BRITT, MORRIS F.: An Exploratory Study of a Color Association Exercise for the Assessment of Verbal Creative Ability. (1967)
Directed by: Dr. Kendon Smith. 40 pp.

A Color Association Exercise (CAE) was devised to assess verbal creative ability. Four scales were developed for utilization with the CAE: Originality, Abstraction, Fluency, and Elaboration. When administered to 173 adolescent students, the Color Association Exercise appeared to have only moderate potential as an assessment technique for verbal creative ability. Abstraction and Elaboration scores were positively related to English compositional ability. Correlations, however, although statistically significant, were not sufficiently high for the CAE to be of immediate practical value.

The Revised Art Scale (RAS) of the Welsh Figure Preference Test was administered to the same students, and it was found that cognitive predisposition for complexity in figures, as measured by that scale, was not related to verbal creative ability or skill in language usage such as theme writing.

Results of the present study suggest that the CAE may have potential as a new technique for the measurement of verbal creative ability, but it may more properly be viewed at this point as an approach in need of further investigation and development. Evidently, the RAS is not a promising device for the assessment of verbal creativity in particular.

AN EXPLORATORY STUDY OF A COLOR ASSOCIATION EXERCISE FOR THE ASSESSMENT OF VERBAL CREATIVE ABILITY

by

Morris F. Britt

A Thesis Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Psychology

Greensboro
August, 1967

Approved by

Director

APPROVAL SHEET

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro, Greensboro, North Carolina.

Thesis Director _____

Oral Examination Committee Members _____

_____

_____

August 21, 1967
Date of Examination

ACKNOWLEDGEMENTS

Many individuals have given of their time and interest to aid this study.

Mr. Robert Lacklen, Director of the Creativity Research Institute, Richardson Foundation, Greensboro, provided the idea on which this study was based. I wish to express my appreciation to him and to the Richardson Foundation for advice and financial support of the project.

To Dr. Kendon Smith, University of North Carolina at Greensboro, goes the writer's gratitude for his unfailing encouragement and helpful guidance in directing and supervising this thesis.

Mrs. Mary Frances Hazelman and Mrs. Linda M. Timmerman, as well as other school personnel at Kiser Junior High School, Greensboro, were most cooperative in providing school time for the testing. Mrs. Hazelman gave invaluable assistance on several aspects of the study.

I wish to acknowledge the cooperation of Mary O'Neill and Doubleday and Company in granting permission to utilize poems from Hailstones and Halibut Bones.

Much gratitude and appreciation goes to my family who underwent many sacrifices of a personal nature to make this work possible.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

The recent psychological literature reveals an increased interest in the creative individual and the creative process. Research findings have, however, often neglected to take cognizance of the fact that diverse definitions of "creative ability" have fostered the development of dissimilar creativity tests and assessment techniques. Thus, differing conceptualizations of the dimension of creative ability have found their way into tests of creative ability via a bewildering array of tasks--verbal and nonverbal, cognitive and noncognitive.

Within the broad domain existing under the rubric of "creativity," several sub-areas have been delineated. One such sub-area is that of verbal creative ability. Verbal creative ability has presented a unique topic for study, because a major portion of human activity transpires through the verbal modality. Increasingly greater emphasis, unfortunately, has been placed on atomistic, narrowly defined, and patently artificial abilities from which verbal creative capacity is inferred. Although such emphasis in test construction has been useful and perhaps necessary, little has been done to evaluate the rich complexity of global verbal creative ability. Investigative reluctance is partly explicable in terms of difficulties inherent in attempting to measure unwieldy verbal responses. It will probably

always be easier to measure abilities based on "right," or convergent, responses, than to measure those based on unexpected, unusual, or divergent responses.

There is a paucity of studies on the measurement of verbal creative ability in the psychological literature. Most pertinent and suggestive, however, is an investigation of creative writing ability by Welsh (1959), which focused on actual writing samples. He found that scores on the Revised Art Scale (RAS) of the Welsh Figure Preference Test were markedly higher for three classes in creative writing at the University of North Carolina at Chapel Hill, with 16 subjects (Ss) in each, than for people-in-general. Mean RAS scores fell at a level obtained by creative artists, a fact which supports the hypothesis that creative ability in various fields is related to scores on the RAS. Rank-order correlations of .40 and .35 between rankings of the students' originality and creativity, as judged by stories written during the term, and RAS scores, were obtained. Although these rho's did not reach statistical significance in the small samples involved, they did encourage the belief that verbal creative ability is moderately correlated with RAS scores. Obviously the relationship between RAS scores and creative writing ability deserves greater scrutiny in a larger sample of Ss.

Most studies of verbal creative ability have, unlike Welsh's, utilized tests designed to measure narrow, specific "verbal" abilities in ways other than via perceptual preference. One

well-known approach for tapping somewhat elementary verbal abilities is Guilford's battery of factor-analyzed and implicitly atomistic tests to measure divergent thinking abilities (Christensen and Guilford, 1959). The manual reports reliability estimates, based upon correlations of alternate forms (halves) of tests, which range from .63 to .76 for three of the fluency tests in the Guilford battery. No data on scorer agreement are presented, and only construct validity data are reported in the manual. In spite of these limitations, the Guilford measures have achieved wide popularity with researchers (Bereiter, 1960; Clark, Veldman and Thorpe, 1965; Feldhusen, Denny and Condon, 1965; Klausmeier, Harris and Ethanathios, 1962; Klausmeier and Wiersma, 1964; Piers, Daniels and Quackenbush, 1960), and they are probably the best measures currently available.

The Guilford tests are partly composed of suffix-and prefix-tasks which are to be performed within given time periods, and items requiring the writing of words beginning or ending with specified letters. Another task requires that the S write words containing a specified letter. Expressional fluency, the ability to produce divergent symbolic systems, is tested by the writing of four-word sentences when the first letter of each word is given. Finally ideational fluency, the ability to produce divergent semantic units or a quantity of ideas, is assessed by requiring as many ideas as possible about a given topic in five minutes, and as many words as possible about a topic in six minutes. It

may readily be observed that these measures of "verbal" creativity are indeed verbal, but that the term is narrowly conceptualized and refers to abilities somewhat different from those which culminate in a global verbal product such as a poem or story.

In view of the emphasis on atomistic "verbal ability" which is implicit in most current creativity tests (Christensen and Guilford, 1957-1958; Torrance, 1966), there appears to be considerable need for alternative approaches in the measurement of verbal creative ability. Thus the construction, administration, and evaluation of a new identification technique has suggested itself, and a simple Color Association Exercise (CAE) for assessing global verbal creative ability has been devised by the writer. The CAE is intended as a free-response test, in that S is not presented with alternatives rigidly controlled by the examiner. The test uses a complex, lifelike, and realistic medium, and presents the subject with a task not unlike the criterion to be predicted. The CAE is based on color associations produced in poetry, and there are many historical antecedents for such an approach in the psychological literature. Thus Galton pioneered in the systematic application of associative techniques before the turn of the century; and Jung, and Kent and Rosanoff, made early clinical application of associational patterns (Anastasi, 1961, pp. 566-567).

The purpose of the CAE is disguised, in that the subject is not aware of the various aspects of his performance which are

being evaluated. The CAE is similar to projective personality tests because the task assigned is relatively unstructured. Its construction is such that it taps and tacitly encourages idiosyncratic traits of verbal behavior. It may thus be likened to controlled verbal association tests. By its very nature, the CAE allows extreme latitude in self-expression, individualistic interpretation of perceptual experiences, and the ordering of perceptual material in terms of color associations. Color sensitivity, perceptual awareness, visual memory, and verbal expressional ability probably could be shown to interact cumulatively to produce the global performance elicited by the CAE.

For such a test as the CAE to have predictive value, it should demonstrate substantial concurrent validity. The present study was in fact designed to investigate concurrent validity by determining the relationship of proposed CAE scales, intended to measure verbal Fluency, Elaboration, Originality, and Abstraction, to English compositional ability; the latter was measured in a way designed to extricate creative writing ability from the factual, reproductive, and more mechanical necessities of English instruction and their influence on the total English grade. The present study also had two secondary aims, both revolving about the fact that the Revised Art Scale of the Welsh Figure Preference Test has been assessed tentatively as a predictor of English compositional ability (Welsh, 1959). The first of these aims was the further

assessment of the Revised Art Scale against the same criterion. The second was the direct correlational comparison of the RAS with the CAE.

METHOD

Subjects

The Ss were 173 Caucasian children (72 boys and 101 girls) enrolled in ninth-grade English classes at Kiser Junior High School, Greensboro, North Carolina. One group was composed of three classes (N = 102), all taught by the same instructor, constituting a special enriched English laboratory. A second group consisted of two regular English classes (N = 71), both taught by a second instructor; it will be referred to as the "comparison group."

Materials

Two instruments were used to measure verbal creative ability. The Revised Art Scale (RAS) of the Welsh Figure Preference Test (Welsh, 1959), a perceptual measure thought to tap a cognitive predisposition for complexity, was used as a general measure of creativity. The newly developed Color Association Exercise (CAE) was used to assess verbal creative ability in particular.

Procedure

The CAE was administered in the following manner. With the investigator present as observer, each class was given a preliminary warm-up period to provide a feeling for free-associating to color and an opportunity to develop spontaneous enthusiasm for the exercise. The warm-up period utilized two stimulus poems (see Appendix A, Page 29), "What Is Brown?" and "What Is White?", which were

read aloud to each class by the English teacher. After the reading of these poems, Ss were encouraged to free-associate verbally. Ss were then presented with the task of writing two poems, one each for the colors red and blue, incorporating associations to these colors. Aside from the suggestion that Ss be as clever as possible and try to "think up things that nobody else will think of," there were no explicit requirements in regard to rhyming, punctuation, spelling, or length. Ss were under the impression that their verbal productions were routine English assignments rather than a test of verbal creative ability. Thus CAE administration took place as an integral part of ongoing classroom activity within the confines of a regular classroom period (the presence of an observer constituted no procedural change for this English laboratory group). There was no rigid adherance to time limits, and presentation of the CAE was informal.

The RAS of the Welsh Figure Preference Test was administered to each class, approximately two weeks later, by the investigator. The Welsh Figure Preference Test is a group test which consists of 400 black-and-white figures, for each of which S is asked to decide whether he likes it or does not. The test was completed by most pupils within 50 minutes. An objective count of "Likes" and "Don't Likes," on a scale employing 60 designs (30 "Likes" and 30 "Don't Likes") standardized on the basis of scores of recognizedly creative individuals, constituted each pupil's RAS score.

The letter grades for regularly assigned English themes were converted to their numerical equivalents and a mean score for each S

was computed. In the English laboratory group, 11 such themes were available. The comparison group, with less stress placed on compositional English, had only four themes suitable for computing a mean score. All letter grades were converted to their mean numerical equivalents according to the following schema:

A+	99.5
A	97.0
A-	94.5
B+	92.5
B	90.5
B-	88.5
C+	86.5
C	84.0
C-	81.0
D+	78.5
D	75.5
D-	72.0

The Ss' grades were taken directly from grade books maintained by the English teachers. Scores were based primarily on the content of the themes, and not on grammatical and other components of the total English grade. These scores, designated English Composition Content (ECC), became the primary criterion of verbal creative ability.

Scoring of the CAE

As Guilford (1950, p. 445) and others have noted, the development of adequate scoring procedures for tests of creativity presents

difficult problems. A compromise must often be made between subjective and objective methods in order that the uniqueness of a subject's response is respected without sacrificing scoring reliability. With this consideration in mind, four scales were developed for utilization with the exercise: they were scales of Originality, Abstraction, Fluency, and Elaboration.

Originality: Subjects were classified as Low, Medium, or High, according to freshness, novelty, originality, richness, and diversity of associations given for the colors red and blue; a low score indicated that the production was one of the poorest of the group in overall quality. Thus the verbal Originality dimension was measured in terms of a three-category rating scale.

The following poem was rated High in Originality:

Blue is the color of a flowing brook
The soft, warm eyes of a blond-headed baby
Blue a sapphire glittering brightly in the light
A fresh new thought for a writer's Chapter three
Blue is the color of a gentle stream
It's the night and day in a worthwhile dream
Blue is the romance after it breaks,
Blue is bruising that boxers take
It's the color of a desk from bottom to top
It's the feeling you get when your memory goes flop.
Blue is the air on a foggy night
Blue is what you see when the ocean comes in sight

It's the color of the print on a shopping sack,
It's the feeling that you lose when your memory
comes back.

The following poem was rated Medium in Originality:

Red is the color of the sun.
Red is the color of the leaves in autumn
Red is the color of your blood which
keeps you alive.
Red is part of the color of my country's flag.
Red is the color of some kinds of trees.
Red is the color of paint and
houses, cars and bikes.
Red is the color of some people's hair.
Red is the color of a battlefield,
Red is the color of your face
on a hot summer day.
Red is the color of the American Indian.

The following poem, reproduced with mispelling intact, received a rating of Low in Originality:

Blue is the sky in the morning
Blue is the car so clean
Blue is coloer in the rainbow
The one so clear and true
It's the one that shines above all

In the cold but wounderful fall
Blue is the coloer of my desk
And the color of my shurt and my
girl friends scurt
Blue is the most wounderful coloer I know
It shiens above all coloers that glow.

Abstraction: Verbal Abstraction was also scored on a three-category rating scale. Productions were rated Low, Medium, or High, according to the utilization of highly abstract phrases, i.e., those characterized by symbolic, allegorical, and anthropomorphic qualities. The following poem, for example, received a High rating on Abstraction:

Red is the balloon and the
autumn apples,
Red are the faces of fighters
as they grapple.
Red is the juice of the fiery sweet
cherry,
And Red is the color of plump
summer Rasberry.
Red are the lips of a new born babe,
And Red is his blood as on
the battlefield he "lays."
Red is the sun as it sets
at night,

And Red is the color of
terrible fright.
Red is disaster though sometimes
its calm,
And Red is the color of a
nail pierced palm.
Red are the eyes of a
sleepless man.
Red are the stripes on a
candy cane.
Red is a blush Red is a
fire,
Red is the color of sin
on wool,
And Red are the eyes of
an angry bull.
Red is the nose of a boy who has
just "fighted,"
Red is the color of the mind
excited.

The following poem was rated Medium on Abstraction:

Blue is the sky on a warm spring day
A winter's stream
A horses eye.
Blue is a shirt

A pair of pants
A boy with a horn named
Little Boy Blue
Blue is clean
Blue is fresh
Blue is a feeling
  of distress.
Blue is the color of a car
A cold winter's day
A solemn star.

The following poem received a rating of Low on Abstraction:

Blue is the color of Duke, Aycock and me.
A boy's blanket
A swimming pool
  and a jewel.
Blue is night
A boy's shirt
And a girl's skirt.

Fluency: Verbal Fluency scores were derived by counting the number of associations given in response to the colors. The passage, "Blue is cold, numbness, ice, twinkling eyes, the sky on an October morning," for example, contained five associations or images--cold, numbness, ice, eyes, and sky--which the S associated with the color blue. The passage, "Blue may be, Boat or coat, Pants or ants, Nail or snail, Rain or cane, Clothes or nose, Smoke or rope,

Metal or Pope - But I shall feel that Blue is hope," contained a total of 15 associations: boat, coat, pants, ants, nail, snail, rain, cane, clothes, nose, smoke, rope, metal, Pope, and hope.

Elaboration: Verbal Elaboration scores were derived by counting the number of adjectives and adjectival phrases which modified the associations for red and blue. The following illustrative poem, with underlined portions to indicate credits for Elaboration, received a score of 9:

> Red is the color of a crackling fire,
> a sports jacket,
> an electric wire,
> a ship with barnacles encrusted,
> a metal that's rusted.
> Red is the flash of a gun, the heat of a day,
> the cigarette butt that glows in the dark,
> a feeling of wonder and the look of damp clay.

If the last line of the poem had contained the phrase, "a bright feeling of wonder and the tired look of damp clay," two additional credits would have been given on verbal Elaboration. The following example contained a total of 13 elaborations:

> Blue is the color of a crisp autumn day,
> forget-me-nots,
> and the ocean bay,
> the bow in her hair,

and the lights at the fair,
lakes in the valleys or streams on the hills,
one-dollar notebooks.
Blue is the thought that you can't remember,
a steel-colored snow on a night in December.
Blue is the face of a man without air.

Because subjective ratings were involved in scoring the CAE, an attempt was made to secure stable ratings on all variables by the replicative coding of poems. Two independent raters, the author and a volunteer assistant, both completely uninformed as to the sex, ability level, or group membership of each subject, rated every production. The reliability of initial scoring of the CAE was assessed by utilization of Pearsonian correlation coefficients in the cases of the Fluency and Elaboration scales, whose scores derived from the counting of responses; and by utilization of contingency coefficients for the Originality and Abstraction rating scales.

Inter-rater reliability coefficients of .98 and .88 were obtained for Fluency and Elaboration, respectively. Inasmuch as these two scales involved counting fairly well defined responses rather than making ratings, high correlations are not surprising. In assigning final scores, it might be said now, the author's count of responses was utilized whenever a difference of one existed between raters; mean ratings were utilized when a difference of two or more existed; in most cases there was actually unaniminity.

The inter-rater reliabilities of the ratings on Abstraction and Originality were evaluated by using the contingency coefficient, C, which provides a measure of the extent of association between two sets of attributes or ratings when data derive from a nominal or an ordinal scale (Siegel, 1956, pp. 196-202). Contingency coefficients of .64 and .59 for ratings of Abstraction and Originality, respectively, were obtained. Inasmuch as a maximum value of .816 is possible with a 3 x 3 table (Siegel, 1956, p. 201), we can conclude that C was substantially different from zero and indicative of a strongly positive relationship between ratings. Both obtained values of C were significant at the .001 level. The significance test can, however, be applied only as a formality to the contingency data for Originality, inasmuch as the latter failed to meet one of two necessary assumptions. It may be observed, however, that complete rater agreement existed on 132 cases (76.3 per cent), moderate disagreement evidenced by placement in adjacent categories in 40 (23.1 per cent), and extreme disagreement in only 1 (0.5 per cent), for Originality. Rater reliability would thus appear to have been adequate on this fourth dimension of the CAE, also.

The final score for the Originality and Abstraction scales was determined by the following procedure: When there was unanimity between raters, as was usually the case, this rating was of course utilized. When raters placed productions in adjacent categories, final placement was made on the basis of the author's evaluation. In the two instances in which the raters placed

productions in diametrically opposed categories, the poetry was re-evaluated until consensus was reached for final rating.

"Split-half" reliability coefficients were computed on the basis of correlations between Red and Blue halves of the poems. Coded poems were randomly shuffled class by class before separate ratings for Red and Blue were made. Visual inspection of poems revealed a marked tendency for Ss to expend more time and effort on the first poem attempted. Nevertheless, estimated coefficients of .69 and .77 for Fluency and Elaboration were obtained when corrected by the Spearman-Brown formula (Guilford, 1956, pp. 457-459). The reliability of ratings on Abstraction and Originality was assessed by utilization of contingency coefficients. Obtained values of C, .56 and .58 for ratings on Abstraction and Originality, respectively, were substantially different from zero (Siegel, 1956, p. 201) and significant ($p < .001$) in both cases.

RESULTS AND DISCUSSION

An examination of the content of free verse written by adolescents discovers their extreme sensitivity, perhaps vulnerability, to social stimuli. They appear to be very reactive to parental and peer attitudes, as well as to liked and disliked teachers. The Ss in this study also seemed concerned about the bloodshed of an undeclared war, about holidays, and even about weather changes. Boys typically made reference to blood, automobiles, and girls; girls more often wrote of clothing, feelings, and their father's eyes. Appendix D (Page 36) contains several sample poems which range in sophistication.

Scores from all four of the CAE scales and from the ECC scores were apparently normally distributed about their means. RAS scores were negatively skewed. Absolute differences favored females over males on the CAE variables (see Appendix B, Page 32); however, even the most obvious difference on Elaboration, did not attain statistical significance ($t = 1.54$, $p = .123$). Females ($N = 66$; 64.7 per cent) were not only more prevalent than males ($N = 36$; 35.3 per cent) in the English laboratory group, possibly suggestive of greater language facility in general; but they were higher on ECC, taken as a criterion measure of creative ability, as well. These differences, though not significant, are consistent

with the general conviction that girls show relatively greater verbal ability than do boys.

Absolute differences favored the English laboratory group over the comparison group on the CAE variables (see Appendix C, Page 34); however, even the most obvious difference (Fluency) did not achieve statistical significance ($t = 1.59$, $p = .114$). Perhaps surprisingly the comparison group was significantly higher ($t = 2.25$, $p < .05$) on the RAS. Quite naturally the English laboratory group was higher on ECC, although the degree to which this difference may have resulted from having two separate teachers assigning theme grades is not ascertainable.

Table 1 shows the correlation coefficients between the five predictor variables in this study and ECC. Correlations reported in Table 1 are either Pearson or point-triserial (Wert, Neidt, and Ahmann, pp. 271-275) coefficients. Triserial correlations were adjusted for coarse grouping. Scales developed for verbal Abstraction and verbal Elaboration on the CAE were significantly ($p < .01$ and .05, respectively) correlated with ECC scores in the English laboratory group. In the comparison group, the only significant ($p < .05$) correlation was between verbal Elaboration and ECC. Correlations of .02 and .16 between ECC and RAS scores were obtained for the two groups, respectively. Thus it may be surmised that RAS shows no concurrent validity with ECC.

In general most of the correlations in Table 1 were probably depressed to some extent by the unreliability of the criterion measure. Teachers' grades, based on the vagaries of rating, have

TABLE 1

CORRELATIONS OF CAE SCALES AND REVISED ART SCALE WITH ENGLISH COMPOSITION CONTENT

	Laboratory Group (N = 102)		Comparison Group (N = 71)	
Variables	Uncorrected	Corrected for Coarse Grouping	Uncorrected	Corrected for Coarse Grouping
Fluency	.1705		-.0409	
Elaboration	.2027*		.2649*	
Originality	.1520	.1687	-.0225	-.0250
Abstraction	.3507**	.3854	.1430	.1587
Revised Art Scale	.0250		.1590	

Note: Pearson correlation coefficients are given for Fluency, Elaboration, and the Revised Art Scale. Point-triserial correlation coefficients (Wert, Neidt, and Ahmann, pp. 271-275), later corrected for coarse grouping, are given for Originality and Abstraction. Tests of significance were performed with the uncorrected values and not the adjusted coefficients.

* $p < .05$
** $p < .01$

always been anathema as criterion measures. Why correlations differed so markedly on CAE scales when applied to the two groups is not readily explained. ECC mean scores for each S in the comparison group, however, were based on approximately one-third the number of themes written by members of the English laboratory group. English laboratory Ss had experienced greater training in writing and were expected to perform better on a compositional task. Different teachers also have different scoring methodologies based on their educational history, length of teaching experience, and other variables. Thus it is not too surprising that a non-significant correlation between the verbal Abstraction scale and ECC was found in the comparison group, in spite of a positive, significant correlation in the English laboratory group. In any case, the equivocal results obtained with the Abstraction scale of the CAE appear sufficient to warrant caution in its utilization.

Table 2 shows correlations between CAE scales and the RAS. Examination of Table 2 detects no significant correlations between the RAS and CAE dimensions. The consistent and marked lack of correlation between all four CAE scales and the other creativity measure strongly suggests that RAS scores reflect a different dimension of creative ability. This finding would not appear unreasonable, inasmuch as the CAE is verbal and the Welsh Figure Preference Test is concerned with visual preferences. Perceptual needs and preferences, and verbal creative abilities, seem unrelated.

TABLE 2

CORRELATIONS OF CAE SCALES WITH REVISED ART SCALE

Variables	Laboratory Group (N = 102)		Comparison Group (N = 71)	
	Uncorrected	Corrected for Coarse Grouping	Uncorrected	Corrected for Coarse Grouping
Fluency	-.0470		-.1449	
Elaboration	.0380		.0347	
Originality	.0314	.0349	.0674	.0748
Abstraction	.1574	.1746	-.0735	-.0816

Noteworthy mean RAS scores for both the English laboratory group (36.32, SD = 11.88) and the comparison group (39.81, SD = 10.35) were obtained. These means are surprisingly higher than those reported by Welsh (1966) with 369 adolescents attending a residential summer program for gifted high school students. A mean RAS score of 31.58, SD = 15.23, was found in Welsh's group. The mean RAS score for this sample was also higher than that obtained by Harris (1961) with 207 ninth-grade pupils from a rural high school in Alamance County, North Carolina. Harris reported a mean RAS score of 23.20, SD = 12.82, for males (N = 111); and a mean of 23.30, SD = 12.76, for females (N = 96).

Data from the present study with the RAS support the position of Mednick (1962), who has suggested that there may be a difference between visualizers and verbalizers. It also has been noted by Lucas and Dana (1966), that the RAS does not give data consistent with the Remote Associates Test, an atomistic verbal measure of creativity. The RAS has also been shown not to correlate with such verbal intelligence tests as the Otis (Harris, 1961) and the Terman Concept Mastery Test (Welsh, 1966). Torrance and Gowan (1963) also found verbal and non-verbal creative abilities largely independent of each other. It appears that there is little relationship between verbal creative ability and visual preferences.

CONCLUSIONS

In summary, we may conclude that, in adolescents, rated level of verbal Abstraction and verbal Elaboration scores on the CAE have some concurrent validity. If the minimum validity for a test of practical usefulness is taken as about .40, however, it would appear that neither the Elaboration nor Abstraction scale is now adequate for predictive purposes.

It may be rather unequivocally concluded that cognitive predisposition for complexity in figures, as measured by the Revised Art Scale of the Welsh Figure Preference Test, is not related to verbal creative ability or to skill in language usage. This fact does not mean that cognitive needs do not play a crucial role in creative ability--they probably do; but other, orthogonal dimensions of creative ability also exist.

Results from the present study suggest that the CAE offers a new measurement technique with satisfactory rater-reliability, relatively low split-half reliability, and questionable validity for verbal creative ability. The concept of the CAE adds a possible alternative method of testing verbal creative ability to the few currently existing measures and offers in particular an approach based on global measures of verbal creative ability. Further investigation and development of adequate scales is necessary, however, before the practical significance of the CAE can be demonstrated.

BIBLIOGRAPHY

BIBLIOGRAPHY

Anastasi, A. Psychological testing. New York: The Macmillan Company, 1961.

Bereiter, C. Verbal and ideational fluency in superior tenth grade students. Journal of Educational Psychology, 1960, 51, 337-345.

Christensen, P. R., and Guilford, J. P. Manual for the Christensen-Guilford Fluency Tests. Beverly Hills, California: Sheridan Supply Company, 1959.

_____. Fluency tests: Word fluency, expressional fluency, ideational fluency I, associational fluency I. Beverly Hills, California: Sheridan Supply Co., 1957-1958.

Clark, C. M., Veldman, D. J., and Thorpe, J. S. Convergent and divergent thinking abilities of talented adolescents. Journal of Educational Psychology, 1965, 56, 157-163.

Feldhusen, J. F., Denny, T., and Condon, C. F. Anxiety, divergent thinking, and achievement. Journal of Educational Psychology, 1965, 56, 40-45.

Guilford, J. P. Creativity. American Psychologist, 1950, 5, 444-454.

_____. Fundamental statistics in psychology and education (4th ed.) New York: McGraw-Hill, 1956.

Harris, T. L. An analysis of the responses made by adolescents to the Welsh Figure Preference Test and its implications for guidance purposes. Unpublished doctoral dissertation, University of North Carolina, Chapel Hill, 1961.

Klausmeier, H. J., Harris, C. W. and Ethnathios, Z. Relationships between divergent thinking abilities and teacher rating of high school students. Journal of Educational Psychology, 1962, 53, 72-75.

Klausmeier, H. J. and Wiersma, W. Relationship of sex, grade level, and locale to performance of high IQ students on divergent thinking tests. Journal of Educational Psychology, 1964, 55, 114-119.

Lucas, F. H., and Dana, R. H. Creativity and allocentric perception. Perceptual and Motor Skills, 1966, 22, 431-437.

Mednick, S. A. The associative basis of the creative process. Psychological Review, 1962, 69, 220-232.

O'Neill, M. Hailstones and halibut bones. New York: Doubleday and Company, 1961.

Piers, E. V., Daniels, J. M., and Quackenbush, J. F. The identification of creativity in adolescents. Journal of Educational Psychology, 1960, 51, 346-351.

Siegel, S. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956.

Torrance, E. P. Torrance Tests of Creative Thinking. Princeton, New Jersey: Personnel Press, Inc., 1966.

Torrance, E. P., and Gowan, J. C. The reliability of the Minnesota Tests of Creative Thinking: Research memorandum BER-63-4. Minneapolis: Bureau of Educational Research, University of Minnesota, 1963.

Welsh, G. S. Preliminary manual, Welsh Figure Preference Test: Research edition. Palo Alto: Consulting Psychologists Press, 1959.

_____. Comparison of D-48, Terman CMT, and art scale scores of gifted adolescents. Journal of Consulting Psychology, 1966, 30, 88.

Wert, J. E., Neidt, C. O., and Ahmann, J. S. Statistical methods in educational and psychological research. New York: Appleton-Century-Crofts, Inc., 1954.

APPENDIX A

APPENDIX A

Stimulus Poems

WHAT IS BROWN?

Brown is the color of a country road
Back of a turtle
Back of a toad.
Brown is cinnamon
And morning toast
And the good smell of
The Sunday roast.
Brown is the color of work
And the sound of a river,
Brown is bronze and a bow
And a quiver.
Brown is the house
On the edge of town
Where wind is tearing
The shingles down.

Brown is a freckle
Brown is a mole
Brown is the earth
When you dig a hole.
Brown is the hair
On many a head
Brown is chocolate
And gingerbread.
Brown is a feeling
You get inside
When wondering makes
Your mind grow wide.
Brown is a leather shoe
And a good glove---
Brown is as comfortable
As love.

WHAT IS WHITE?

White is a dove
And lily of the valley
And a puddle of milk
Spilled in an alley---
A ship's sail
A kite's tail
A wedding veil
Hailstones and
Halibut bones
And some people's
Telephones.
The hottest and most blinding light
Is white.
And breath is white
When you blow it out on a frosty night
White is the shining absence of all color
Then absence is white
Out of touch
Out of sight.

White is marshmallow
And vanilla ice cream
And the part you can't remember
In a dream.
White is the sound
Of a light foot walking
White is a pair of
Whispers talking.
White is the beautiful
Broken lace
Of snowflakes falling
On your face.
You can smell white
In a country room
Toward the end of May
In the cherry bloom.

APPENDIX B

APPENDIX B

Sex Differences on All
Variables for All Subjects

Variable	Males (N = 72)		Females (N = 101)	
CAE Originality	High	15.2%	High	18.8%
	Medium	66.6%	Medium	67.3%
	Low	18.0%	Low	13.8%
CAE Abstraction	High	18.0%	High	17.8%
	Medium	59.7%	Medium	69.3%
	Low	22.2%	Low	12.8%
CAE Fluency	M	23.34	M	24.97
	SD	7.97	SD	7.75
CAE Elaboration	M	23.59	M	25.69
	SD	9.29	SD	7.70
Revised Art Scale	M	37.56	M	37.79
	SD	11.63	SD	11.29
English Composition Content	M	87.19	M	90.49
	SD	6.26	SD	5.11

APPENDIX C

APPENDIX C

Group Differences on All
Variables for All Subjects

Variable	Laboratory Group (N = 102)		Comparison Group (N = 71)	
CAE Originality	High	19.6%	High	15.5%
	Medium	66.6%	Medium	63.3%
	Low	13.7%	Low	21.1%
CAE Abstraction	High	22.6%	High	9.8%
	Medium	61.7%	Medium	74.6%
	Low	15.6%	Low	15.5%
CAE Fluency	M	25.13	M	23.08
	SD	8.23	SD	7.19
CAE Elaboration	M	24.97	M	24.60
	SD	8.16	SD	8.88
Revised Art Scale	M	36.32	M	39.81
	SD	11.88	SD	10.35
English Composition Content	M	93.08	M	83.42
	SD	2.16	SD	4.65

APPENDIX D

APPENDIX D

Sample Poems

What is Blue?

Blue is the color of a
flowing brook
The soft, warm eyes of a blond-
headed baby
Blue a sapphire glittering
brightly in the light
A fresh new thought for a
writer's chapter three

What is Red?

Red is the color of a fire's warm glow
A bundled up child running in
from the snow
Red is a lobster raised up from
the sea
A scrape from a fall off the
old oak tree.
Red is Santa in the Christmas
parade
A cool refreshing sip of cherry
koolade
Red is the glossy shine from
a warm, friendly smile
A heart-shaped box of candy
for a loving child.
Red is a stoplight flashing
through the night
A fire truck racing down the
street and, then, out of sight
Red is measles on a fat, little face
Painted nails to match a new
suit in a square case.

What is Blue?

Blue is cold and
Tinge of frost,
Football team,
and book that's lost,
and summer sky,
and water tossed...
and Final color -
In death embossed.
And blue is a lake
On the Autumn day,
When hands feel cold,
and the birds are away -
and won't be back till Spring.

What is Red?

Red is fire, hot and bright
In the hearth
On a wintry night
That crackles and makes you happy...
And the color that splashes
In your head,
When your eyes shut tight
After staring at a light...
Red is the dash of beauty
On a bird's back,
As he perches on a dead tree
In a dead forest, in a dead winter...
Red is life, and the bright Life's
Blood which flows and leaps
And bounds - Life...and pain...
Red is the color of the new baby -
And the tot's overalls
and the boy's cheeks
And the nose over cold breath
On a cold, Frosty, day -
And the old man's fat head, with lips
Creased in a smile -
And red is the color of leaves
Beautiful in death...
Red is all life, the Alpha to the
Omega.

What is Blue?

Blue is the color
Of my knee
When I've fallen
From a tree.
Blue is the sound
Of a singing stream,
The whistle of wind
The dark in a dream.
Blue is satin,
Silk, and lace.
Blue is soft:
Seamist in your face.
Blue is alone
In a room full of laughter.
Tears,
Sighs,
Cries,
Blue is lonely
And afraid.
Blue is the feeling
Of not being loved.
Blue is alone.
Blue is a candle
Ready to light.
Blue is dark.
Blue is night.

What is Red?

Red is fire,
Red is fury,
Red is courage and strength.
Red is blood, the life liquid.
Eyes are red after a hard
cry and deep sorrow.
Red is the ribbon on an Easter basket
Or a Merry Christmas wreath.
Red is a cherry lollipop for good
Children or cranberries on turkey.
Red is a juicy morsel of steamed
Lobster or fresh strawberry shortcake.
Red is loud, vibrant and alive, a
color of spirit.
Red is a berry on a holly bush or a
rabbit's eye.
Red is a bright pair of socks my father
wears or my mother's best necklace.

Red is a warm color full of life.
It speaks of the courage of the pioneer
And of those who lived and fell.
Red is our tablecloth and my favorite
dress and the color of my flower garden.

What is Blue?

Blue is the color of the sky on
A warm, sunny day.
Blue is the feeling you get
When you've lost your
Best friend.
My father's eyes are sparkling
Blue, especially when he's mad.
When I sniff the air of
Berries ripening I smell Blue.
Blue is Mother's new dress,
The one that I gave her.
Blue is the light hitting
Kristin's hair.
Deep Blue is forgetting.
Blue is sunny.
Blue is drab.
Blue is a meadow.
Blue is shade.
And above all Blue is
Contentment.