saw themselves as good school learners and critical thinkers, were seen by their peers as intellectuals and tended to be enthusiastic and happy-go-lucky.

On the A-E Total score, since somewhat different characteristics appeared for the three ratings on the A-E when they were combined, no clear picture emerged to describe the students who had a high total score.

On the Plot Titles test, the boys who wrote the most clever titles to the story came from lower status homes and tended to be shy and threat-sensitive and tough and realistic. The girls high on Plot Titles

also tended to be tough and realistic.

On the Consequences Test, the boys who scored highest on the test were first-born children, got high grades, had mothers with high level educations, were seen as good critical thinkers by their classmates and tended to be enthusiastic and happy-go-lucky. Girls who scored high tended to have mothers with lower levels of education which was the opposite of the finding for the boys. These same girls were seldom selected as social choices on the sociometric and had significantly lower concepts of themselves as school learners.

On the Sociometric Rating on Creativity, the boys most often selected as creative were also most often chosen as the intellectuals, the best critical thinkers, and the most open-minded by their classmates and tended to be the first-born children in their families. The girls rated as creative were also rated high on all the sociometric choices and rated themselves in the same way. These girls got high grades, did better on all the achievement tests, came from high status homes with well-educated parents, were first-born children, and had high aspirations to do graduate work.

Composite Originality Score. The boys scoring highest on the composite score made significantly higher grade point averages and were selected by their classmates as the most intellectual, the most open-minded and best critical thinkers. The girls who scored highest on the composite score were chosen by their classmates as intellectuals and good critical thinkers. They tended to be less rigid, more enthusiastic and adventurous, and had higher concepts of themselves as

good students than did the lowest scorers on the composite score.

This sub-study was performed to try to see why the different measures used to tap originality did not correlate for the total sample. The results support the fact that they do correlate at the extremes of the group. This sub-study still does not help to clarify what characteristics differentiate the high versus the low scorers on the different components of the composite score. Since most studies find personality characteristics which differentiate the creative versus the non-creative person, it is hypothesized that using a sample restricted by intelligence and using the Cattell HSPQ, which has a fairly restricted range, as the personality measure of the original adolescent may well have decreased the variability possible.

#### Conclusions

To draw conclusions from this study is very difficult. To generalize from it would be inappropriate. The main hypothesis that a group within this select sample of bright students could be identified as consistently scoring high on various proposed measures of originality was not found to be the case. Since there were not significant relationships between the various measures of originality this throws doubt not only on whether these were adequate measures but also on the worth of combining them into a composite score.

When using only those students who scored highest and lowest on the originality variables, however, there was consistency in the data in that those who scored high did so m all the measures. It looks as

if using a sample restricted on intelligence was a limitation in design. Stretching the ratings out into more categories using specificity of response as a differentiating criterion may well have been an error. It seemed to produce a halo effect on the raters to score higher the more verbally eloquent responses. The third limitation was using the Cattell HSPQ as the personality instrument since it too is quite brief and has a restricted scoring range and this restricted variability.

For the above reasons the results of this study were equivocal, for example, with the personality measures, more correlations were significant than would be expected by chance. It may also be hypothesized that with the restrictions on the sample and the data that the results are only minimal estimates of what might have been found, but the directions of findings of further studies cannot be predicted. For these reasons, the section below on conclusions must be viewed with caution.

Original Boys. Looking at the results for the entire sample, although the results are by no means clear cut, there are indications that the more original adolescent boy seems to achieve well in school in terms of grades and scores higher on standardized tests than does the less original boy. In terms of personality, he seems to be adventurous, esthetically sensitive, excitable and unrestrained, secure, confident, and resilient. The more original boy seems to have a high level of aspiration which tends more toward theoretical scientific fields, whereas the less original boy tends more toward an applied science career.

Original Girls. The results of this study yielded even less of a description of the girls than of the boys. One pattern indicated by this study suggests the more social nature of the girls, their clinging to the stereotyped feminine role of wife and mother, and their primary desire for a happy home life. The original girls are more adventurous and thick-skinned than the less original girls on the Cattell HSPQ, but this was the only personality variable significant on this test. Although these girls feel their parents expect them to be very successful in school, they do not transfer these expectations to their future life; however, the more original girls do have hopes of doing graduate work. Even at this young age, it appears the talented girls are being smothered by the female role rather than encouraged to use their academic talents. The primary interest with regard to school for original girls is "learning", and as with original boys, original girls more often select theoretical and science-related occupations.

Girls who are considered most social by their peers are also considered the most intellectual. This finding, in contrast to that for the boys, may account for the fact that the same measures which yielded descriptive results for the boys were not so descriptive for the girls; that is, it implies a more conforming nature which requires them to strive more toward fulfillment of the feminine role rather than seek expression in more individual terms.

High-Original Versus High-IQ Students. The high-original group, who scored below the mean on IQ, in contrast to the high-original boys in the main study, tend to be quite social. The boys describe themselves as "the social type", and both boys and girls have high social rating

on the sociometric measure. As a group they are much more interested in extra-curricular activities than the high-IQ group; on the personality measures, the high-original-low-IQ group appear more adventurous, warmer and more sociable, and more submissive. The girls also have a high self-sentiment. The high-IQ group and the high-original group achieve equally well in grades, but the high-IQ girls tend to do better on standardized achievement tests.

In that the high-IQ group comes from homes with higher education levels and the high-original group comes from higher status homes, there are implications of differences in upbringing which suggest areas for further study.

High Original Versus Low Original. A consistent picture of personality and personal history items did not appear on the various variables to differentiate the high scorers versus the low scorers on the originality measures. Again the results were scanty and in places conflicting and unexplainable, yet a theme runs through the various significant findings for both boys and girls.

The picture that emerges for the original boy is that he gets very high grades, is seen by his classmates as an intellectual and comes from a high status home with parents having high level educations, and tends to be the first-born child. In personality he tends to be dominant, individually resourceful, relaxed and confident. The more original girl likewise tends to get high grades, is seen as an intellectual, comes from a high status home, is a first-born child, sees herself as a good school learner, and has high educational aspirations. In personality she tends to be enthusiastic, adventurous, conscientious and

mature. The students who score highest on the originality measures, both boys and girls, tend to do so consistently.

In the sub-study of the extreme groups, both boys and girls who scored highest on the originality measures were seen by their peers as intellectuals and were not rated high as social choices. They tended to be high-aspiring students educationally and vocationally and were interested in the theoretical rather than the applied. For the most part, however, it seems the originality instruments used to isolate the original student actually did more to identify what would usually be called "the good student", who achieves well in school, is conscientious and persistent in his schoolwork, probably dominates class discussions and comes from high status homes with well-educated parents.

### Implications for Future Research

In the main study, since the various measures of originality did not correlate, it was very difficult to explain the results which did occur. In part the results of the study may have been affected by the methods in which the originality instruments were rated. Using specificity of response as a dimension for further discrimination to spread the scores over a wider range may well have been an error in judgment on the part of the raters. It could be hypothesized that in so doing the raters were unduly affected by word usage and the academic talents of the subjects.

In relating the components of the composite score and the composite score itself to the intelligence, achievements, personality, and personal history items for the whole group provided very few results to describe the more original adolescent in contrast to the less original adolescent. Limitations in the selection and in the size of the sample, possible

biases in raters' judgments, and the restricted scoring range of the personality instruments used all seemed to contribute to limiting possible results. It seemed using extremes of the group as in the sub-studies in this thesis might provide a more useful approach, except that here they had to be very small groups. Yet even in these extremely small samples important discrepancies did appear and there was relative consistency of performing originally on all the components of the composite score when extreme composite scores were used.

In retrospect this thesis also brings forth questions as to the usefulness of Guilford's tests, and the usefulness of combining the four originality instruments used into a composite score. - All the measures of originality in this study were basically influenced by verbal aptitude. Even the sociometric creative choice was probably unduly influenced by classroom verbal participation. A broader definition of creativity might have produced results more comparable to current fruitful research. In current research non-aptitude measures centering around divergent thinking, motivational and stylistic life patterns and personality traits seem to be the most productive areas of investigation.

Guilford's single factor tests seem to be tapping more spontaneous novel responses, whereas current literature stresses that creative accomplishment is not only producing a novel response but adapting it to reality, elaborating on it, developing it and showing a sustained endeavor to complete a task. Either a more diverse criterion of creativity must be used than just verbal tests or else one possibility for future research would be the use of a criterion of creativity which would include a wide variety of originality instruments emphasizing nonverbal as well as verbal facility. Another direction research could take would be to in-

vestigate the characteristics of a "by definition" group of creative students; such as selecting samples of students with demonstrated artistic, scientific, literary, dramatic, or musical creativity. This could be done on a cross sectional basis and it could also be used for a longitudinal study of development and persistence in creative pursuits.

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APPENDIX A

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#### APPENDIX

Rating Procedures

## Introduction

This chapter concerns the rating of all the measures of originality which required subjective judgments. In each case ratings were made by two raters so that correlations of reliability could be determined.

Before the independent ratings were begun, extensive discussion and trial ratings were performed. A sample of responses was pulled at random from the population of responses for a given test and rated with concurrent discussion for defining of categories on the rating scale. Subsequent to this, all the responses were rated independently by each rater. The subject's score was the average of the scores assigned by the two raters.

In the following pages each measure of originality is described separately with regard to (a) the nature of the test, (b) the categorles as defined by the raters and, (c) examples falling in each category.

It was noted throughout the rating process that the student's ability to give original responses was related to his ability to interpret the adult world with a maturity beyond his years. That is, high quality responses were related to the adolescent's ability to Conceptualize beyond the scope of the resources of his immediate social.

academic, and personal environment. This implies a developmental continuum for originality and a relationship to the ability to reason and think critically.

Originality in adolescents seems to be different than originality in adults, in that their powers of conceptualization are less advanced. A large proportion of the responses in each rating were of very poor quality. Responses to these tasks calling for original thinking by an adult group of superior intelligence would be of far better quality because of their ability to grasp the situation as defined. The adolescent in the same length of time had to grasp the situation and change his frame of reference from that of a 15 year old to that of an adult in order to produce responses of high quality. This required not only the ability to think, but flexibility in transcending their own immediate environment. It was necessary for the raters to continually keep in mind that the concept in a response was the essence to be rated rather than the phraseology except in the cleverness ratings where literary talent was important. In refining the categories of the rating scales, continuous attention had to be paid to the difference between the adolescents' and the adults' immediate world.

#### I. Consequences Test

On this test, the subject was to write what would happen if specifically defined changes were to take place. He was to list as many consequences or results of these changes as he could to the two following situations: (a) what would happen if pills were developed which Would substitute for food? and (b) what would happen if everyone Would always tell the truth about everything?

Guilford found this test to have moderately high loadings on two factors: fluency of ideas, and originality. His scoring system was to rate each response as either immediate or remote to the situation as defined. The remoteness score was one of the three factors of originality and the immediate or direct response score was a measure of ideational fluency.

In order to further differentiate quality of responses, a threepoint scale was used for scoring the test in this study. Discriminations of a higher order than a three-point scale could not be defined for this age group. Each response was scored for remoteness, the most remote received scores of three and the most immediate receiving scores of one. Those judged most remote occur farther sway in the time dimension in relationship to the situation as defined. The score for originality was the sum of the responses given scores of two and three. The numbers of responses given scores of one was a measure of fluency.

In the training session held prior to the independent ratings, it became apparent through discussion that the ability to produce remote responses seemed to be correlated with the developmental principles of concept formation. The most immediate responses were often very direct, highly personalized, misinterpretations of the situation, or of such poor quality that it was evident that little thought was involved. The three-point scale was developed to differentiate immediate veraus remote responses as judged on the dimension of time, incorporating quality and specificity of differentiation in the subject's actual grasp of the concept as given. This differentiation was dependent in part on the rater's interpretation of the subject's ability to verbalize his concept understandably in writing. Therefore, the literary quality had to be continually kept in mind by the raters so as not to produce any artificial effect on the ratings. The specificity of the consequence seemed to illustrate well the degree of thinking ability or the ability to conceptualize by the subject. The best responses were in specified terminology and seemed indicative of high level conceptualization showing a clarity of thinking on the issue.

### Consequences 1

"What would happen if pills were developed which would substitute for food?"

#### A. Rating 1

Responses which were judged the poorest on the continuum were those which misinterpreted the situation; for example, answers which saw food as completely replaced by the use of pills. These typically included answers which had immediate connections to the consumption, distribution or manufacture of food. These responses most often were of very poor quality and used definitive qualifying words such as no, no more, none, etc., implying only an either-or situation and were in large part unspecified. Since these were usually very popular responses this might indicate they were immediate associations for this age group.

A seldom found response which would be given a score of 1 would be a response which was highly personalized, making interpretation of what is meant by the consequence almost entirely up to the rater.

 Immediate poor quality responses seeing the change as an all of none type situation:

> No more refrigerators No kitchens No more cooking

No farms Farmers wouldn't be needed No dishes to wash No garbage No stores needed Soap manufacturers would be out of business No more restaurants We wouldn't have to go to the store

2. Responses too personalized or uncomprehensible:

More people would choke to death Not many people would want them People would be hungry

#### B. Rating 2

Responses given a score of 2 were similar to many consequences given a score of 1, except they more often used qualifying words at a higher level of differentiation so that the situation was seen as having many possibilities rathern than misinterpreted as an either-or process. While many were better quality responses, they were still related to the consumption, distribution or manufacture of food or pills.

Another type of response found frequently in this scoring group was one which gave an immediate economic or time advantage or disadvantage of the situation. Responses which were gross aesthetic judgments of rather poor quality were also included in this group.

1. Immediate generalized economic results:

A lot of unemployment Start of a recession More or less expensive to eat Many manufacturers out of business More water would be used.

 Responses related closely to situations of food and/or pill consummtion, distribution, or manufacture:

> Food workers unemployed Pill makers would prosper

Drug stores would get rich quick Bottles would have to be made Supermarkets would be smaller Shopping would be a lot easier Farmers would lose business Less storage space needed More room in kitchen cupboard

3. Responses which imply time-saving by this change:

Less time needed to eat More recreational time No wasting time doing dishes or cooking No lunch hour Easier food preparation

4. Gross aesthetic response:

I would suddenly lose my appetite If tasty, farmers would go out of business

## C. Rating 3

Responses which were given the highest score possible were those which were farthest away from the situation given in terms of the amount of time needed for the consequence to actually occur. These were usually highly specified economic, health, aesthetic, or schedule advantages or disadvantages. Specificity itself was frequently the deciding factor.

1. Highly specified economic results:

Easier to transport, and to eat anyplace Things wouldn't spoil More land for houses Space travel would be developed quicker Less food ads on TV and radio Save on electricity

2. Specified health results:

Everyone would get certain vitamins Easier diets Better health Less indigestion

3. Aesthetic responses:

No more appetizing menus

. . .

Peat

•

It would take the fun out of eating Not as flavorful -- little taste variety No more treats or delicacies No more picnics

4. Specified schedule advantages:

Could carry dinner with you (in pocket or purse)

## Consequences 2

"What would happen if everyone would always tell the truth about everything?"

The responsees to this consequence were more difficult to categorize because they were not as clearly conceptualized. Many answers were rather gross emotional reactions to the situation. Children in this sample evidently have some difficulty specifying an emotional reaction in writing.

#### A. Rating 1

Responses to the consequence receiving a rating of 1 were often highly personalized reactions or very immediate associations in terms of the subject's current experience and age group. Also included were answers which misinterpreted the situation, answers which repeated the concept of the idea presented, and gross unqualified emotional reactions.

 Highly personalized responses which were either worthless or immediately involved in time and experience of this age group:

> It would seem strange More spankings for kids Get in lots of trouble with parents Couldn't go places I wanted No more failed tests No cheating on tests

 Unspecified immediate responses which are obvious and often repeat the idea given in the situation: No more lies No liars No such thing as secrets 3. Misinterpretations concerning law and order of an unqualified nature: No more police No crime No more laws, courts, judges, trials, etc. 4. Gross emotional responses with no qualification: No fighting Couldn't get away with anything No friends No arguing No stealing

## B. Rating 2

Responses most frequently given a score of two were qualified emotional events or poorly specified effects on people. While these were of a rather poor quality, they seemed again to reflect a general weakness on the part of 15-year-olds to clearly state their thinking along emotional lines. This is understandable in relation to adolescent's stage of socialization and their thinking in terms of peer group approval or disapproval. Other responses receiving a rating of two included those dealing specifically with law and order and those describing generalized effects on the world.

 Consequences pointing out qualified emotional events and poorly specified effects on people:

> A lot less marriages Might lose friends No more broken hearts Feelings would be hurt More arguments You would know who liked or disliked you Less or more fighting

No one you couldn't believe or trust More faith or trust in people No misunderstanding of what you said

2. Qualified responses dealing with law and order

Less crime Less need for courts

3. Consequences describing generalized effects on world:

Less chances for war No Communism Free world A better world Whole world would be better Everyone would be poor Unemployment

C. Rating 3

The primary qualification for a rating of 3 was the student's ability to give a much more specified consequence to the situation in terms of economical, aesthetic, humorous effects on the personality, our judicial system, or on world affairs.

1. Specified effects on world or world affairs:

Better international relations Clean politics Top secrets of the government would be exposed No threat of surprise attacks Much less corruption More truth stations (Radio Free Europe) Russia would be changed

2. Effects on economy:

Better buying Prices would come down No false commercials Advertising revolutionized No more Truth or Consequences on TV

3. Aesthetic consequences:

No surprises or surprise parties No more tall tales for fishermen

Less bragging No more fiction No rumors No gossip

4. Effects to general personality development:

People would have stronger character Doubtless your personality would improve People would have better knowledge of selves

5. Realistic humorous consequences:

Couldn't do much kidding around Fat ladies couldn't lie about their weight Would wreck women's gab sessions No gossip Card sharks out of business No practical jokes George Washington wouldn't be so famous Everyone would know Jack Benny's age Santa Claus wouldn't come

6. Highly specified law and order consequences:

No perjury No embezzlement No blackmail No swearing in at court Shorter trials

# II. Plot Titles

On this test the subject was given a plot of a story and asked to write as many clever titles as he could for the plot in three minutes.

Guilford scored this test by assigning a rating to each response as being clever or non-clever. The cleverness score was the total number of titles given a rating of being clever and this score came out to be one of the originality factors in his factor analysis. The noncleverness score, or low-quality score, was loaded on the ideational fluency factor.

In this study, the ratings were expanded to a five-point discrimination scale. The most clever titles received scores of five, and the least clever titles received scores of one. In making a judgment as to the cleverness of each title, the rater was supposed to think in terms of whether or not the title would arouse his interest enough for him to want to read the story. Therefore, cleverness on this test was judged primarily with a concern for the literary quality of the titles. The least clever titles were generally literal or direct statements taken from the story, or apparent irrelevancies. Choice of words, brevity of statement, and complexity of thought all were involved in rating discriminations. Colorless and abstract words were judged less clever because they involved trite or incomprehensible titles. Brief titles were often much more interest-arousing than long titles which tended to tell too much of the story. The more complex thought involved the more clever title because it allowed for incongruity, contrast, analogies, and clever twists of cliches to be used which aroused more interest. The most clever titles often hinted at the plot briefly yet with considerable pithiness, so that they were interest-arousing while still disguising the plot.

The score for originality was the total number of weighted ratings receiving scores of 2, 3, 4, and 5. The responses rated as one were considered a measure of fluency.

The plot to which the titles were written was the following:

Tex was the biggest racing car driver in the United States and yet he drove one of the smallest racing cars. He was seven feet tall and weighed two-hundred and fifty pounds. One day he entered the most important race in the country. His car was very fast and he was winning the race until his car stopped just a few feet from the finish line. The next car seemed like it would surely win, but Tex got out of the car, picked up and pulled it across the finish line, winning the race.

#### A. Rating 1

1. Titles which are irrelevant:

The Little Red Car Speed Demon Eating is an Asset

2. Use of colorless or abstract words:

Consequences of Being Big Ability to Win Important Race Tex's Unusual Race

3. A very literal or direct statement of the story:

Tex and the Race Small Racing Cars Tex's Racing Car Tex and the Race He Almost Didn't Race The Big Guy

### B. Rating 2

Somewhat literal titles which were brief and at least partially disguised the story to arouse mild curiosity:

Tex Wins Tex Won the Race Tex the Champ The Surprise Ending Heave-Ho Tall Tex Terrific Tex One Way to Win a Race Tale of a Texan Over the Finish Line Cheating? How Ingenuity Won a Race Close to the End How Did Tex Win the Race A Sure Way of Winning a Race

#### C. Rating 3

Titles which aroused interest primarily through the use of incongruity or contrast in the title:
Carrying Car Across the Finish Line Carrying Car and Winning the Race Big Man, Little Car Big Tex, Little Car Littleness and Bigness Go Together Little Car Pay-Off 250 Pound Racer What Muscles Can Do for a Race What Muscles Can Do for a Race Who Needs an Engine? Little Car Carries Big Package The Long and Short Racing is Not Just for Small People What it Takes to be a Winner -- Muscles

### D. Rating 4

Titles which were clever enough to arouse considerable interest but somewhat more literal or revealing of the plot than titles given a score of five:

> A Few Feet I'll Win Yet Carry Your Car Tex's Close Call Strength Sometimes Wins Tex's Tired Racing Car Legs Instead of Wheels Have Car, Will Race Human Horsepower Wins Just a Little Push and Pull Two-footed Racer Car Won by a Step I Huffed and I Puffed 'Til I Pulled the Car In

## E. Rating 5

Exceptionally clever titles because of pithiness and brevity of expression. These titles expertly summarized the plot or described the crux of the story in a disguised manner that was very interest-arousing. They were frequently clever analogies, clever twists, or applications of cliches:

> Pick-Up Finish If It Stops, You Start Running Finish

Giant in a Bug Carry It To the Finish The Big and the Bug Have Muscles - Will Pull Cars Have Stalled Car - Must Travel It Stopped, But Tex Didn't Driver Carries Race Few Feet by Foot Tex Walks Away with the Prize The Giant and the Midget Gone with the Car A Step in the Right Direction

III. The A-E Test

The instructions for this 15 minute projective test were as

# follows:

On this page write a personal history of a completely <u>fic-</u><u>titious</u> person whom you would like to be. You are to make up the name, age, sex, race, and all personal history items of the character and to tell some of the most important experiences he or she has had. Do not plan to spend more than 15 minutes on this. Use the reverse side of the paper to complete your story if you need to do so. Remember this is not a story of your real self.

Each story was rated for the three major components which contribute to the factor of originality as defined by Guilford. These ratings were made for uncommonness, cleverness, and remoteness of response. An unexpected problem arose in making the ratings for uncommonness. It was found that the boys' and the girls' stories had to have differently defined categories. In many respects the raters defined the categories as similarly as possible, but it was quite apparent in reading the stories that the girls took a much more stereotyped approach to the problem. The fact that the vast majority of the girls wrote about being wives and mothers is in keeping with the socialization process and showed how defined girls' roles are even at this age. In that girls of superior intelligence, when asked to write about a fictional person they would like to be, choose to fulfill the typical female role, presents a striking need for educators to help gifted girls enlarge their concepts of what intelligent women can do. It was clear in these stories that the female role as wife and mother is well established in girls' minds at the age of 15, long before they even sample high level academic course work. For the country to really develop its potential academic talent, role perception for girls must be expanded even before junior high school.

All the stories are reproduced here exactly as the children wrote them, without any editing or correction of spelling or grammar.

### Uncommonness

Uncommonness is demonstrated primarily in the occupational situation in which the main or central character of the fictional story is found. But after considering the type of occupation, the rater had also to consider the amount of imagination the person was using in being a member of this occupation. The stories were rated on a five-point scale with the most uncommon stories receiving scores of five and the most common stories receiving scores of one.

## A. Rating 1 (Girls)

This category included stories which in situation were the stereotyped frames of reference for a 15-year-old girl. These stories included frequent references to topics which concern this age group such as physical appearance, sports, travel, peer group approval, school success, sibling relationships, parties, dating, popularity and a superficial mention of college aspirations:

Example 1: "Judy is a very pretty girl with a radiant complexion and a very vivacious personality. Whenever one of the girl's sports events comes up you can be sure that Judy will take take part in it. She gets good grades and works quite hard on her homework, but she is not a teacher's pet. She has a pleasing personality and enjoys helping other people.

"Besides achieving good marks and lending a hand in sports events, she is a very active member in her church and youth group. People like to come to church and hear Judy sing on Sunday.

"Don't however, get the wrong opinion of her. She is not conceited in the least. Although she goes out for all of these various activities, including active work in many of her school clubs, Judy is not the star athlete or main attraction. She does all of these various things because she enjoys them. She knows that everyone can't be the leader, there have to be many faithful followers. It is this belief of hers that makes her so popular and well-liked by her teachers, fellow students and adults."

Example 2: "Ann Sullivan is sixteen. She was born in California and has lived there all her life. She has two brothers and one sister, all older than herself. Ann is very successful in anything she tries to do. She is very popular and holds many school offices. She is very active in extra-curricular activities also. Ann is very athletic and loves all kinds of sports.

> "Ann's family likes to travel very much, and have been to many interesting places throughout the world."

## B. Rating 2 (Girls)

This category included stories which were fairly well specified in the student's stereotyped frame of reference but placed in a foreign setting; however, the occupational aspects were treated unimaginatively. Also included in this category were stories which mentioned the wifemother role, career aspiration, or mention of college major, with little or no specification:

Example 1: "Kathy Andrews is a girl of about sixteen or seventeen. She has a pretty face and is always dressed neatly and appropriately. She is popular with just about everyone because she is the type of person who does everything she can for other people. She gets grades that are above



average and plans to advance as far as she can in her education. She, of course, looks forward to meeting the right guy and having a happy family. She is active in her church and other activities around her. Although her family is financially well-off and has many nice things, this is not the most important thing in her life."

Example 2: "Cathy Baker, age 15, is a white girl living in Hawaii. She has an older brother, age 18, who is in the Naval Academy in the States. The Bakers came to Hawaii soon after Cathy was born, so she has grown up with the ways of the natives. She is a lovely girl, and her friends who love and respect Cathy include people of all nationalities.

> "Lest summer, Gethy won a prize in a Music Festival, which was a trip to the United States. Cathy flew to California on a deluxe airliner. There she had a chance to meet some important persons, such as the President and Van Cliburn, a great musician. Then she traveled to New York to visit her relatives. On the way back to California she stopped at the Naval Academy to meet her brother David. From there, David and Cathy took an ocean liner to Hawail."

### C. Rating 3 (Girls)

This category included stories which gave a somewhat detailed description of the wife-mother role or stories which gave a fairly detailed description of a common career such as being an airline hostess, teacher, nurse, or model, with no distinctive situational aspects:

Example 1: "Susan Kohler, who is 20 years old, is a tall, stately young woman with oceans of blonde, glistening hair falling in waves down her back. Since her career as a model in New York began 3 years ago, she has been in almost constant demand by the magazines and public alike. Susan has been engaged four months but as yet has not set a date for the wedding. She has just recently bought a beautiful white mink coat and a dashing blue convertible. One of the most wonderful times in Susan's life happened just recently when Steve asked her to marry him. Now he sends roses twice a week as a remembrance. The leasing of her new apartment also has been a step in Susan's life. An organ engagement in one of New York's most expensive nightclubs has been keeping Susan extremely busy also." . .

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"My girl is a famous part-time model and wife. She is Example 2: about 23 years of age and her name is Carol Montgomery. She is married to a doctor makes fairly good money by the name of Hal Montgomery. They have been married for a year now and have no children. They plan not to until they are financially well off and Hal has a good practice set up. Carol works three days a week as a top model for various magazines. She is unusually charming and is popular with all her co-workers. Both Carol's and Hal's parents are living and each Sunday they go to either of the homes for dinner. They both had several brothers and sisters and were a part of a closely knit family. Hal and Carol always make important decisions together, but Hal is the head of the household just as Carol thinks he should be. With Hal away often on calls, Carol has had time for extra activities working on various charity committees and doing minor parts in neighborhood plays. She is always busy doing something."

# D. Rating 4 (Girls)

This category included stories which mentioned a common career (teaching, nursing, etc.) but with specific references to possible contributions in this field of work. Also included were stories which gave a mother-career combination role which was discriminated in its key aspects or stories which mentioned an uncommon career with very little detail:

- Example 1: "Terry is a person that never seems to grow old. She has led a very interesting and happy life. College for 4 years, where she was pretty and popular, someone people really enjoyed being with as well as being an excellent student, well-liked by profs and housemothers, too. Teaching on a Naval base where her husband, whom she married shortly after graduation, broadened her experience and gave her many new friends. Teaching, social work, community projects, and just plain helping others fill in time between her children - 2 boys and 2 girls. Somewhere along the line she finds time to do graduate work and obtain her M.A. degree. Terry is a person I'd like to be - people enjoy her because she enjoys people I"
- Example 2: "Angela Simpson, 28 or 29, white. Married with a  $3\frac{1}{2}$  year old girl. Live in a fairly extremely modern house with 4 bedrooms (for family expansion), dining room, kitchen,

living room, den, 2 bathrooms, and a basement with a large recreation room. Come from a fairly well-to-do family. Husband the same. Husband is independent business.

"I'd like to be mainly a housewife, but do volunteer work in occupational therapy and maybe have a Brownie troop or a 5 year old kindergarten Sunday School group.

"Went to college and majored in Home Economics and Occupational Therapy. Was in top 1/5th of high school class. Went on a trip to Africa and India in junior year of college with a group of researchers on malnutrition, etc."

### E. Rating 5 (Girls)

This category included stories which mentioned an uncommon career with good description of the role, including mention of some significant contribution in the chosen field. These stories often combined career and marriage hopes together with well thought out plans for each:

Example 1: "Karen Carrac is an American girl who is 25 years old. She graduated from high school with high honors and spent 6 years at college.

> "Karen studied to be a nurse and a lab technician. When she graduated from college she went to work as a nurse and lab assistant to a doctor.

"The doctor was trying to find a cure for cancer and he decided to have Karen help him.

"For several years they worked on the disease. Taking tests with small animals, studying and more studying. Finally, when Karen was 40 years old, she and the doctor, whom she had married, found the oure for cancer.

"There was more study to be done, but they had found the cure and now they were going to Washington, D.C. to have it checked by the government. They hoped soon the "Bradley Vaccine" would be accepted.

"Karen and her husband and 7 children, all boys, ranging from 6 months to twelve years, went to Washington, D.C. and received the happy news that their serum was accepted. They were very happy and when they got back to Idaho, they opened a hospital in Boise for cancer patients. They worked there together the rest of their lives and 3 of their sons became doctors and worked there, too." Example 2: "Liann is only 27, but her life has been as full as any 70-year-old. The first years of her life were as everyone else's. She received her high school education from one of the best schools in her town. When she began college, she was not sure of what kind of work she would go into. Although she had many talents and interests, she finally decided upon training to be a lab technician. That was one of her wisest decisions, for she found the work pleasing and easy enough to succeed in. With a few lucky breaks, she found herself working for one of the best research labs in her own America. Now she had not only just finished an outstanding product which rocketed the world of science, but she had just been chosen to be the first woman to go to the moon H"

F. Rating 1 (Boys)

This category included stories set in the stereotyped frame of reference of a 15-year-old boy with references to sports, conventional hobbies, physical appearance, parental and sibling relationships, care, wealth, academic success, peer and adult approval:

Example 1: "My name is bob Walker. I have a birthday coming up next week. I will be 17.

"I have a lot of, what I think are, wonderful hobbies. I enjoy music very much, and I like to fool with a camera now and then. I love to play basketball, football, and swim, I am also interested in track.

"I have had some very good times on the football court also. I don't consider myself as a 'great' but I do come up with a few good plays, and make my share of points.

"I have wonderful parents and three terrific sisters. Our family is very close and we do almost everything together. We live in a very nice house in a very good neighborhood.

"I have my own car. I like to keep it shining and bright. It's a convertible. It sure is nice on hot summer days.

"I have a very nice girlfriend. I like her parents and she is very fond of mine. We have a wonderful time wherever we go. She and I are very close.

"All in all, I feel that I lead a very happy and interesting life."

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Example 2: "The name of the person is Bob Johnson. He is a very good student in the twelfth grade in school. Bob is active in sports but still finds time for a part-time job. He is quite good-looking and is very popular. He goes to a lot of parties and dances. He enjoys the popular music and is a good tap dancer. He enjoys reading very well."

#### G. Rating 2 (Boys)

This category included stories which briefly mentioned a career

aspiration with little specificity as to the work situation:

- Example 1: "The person that I would like to be is one who lives here in Lansing. I would like to be about seventeen and a boy. I would like to be out of high school and working for the WILS radio station as a disc jockey. When I become 20 I would start college out of state and try to further my education as a radio man. I would like to get married in about two years and live in a small little house on the outskirts of town. I would like to be able to play golf, baseball and have fun with and kids."
- Example 2: "His name is Bill Martin, 16, and he is a white person. He's good looking, charming, and fun to be around. He goes on dates often and is very popular in and out of school. He is admired and respected by many people, including teachers and adults. He has a nice home, family, and has a summer cottage, and his own boat. He also has his own car. He plans to be an executive or just to have a good, steady, and well paying job. He has been on vacations in Hawaii, South America, Mexico, and has toured Europe. He resides in Sarasota, Florida."

### H. Rating 3 (Boys)

This category included stories which mentioned a career aspiration and gave considerable detail and specificity. However, the details usually were stereotyped references to character, duties, success and community participation or leadership rather than any detailed description of contribution in the mentioned career field. These stories often included stereotyped details on marriage and family role as well as on the career:

- Example 1: "My story is about Jim Jenkins. He is 25 years old, and bas an excellent job as an engineer. Jim has had quite an educational history. After he finished high school, he went on to college to learn engineering. He studied hard for four years and finally received his degree. A large corporation signed Jim up with a good salary and steady work. Jim began to move up the ladder to success. He was promoted and given raises. Today, Jim is a happily married man with a wife and two children. He is a top executive in his field of work. Jim is alea a social leader and wellliked and respected by everyone. Jim has truly made a success out of his life."
- Example 2: "Bill is a white, male who had a better than average intelligence for a baby. He learned to talk and walk before he was a year old. This little character is not a bit bashful, and goes up to people and starts a conversation right away. In school his teachers liked him very well, and he is in the top 2 per cent of his class. During high school Bill was quite an athlete, getting an athletic scholarship to a well-known university. Among his classmates he was very popular and makes new friends easily. He was a member of the honor society with a 3.6 scholarstic average. In medical school, he made quite an impression on his professors and medicine seemed to come to him easily. After Bill graduated from medical school with honors, he set up practice in a medium sized town and was very successful and enjoyed his work."

#### I. Rating 4 (Boys)

This category included stories which mentioned common careers (law, medicine, pilot) but gave some degree of uniqueness of detail in performance of the job. Also included were stories which mentioned uncommon careers but with little specificity of detail as to duties, contributions and character:

Example 1: "Rex Harrison awoke to the ring of the telephone. The woman on the line said, "Gapt. Harrison i flight 208 to Dallas will depart at 9:30 a.m. P.S.T. You are to report for pre-flight britefing at 8:00 a.m." Rex replied that he could make it and hung up. This was a routine morning for an airline pilot. After breakfast he kissed his beautiful wife, Sandy, goodbye and was to the airport. As he drove up into the airport parking lot, a young man pulled up beside his snazy Corvette. The young man was Jim Ostrander, his co-pilot. After weather briefing with the rest of the crew he porceeded out to the parked DC-8, newest of the jet airlines. He inspected it with precision and knowhow of an veteran flyer.

"Up in the cockpit he received an all clear signal from the tower. His right hank pushed 4 of the throttles forward, simultaneously with the co-pilot's left hand pushing 4 more. At 30,000 feet the big jet was pushing 600 m.p.h. Grand Canyon was just below now."

Example 2: "I am John Chandler, prominent Philadelphia lawyer. I have a good profession and live comfortably. I am, at the moment, a bachelor, and hope to stay that way for a while. My most exciting case was only a while ago. It was a real struggle, a private suit against my client; there was no state's case involved. The court session lasted two weeks and the jury convened for three days. I finally won and I'm still a little shaky."

## J. Rating 5 (Boys)

This category included stories which mentioned uncommon careers treated with considerable specificity of detail as to work situations, duties, and contributions:

- "After he was through high school, Jim decided that he would Example 1: like to major in international law. He went for 2 years of pre-law at Albion, and then went on to the University of Michigan to study law. After attaining a doctor's degree, he decided to go into the Army (in the Judge Advocate General's Department). After serving for 3 years he returned home a captain and a husband. He taught for 3 years (until the age of 30) and then decided to take up the career he always wanted to enter, Foreign Service, He requested information about the job from the State Department, which was sent to him. After several months of studying, he was ready to take the exam, the roughest exam the government gives. He passed the exam, and was recommended because he knew law well, and he spoke 3 languages fluently. His first assignment was with the American Embassy in Bonn; he was a vice consul. From there he was transferred to Bern, and then to Vienna. At 45 he was transferred to Brussels and was made a consul. Five years later he was transferred to Paris and was made and ambassador. He retired to Washington at 65."
- Example 2: "This person's name is Jim. He is an average American boy in an average American town. When he was a boy he raised pigeons and always wanted to be able to fly like them. As he got older, he joined the Air Force R.C.T.C. He earned

his wings and became a pilot. Then he specialized in jets and was a war hero. After this he became interested in space flight. He went to a special school and took many tests and became a space engineer. Working with others he designed a rocket ship and a statellite similar to a space station. He disigned new types of flying equipment for space and became a very good space pilot. Using this space situation as a base he explored into the vast reaches of space and opened many gateways to far better and newer knowledge. He became famous as a space 'pathfinder' but never go 'big headed' about it. People liked him and he became famous all over the world, all over the universe."

#### Cleverness

The cleverness of the story was in large part determined by uniqueness of approach to the problem presented. Since the story was to be of a completely fictional person, the instructions did mt restrict the reality of the situation. The stories were to be judged on a five-point scale depending on the quality of literary style and complexity of thought involved with a rating of one showing the least cleverness and a rating of five the most cleverness. The factors involved in rating writing ability were of the most consequence in this judgment; these involved the student's ability to arouse interest, to arouse suspense, to convey humor or satire, to verbalize emotional content, and to write in a coherent and organized style.

#### A. Rating 1

Stories included in this category were particularly noted for the repetitive use of personal pronouns as the first word of a sentence, which made them primarily a catalogue of personal history items. These stories often gave considerable biographical information but treated it very unimaginatively. They were documentary stories rather than conveying any feeling tone and aroused little or no interest on the part of the reader: Example 1: "Cherie Star is sixteen, a sophomore, and she stands five feet three inches tall. She has one brother and one sister. She is a cheerleader for her school and she received B's and A's on her report cards. She has very nice clothes, but she is not a clothes horse. She has a way with people that has made her very popular and well-liked. She takes part in all of the activities of the church and is president of the youth group and her Sunday school class. She has a job on Saturday mornings. She owns a small sports car which she is paying for by working in the summers.

> "She has won a contest with a grand prize of a trip to Europe and she has also been in several of the different states.

"She is going steady with the captain of the football team who has a 1960 white convertible."

Example 2: "Ted is a nice guy, everybody likes him. He has a nice personality and he's nice to be around. He's been 16 for 5 months now and since he has had his driver's license, he's been all over town. Ted has been getting straight A's almost since he started school. After he graduates from high school he will enter Annapolis and after that he will enter Berkeley U.

> "Ted isn't necessarily rich, but isn't poor either. He usually gets the prettiest girls and is always happy. Once and a while he'll pull a practical joke on someone. The whole gang usually laughs at it.

> "Ted has been to New York, Washington and even Miami. He travels a lot with his folks and goes places with different groups. He's a good athlete too. He's on the basketball team and swimming team."

- Example 3: "This is a story of Debbie Westerhouse. She is 17 years old. She lives with her father and mother in a nice section of town. She is friends with both boys and girls. She likes to have fun and good times, but she likes to have quiet and serious moments, too. She is going steady with a nice, good-looking boy which she plans to marry after she is out of high school. She wants to have two or three children and have quite a nice house. She would like to live near her friends, now. She gets fairly good grades. Her hobbies are sewing clothes, reading, and collecting popular records. Her experiences are just the usual for a wellliked teenager."
- Example 4: "The person's name, Ron Andersen. He is 15 and a sophomore. The boy is white. In his sophomore year he was on

the JV football, varsity basketball and varsity baseball teams. In the first game of the basketball season he scored 25 points to lead his team to victory. He is 6'0 and weighs 185 pounds. He was a main factor in the winning season of the baseball and football teams. He is well liked by his fellow students and was elected president of the sophomore class. He carried a B+ average in all his classes. He has dark brown hair and brown eyes. He plans to take up hotel administration upon entering college. He wishes to play professional basketball and baseball."

### B. Rating 2

Stories included in this category again were primarily noted for a great deal of categorizing of personal history items but used some degree of realism and persuasiveness in portraying character. For example, more descriptive adjectives were used, but in this category they were mostly colorless and cliche-ridden expressions. Slightly more emotional tone was conveyed which aroused slight interest in the reader:

- Example 1: "The person I would like to be would be about 16. She would have long blonde hair and blue eyes, be sort of tall, with a cute figure and sort of pretty with a real good personality. She would live in a big city such as Chicago or Philadelphia and have an older sister and a younger sister and real nice parents. She would be quite popular in school and receive good grades. She would participate in extra-curricular activities and be willing to help out whenever she is called upon. She would be respected by her friends and adults and have many friends. She would probably like one particular boy and maybe she would be going steady. She would be a real good dancer and like to dance and sports and be interested in teenage activities, not try to act a lot older. She would be planning to attend college and be interested in teaching. As far as experiences go, she has probably had many, good and bad. She likes to have fun, but doesn't over do it, and usually does and says the right things at the right time. She doesn't have any specific name. but one that fits her and is short and nice. She would be an all-around person, one people like to be with. That's who I would like to be."
- Example 2: "My name is Bill James. I'm 16 and attending a leading high school. I'm one of the leading athletes and scholars. I have played football and other sports since I was in grade

school. I come from a happy family of average income. I hold a part time job to help buy personal things. I'm popular with all the students and I am president of the IOA class. One of the most exciting things that ever happened was in sports when I caught the winning touchdown pass that won the game in the fading seconds. I have a straight A average in all classes and I am popular with the teachers."

Example 3: "Terri Sue Clare is a senior at Lansing Eastern High School. She was born May 15, 1943, in Louistana. She moved to Lansing in the summer of 1957. At one time she went to France for a vacation. Making friends comes for her because she is charming, good looking, active, and sympathetic. Scholastically she maintains a B average and belongs to several clubs.

> Her parents and general home life are very good. There are four children in her family, two boys and two girls. Terri's sister is a year younger, but her brothers are older.

She is popular, gets along with everyone and can speak before a group and maintain her natural poise."

Example 1: "My name is Thomas Williams. I am a 21 year old American with a beautiful wife. I started my career in the Naval Air Force 6 years ago as a jet mechanic. My rank is now ensign. One of the best and most-liked experiences I've had was in the Navy Training School where I learned jet mechanics. I always liked the field of mechanics and I was proud of schooling which has helped me right up until the present time. I always thought I would have liked to be a pilot but I am just as happy keeping the pilots flying. I don't know what I'll do when my 20 years are up but I hope to find something. The Navy has been my whole life."

#### C. Rating 3

Stories included in this category combined factual descriptions of the fictional person together with enough emotional expression to arouse moderate interest. In most cases the personality of the character was delineated rather smoothly but in a style which was rather tedious to the reader:

Example 1: "I am Marcia Gibson, teacher. I'm 40 years old and reside in Lansing. I resigned from teaching this year because I have a baby now. I'll just settle back and devote my life to my family completely. My son, Richard, is a freeshman in college and be's working to be an engineer. My oldest daughter, Elaine, is 16 and is looking forward to the teaching career. The baby of the family is Rita aged 6 months old. I remember when Rita was born I thought that we were too old to be parents again but then I realized that this was really a miracle. The two older children just worship Rita and even spoil her a little. My husband and I are glad to have her around. I remember years ago when I first met Ed. It was in an anusement park. We fell in love and got married while I was still in ith year college. Richard was born a year later and then I just did substitute work in teaching. When Richard was four we were blassed with Elaine. When Elaine was 12 and Richard was 16, I started working full time as a teacher."

- Example 2: "Odisseus Spokes, age 17, was a good looking tall boy with black hair. He was a hard worker and had things to show for his hard work. He was well dressed and owned and took good care of a late model "Chevy." Besides his tenacity toward his job he was also a good athlete and a member of the honor society at this high school. He was planning on being an airplane pilot and had been recommended by his congressman to go to the Air Force Academy. This boy loved motors and airplanes and took good care of his car and helped with his uncle's "Cesena" (a twin engined light plane). He could remember about seven years ago when his uncle took him for a ride and his uncle got sick. He had to take over the controls and keep the plane aloft until his uncle could land it. From then on he knew he wanted to be a pilot."
- Example 3: "I am Janet Johnson and I am a physical education instructor at Jones High School. I have just completed four years of college and now I am in the kind of work I like best and had planned for many years.

"I have only completed a semester's course here and have already had many experiences. Two girls, who couldn't swim a stroke, slipped and fell into the pool. They had to be rescued, of course, and so I did it. Another time a girl fell on the gym floor and I administered first aid.

"I enjoy my work very much and I am looking forward to many years of service and fun."

Example 1: "Tom Smith was born in Michigan on March 16, 1933. In his younger days he spent most of his time indoors. His father was an insurance agent and his mother was a housewife. He lived in a big house on the corner of ELm and Pine Streets. When he was about 5 years old his father gave him a baseball and a baseball glove. Tom practiced nearly all day in the summer and after school in the winter and spring. Tom was so good that he made the junior high baseball team in the 7th grade. As he was going on to high school he kept improving. In his first year at high school he made the varsity first team. He played shortstop and won many ballgames for his team in 3 years of high school playing. After high school he was asked by the scout of the New York Titans to sign a contract and play major league ball. Tom accepted the contract for a \$85,500 bonus. As of today he is one of the most talked about players in the league."

### D. Rating 4

Stories included in this category combined fact and feeling in a well organized fashion to create a fairly high degree of interest. These stories were noted for their good plot delineation and organization, together with some conveyance of depth of feeling but in general had a weak literary style. Some of these stories also showed a more sophisticated level of social insight or a more philosophical view of life:

Example 1: "This is a story of a girl named Jane. Jane's parents are very rich and Jane is very popular at school. She is almost 17. She has a birthday coming up day after tomorrow. Her parents are giving her a party. Jane wants to invite some of her friends who just happened to be colored kids. Finally Jane has gone to her mother to talk the party over. Here is the conversation, "Mother, I can't understand why you won't let me invite my friends who are colored. They are just as good as you and I. These kids are an awful lot of fun." Her mother answered her saying, "Dear, I think I am beginning to see what you mean. Invite your friends and we will see how it comes out."

> "Jane gave the party which was a grand success. Little did Jane know it but that was the start of a great career toward the furtherment of colored people. Jane made great strides in this field."

Example 2: "Jim Landis works for DuPont and Company as chief chemist. He is 6'3 and has blond hair. Jim is 30 years old. He is known among his many friends as a true leader, a person not afraid to express his views and convictions on a subject. Yet he is not temperamental and carefully examines other people's ideas in order to improve his own. An all around epicurian, he does not waste his time on frivolous things. ·

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such as needless fears and worries, but searches for the deeper things in life. Although he works hard for money, he rules the money instead of the money ruling him. He enjoys his job."

- "One day as Teressa Smith left her last patient, she head-Example 3: ed to her personal worker's office. There while she reviewed her days work she dicided she would like to see the whole world changed, and be the type of person God would like. A month later, she was working in Africa as a missionary seeing to it that others were happy, and that they would be better informed of her Lord and Savior. She worked hard, because she realized that no task would be difficult if she put all of her faith and confidence in God. For four years she was stationed there, then she received a letter from her pastor telling that their Child Evangelism was slipping. At once, she prayed and asked God for his command. She was doubtful whether God would send her home or allow her to stay there. Upon feeling God's will, she left for home on an ocean liner. She felt God's presence even more on the boat, and saw many souls come to her through Christ working in her. She was surely a Temple of God. If I was to be an overly successful person, I would rather be successful for Christ. And be rich in Christ and not worldly pleasures."
- Example 4: "My parents call me Bobby and my friends call me Robert but I prefer to be called Bob. Bob Ryan is the name. Many interesting things have happened in my twenty years of life in Los Angeles, California. I was born and raised here in sunny California along with all the other native Californians.

"I remember a very thrilling situation which happened to me a few years ago. I was haunting in the Sierra-Navada Mountain Range in late July. We were hunting wildcat. The treacherous slopes and canyons made parts of our pre-planned route quite impossible. We started up a steep canyon wall because we spotted a cat at the top of a narrow ledge at our right. We decided that we should get in front of him and shoot at him. We managed to do this. Then the cat leaped at us causing us to fall into a pit. We had recovered from the fall and tried to think of ways out. We found twigs and had matches. We started a fire and that brought a passerby from the highway. He went for help. Our rescuers approached us from the sky in a hellicopter. We were lifted from the pit - one by one - and taken to the hospital by way of the hellicopter. This was not very exciting for me because my hunting trips had taken me all around the world in the ten years I had traveled."

# E. Rating 5

The stories included in this category were noted mostly for arousing high interest on the part of the reader. They combined fact and feeling with high literary style, through techniques such as arousal of suspense, dramatic quality, novelty, persuasive character portrayal, and humor. A few were included because of outstanding uniqueness and imaginative responses to the stimulus given.

Example 1: "Jane O'Hara is an attractive girl of seventeen. She lives with her parents, her older brother, and her four black and white cockers in a small town in Ireland. As most teenagers, she fights with her brother Jim more often than not. This is nothing new though, since they have always fought. So whenever Jim is home, Jane takes her dogs for a walk through the woods or they climb the mountain on which their home is situated. It has been on these walks with her numerous dogs that Jane has had some of her most chilling adventures.

> "At the age of twelve, Jane took her dogs for a walk up the mountain (at the time she had two cockers and two St. Bernards which soon outgrew the food bill and the house). As Jane had never been allowed to climb the mountain by herself before, she decided to explore. She and her dogs climbed closer to the top and became more exhausted all the time. She sat down for lunch when she was really all in and ate half of her lunch, giving the other half to the dogs. Shortly after lunch Khan, the biggest St. Bernard, found a cave which naturally had to be explored. The cave which they found could not be seen very well because of the tangled brush covering the entrance. Jane with the help of her dogs (that is, if they were of any help) tore away the brush and entered. It was dark and gloomy inside so they did not go very far into the cavern. When they reached home she heard that there was no cave in the mountain. She knew that there was so took her family to see it. When they got there with a lantern they found skeletons of what appeared to be humans and their animals. Archeologists were called in and a link to man was discovered."

Example 2: "My name is Acie Campbell and I was born Sectober 33, 2099. I was a Neapoliton (whatever that is). My religion was Prosthlic but I switched to Castant. I lived in Chipolis and like it very much. The people were poor but friendly. The population is estimated at five. (It was the five in our family.)" Example 3: "Penelope Crane was a huge success as a child (as far as her parents were concerned). She was of average height and weight, and she was one of three extremely healthy, happy children. She had great artistic ability and you would never see her without a sketch pad in her hand. She sketched people, mainly in different surroundings. When in church she would capture the earnestness of the preacher and the restlessness of the little boy sitting beside her on the church bulletin.

> When she was in her early teens she decided that she would very much like to travel and so she applied for being an exchange student. When accepted, she nearly went wild with joy! She found that she would live with the Teel family in Ireland which also had 3 children, one of which was a girl her age. While living there she got terribly interested in architecture and buildings, as the head of the Teel family was a great architect. She showed her interest and Mr. Teel found out about her talent and so in his spare time he worked with her, broadening her knowledge, and cultivating her ability. When the 2 year stay was coming to an end she had already helped design 3 buildings - 2 homes and a small office - with the help of many people who were also interested in the small architect from America."

Example 4: "Jerex stepped out of the space cruiser "Sunfire" the pride of the Zerex fleet. He stepped up to the Primate and bowed low. The Primate held something in his hand. He pressed it on to Jerex's shoulder. At last the long hoped for 'Pentagon Star Cluster' was complete. The fifth star had just been added. Seventeen years of service from his twentieth birthday had been successfully completed. He must now go where all of the highest of Starmen go. With his heart singing and his eyes filled with tears of joy he took his ship, the "Sunfire" up and drove into the cleansing fires of the sun."

### Remoteness

The score for remoteness was the number of years projected in the life of the fictional person. The remoteness of the projection was primarily established by evidence of time perspective. This perspective needed only involve movement in time; whether into the historical past or into the future was of no concern. The student who wrote of a fictional person his own age showed little remoteness of response, whereas the story which spanned a lifetime showed much remoteness. The amount of time spanned within the story itself was the evidence to be considered.

The purpose of this rating was to see if an estimate of remote thinking on this type of test would correspond to scores for remoteness on a test such as Guilford's Consequences Test. In both cases the remoteness was judged in the distance away from the situation as it was given. In Guilford's test, it was the remoteness of a consequence in time from a given event, and on this test it was the projection of remoteness in years from the student's current age.

For determination of this rating, the two raters held a preliminary discussion and established appropriate ages for varying common life events. For example, the typical high school graduate is 18 years of age. The following table shows the ages used as guide lines for these ratings:

Life Situation		Age
High School graduate		18
College graduate		22
Obtaining Ph.D.		28
Obtaining M.D.		28
Getting Married	Add	2
Each child born	Add	2
Top executive		35
Prominent lawyer		35
Wise old man		60
Successful professional athlete	Add	5
Space engineer		25
Young married woman with children		25

Life Situation	Age	
Registered nurse	664	3

A pilot trial for rating these stories on remoteness proved rather discouraging in obtaining reliability. It was decided that two minds working as one at the same time on the same story was far more reliable. Due to the length and/or involvement of so many of the stories it was very easy in independent ratings to miss one phrase and thus make a crucial mistake in judgment. Therefore, since the error was not of a subjective nature but rather of an additive nature, it was decided to do the ratings together.

A frequency distribution of these ages showed a large recurrence of the same ages appearing rather than a normal distribution of ages. The ages actually fall rather neatly into a pattern of five categories comparable to the five-point scales used for the ratings of uncommonness and cleverness on this test. Due to this similarity of categorization of data, the actual ages assigned were converted into a five-point scale for consistency of scoring to make the three scores assigned of an additive nature so that a total score could also be given for the A-E Test.

#### A. Rating 1

This category included the group assigned ages from 15 to 17. This is primarily a peer group identification and shows no projection in time from the immediate environment.

#### B. Rating 2

This category included the group assigned ages from 18-22. This group essentially profected slightly beyond their immediate environment.

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This generally included graduation from high school and beginning or concluding a four year college program.

## C. Rating 3

This category included the group assigned ages from 23 to 30. This is essentially a projection into the years in which a person begins working and establishing themselves in a career.

# D. Rating 4

This category included the group assigned ages from 31 to 39. This is a projection into the period of life where a person has not only established themselves occupationally but accepted the degree of success they have reached in their career or life. In essence, stories falling in this category seemed to connote an identification by the student with his parents who would for the most part fall in this category according to age level.

# E. Rating 5

This category included the group assigned ages of 40 or over. This was the most remoteness possible in that the student was able to project into and through the fictional character's life span from birth to old age or death.

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