THE RELATIONSHIP OF CERTAIN PREDICTION AND SELF-EVALUATION DISCREPANCIES TO ART PERFORMANCE AND ART JUDGMENT.

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I. INTRODUCTION

Problem

The values of art experience, and the need to provide guidelines for their implementation in the public school, make it increasingly important to provide information about ways the dimensions of art experience interact. The relationship between Art Judgment and Art Performance is the primary concern of this pilot study.

The dimensions of art experience known as Art Judgment and Art Performance, using the terms without intentional reference to mechanical processes and the like, also represent two major approaches to teaching art. Research indicates the two dimensions should be taught in different ways. Art Judgment appears based on attitudes, values, and beliefs, and Art Performance appears based on general acuity, as points of major emphasis. The goals providing direction for art experience are obviously the correct questions to ask. The ways the two dimensions, and their several subdimensions, relate within the student is the concern

of this research.

To ask the question of relationship between these dimensions and related sub-dimensions, the discrepancies in the students' response to the two dimensions, seemed useful information. The observable magnitude of this discrepancy in practice made this approach seem at least logical.

To gain a more thorough research into Art Performance and Art Judgment, several sub-dimensions of each were examined. Within Art Performance, Experimental Measures of Predicted Art Performance, Predicted Art Performance of Peers, Self-Evaluated Art Performance, and Evaluated Art Performance of Peers, were used. Within Art Judgment, experimental measures of judgment of a "reference" painting by students and professional judges, and judgments by professional judges on student art performance were used.

Self-Evaluated Art Performance, and Evaluated Art Performance of Peers were considered to be related to both Art Performance and Art Judgment. The discrepancies between student prediction and evaluation tasks were needed as reference measures for the entire study.

To provide a broader base for the inquiry, all experimental measures in the study were examined with

measures of Intelligence, Personality, and Creativity.

The problem, then was to examine as many relationships as permissible within the limitations of the study, using the mechanism of experimental discrepancy scores between internal projections of performance prediction and evaluation characteristics. The natural order of these discrepancies and their relationship with external phenomena were considered a likely basis to gain information about Art Judgment and Art Performance. Such information is considered useful in the development of art experiences for public schools.

Objectives

The following questions were asked:

Question 1. Is there significant relationship between Predicted Art Performance and Self-Evaluated Art Performance?
(A high correlation was expected. The study will make use of the magnitude of difference between scores.)

Question 2. Is there significant relationship between Predicted Art Performance and Self-Evaluated Art Performance Discrepancy and Judged Art Performance?

(Judged Art Performance indicates scores by experienced judges using uniform scaling devices and "gestalt" techniques.)

Question 3. Is there significant relationship between Predicted Art Performance and Self-Evaluated Art Performance Discrepancy and Predicted Art Performance of Peers?

Question 4. Is there significant relationship between Predicted Art Performance and Self-Evaluated Art Performance Discrepancy and Art Judgment?
(Student judgment of a "reference" painting.)

Question 5. Is there significant relationship between Predicted Art Performance and Judged Art Performance?

Question 6. Is there significant relationship between Predicted Art Performance and Predicted Art Performance of Peers?

Question 7. Is there significant relationship between Self-Evaluated Art Performance and Predicted Art Performance of Peers?

Question 8. Is there significant relationship between Self-Evaluated Art Performance and Judged Art Performance?

Question 9. Is there significant relationship between Predicted Art Performance of Peers and Judged Art Performance?

The following is a list of the 22 experimental measures produced by Questions 1-9:

Experimental Self-Prediction and Evaluation Measures

1. Predicted Art Performance
2. Predicted Art Performance of Peers
3. Self-Evaluated Art Performance

Art Judgment (Student judgment of a "reference" painting).

4. Bad-Good
5. Cool-Warm
6. Simple-Complex
7. Brutal-Tender
8. Boring-Interesting
9. At rest-Moving
10. Subjective-Objective
11. Unbalanced-Balanced
12. Light-Heavy

Discrepancy

13. Discrepancy between Predicted Art Performance and Self-Evaluated Art Performance.

Art Performance (Judges' evaluation of student art performance).

14. Interesting-Boring
15. Crude-Sophisticated
16. Literary-Visual
17. Use of Color
18. Use of Pictorial Space
19. Use of Line
20. Use of Tonalities
21. Understanding of Page
22. Judges' projection of Student Art Ability

The event of these 22 experimental measures produced Questions 10-22 below relative to measures of Intelligence, Personality, and Creativity.

Question 10. Is there significant relationship between any of the 22 experimental measures and Language Intelligence?

Question 11. Is there significant relationship between any of the 22 experimental measures and Non-Language Intelligence?

Question 12. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Anxiety?

Question 13. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Self-Confidence?

Question 14. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Interest in Reflective Thinking?

Question 15. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Interest in Divergent Thinking?

Question 16. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Interest in Convergent Thinking?

Question 17. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Interest in Logical Thinking?

Question 18. Is there significant relationship between any of the 22 experimental measures and the Personality Measure of Tolerance of Ambiguity?

Question 19. Is there significant relationship between any of the 22 experimental measures and the Creativity Measure of Alternate Uses?

Question 20. Is there significant relationship between any of the 22 experimental measures and the Creativity Measure of Production of Figural Effects?

Question 21. Is there significant relationship between any of the 22 experimental measures and the Creativity Measure of Gestalt Transformations?

Question 22. Is there significant relationship between any of the 22 experimental measures and the Creativity Measure of Simile Interpretations?

Although only one discrepancy score was included in the proposal's set of 22 questions there were four experimental scores of discrepancy examined. They are as follows:

1. Between Predicted Art Performance and Predicted Art Performance of Peers?

2. Between Predicted Art Performance and Self-evaluated Art Performance.

3. Between Self-Evaluated Art Performance and Evaluated Art Performance of Peers.

4. Between Predicted Art Performance of Peers and Evaluated Art Performance of Peers.

The relationship between the experimental measures of discrepancy and all other measures in the study is stated as Question 23:

Question 23. Is there significant relationship between any of the four experimental measures of discrepancy, the other 22 experimental measures, and measures of Intelligence, Personality, and Creativity?

Another sub-objective was to examine the intra-relationship between the 22 experimental measures. This appears in III. Analysis of the Data, and is studied briefly to provide better understanding of the study's conclusions.

Related Research

The author does not know of other studies directly concerned with using discrepancies for anchor variables. Related research has primarily focused on measures of Art Performance and Art Judgment, and their relationship to measures of Intelligence, Personality, and Creativity.

Getzels and Jackson (1:75-77) suggest that high Intelligence and high Creativity may both yield high achievement scores.

McFee (2:64) suggests a relationship between high Non-Verbal Intelligence and need to pursue ideas visually.

It is usually thought the factors which influence judgment about Art may be attitudes, values, and beliefs. Training in art judgment, through appreciation courses and the like, usually make use of an intelligent, rather than attitudinal, base. Conversely, training in art performance is usually gained through realization of attitudes, values, and beliefs.

Burkhart (3:9) indicates that personality process factors partially determine types of art performance. Persons of divergent capability yield what are judged to be spontaneous art performances.

Beittel (4:4) found scores on the polar judgment good-bad correlated high (.81) with the polar judgment interesting-boring on the same work-of-art.

Process strategies structured by Beittel (5), Burkhart (6:24-32), and Bernhoim (7), probably offer the most useful information for art education. This is partly due to the lack of consensus on aesthetic quality. Process evaluations minimize the issue of aesthetic quality; however, they can be productive of useful information for public school art needs. The aesthetic quality of process, considered as superior in purpose to aesthetic product quality, remains a favorite in developing better ways to teach art, although limited descriptions of process quality still exist.

Burkhart's (8:4) Divergent Strategy revealed four types of process control, 1) surface control, 2) simple element construction, 3) variation of elements,

and 4) progressive control. Burkhart's (8:4) Spontaneous Strategy indicated four types of process control, 1) quick motion, 2) media overlayment, 3) flowing large movements, and 4) erratic, wandering fine lines.

Discrepancies between self-prediction and self-evaluation are considered useful for the production of new information about the nature of aesthetic process quality. Such information would be useful in the implementation of art process involvements, which are most desirable in public schools.

Harvey (9:20-25) indicates when groups were sorted high and low by Language I.Q., the high group had a significantly higher mean score on the Creativity measure of Elaboration (t= 3.667), and also a higher mean score on the experimental Art Performance Measure of Form. The variability of focus by the judges on the experimental Measure of Form may have skewed that result. Bently (10:112) suggests that Language I.Q. may be separate from Creativity. Michael (11:103) indicates that intrinsic creativeness relates to aesthetic quality, while creativity influenced by external sources does not.

Bently (10:114) noted that scores from a test of creative thinking correlated significantly with a personality measure of divergent thinking. The creative thinking and divergent thinking tasks were semantically based.

Burns (12:129) noted that active design productions seemed to suggest active attitudes, or active personalities.

Linderman (13) indicates that subjects with similar personality characteristics respond similarly to works-of-art.

This research does not primarily intend to question existing knowledge about relationships between Art Performance, Art Judgment, Intelligence, Personality, and Creativity. It merely seeks another approach into how to ask questions for future research. The research, in it's conclusions, if not in it's design, is a conservative one. The number and magnitude of the process mixes in art must be sorted out and re-thought over time relative to local goals.

II. PROCEDURE

Population and Testing Sequence

It was reported in error in the proposal of this research that measures of Intelligence, Personality, and Creativity were part of the Office of Education Contract No. F156. That research did not propose to include the Ninth-Grade at University School, Kent State University, Kent, Ohio. It was therefore necessary to test the Ninth-Grade population on these measures, in addition to the experimental measures in the study.

Testing was completed on the Ninth-Grade (N=100) in the following order:

1) Experimental Measures, 11/24/65
2) Intelligence, 1/13/66
3) Creativity, 1/17/66
4) Personality, 1/17/66

The Ninth-Grade population (N=100), at University School, Kent State University , Kent, Ohio was tested on all measures in the study within a 60 day period under good conditions.

Experimental Measures

Measures of Predicted Art Performance, Predicted Art Performance of Peers, Art Performance, Self-Evaluated Art Performance, Evaluated Art Performance of Peers, and Art Judgment, were gained through the use of an experimental booklet summarized in Appendix A.

Uniformly through the experimental booklet, rank choices of ten positions were used on all measures. Ten positions were considered enough to enable choice and also permitted likeness to the public school scale for student self-evaluation tasks.

Discrepancy scores were obtained by the magnitude of difference between raw scores carried on separate pages of the booklet.

Professional judgments of the "reference" painting were gained through the use of the criteria in Appendix B. With the exclusion of the scale - item Good-Bad, it was the same scale used by the students to judge the "reference" painting, to obtain Art Judgment scores.

The professional judge-team was used twice, to evaluate student art performance and to judge the "reference" painting. Each judge, judged independently of

the others.

To facilitate the Art Performance Task, the students were assembled with ample drawing area, and were provided 18"x24" premium drawing paper and separate boxes of oil crayons. The stimulus for the task was also verbalized to the group as it appears in Appendix A. The time allowance of 30 minutes was considered ample after the results had been viewed.

To facilitate Art Judgment, the large "reference" painting was circulated in view of the students during a period of eight minutes.

The criterion appearing in Appendix B was used by the students to judge the "reference" painting. Although the items appear as polar concepts, this was done to facilitate response. For example Cool $\frac{X}{}$ would be interpreted to mean the most cool, and Cool $\frac{X}{10}$ the least cool, or warm.

The other criterion appearing in Appendix B was used by the judge-team to evaluate student art performance. Again, polar concepts were used at times for clarity.

Definitions of terms appear in Appendix C.

Intelligence Measures

Measures of Language and Non-Language I.Q. were obtained through the use of the Lorge-Thorndike Intelligence Test.

Creativity Measures

Measures of Creativity were gained through the use of the following four tests: 1) Gestalt Transformations, 2) Simile Interpretations, 3) Alternate Uses, and 4) Production of Figural Effects. The four tests. came from research by Guilford and Merrifield.

Gestalt Transformations yields a score resembling Closure, Alternate Uses yields a score resembling Originality, Simile Interpretations was used because it relates to the Art Performance stimulus, and Production of Figural Effects was used for it's less semantic nature. Sample items of the four tests and their descriptions appear in Appendix D.

Personality Measures

Following are the seven measures of Personality used in the study. Sample items and descriptions appear in Appendix D.

1. Anxiety
2. Self Confidence
3. Interest in Reflective Thinking
4. Interest in Divergent Thinking
5. Interest in Convergent Thinking
6. Interest in Logical Thinking
7. Tolerance of Ambiguity

III. ANALYSIS OF THE DATA

Statistical Procedures

The correlation of all data employed the Pearson Product-Moment Coefficient, and analysis-of-variance techniques. Frequency distributions were run as required to determine linearity among correlations. When it was considered necessary for good analysis, Eta, Phi, and Biserial statistics were also used.

Using 38 as the number of variables in the study, the figures .2732 and .3541 were computed as the levels of significance, 5% and 1% respectively. The Pearson "r" is a conservative estimate based on linear correlation.

Results

Answers to Question 1-23 from pages 3-7 are summarized below for brevity.

Question 1.	Yes	Question 12.	No
Question 2.	No	Question 13.	No
Question 3.	No	Question 14.	No
Question 4.	No	Question 15.	Yes
Question 5.	No	Question 16.	No
Question 6.	No	Question 17.	No
Question 7.	No	Question 18.	No
Question 8.	Yes	Question 19.	No
Question 9.	No	Question 20.	Yes
Question10.	No	Question 21.	No
Question11.	No	Question 22.	No
		Question 23.	No

The primary yield of the research, gained through the pattern of answers to Questions 1-23, are considered below in tabled form to indicate major dimensions in the study showing relationship.

	Judged Student Art Performance	Student Art Judgement	Personality
Self-Measures	(+)		
Personality	(+)	X	
Creativity	(+) X	(-) X	
Discrepancies	X	(-) X (+)	X

(+) Significant Positive Relationship

(-) Significant Negative Relationship

X Relationship Approaching Significance

Measures showing relationship were plotted graphically to determine the necessity of more appropriate statistics. In the following analysis, unless otherwise mentioned, scatter-grams indicated the appropriatness of the statistic employed. As mentioned previously, Phi, Eta, and Biserial statistics were used in certain cases where scatter-grams indicated non-linear relationship between the sets of data.

Analysis of Measures Showing Relationship

Self-Measures and Judged Student Art Performance

Complete correlations appear on page 51 of Appendix E. This analysis should be preceeded by the information that Predicted Art Performance and Self-Evaluated Art Performance were highly related (.381), as expected.

The data indicate a significant relationship (.283) between student's evaluation of their own art performance and the judges' projection of the student's art ability based on the student art work. Since Predicted Art Performance and Self-Eval-

uated Art Performance are highly correlated (.381), it is understandable that student's prediction of their art performance would relate highly (.267) with the judge's projection of the student's art ability based on the student art work. The data indicate students and judges agreed on predicted and projected art ability.

Student's self-evaluation of their own art performance is significantly related (.328) to the judge's evaluation of the student art work on the Measure of Color. When the Phi statistic was used to remove effects of extreme cases, the coefficient was reduced to .180. This result may indicate the Measure of Color was particularly clear to the judges and, when the students evaluated their own performance, their criteria largely embraced color. The Measure of Crude-Sophisticated was also a useful factor in the student's evaluation of their own work, although there was not a significant relationship (.260). The Phi statistic produced a coefficient of .120. The measure of Crude-Sophisticated was also a category the judges interpreted relatively clearly. There was an extremely high relationship (.740) between

the Measures of Crude-Sophisticated and Color (page 61), which indicates the measures may not have been separate in the judging process.

Personality and Judged Student Art Performance

Complete correlation between these two major dimensions appear on page 52 of Appendix E.

The data indicate the Personality Measure of Interest in Divergent Thinking is related to Art Performance. This Personality Measure shows significant positive relationship with Judged Student Art Performance Measures of Pictorial Space (.345), Understanding of Page (.331), and Boring-Interesting (.306).

The student's interest in thinking divergently was a function of semantically-based tasks. The ability to develop Pictorial Space in a drawing (see definition in Appendix C) is usually thought of as a visual ability. The high, significant relationship may indicate the development of Pictorial Space has more to do with interest in divergency.

The relationship between Interest in Divergent Thinking and student's Understanding of Page is less

easy to explain. It would seem that ability to articulate an idea visually, from either external or emergent origin, would more nearly require interest in convergent thinking. It may be that the divergent personality also has convergent power. The measure of Interest in Convergent Thinking shows a negative relationship (-.127) with the Measure Understanding of Page. The data seem to suggest the divergent personality can converge, as required in an art performance. The items measuring Interest in Divergent Thinking appear to have more aesthetic reference, of the kind referred to in Understanding of Page, than do the items measuring Interest in Convergent Thinking.

The data do not indicate relationship between Interest in Divergent Thinking and the Creativity Measure of Gestalt Transformations (Closure), however.

It may simply be the divergent thinking students were advantaged in the verbally-motivated art performance task, enough to motivate them to the end of handling their ideas within the visual limitations referred to in the concept, Understanding of Page (See definition in Appendix C).

Interest in Divergent Thinking did not significantly relate to the judges' projection of Student Art Ability. There was a tendency to relate (.177) and, therefore student's interest in thinking divergently does have partially to do with projected ability in art.

The data shows significant correlation (.306) between Interest in Divergent Thinking and the Art Performance Measure of Boring-Interesting. The divergent personality does develop interesting art work, and has a process advantage when the art performance is verbally motivated.

Creativity and Judged Student Art Performance

Complete correlations between these two major dimensions appear on page 53 of Appendix E.

Part scores on Creativity are discussed for interest. Major conclusions are based on total scores.

The data indicate relationship between Measures of Creativity and Judged Student Art Performance. Gestalt Transformations Part 1 is significantly related (.282) to the Art Performance Measure of Pictorial Space. Use of the Phi Statistic reduced the number to (.160). Gestalt Transformation is a measure of con-

vergent production of semantic transformations, or Closure. Student ability to transform semantic ideas into production via the Measure of Pictorial Space is the relationship in question. This does not seem particularly noteworthy when using the more conservative Phi statistic. The Creativity Measure of Gestalt Transformations does not relate (.047) to the Personality Measure of Interest in Divergent Thinking. The terms of relationship between divergent personality and Creativity need further exploration.

There is a tendency for Gestalt Transformations Part 1 to relate to Tonalities (.265), and Understanding of Page (.267). The Phi statistic reduced those numbers to .180 and .080 respectively.

The Creativity implied in the handling of Pictorial Space is also semantically-based. Divergency, being as personality measure, would seem basic to both. Divergency, only relates to Pictorial Space, however. Pictorial Space ability is semantically related to the ability to converge on semantic transformations (Gestalt Transformations). A person able to handle Pictorial Space could be able to diverge

and also to converge on the verbal-motivation. Again, like Interest in Divergent Thinking, the data shows a positive relationship (.261) between Gestalt Transformations Part 1 and the Art Performance Measure of Boring-Interesting. In other words, there is an insignificant relationship implied between the Measure of Gestalt Transformations (Closure) and qualitatively interesting Art Performance.

The Art Judgment of the students, gained through the Measure of Boring-Interesting on the "reference" painting also showed no significant relationship (-.048) with Interest in Divergent Thinking, or Gestalt Transformations (-.260). In both cases, a negative relationship exists which approaches significance in the case of Gestalt Transformations.

The highest tendencies to significant relationship are generally between Gestalt Transformations Part 1 and Judged Student Art Performance Measures. The Measure of Production of Figural Effects, tends to relate to Color, Pictorial Space, and Understanding of Page.

Mean ratings of Judged Student Art Performance

appear on page 59 of Appendix F. Appendix H shows photographs of Student Art Performance judged high, average, and low, for further reference.

Personality and Student Art Judgment

Complete correlations between those major dimensions appear on page 54 of Appendix E.

The only relationship indicated between these two dimensions is the Personality Measure of Interest in Divergent Thinking and the Student Art Judgment Measure of Brutal-Tender. This relationship approaches significance (.272). Using the Phi statistic, this number reduced to .240.

Students who scored high on Interest in Divergent Thinking judged the "reference" painting as more Tender. Interest in Divergent Thinking appears to have association with the judges evaluation of the "reference" painting as more Tender. Considering the judges response, the interpretation could be made that the divergent personality has more capacity for aesthetic appreciation.

There were no significant relationships between the Art Judgment item Brutal-Tender and 1) Language

I.Q. (.014), 2) Non Language I.Q. (.028), 3) any of the creativity measures, or 4) any of the measures of Judged Student Art Performance. There were also no significant relationships between Interest in Divergent Thinking and Language I.Q. (.069), and Non-Language I.Q. (.068), to provide further understanding of this section. Although not of major interest in the study, Language I.Q. shows significant relationship (.295) with the single Personality Measure, Tolerance of Ambiguity.

It should be mentioned at this point that there were no statistically significant mean differences between the students' and judges' judgments of the "reference" painting.

The mean ratings of the "reference" painting appear on page 59 of Appendix F. The chart does show the majority of judgment directions were the same, but varied in intensity, or decisiveness. The professional judges were more extreme in their judgments and were therefore more decisive.

Creativity and Student Art Judgment

Complete correlation between these two major dimensions appear on page 55 of Appendix E.

Part scores on Creativity are discussed for interest. Major conclusions are based on total scores.

There are significant negative correlations between the Student Art Judgment Measure of Subjective-Objective concerning the "reference" painting, and the Creativity Measures of Alternate Uses Part 1 (-.274), Production of Figural Effects Part 2 (-.381), Part 1 (-.296), and the total score on the test of Production of Figural Effects (-.360).

The Mean Ratings Chart on page 59 of Appendix F indicates the mean judgment on the "reference" painting to be the same for both the professional judges and the students. As the figure indicates, this "Mean" judgment is only slightly in the direction of Objective, which indicates , in all probability, that neither the professional judges, nor the students, found the item particularly descriptive.

Both measures of Creativity, Alternate Uses Part 1, and Production of Figural Effects, yield

scores of divergent production. Production of Figural Effects yields divergent production of figural implications. Alternate Uses yields divergent production of semantic classes.

The high inverse relationships indicated by the data probably should be interpreted to mean that the concept Subjective is positively related to the capacity for divergent productions. The divergent producer of semantic and figural outcomes sees the "reference" painting more as Subjective than Objective.

Other relationships of interest are between the Creativity Measures of Gestalt Transformations Total and the Art Judgment Measures of Bad-Good (-.236), and Boring-Interesting (-.260), and Production of Figural Effects Total and Bad-Good (-.262) and Boring-Interesting (-.225). None are significant relationships. The data indicates a tendency to negative relationship. Since these "Gestalt" Art Judgment Measures are reasonably tried through earlier research and significantly relate to each other in this research (.606), the data is generally interpreted to mean an almost inverse relationship exists between production on Creativity tests and judgments on the "reference" painting as Bad and Boring.

Discrepancies and Other Major Dimensions

Cpmplete correlati ons appear on pages 56, 57, and 58 of Appendix E.

The single, most interesting producer of near significant relationships is Discrepancy 3 (page 7), between Self-Evaluated Art Performance and Evaluated Art Performance of Peers.

There are negative relationships, approaching significance between Discrepancy 3 and the Art Judgment Measures of Cool-Warm (-.238), and Boring-Interesting (-.216). Discrepancy 3 is a numerical function of Self-Evaluated Art Performance and Evaluated Art Performance of Peers. The data indicates a negative significant relationship between the single measure of Self-Evaluated Art Performance and the Art Judgment Measures of Cool-Warm (-.309) and near significant on Boring-Interesting (-.231). The single measure of Evaluated Art Performance of Peers does not relate to Cool-Warm (-.092), or Boring-Interesting (-.018). The "discrepancy" as such, is no more useful than the single Measure of Self-Evaluation, only understandable in terms of it's parts. Certainly, though, the significant, negative relationship (-.309) between Self-Evaluated Art

Performance and the Art Judgment Measure of Cool-Warm is noteworthy. Students with better opinions of their own work, see the "reference" painting as more Cool.

Student self-evaluations were based on personally gained criteria, if indeed, there were criteria at all. This phenomenon is interpreted to mean the students did not organize criteria for evaluating their art performance; especially not of the type they were required to use in the Art Judgment Task.

Self-Evaluated Art Performance does not related to any of the measures of Personality or Creativity. There is an insignificant relationship indicated with Non-Language I.Q. (.189). This may mean, in the absence of clear evaluative criteria, students tended to rely on quantitative evaluation such as measured by Non-Language I.Q.

The Art Judgment Measures of Cool-Warm and Boring-Interesting significantly related to each other (.351). It serves to demonstrate the Art Judgment measures were not independent enough to minimize the effects of "transfer" of judgment, particularly between the polar-sets, Cool-Warm, and Boring-Interesting. It

is interesting that the "Gestalt" Art Judgment Measure Boring-Interesting, significantly relates to the partially descriptive Measure of Cool-Warm. Therefore, students who thought the "reference" painting was Boring, also thought it was more Cool.

The data indicate on page 56 of Appendix E a negative relationship, approaching significance (-.239) between Discrepancy 3 and the Personality Measure of Anxiety. Students who rate themselves higher than their peers, appear less anxious. There is a positive , insignificant relationship (.211) indicated between Discrepancy 3 and the Personality Measure of Logical Thinking. This may indicate the criteria the students used for self-evaluation and evaluation of peer art performance, which is unknown, was not particularly useful or appropriate, but was perhaps somewhat logical.

The data suggest a tendency to positive relationship between Discrepancy 3, and the Judged Student Art Performance Measures of Crude-Sophisticated (.224), Color (.236), Tonalities (.220),

Projected Art Ability (.209), and Boring-Interesting (.203). Students who judged their own work higher produced more sophisticated, colorful, tonal, and interesting art work, and were considered to have more ability at art. Since the Intra-relationship of these art performance criteria are quite high, as seen in Appendix G, it is reasonable to assume they were not useful as separate criteria. It may mean further, that student self-evaluations made use of generalized criteria similar to that actually used in the Judged Art Performance of student art work.

The Eta statistic was computed between Discrepancy 2 and the Art Judgment Measure of Cool-Warm (.460) and between Discrepancy 3 and the Art Judgment Measure of Boring-Interesting (-.450), indicating significant curvilinear relationships. Students who judged their own work higher than their peers, considered the "reference" painting as more Boring. Students who predicted their work higher than they evaluated it, judged the "reference" painting as Warm.

The relationship between the Art Judgment Measure of Boring-Interesting and the discrepancy between Predicted Art Performance and Predicted Art Performance of Peers (Discrepancy 1) was re-computed using the more

conservative Phi coefficient. It produced a significant relationship (-.280). The data indicate then, that when students predicted their own apt work higher than their peers, they judged the "reference" painting as Boring.

Judged Student Art Performance Intra-Relationships

A particularly interesting result is the extremely high positive correlation (.774) between the Judged Art Performance Measures of Boring-Interesting and Projected Art Ability. The data indicate positive relationship (Appendix G) between Projected Art Ability and all other Art Performance Measures, except Literary-Visual. Literary-Visual was a confusing item and not considered productive for this study. Perhaps the determination of Projected Student Art Ability was based on accumulated descriptive art performance judgments. Perhaps, the data indicate that Boring-Interesting is a major consideration in the projection of Student Art Ability. Or perhaps more important, it points to the usefulness of separate

criteria for descriptive rather than evaluative purposes. Descriptive criteria may be most useful in process-oriented conditions where it is given that self-evaluation is the goal.

IV. SUMMARY

Conclusions

Within the admitted limitations of the study, Ninth-Grade students predict their Art Performance in agreement with judge's projections of Student Art Ability based on their work. The prediction of Student Art Ability by the judges agrees with student Self-Prediction.

There are indications that student self-evaluations of Art Performance (generalized "gestalt" self-evaluations) relate to judges estimates of student art performance on measures that are descriptive in nature.

The study also indicates the "gestalt" manner of judging student art performance is as reliable as separate descriptive criteria. The question to be asked, of course, still relates to the intention of evaluating student art performance. Separate, descripitve, criteria are the most useful when the intention of the evaluation is to guide student art progress. Overall, "gestalt" evaluations are apparently accurate, but not informative for teachers of art.

The Personality Measure of Interest in Divergent Thinking is related to certain categories of Art Performance and Art Judgment. Ninth-Grade students with higher interest in thinking divergently are better able to develop space in their drawings, are better at understanding and solving the limitations imposed by the size and shape of the drawing paper they are given, and their art work is more interesting. Students with high interest in thinking divergently, tended to judge the "reference" painting as more Tender. Students with low interest in thinking divergently, tended to judge the "reference" painting as more Brutal.

The Ninth-Grade student interested in thinking divergently appears better able to converge on an art task, than is his peer, who is more interested in thinking convergently.

Scores on the Creativity measures used in the study do not convincingly relate to Ninth-Grade Art Performance. The single exception is between the Cre-

ativity Measure Production of Figural Effects and certain measures of Art Performance, notably Color, Pictorial Space, and Understanding of Page. A cautious interpretation of the data is that Creativity scores arising from tasks primarily semantic, such as were used in the study, do not accurately predict Art Performance. Other factors may have influenced the results, particularly, the inherent weaknesses in the criterion for judging Student Art Performance. Retesting under better conditions with better instruments may reveal relationships between semantic measures of Creativity and certain categories of Art Performance.

The results should be tempered with the caution that Interest in Divergent Thinking does not relate to any of the Creativity measures.

The study indicates that professional and Ninth-Grade students' judgments concerning the "reference" painting were alike in direction. The professional.

judges were only more decisive. The differences in the mean judgments of the two groups were not statistically significant.

Several measures of Creativity show significant, nggative, relationship with the single Art Judgment Measure of Subjective-Objective. The inverseness of this relationship, and other relationships in this section, suggest that Ninth-Grade students scoring higher on Creativity rate the "reference" painting as Subjective.

It was hypothesized that discrepancies between internal projections of prediction and evaluation may provide leads into the natural order of relationship between Art Judgment and Art Performance. The discrepancy between Self-Evaluated Art Performance of Peers seems the most useful discrepancy produced by the study. There are weak tendencies for this discrepancy to relate to certain measures of Art Performance and Personality. Perhaps, more sophisticated means of evaluating Art Performance and re[illegible]

trieving discrepancy scores would make the relationship more clear. The data merely suggest that the difference between how Ninth-Grade students evaluate themselves and their peers tends to relate to certain aspects of Art Performance and Personality.

When more appropriate statistics were used, there was a significant relationship between the discrepancy in how Ninth-Grade students evaluate their Art Performance compared with their peers, and the Art Judgment Measure of Boring-Interesting. A significant negative relationship exists between how Ninth-Grade students predict their Art Performance compared to their peers, and the Art Judgment Measure of Boring-Interesting. To summarize, students predicting their Art Performance higher than their peers tended to evaluate the "reference" painting as Boring. Students evaluating their work higher than their peers also evaluated the "reference" painting as Boring.

The study also reveals a significant relationship between the discrepancy in how Ninth-Grade stu-

dents predict and evaluate their own art performance and the Art Judgment Measure of Cool-Warm. If they predicted their art performance higher than they evaluated it, they evaluated the "reference" painting as more Warm.

Certain aspects of Art Judgment appear predictable through the use of discrepancy techniques. Discrepancies and Art Performance appear less related by this study. Certainly, both dimensions of Art Performance and Art Judgment warrant further study than is provided by this pilot study using the experimental mechanism of discrepancy scores.

Implications and Suggestions for Further Research

The design of the study is limited. As a pilot study, also conservative in analysis, it has indicated promise in the use of discrepancy techniques to predict student disposition in the dimensions of Art Performance and Judgment. The natural order of relationship between these dimensions has not been gained by the study, but this is considered the fault

of the design rather than the idea.

The author would not wish to make predictions on the basis of this pilot study. Further research, developing ways of examining the variability of relationship between Art Judgment and Performance is very much needed. Further work with discrepancy techniques seems particularly appropriate.

Greater sophistication is also needed in the measurement of Art Judgment and Art Performance.

Purely non-discursive ways of examining the production and assessment of Art could perhaps be indicated by further research with impersonal mechanisms like discrepancy.

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Appendix A

Following are summaries of the pages in the experimental booklet used to gain scores on the experimental measures in this research.

Page 1 Instructions and title page.
Page 2 Self-Predicted Art Performance. Rank from 1-10, based on how well the student thought he would perform with knowledge of the stimulus.
Page 3 Predicted Art Performance of Peers. Rank from 1-10, based on how well the student thought his peers would perform with respect to the same stimulus.
Page 4 Instructions for 30 minute Art Performance. The written and verbal stimulus was, "With electric sky threatening, their thoughts turned inward, to the warmth of days gone by".
Page 5 Self-Evaluated Art Performance. Rank from 1-10, based on how well the student thought he performed.
Page 6 Evaluated Art Performance of Peers. Rank from 1-10, based on how well the student thought his peers performed.
Page 7 Art Judgment. Students were asked to judge the "reference" painting from 1-10, good-bad continuum.
Page 8 Art Judgment. See Appendix B.

Appendix B

The following criteria were used by the professional judges to judge the "reference" painting. They were to rank from 1-10 on each of the following items, expressed as polarities for clarity.

1) Cool-Warm
2) Simple-Complex
3) Brutal-Tender
4) Boring-Interesting
5) At rest-Moving
6) Subjective-Objective
7) Unbalanced-Balanced
8) Light-Heavy

These are the same items used by the students to judge the "reference" painting, with the single exception that the students were also to judge on the basis of Bad-Good (See Appendix A, reference to Page 7 of the experimental booklet).

The following criteria were used by the professional judges to judge Student Art Performance. They were to rank from 1-10 on each of the following items, 3 of which are expressed as polarities for clarity while testing, and 6 of which are straight rank items. As the analysis indicates, the item, Literary-Visual was eliminated because it was not polar. The item Interesting-Boring was reversed in the analysis and in the tabled information in Appendix E, to make it read the same direction as the other scale items.

1) Interesting-Boring
2) Crude-Sophisticated
3) Literary-Visual
4) Color
5) Pictorial Space
6) Line
7) Tonalities
8) Understanding of Page
9) Projected Art Ability

Appendix C

Following are definitions of terms used in the study.

Literary-Visual
Refers to subject-matter derivation. A literary derivation refers to conception of content based on hearing the stimulus. A visual derivation refers to content emerging from the materials employed, and less directly related to the stimulus. Not the same as naturalistic-abstract.

Color
Number and used of color, resulting in overall color handling with respect to drawing, rather than the stimulus.

Line
Number and uses of differin lines. The expressive rather than delineating, use of line.

Tonalities
The ability to develop the illusion of three-dimensions within a drawing, through shading and tinting.

Understanding of Page
The ability to take an idea, and deal with it in terms of an 18"x24" page. The phenomenon of scale and proportion.

Appendix D

Explanations and sample items of Creativity and Personality tests used in the study are presented below.

1. Simile Interpretations. Give different explanatory statements about the same simile, e.g., A woman's beauty is like the autumn.....

   Scored for DMK-"divergent production of semantic systems" (expressional fluency); the ability to organize elementary ideas into complex ideas.

2. Alternate Uses. Given the name of a common object, e.g., a newspaper, and its common use, list a variety of uncommon used. Each uncommon use is almost always in a different class of uses.

   Scored for DMC-"divergent production of semantic classes" (spontaneous flexibility); the ability to produce a variety of class ideas appropriate to a given idea.

3. Production of Figural Effects. Givenaa simple line, such as a V-shaped figure, build other lines around it, adding details to make a more complex figure.

   Scored for DFI-"divergent production of figural implications" (figural elaboration): the ability to elaborate upon given figural information.

4. Gestalt Transformation. Select one of five alternative objects, or parts of objects, to be used to serve a stated purpose. A sample item reads:

   TO LIGHT A FIRE
   1. cabbage
   2. fish
   3. pocket watch
   4. string
   5. pipe stem

   Answer: Pocket Watch(use cover as condensing lens).

Scored for NMT-"semantic redefinition": the ability to produce a change of emphasis on, or interpretation of, ideas so that the changed ideas are related in a new way, to meet a specific criterion.

5. Interest Inventory (Personality) Bureau of Educational Research, Kent State University, 1966.

Based on previous research with adults and children, involving the factor analysis of interitem correlations for several large groups, 56 items are grouped into 7 scales of 8 items each. Response to each item is "Agree" or "Disagree". These responses were not factor-analyzed; scores in this study are based on number of responses agreeing with the key, which consists of responses most logical in terms of previous results.

Names of the 7 scales and sample items follow.

Interest in Divergent Thinking
When you start to think about a problem, your thoughts stand to go off in all directions. (Agree)

Interest in Convergent Thinking
Usually you don't lose sight of the goal you are working toward while solving a problem. (Agree)

Tolerance of Ambiguity
For most questions there is just one right answer once you are able to get all the facts (Disagree).

Interest in Logical Thinking
You like to look for errors of reasoning in an argument. (Agree)

Interest in Reflective Thinking
You like to live in the present, leaving the past and the future out of your thoughts. (Disagree)

Self-confidence

There are some things that you can do better than most of your friends. (Agree)

Anxiety

When the teacher says that she is going to find out how much you have learned, you got a funny feeling in your stomach. (Agree)

Appendix E

Table 1

Complete Pearson Product-Moment Coefficients Between Experimental Measures of Self-Prediction and Evaluation, and Experimental Measures of Judged Student Art Performance.

	Boring-Interesting	Crude-Sophisticated	Literary-Visual	Color	Pictorial Space	Line	Tonalities	Understanding of Page	Projected Art Ability
Self-Predicted Art Performance	.227	.164	.068	.158	.186	.010	.115	.133	.267
Predicted Art Performance of Peers	.112	.103	.234	.077	.047	.056	.087	.045	.082
Self-Evaluated Art Performance	.200	.260	.188	.328*	.196	.220	.210	.179	.283*
Evaluated Art Performance of Peers	.003	.046	.022	.119	.061	.032	.013	.054	.095

*Significant at 5% Level-Of-Confidence

Table 2

Complete Pearson Product-Moment Coefficients Between Measures of Personality and Experimental Measures of Judged Student Art Performance.

	Boring-Interesting	Crude-Sophisticated	Literary-Visual	Color	Pictorial Space	Line	Tonalities	Understanding of Page	Projected Art Ability
Anxiety	.103	-.038	-.134	.053	-.030	-.089	.006	-.042	-.138
Self-Confidence	.072	.009	.117	.166	.038	.008	.052	.027	.054
Interest in Reflective Thinking	.022	.065	.008	.105	.015	-.018	.107	.059	.017
Interest in Divergent Thinking	.306	.237	.092	.256	.345*	.243	.269	.331*	.177
Interest in Convergent Thinking	.167	-.095	.016	-.034	-.145	-.231	.037	-.127	-.026
Interest in Logical Thinking	.066	-.045	.060	.097	.003	.044	.116	.021	.029
Tolerance of Ambiguity	.063	.139	.012	.003	.052	.145	.033	.074	.046

* Significant at 5% Level-of-Confidence

Table 3

Complete Pearson Product-Moment Coefficients Between Measures of Creativity and Experimental Measures of Judged Student Art Performance.[1,2]

	Boring-Interesting	Crude-Sophisticated	Literary-Visual	Color	Pictorial Space	Line	Tonalities	Understanding of Page	Projected Art Ability
Gestalt Transformations 1	.261	.226	-.132	.208	.282*	.236	.265	.267	.240
Gestalt Transformations 2	.016	.016	-.063	.025	.021	-.010	.002	-.018	-.003
Gestalt Transformations Total	.163	.142	.113	.137	.178	.132	.157	.147	.140
Simile Interpretations 1	.020	.044	.050	.092	.106	.028	.030	.093	.181
Simile Interpretations 2	.012	.015	-.232	-.048	.035	.010	-.044	.063	.028
Simile Interpretations Total	.019	.035	-.113	.024	.083	.022	-.009	.092	.119
Alternate Uses 1	.086	.221	-.026	.209	.199	.167	.157	.195	.148
Alternate Uses 2	.013	.050	-.102	.128	.146	.079	.001	.104	.120
Alternate Uses 33	.082	.161	-.003	.165	.190	.145	.110	.199	.183
Alternate Uses Total	.063	.173	-.050	.200	.213	.156	.107	.200	.181
Production of Figural Effects1	-.173	.242	-.045	.257	.221	.177	.109	.229	.199
Production of Figural Effects2	-.146	.169	-.075	.182	.213	.219	.081	.209	.122
Production of Figural Effects Total	-.177	.233	.062	.248	.238	.211	.107	.241	.183

*Significant at 5% Level-of-Confidence

[1]Various coefficients were recomputed using the Phi coefficient, reader should refer to text.

[2]Conclusions were based on total scores, part scores were included for interest.

Table 4

Complete Pearson-Product-Moment Coefficients Between Measures of Personality and Experimental Measures of Student Art Judgment.

	Bad-Good	Cool-Warm	Simple-Complex	Brutal-Tender	Boring-Interesting	At Rest-Moving	Subjective-Objective	Unbalanced-Balanced	Light-Heavy
Anxiety	.193	.140	.106	.069	.067	.074	-.053	.162	-.175
Self-Confidence	.021	-.180	-.102	-.119	.024	.135	.028	.111	-.054
Interest in Reflective Thinking	.087	.006	-.146	-.198	.114	.040	.194	.080	-.031
Interest in Divergent Thinking	.063	-.002	-.013	.272*	-.048	.023	-.105	.049	.008
Interest in Convergent Thinking	.091	-.006	-.116	-.069	.132	.021	-.083	.034	-.136
Interest in Logical Thinking	.068	.007	-.067	-.040	.074	.119	.045	-.060	-.057
Tolerance of Ambiguity	-.015	.054	-.106	.029	.062	.003	-.076	-.003	-.006

*Misses 5% Level-of-Confidence .001

Table 5

Complete Pearson Product-Moment Coefficients Between Measures of Creativity and Experimental Measures of Student Art Judgment. 1,2

	Bad-Good	Cool-Warm	Simple-Complex	Brutal-Tender	Boring-Interesting	At Rest-Moving	Subjective-Objective	Unbalanced-Balanced	Light-Heavy
Gestalt Transformations 1	-.159	-.167	.100	.125	-.213	-.107	-.214	-.192	-.112
Gestalt Transformations 2	-.249	-.101	-.002	.027	-.237	.039	-.224	-.087	-.066
Gestalt Transformations Total	-.236	-.156	.058	.089	-.260	-.041	-.254	-.163	-.104
Simile Interpretations 1	-.063	.060	.082	-.019	.064	.035	-.163	.061	.036
Simile Interpretations 2	-.032	.042	.042	-.114	.038	-.105	.077	-.019	.032
Simile Interpretations Total	-.057	.061	.073	-.081	.061	-.044	-.046	.023	.041
Alternate Uses 1	-.058	.252	.099	.003	-.026	.109	-.274*	-.043	-.020
Alternate Uses 2	-.106	.111	-.078	.018	-.119	-.004	-.055	-.005	.127
Alternate Uses 3	.052	.082	.006	-.035	.086	.138	-.081	.064	.188
Alternate Uses Total	-.040	.174	.010	-.006	-.018	.099	-.160	.008	.121
Production of Figural Effects 1	-.236	-.154	-.016	-.012	-.199	.021	-.296*	-.146	.033
Production of Figural Effects 2	-.245	-.067	-.023	-.015	-.218	.037	-.381**	-.144	.013
Production of Figural Effects Total	-.262	-.130	-.020	-.014	-.225	.030	-.360**	-.159	.028

*Significant at 5% Level-of-Confidence
**Significant at 1% Level-of-Confidence

[1]Various coefficients were recomputed using the Phi coefficient, reader should refer to text.

[2]Conclusions were based on total scores, part scores were included for interest.

Table 6

Complete Pearson Product-Moment Coefficients Between Experimental Measures of Discrepancy And Experimental Measures of Student Art Judgment.

	Bad-Good	Cool-Warm	Simple-Complex	Brutal-Tender	Boring-Interesting	At Rest Moving	Subjective-Objective	Unbalanced-Balanced	Light-Heavy
Discrepancy #1 (page 7)	-.139	.099	.020	-.116	-.248	.138	-.081	.015	-.043
Discrepancy #2 (page 7)	.143	.216	-.048	.171	.155	.010	-.047	-.016	-.165
Discrepancy #3 (page 7)	-.126	-.238	.057	-.078	-.216	.046	.046	.049	.134
Discrepancy #4 (page 7)	.083	.118	.019	.157	.111	-.146	.048	.083	-.051

Table 7

Complete Pearson Product-Moment Coefficients Between Experimental Measures of Discrepancy and Measures of Personality.

	Anxiety	Self-Confidance	Interest in Reflective Thinking	Interest In Divergent Thinking	Interest In Convergent Thinking	Interest in Logical Thinking	Tolerance of Ambiguities
Discrepancy #1 (page 7)	-.061	.200	.089	.071	.132	.078	-.038
Discrepancy #2 (page 7)	.042	-.028	-.006	.098	.095	-.084	-.087
Discrepancy #3 (page 7)	-.239	.091	-.008	-.012	.193	.211	.144
Discrepancy #4 (page 7)	-.069	-.124	.052	.046	.082	.141	.184

Table 8

Complete Pearson Product-Moment Coefficients Between Experimental Measures of Discrepancy and Experimental Measures of Judged Student Art Performance.

	Boring-Interesting	Crude-Sophisticated	Literary-Visual	Color	Pictorial Space	Line	Tonalities	Understanding of Page	Projected Art Ability
Discrepancy #1 (page 7)	.111	.066	-.092	.077	.117	-.027	.037	.077	.161
Discrepancy #2 (page 7)	.034	-.142	-.140	-.216	-.058	-.215	-.127	-.084	-.090
Discrepancy #3 (page 7)	.203	.224	.170	.236	.145	.195	.220	.137	.209
Discrepancy #4 (page 7)	.051	.033	.174	-.035	-.046	-.008	.054	-.062	-.044

Table 9

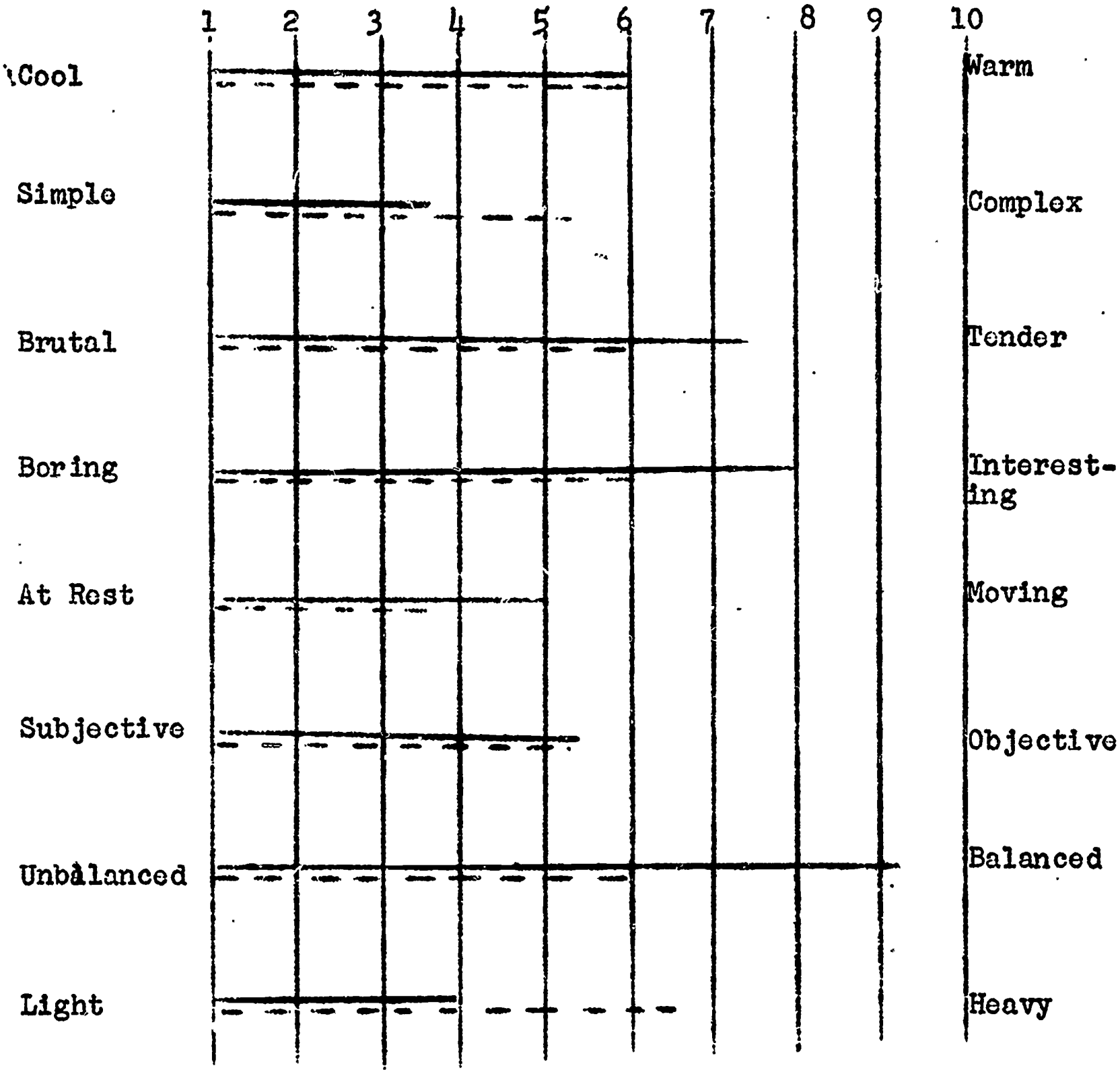
Complete Pearson Product-Moment Coefficients Between Measures of Creativity and Experimental Measures of Discrepancy.

	Discrepancy #1 (page 7)	Discrepancy #2 (page 7)	Discrepancy #3 (page 7)	Discrepancy #4 (page 7)
Gestalt Transformations 1	.119	-.057	.020	-.118
Gestalt Transformations 2	.152	-.045	.019	-.056
Gestalt Transformations Total	.157	-.059	.023	-.102
Simile Interpretations 1	.071	.045	-.015	.054
Simile Interpretations 2	-.048	-.087	.039	.134
Simile Interpretations Total	.011	-.027	.014	.114
Alternate Uses 1	-.038	.085	-.071	.156
Alternate Uses 2	.148	.036	.037	.034
Alternate Uses 3	.057	.044	-.086	-.000
Alternate Uses Total	.066	.065	.049	.072
Production of Figural Effects 1	.068	-.002	.063	.024
Production of Figural Effects 2	.002	.010	-.060	-.045
Production of Figural Effects Total	.045	.002	.015	-.003

Appendix F

Chart 1

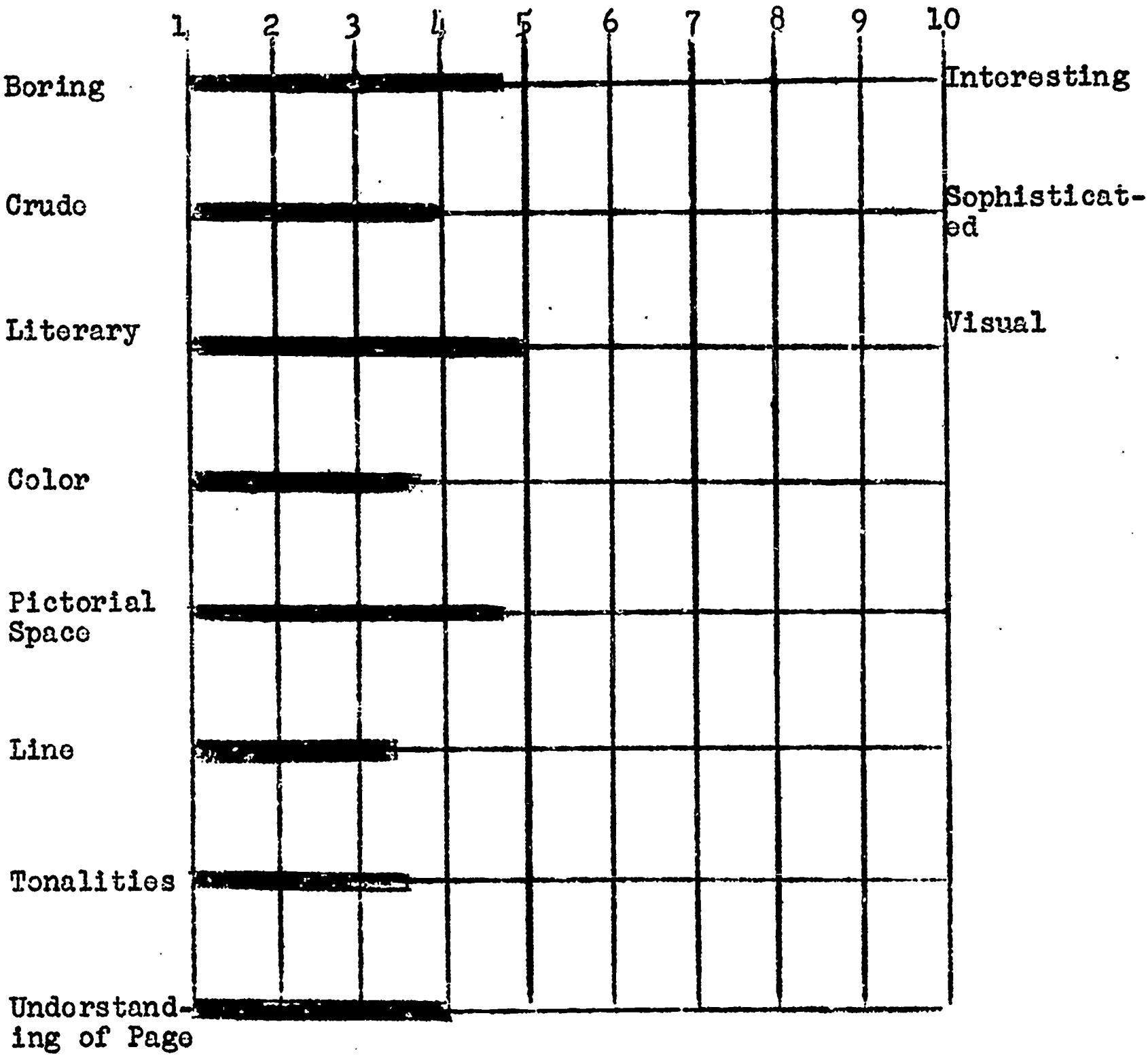
Mean Ratings of Judge's and Student's Judgments on the "Reference" Painting.



Solid line-Judges
Dash Line-Students

Chart 2

Mean Ratings of Judged Student Art Performance



Appendix G

Table 10

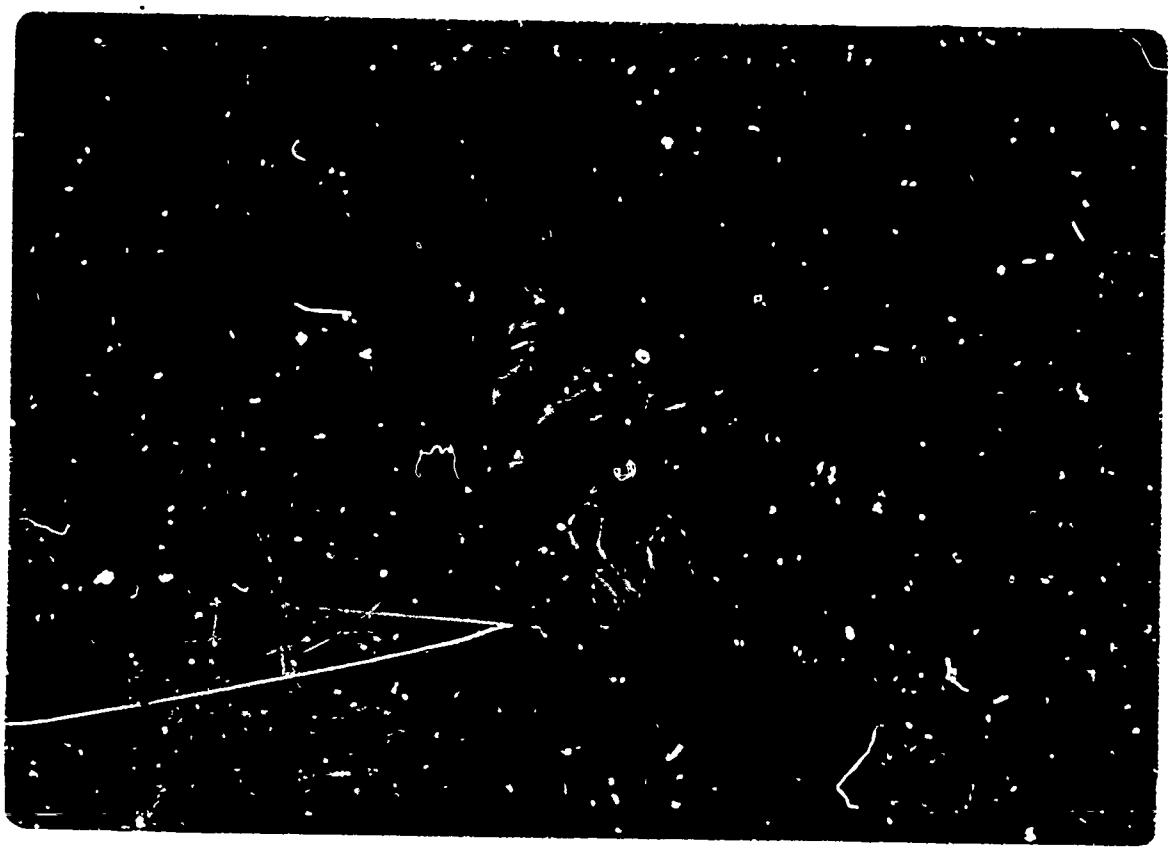
Intra-Correlation of Separate Measures of Judged Student Art Performance.[1]

	Boring-Interesting	Crude-Sophisticated	Literary-Visual	Color	Pictorial Space	Line	Tonalities	Understanding of Page	Projected Art Ability
Boring-Interesting		.768	.255	.662	.719	.688	.703	.733	.774
Crude-Sophisticated			.185	.740	.769	.728	.796	.803	.807
Literary-Visual				.409	.240	.210	.379	.168	.248
Color					.785	.658	.843	.749	.743
Pictorial Space						.751	.827	.947	.816
Tonalities							.717	.774	.742
Understanding of Page								.831	.793
Projected Art Ability									

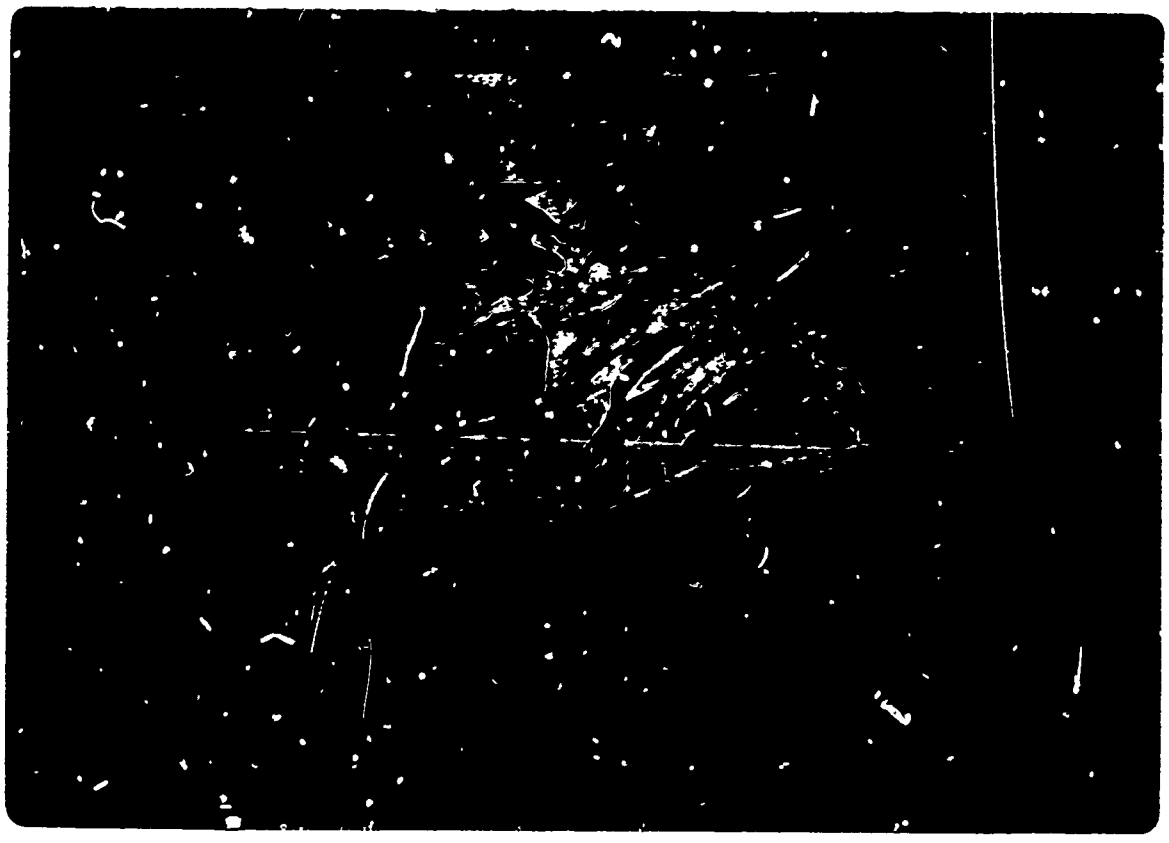
[1] As the data indicate, intra-relationships are extremely high except with the item Literary-Visual which was considered inappropriate. Refer to text for discussion.

Appendix H

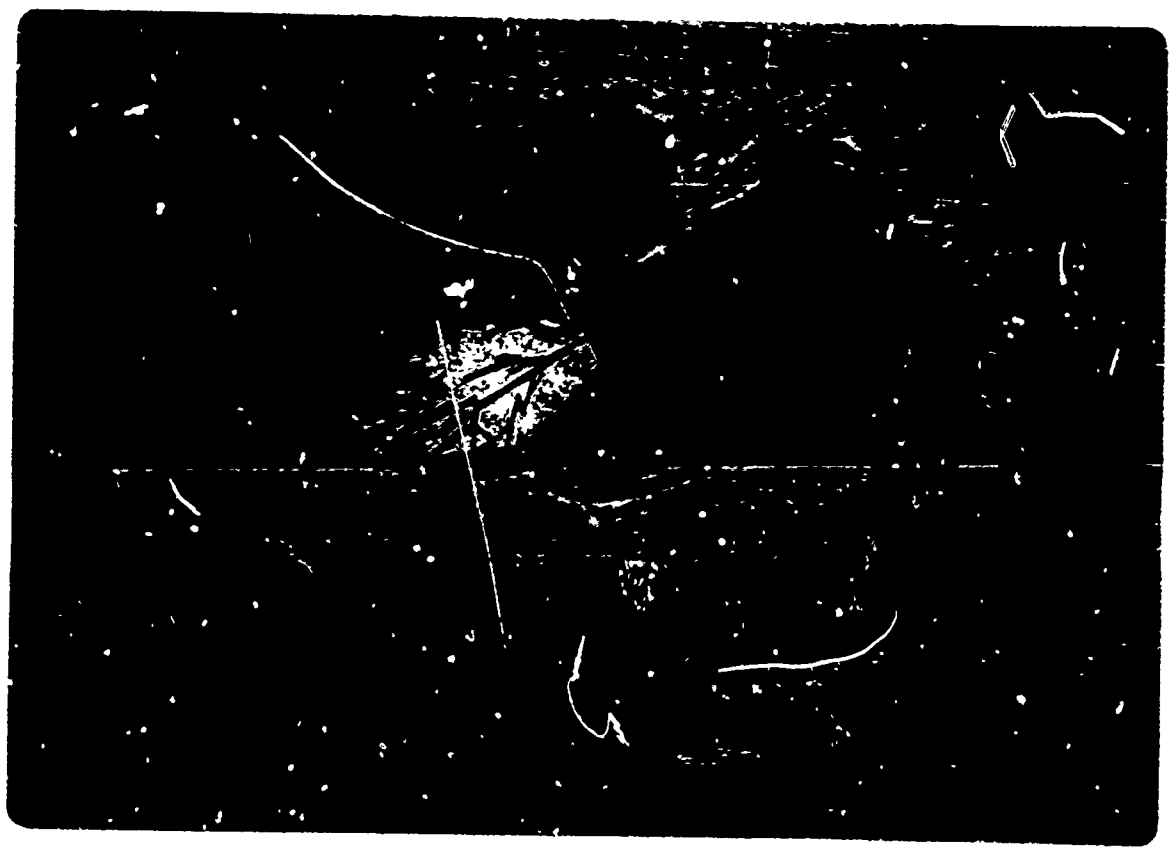
Following are four random examples of Student Art Performance with corresponding "Mean" ratings of the judges. They were selected to show performances rated high interesting, average interesting, and low interesting, in comparison with "Mean" ratings on the descriptive criteria. See Appendix B, for the items used to evaluate Student Art Performance.



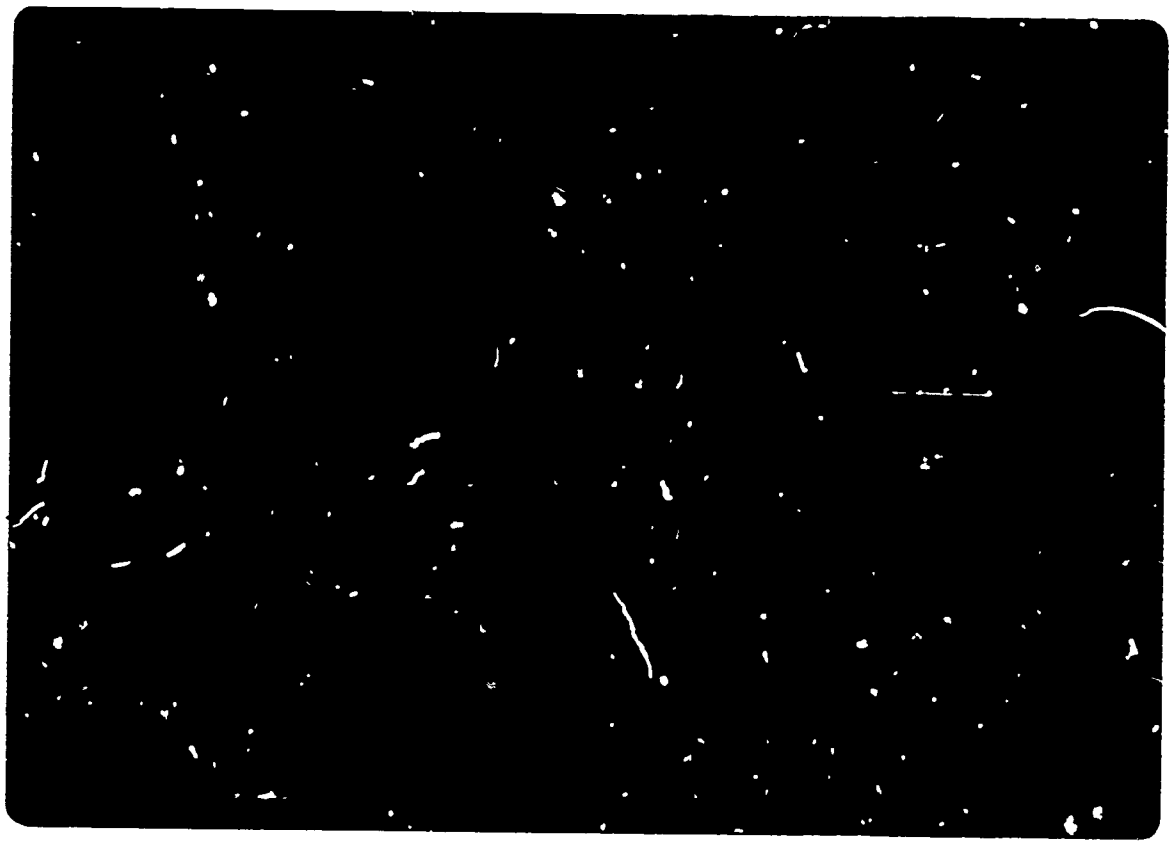
HIGH INTERESTING



HIGH INTERESTING



AVERAGE INTERESTING



LOW INTERESTING

Data shown on the four photographs was not clear and is summarized below.

	High Interesting (page 62)	High Interesting (page 63)	Average Interesting (page 63)	Low Interesting (page 64)
Gestalt Measure of Interesting	9.75	8.25	4.75	1.50
Total of Descriptive Measures Excluding Literary-Visual	8.75	5.12	5.58	3.25
Projected Art Ability	4 judges yes	3 judges yes 1 judge no	2 judges yes 2 judges no	4 judges no