

**CORRELATES OF THE OBJECT ASSEMBLY AND  
THE BLOCK DESIGN TESTS OF THE WECHSLER  
ADULT INTELLIGENCE SCALE AND THE  
TORRANCE TESTS OF CREATIVE THINKING**

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**GLORIA FAYE ARMSTRONG**

**CORRELATES OF THE OBJECT ASSEMBLY AND THE BLOCK DESIGN TESTS  
OF THE WECHSLER ADULT INTELLIGENCE SCALE AND  
THE TORRANCE TESTS OF CREATIVE THINKING**

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**An Abstract**

**Presented to**  
**the Graduate Council of**  
**Austin Peay State University**

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**In Partial Fulfillment**

**of the Requirements for the Degree**  
**Master of Arts**

---

**by**

**Gloria Faye Armstrong**

**July 1971**

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## ABSTRACT

The purpose of this study was to determine the relationship between the Object Assembly and the Block Design Tests of the Wechsler Adult Intelligence Scale and the Torrance Tests of Creative Thinking.

The subjects were 40 undergraduate students enrolled in Psychology 212 during the Winter Quarter, 1971 at Austin Peay State University, Clarksville, Tennessee. The WAIS was administered individually to each subject; the TTCT was administered in group settings.

Pearson Product-Moment coefficients were computed. The correlations ranged from .014 to .601. The coefficients between Block Design and Verbal Originality and Figural Elaboration were significant beyond the .05 level. The coefficients between Object Assembly and Verbal Originality and Figural Elaboration attained significance beyond the .01 level.

The results of this study indicate that the Object Assembly and the Block Design Tests do get at some sort of creative ability, specifically verbal originality and figural elaboration.

CORRELATES OF THE OBJECT ASSEMBLY AND THE BLOCK DESIGN TESTS  
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To the Graduate Council:

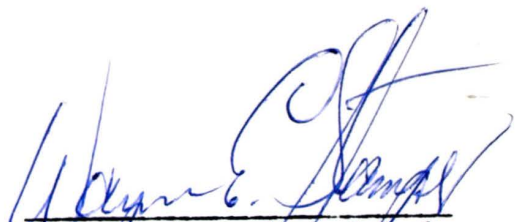
I am submitting herewith a Thesis written by Gloria Faye Armstrong entitled "Correlates of the Object Assembly and Block Design Tests of the Wechsler Adult Intelligence Scale and the Torrance Tests of Creative Thinking." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

  
Major Professor

We have read this thesis and  
recommend its acceptance:

  
Second Committee Member

  
Third Committee Member

  
Dean of the Graduate School

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## CHAPTER I

### INTRODUCTION TO THE PROBLEM

The year 1950 is often cited as the opening of the present era of research on creativity. In 1950 less than two tenths of one percent of the books and articles indexed in Psychological Abstracts for the previous century were directly related to creativity. In the 1965 Abstracts, 130 items were listed (Wade, 1968). J. P. Guilford opened the era with his 1950 presidential address to the American Psychological Association (Razik, 1967). Guilford (1959) states that there is undoubtedly in this country, and possibly in others, an undercurrent of need felt for increased creative performance and a desire to know more about the nature of creativity itself.

During the 1960's the field of creativity received increasing attention from scientific investigators. Parnes, in his review of the literature, noted that from January, 1965 to January, 1966 the volume of research equalled that of the preceding five years. Only about 300 doctoral dissertations relevant to creativity existed prior to 1965; in the succeeding eighteen months, almost 200 new dissertations were recorded (Bachtold and Werner, 1970).

Of all types of data available on creativity, investigations of the creativity-intelligence question are the most plentiful (Wade, 1968). The studies by Getzels and Jackson in 1959 and Torrance, also in 1959, indicated that measured intellectual ability and measured creative ability are by no means synonymous (Golann, 1963). Getzels and Jackson clarified the meaning of the concept of creativity and indicated that it is not closely related to conventionally measured intelligence (Sanford and Wrightsman, 1970). Golann (1963) reports

that the studies of Meer and Stein in 1959, Barron in 1961, and MacKinnon in 1961 agree that, while there is a correlation over the entire ranges of intelligence and creativity, the magnitude of the correlation varies greatly at different levels of intelligence. Wallach and Kogan (1965) reported the correlation between creativity and intelligence measures to be extremely low. In 1967 Torrance summarized all the available evidence on the question of the relationship of creativity to intelligence by tabulating 178 correlation coefficients reported in the literature. This tabulation showed the median correlation to be .20. When creativity scores are grouped according to whether the test is primarily verbal or nonverbal, the median of 88 coefficients between intelligence and verbal creativity is .21, and the median of 114 coefficients of correlations between intelligence and nonverbal creativity is .06. The strongest statement that any reported finding would warrant is that there is no relationship at all between certain purported measures of intelligence and measures or ratings of certain aspects of creativity. Even this statement is open to criticism on statistical and other grounds and more definitive studies are needed (Barron, 1969).

After reading these findings, it is somewhat surprising to find the following statement in David Wechsler's book The Measurement and Appraisal of Adult Intelligence (1958): "The Object Assembly, like the Block Design Test, seems to get at some sort of creative ability, especially if the performance is done rapidly." The statement seems to contradict the findings reported above and especially to be in opposition to the distinction Guilford (1959) has made between divergent and convergent thinking. Divergent thinking moves away from

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responses already known and expected. Convergent thinking moves toward responses that fit the known and the specified. The experimental tests used to measure creativity emphasize divergent thinking; traditional measures of intelligence emphasize convergent thinking -- logical reasoning toward single, "right" answers (Razik, 1967). The Object Assembly and the Block Design Tests of the Wechsler Adult Intelligence Scale (WAIS) have only one "right" answer and would be categorized as convergent thinking.

It would be helpful to know how Wechsler defines creativity, but this has not been found in the literature reviewed. The only study found which comes close to the idea suggested by Wechsler is one reported in Mooney and Razik (1967). In 1949 Corter found several factors on the Kohs Block Design Test. The first and most important he named "Mental Productiveness" which he defined as "speed of operation and fluency of expression" or "speed and number of ideas which come to one's mind that pertain to the problem." He also found a factor that he called "flexibility" which he defined as "the ability to change one's mental set." Guilford (1959) states that two of the criteria of creativity are fluency, "a quantitative aspect that has to do with fertility of ideas" and flexibility, "the ability to produce a great variety of ideas, with freedom from inertia or perseveration."

The Block Design Test, as adopted for the WAIS, is basically similar to that employed by Kohs in his original standardization (Wechsler, 1958). The Kohs Block Design Test has been shown to correlate .714 with the Wechsler test of intelligence (Mooney and Razik, 1967). Therefore, it is assumed in the present study that the Wechsler Block Design contains the factors of fluency and flexibility.



Barron (1969) states that we have reason to believe that intelligence tests provide reliable and accurate measures of various manifestations of fluency and flexibility, but they most notably fail to measure originality.

Wechsler does not support his statement with any evidence, nor does he give any explanation of the statement. Because of this and the reported low correlations between tests of intelligence and creativity, the question arises, "Are the Object Assembly and the Block Design Tests really getting at creativity?" If so, they should correlate positively with a test of creativity.

E. Paul Torrance (1966), author of the Torrance Tests of Creative Thinking (TTCT), has made deliberate attempts to construct test activities that are models of the creative process. He defines creativity as "a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on: identifying the difficulty; searching for solutions; making guesses, or formulating hypotheses about the deficiencies; testing and retesting them; and finally communicating the results." The TTCT samples a rather wide range of the abilities in a universe of creative thinking abilities.

The purpose of the present study was to determine the relationship between the Object Assembly and the Block Design Tests of the WAIS and the TTCT. Positive correlations were expected to result.

## CHAPTER II

### METHOD

#### The Sample

The sample used in this study was undergraduate students enrolled in Psychology 212 during the Winter Quarter, 1971 at Austin Peay State University, Clarksville, Tennessee. All participants volunteered to serve as subjects. The sample was composed of 40 students, of which 14 were males and 26 were females. The subjects were sophomores, juniors, and seniors. The ages ranged from 18 to 25.

#### Description of the Instruments

The WAIS is the most widely used individual intelligence test and is considered by authorities in the field to be one of the most, if not the most, valid and reliable. It comprises six verbal subtests and five performance subtests. It yields a Verbal IQ, a Performance IQ, and a Full Scale IQ. The Object Assembly requires subjects to put together the pieces of a Manikin, Profile, Hand, and Elephant in that order. Two minutes each are allowed for the first two and three minutes each for the last two items. Bonuses are given for rapid performance. On the Block Design, the subject reproduces ten designs of increasing complexity requiring the use of from four to nine cubes. The time is recorded for the subject to complete each design correctly within the time limit; bonuses are given for rapid performances on the last four designs.

The TTCT consists of ten tests, grouped into a verbal and a figural battery. The first battery is labeled Thinking Creatively with Words; the second, Thinking Creatively with Pictures. Verbal and



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Figural Forms A were used in this study.

In Thinking Creatively with Words, the first three activities utilize an intriguing picture to which the subject responds by (1) writing all the questions he would need to ask to find out what is happening; (2) listing possible causes of the action depicted; and (3) listing possible consequences of the action. Activity 4 is concerned with ways of improving a toy elephant so that children will have more fun playing with it. Activity 5 calls for a list of unusual uses for cardboard boxes. Activity 6 requires unusual questions that could be asked about the boxes. Activity 7 asks for all the things that would happen if a given improbable situation were true. The entire battery yields a total score in each of three traits: Fluency, Flexibility, and Originality.

Thinking Creatively with Pictures consists of three activities. In Picture Construction, a brightly colored curved design is pasted on a blank sheet in a position of the subject's choice and is used as a starting point for drawing an unusual picture "that tells an interesting and exciting story." Picture Completion provides a few lines as a start for drawing a picture in each item. The last activity provides pairs of short parallel lines with which as many different pictures as possible are to be produced. Four total scores are obtained: Fluency, Flexibility, Originality, and Elaboration.

The manuals accompanying the Torrance batteries provide detailed scoring guides, with many examples. The technical manual cites the results of several studies of scorer reliability, indicating a range of interscorer correlations from .76 to .99. Some studies on alternate-form reliabilities with intervals of one to two weeks yield coefficients

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ranging from the .70's to the .90's. In general, the verbal scores show higher reliabilities than the figural scores (Anastasi, 1968).

To insure content validity, a consistent and deliberate effort was made to base the test stimuli, the test tasks, instructions, and scoring procedures on the best theory and research available. Analyses of the lives of indisputably eminent and creative people, the nature of performance regarded as creative, research and theory concerning the functioning of the human mind, and the like were considered in making decisions regarding the selection of test tasks. A deliberate and consistent effort was made to keep the test tasks free of technical or subject matter content (Torrance, 1966).

Many unrelated studies are reported that contribute toward the construct validation of the tests, but no clear picture is presented. Most of the studies were conducted with school children, although some data on high school and college students and on occupational adult groups are cited. Many suggestive relationships have been found between Torrance scores and interests, attitudes, and other personality traits measured by tests, ratings, or other assessment procedures.

In general, there is little evidence of a relationship between the Torrance tests and everyday-life criteria of creative achievement. Ongoing longitudinal studies of high school students, cited in the manual, should contribute toward this type of validation (Anastasi, 1968).

Since knowledge and understanding about creative thinking are still in a relatively underdeveloped state, the Torrance tests are published in the form of a Research Edition. Certain uses for which the test is now ready are described in the technical manual (Torrance,

1966).

### Administration and Scoring

The WAIS was administered individually to each subject by this researcher and six fellow graduate students who were enrolled in Psychology 554a, Individual Intelligence Testing, during the Winter Quarter, 1971. The TTCT was administered to small groups by this researcher during this same period of time. Each test was scored according to the manuals of direction.

### Significance

2.04	n.s.
2.11	n.s.
2.28	.01
1.28	n.s.
1.15	n.s.
1.12	n.s.
1.12	.01

## CHAPTER III

### RESULTS

The Pearson Product-Moment technique was used to compute the correlation coefficients. Tables 1 and 2 summarize the correlations. Means and standard deviations are given in Table 3.

TABLE 1

Correlations between the Object Assembly  
and Verbal and Figural Forms A Measures

	r	Significance
Verbal Fluency	.248	n.s.
Verbal Flexibility	.233	n.s.
Verbal Originality	.399	.01
Figural Fluency	.105	n.s.
Figural Flexibility	.014	n.s.
Figural Originality	.169	n.s.
Figural Elaboration	.601	.01

TABLE 2

Correlations between the Block Design  
and Verbal and Figural Forms A Measures

	r	Significance
Verbal Fluency	.176	n.s.
Verbal Flexibility	.121	n.s.
Verbal Originality	.333	.05
Figural Fluency	.039	n.s.
Figural Flexibility	-.024	n.s.
Figural Originality	.287	n.s.
Figural Elaboration	.382	.05



TABLE 3

## Means and Standard Deviations

Item	Mean	SD
Object Assembly	35.750	6.204
Block Design	38.925	7.954
Verbal Fluency	85.950	24.111
Verbal Flexibility	40.750	9.507
Verbal Originality	15.925	8.898
Figural Fluency	19.000	5.353
Figural Flexibility	15.900	4.011
Figural Originality	24.550	8.387
Figural Elaboration	46.300	24.003

It was originally proposed to determine whether the Torrance tests correlated significantly higher with the scores of those who received bonus points on the Object Assembly and the Block Design Tests than with those who did not. However, of the 40 subjects in the sample, only one person did not receive bonus points on the Object Assembly, and only five persons did not receive bonus points on the Block Design Test. Therefore, the proposal was abandoned.

It was not the purpose of this study to determine the correlations between the WAIS Performance IQ and the Torrance Verbal Originality, Figural Elaboration, Total Verbal, and Total Figural scores. However, these coefficients were computed and included in this study in Table 4. Means and standard deviations are given in Table 5.

TABLE 4  
Correlations between WAIS Performance IQ  
and Selected Torrance Measures

	r	Significance
Verbal Originality	.402	.01
Figural Elaboration	.645	.01
Total Torrance Verbal	.384	.05
Total Torrance Figural	.180	n.s.

TABLE 5  
Means and Standard Deviations

Item	Mean	SD
WAIS Performance IQ	113.475	11.349
Total Torrance Verbal	142.625	38.305
Total Torrance Figural	105.575	8.188

## CHAPTER IV

### DISCUSSION

Significant correlations obtained between the Object Assembly and Block Design Tests of the WAIS and the Verbal Originality and Figural Elaboration measures of the TTCT. The correlations between the Object Assembly and Verbal Originality and Figural Elaboration were of sufficient magnitude to be significant at the .01 level. The correlations between Block Design and Verbal Originality and Figural Elaboration were significant at the .05 level.

The Verbal Originality score "represents the subject's ability to produce ideas that are away from the obvious, commonplace, banal, or established." The person with a high score on Verbal Originality is "able to make big mental leaps or 'cut corners' in obtaining solutions." The Figural Elaboration score "reflects the subject's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas. High scores seem to be associated with keenness or sensitivity in observation" (Torrance, 1966). The Object Assembly and the Block Design Tests depend on the subject's ability to perceive and to break down the whole into its component parts (Wechsler, 1958). Therefore, a positive and significant relationship between these tests was to be expected.

The findings of the present study were contradictory to Corter's findings reported earlier. Whereas Corter found fluency and flexibility to be factors in the Kohs Block Design Test, the correlations between the WAIS Block Design Test and the Torrance Verbal and Figural Fluency and Flexibility range from .039 to .176, with Figural Flexibility showing a negative correlation of .024. The findings were also in

opposition to Barron's statement that intelligence tests provide reliable and accurate measures of fluency and flexibility, but most notably fail to measure originality.

The findings reported in this study support Wechsler's statement that "The Object Assembly, like the Block Design Test, seems to get at some sort of creative ability," specifically verbal originality and figural elaboration.

#### Suggestions for Further Study

The correlations between WAIS Performance IQ and Torrance Verbal Originality and Figural Elaboration were significant at the .01 level, with the coefficients being greater than those found with Object Assembly and Block Design. The above findings suggest that the other three performance subtests of the WAIS (Digit Symbol, Picture Completion, Picture Arrangement) are measures of originality and elaboration, both verbal and figural. Subsequent research is indicated.

The correlations between WAIS Performance IQ and total Torrance Verbal were significant at the .05 level, suggesting that the other three performance subtests of the WAIS may measure verbal fluency and/or flexibility. Since the correlation between WAIS Performance IQ and total Torrance Figural was not significant, the three other performance subtests of the WAIS are probably not measures of figural fluency or flexibility. Again, more investigations are indicated.



## CHAPTER V

### SUMMARY

The purpose of this study was to determine the relationship between the Object Assembly and the Block Design Tests of the Wechsler Adult Intelligence Scale and the Torrance Tests of Creative Thinking. The subjects were 40 undergraduate students at Austin Peay State University, Clarksville, Tennessee. Pearson Product-Moment correlation coefficients were computed.

Significant correlations obtained between the Object Assembly and Block Design Tests of the WAIS and the Verbal Originality and Figural Elaboration measures of the TTCT. The correlations between the Object Assembly and Verbal Originality and Figural Elaboration were of sufficient magnitude to be significant at the .01 level. The correlations between Block Design and Verbal Originality and Figural Elaboration were significant at the .05 level.

In light of these significant correlations, it is concluded that, in agreement with Wechsler's statement, "Object Assembly, like the Block Design Test, seems to get at some sort of creative ability," specifically verbal originality and figural elaboration.

Significant correlations obtained between the WAIS Performance IQ and the Torrance Verbal Originality, Figural Elaboration, and Total Verbal scores. Correlation between the WAIS Performance IQ and Total Torrance Figural was not significant. Subsequent research is indicated to determine the relationship between the three other WAIS performance subtests (Digit Symbol, Picture Completion, Picture Arrangement) and Torrance measures of verbal and figural fluency, flexibility, originality, and elaboration.

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