A CORRELATIONAL STUDY OF THE SOI-LA, THE OTIS LENNON, AND THE SRA ACHIEVEMENT SERIES AS PREDICTORS OF GIFTEDNESS

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ANN CROUCH POE

A CORRELATIONAL STUDY OF THE SOI-LA, THE OTIS LENNON, AND THE SRA ACHIEVEMENT SERIES AS PREDICTORS OF GIFTEDNESS

An Abstract

Presented to

the Graduate Council of

Austin Peay State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

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by

Ann Crouch Poe

July 1982

ABSTRACT

Educators and parents have sought for many years to identify and enrich the abilities of the gifted child. However, it appears possible that in their search they may have created a barrier to the very goals they desired. Until recently giftedness has been identified by very rigid criteria. Generally, the results of either an intelligence test or an achievement test or both have been used to identify gifted students. Included in this select group are those students who are academically gifted and who fit educational ideals.

Recently, however, the Structure of Intellect Learning Abilities Test (SOI-LA) was designed and published in an attempt to identify some unique kinds of intelligence such as creativity, memory and evaluational abilities. The SOI test is based on the Guilford Structure of Intellect Model. Very little research has been conducted to determine the validity and reliability of the SOI-LA; therefore, the purpose of the present study was to determine the relationship between the SOI-LA, the Otis-Lennon Mental Ability Test and Science Research Associaties Achievement Tests (SRA). It is possible that the SOI-LA could be a valuable tool for the identification of students who are gifted in areas other than academics.

A sample of seventy-three students was used for the present study. The subjects comprised the total elementary population of a small, independent school in Hopkinsville, Kentucky, and were enrolled in grades one through six. All three tests were administered to the sample in a group setting within a two-month period by the classroom teacher during regular school hours.

The obtained data were analyzed by means of multiple regression. The results indicated significant positive correlations between the SOI-LA and the Otis-Lennon ($R=.66$; $p < .000001$) and the SRA and the SOI-LA ($R=.54$; $p < .000001$) with the population studied. However, results obtained on the three subtests of the SOI-LA that purport to identify creativity, the DSR (creativity with arithmetic facts), DFU (creativity with things), and DMU (creativity with words and ideas), produced varied and inconclusive results. The Otis-Lennon correlated negatively with all three subtests of creativity. The SRA Achievement Series also produced negative correlations with the subtests of creativity. The total SOI-LA score correlated positively with the three creativity subtests.

The results of the present study support the contention of the developers of the SOI-LA that additional students may be identified as gifted using the test and the proposal that gifted identification should be based on multiple and divergent sources of information.

A CORRELATIONAL STUDY OF THE SOI-LA, THE OTIS LENNON, AND THE SRA ACHIEVEMENT SERIES AS PREDICTORS OF GIFTEDNESS

A Thesis

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by

Ann Crouch Poe

July 1982

To the Graduate Council:

I am submitting herewith a Thesis written by Ann Crouch Poe entitled "A Correlational Study of the SOI-LA, the Otis-Lennon, and the SRA Achievement Series as Predictors of Giftedness." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Linda B. Rudolph
Major Professor

We have read this thesis and recommend its acceptance:

Garland E. Blair
Second Committee Member

Theodore H. Hayes
Third Committee Member

Accepted for the
Graduate Council:

William H. Ellis
Dean of the Graduate School

ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to Dr. Linda Rudolph, who aided and counseled her during the course of study; to Dr. Garland Blair for his patience and his insurmountable knowledge of statistics; and to Dr. Theodore Hayes for his moral support.

Appreciation is also extended to University Heights Academy, both administration and faculty, for their support and encouragement during this study.

I also wish to express special appreciation to my husband, Ed, whose patience and encouragement keep me going through the rough days.

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Chapter 1

INTRODUCTION TO THE PROBLEM

In recent years the gifted child has been the subject of intense study by educators and other researchers (Burt, 1975; Gallagher, 1975; Getzels & Jackson, 1962; Tuttle & Becker, 1980). Each of these researchers and writers has strongly recommended the use of multiple criteria in the identification of giftedness.

Many studies have been conducted to investigate the various facets of giftedness. Dirks and Quarfoth (1981) studied two multiple criteria models used to identify giftedness: breadth models and depth models. In the breadth model students who scored "moderately well" on several assessment measures were placed in gifted classes. In the depth model students who scored "superlatively well" in any one assessment measure were placed in gifted classes. Their results indicated that depth models were more advantageous than breadth models with fourth grade students.

Passow (1981), in a recent paper, surveyed the studies and gifted programs implemented since the turn of the century. He summarized more than thirty studies or programs whose goal was to identify the nature of giftedness. Passow (1981) sees the underlying problem in identifying giftedness as the lack of a consistent operational definition. He cautions program planners to be sensitive to this

operational definition as it relates to curriculum, resources, and other factors in education (Passow, 1981).

Any search for identification processes of the gifted must consider the monumental work of Lewis Terman. While working at Stanford University in 1916, Lewis Terman revised a test of mental abilities previously used and developed by two Frenchmen, Binet and Simon. Terman's new test was called the Stanford-Binet in honor of his university and Binet, the originator of the test. In the process of this work Terman coined the term intelligence quotient or I.Q. Intelligence, as used by Terman, refers to the ratio between mental age and chronological age (Khatena, 1978).

Lewis Terman and his co-workers compiled a five volume study on giftedness between the years 1925 and 1959. In the field of psychological research this study was a pioneer effort. Terman's findings from this comparative and longitudinal study of gifted children suggested that certain differences existed in these children when compared to "average" children. For example, Terman found that the socioeconomic background, physical development, school achievement, reading ability and personality traits of the gifted children included in his sample were significantly above those of average children. His research is of additional importance because it identified other

factors, such as family background and emotional and social adjustment, that indicated giftedness in children. These factors can be recognized early in a child's life and remain fairly constant throughout his or her life according to Terman (Ziv, 1977).

The many faceted criteria for the identification of giftedness has been fairly well accepted by clinicians and educators of today. In 1972 the U.S. Commissioner of Education recommended

> that gifted children be identified not only by measures of intellectual ability and scholastic aptitude, but also by indices of creativity, leadership, talent in the visual and performing art, and psychomotor ability. (Roedell, Jackson, and Robinson, 1980)

If multiple criteria for identifying giftedness in children are accepted, then it is essential to determine specific measures of these abilities. The Stanford-Binet and the Wechsler Intelligence Scale for Children-Revised have proven to be valid and highly reliable in numerous research studies seeking to determine the intellectual ability of children; however, both of these tests have drawbacks for use with a general school population. The tests must be administered on a one-to-one basis and scored and interpreted by a highly trained

examiner; they cannot be used routinely by the classroom teacher. The use of these tests is, therefore, limited.

The need to quickly identify large groups of people according to their intellectual abilities was recognized with the advent of World War I. At this time it became imperative for the army to examine intellectually a large number of recruits and to assign them to appropriate jobs. This need gave impetus to the development of group intelligence tests. Arthur S. Otis, a student of Terman's, designed an objective intelligence test that could be administered to large groups (Anastasi, 1976). Since that time several other group mental ability tests have been developed and are in general use today.

Another of the many factors considered in defining a gifted child is creativity. Feldhusen and Treffinger refer to Gallagher's definition of creative thinking. They state that creative thinking

> is the ability to think of a lot of ideas where there is a problem or need for ideas. It is also being able to think of many different ideas, to think of unique or original ideas, and to develop or elaborate ideas. (Feldhusen & Treffinger, 1980)

The relationship between giftedness and creativity has been the subject of many studies. In their early

research Getzels and Jackson (1962) found only a slight correlation between giftedness and creativity; however, later study by Getzels and Jackson (1962) supported this relationship.

Callahan (1978) suggests that society identifies as gifted those individuals who make a creative contribution to the world. She proposes that even though students identified as gifted on the basis of I.Q. may not score high on creativity, we should nurture this characteristic since there exists the potential for a worthwhile contribution. Callahan (1978) contends that it is of primary importance that we encourage our intellectually gifted in the areas of creativity and problem-solving. Renzulli (1977) suggests that in adults the two characteristics of giftedness and creativity are essentially the same in the final analysis.

Khatena (1978) pointed out to parents and teachers the importance of recognizing the creatively gifted child early and nurturing that creativity. Creative children should not be restricted in development, but should be allowed to grow and blossom at their own rate. Providing opportunities for the children to expand their thinking and supplying them with generous doses of love and affection should be the goal of significant adults according to this researcher. The unfolding of creativity in a

young child is like magic and the parent or the teacher can begin the magician (Khatena, 1978).

The U.S. Office of Education proposed the need for special programs to deal with the area of giftedness labeled as creativity and productive thinking; however, the office was unable to define or suggest a measurement for this type of giftedness (cited in Rodell et al., 1980). Herein lies the crux of the problem. The results of creativity, whether it is artistic, musical or scientific, have been measured during the past years by performance. The identification of creative potential by measuring thought processes or personality traits is a relatively new challenge. Since young children rarely reach a level of skill that can be considered actual creative achievement, the problem is even more complex. Rodell et al. (1980) write that there is lack of agreement as to what tests of creativity and productive thinking should be used to measure or predict. The abilities measured thus far have been labeled by the U.S. Office of Education as productive thinking abilities, a term that covers several kinds of behavior. Another term used in assessing giftedness is divergent production as opposed to convergent production as measured by I.Q. and achievement tests. The distinction between convergent production and divergent production is based on a model of intellectual functioning proposed by

Guilford called Structure of the Intellect (Rodell et al., 1980).

In the early 1950's Dr. J. P. Guilford, a noted American psychologist, identified 120 different factors of intelligence. He conceptualized these factors in the shape of a cube. Each face of the cube defined the different functions of the intellect in processing information. The first dimension was operations which includes cognition, memory, convergent thinking, divergent thinking and evaluation. Each of these provide a method for processing raw information. The second dimension of the cube is content. Content is made up of figural, symbolic, semantic, and behavioral representations of information arriving in the intellect. The final dimension is products. Products refer to the form that information takes as a person processes it. These products may be categorized as units, classes, relations, systems, transformations or implications. Each of the 120 intellectual abilities as identified by Guilford is an intersection of one intellectual product. The importance of Guilford's model lies in its ability to describe the many ways an individual can be gifted; no one is expected to be gifted in all areas of the intellect (Gallagher, 1975).

Meeker, a student of Guilford, thought that identifying the many factors of intelligence was only a beginning

point in the study of intelligence. Using these identified factors or abilities, Meeker proposed that learning experiences be developed to improve these abilities. Meeker constructed the Structure of Intellect Profile (SOI) in an effort to allow differential intellectual assessments with meaning and validity in the academic framework. Using the assessments the teacher can construct individual academic programs that will offer development and remediation within the classrooms academic program. Meeker provides specific tests and curricula suggestions which encourage the development of this specific ability. She strongly supports Guilford's basic assumption that specific abilities can be developed (Meeker, 1969). Using these identified items specific instructional objectives are taught to the student. The classroom teacher identifies a learning weakness, and by using the Meeker Profile, refers to instructional and behavioral objectives that can be used to strengthen this ability. This method has been used widely in programs with the gifted where Individualized Educational Programs (IEP's) are required (Hedbring & Rubenzer, 1979).

In 1975 Meeker and her co-workers founded the SOI Institute. The Institute continued the work with Guilford's model and developed additional educational materials and programs. An outgrowth of this work was the development of the Structure of Intellect (SOI) Learning Abilities

Test in 1976. This test purports to measure twenty-four of the intellectual abilities identified by Guilford. Three of the sub-tests produce scores on the creativity-related factors that measure divergent thinking ability--a key area in the identifications of giftedness (Cunningham, Thompson, Alston, & Wakefield, 1978).

The potential of the SOI-LA Test for identifying certain factors that make up the intellect is intriguing; however, only a limited amount of research has been conducted with this instrument. The significant subtests have yet to be identified and the best utilization of this information is yet to be determined. The purpose of the present study was to determine the relationship between the Otis-Lennon Mental Abilities Test, the SRA Achievement Test, the SOI-LA Test and the three subtests of the SOI-LA that measure creativity. The identification of additional instruments that effectively locate and identify children talented intellectually, academically, and creatively is a goal of educators. The ability of the classroom teacher to administer, score and interpret the tests enhances their value even further.

Chapter 2

METHOD

The Sample

Permission was obtained from University Heights Academy Headmaster to conduct the present study at University Heights Academy, Hopkinsville, Kentucky (see Appendix A). University Heights Academy is a small, independent school. All the children enrolled have been determined to have average or above average ability through entrance tests. A total of 84 children participated in the study--the total population of grades one through six at University Heights Academy. The testing administration was interrupted for eleven students, therefore, their scores were omitted from the data. This reduced the sample size to 73 students. Included in the sample were 34 female and 39 male students, ranging in age from 6 years 3 months to 12 years and 10 months.

Instrumentation

The Otis-Lennon Mental Ability Test (Form J) was designed to provide comprehensive assessment of the general mental ability or scholastic aptitude of pupils in grades K-12. The tests purposed to measure a student's reasoning ability and the ability to deal in abstractions. Reliability coefficients for the Otis-Lennon Mental Ability Test

were determined on the basis of split-half correlations, the Kuder-Richardson, and the alternate-forms procedures. Split-half reliability coefficients resulted in correlations from .94 to .96. The Kuder-Richardson resulted in correlations ranging between .93 and .96. The alternate-forms reliability produced correlations varying from .86 to .94.

The SRA Achievement Series (Form 1) was designed to assess educational skills and knowledge for pupils in grades K-12. The tests include such areas as reading, mathematics, language arts, science, social studies, consumer economics, health and safety, employment and community resources. Reliability data for Form 1, Levels A-F, resulted in correlations varying from .90 to .98.

The SOI Learning Abilities Test was designed to assess twenty-four factors relating to reading, arithmetic, creativity, cognition, memory, evaluation, convergent production, and divergent production. Individual scores for each of the twenty-four factors are obtained from the test. Normal score equivalents, means, and standard deviations are provided for grades one through six and seven and eight combined.

Procedure

The SRA Achievement Test Series, the Otis-Lennon

Mental Abilities Test, and the SOI-Learning Abilities Test were administered to each student by the classroom teacher in a group setting. The testing was integrated into a usual elementary school day. The SRA Achievement Tests were sent to the testing company, Science Research Associates, Inc., for scoring. The Otis-Lennon was scored by the classroom teacher and checked by the present researcher. The SOI-LA was scored by the researcher according to the directions supplied in the instruction manual.

Chapter 3

RESULTS

The multiple regression procedure was used to analyze the data obtained in this study to determine the relationship between the three tests administered, the SRA, the Otis-Lennon, and the SOI-LA, and the three subtests of the SOI-LA that measure creativity.

The results indicated a highly significant correlation existed between the SRA Achievement Series and the Otis-Lennon ($R=.70$, $p < .000001$) and between the SRA and the SOI-LA ($R=.54$, $p < .000001$). There was also a significant relationship between the SOI-LA and the Otis-Lennon ($R=.66$, $p < .000001$). However, the multiple regression procedure did not reveal correlations of significance between the three major tests administered to the subjects and the three SOI-LA subtests purported to measure creativity: creativity with arithmetic facts (DSR), creativity with things-figural level (DFU), and creativity with words and ideas (DMU). There was a significant correlation between the DSR subtest and the DMU subtest ($R=.70$, $p < .000001$) (see Table 1, Appendix A).

Total percentile scores from the Otis-Lennon and the SRA were converted to Normal Curve Equivalent Scores (NCE's), using a table published under the auspices of the

Office of Education, U.S. Department of Health, Education and Welfare (Tallmadge, 1976). Raw scores on each of the 24 subtests of the SOI-LA were converted to NCE's using comparable tables prepared by the SOI Institute. A separate table was presented for each grade level enabling the present researcher to arrive at a total score for the SOI-LA and, therefore, make the composite SOI-LA scores comparable to the SRA and the Otis-Lennon. The conversion of all scores to NCE's allowed researcher to compare the predictive ability of each variable for identifying gifted children. A NCE of 93.3, which is equivalent to the 98th percentile, was used for identifying a gifted child on all of the variables analyzed. Most researchers have considered persons scoring at the top 2% of the continuum as being gifted. Using these criteria the present study found 13 students scored at this level on the Otis-Lennon, 3 on the SRA, 29 on at least 4 subtests of the SOI-LA, and 17 on at least 1 of the subtests that purport to measure creativity (see Table 2, Appendix B).

Meeker suggests the 94 percentile for identifying gifted children. Applying these criteria to the data obtained resulted in 29 students identified as gifted on the Otis-Lennon, 12 on the SRA, 50 on at least 4 subtests of the SOI-LA, and 36 on at least 1 of the subtests that measure creativity. None were identified as gifted at

either the 94th or the 98th percentile using the composite score obtained on the SOI-LA (see Table 2, Appendix B).

Chapter 4

DISCUSSION

The purpose of the present study was to determine the relationship between the Otis-Lennon, the SRA Achievement Series, and the SOI-LA, tests purporting to assess mental ability and academic performance, and their ability to identify giftedness. A second part of the study was to examine subtests of the SOI-LA that purport to measure creativity and determine the correlation between the three subtests and the major tests studied.

A significant correlation was found between the SRA, the Otis-Lennon, and the SOI-LA. The subtests that measure creativity correlated positively with the SOI-LA. They did not correlate positively with either the SRA or the Otis-Lennon.

A recent national survey conducted by the Educational Improvement Center-South, Sewell, New Jersey, under the auspices of the U.S. Office of the Gifted and Talented points up the prevailing confusion over gifted identification as exemplified by the varying measures currently used by educators across the country. The results of the survey indicate that many measures are being used inappropriately and misidentifying gifted children. In conclusion the survey recommends a multiple identification procedure

using identification measures yet to be determined (Alvino, McDonnel, & Richert, 1981).

The present study using three different measures of identification reflects the varied results previously found by Alvino et al. (1981) (see Table 2). Only seven subjects in the present study scored at the 98th percentile on more than one measure. Two of the seven subjects scored in the gifted range on all three tests administered. Thirty-seven subjects were identified as gifted on at least one of the measures used.

The subjects were arranged in an ascending order grades 1 through 6. It is interesting to note the large number of subjects scoring in the gifted range on the Otis-Lennon. Nine of the thirteen subjects identified as gifted by the Otis-Lennon were in grades 1 and 2. The researcher suggests that the population of the present study, students in an independent school, might be from more advantaged homes and, therefore, score better on measures administered at an early age. This type of result has been noted by Ziv (1977) in his studies. Nature versus nurture was also a factor identified by Terman (Seagoe, 1975).

The subtests of the SOI-LA identified some of the same subjects as being gifted creatively and academically as did the SRA and the Otis-Lennon. However, this identification was not consistent throughout the present study. Only

three subjects of the 73 in the total study were identified as gifted by the SRA Achievement Series. Two of the three were identified by both the Otis-Lennon and the SOI-LA. The third subject was identified by the SOI-LA. It is interesting to note that all were identified by at least one other measure. The findings of the present study suggest to the writer that either the population studied is made up of a surprising number of underachievers or that achievement as measured by this test does not identify a significant number of gifted students.

In examining the results found using the SOI-LA the researcher identified 23 subjects as gifted, scoring 98 percentile on 4 or more subtests, that were not identified by either of the other measures. Ten of the 23 had been identified by the creativity subtest DMU (creativity with words and ideas). Although several students fell in the gifted range on the other two measures of creativity, DSR and DFU, none had the necessary total of four for gifted identification.

Not a single subject scored in the gifted range using a composite score on the SOI-LA. This suggests to the present researcher that the 24 subtests of the SOI-LA must be considered separately when gifted identification is being made.

Even though the various discrepancies in gifted

identification of the three tests have been pointed out by the present researcher, the significant correlation derived from the multiple regression must be noted. All three major tests correlated well with each other. This type of correlation is encouraging to any researcher as it strengthens the value of each test.

From the present research the SOI-LA appears to be a valuable measure for gifted identification, however, it too should be used in conjunction with other measures. A definite need for further research is recommended by the researcher. A factorial study of the SOI-LA subtests would provide additional needed information concerning specific abilities measured by each subtest and the relationship of that subtest to the entire battery. Also, further validity studies would give credence to the test's ability to predict giftedness.

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APPENDICES

APPENDIX A

Permission Letter

University Heights Academy

Post Office Box 1070 • Phone (502) 886-0254
Hopkinsville, Kentucky 42240

June 12, 1981

Graduate Office
Austin Peay State University
Clarksville, Tennessee 37040

To Whom It May Concern:

This letter is to certify that we have given Ann C. Poe permission to use our cumulative files to gather data for her Master's thesis. As a member of our staff and as a result of her research, we are planning to incorporate a program for the gifted in our school.

She will have access to the tests gathered by the classroom teachers in grades one through six. These tests consist of the Otis Lennon Mental Abilities Tests, S.R.A. Achievement Tests, and the S.O.I. Learning Abilities Tests.

The results of her study and these test scores will be kept in strict confidence. The results we hope will enhance our school and provide us with an additional tool to enhance University Heights Academy's curriculum.

Sincerely,

R C Baker

Robert C. Baker
Headmaster

RCB:cld

APPENDIX B

Tables

Table 1

Correlation Matrix

Variable Label	1	2	3	4	5	6
DSR	1.00000	-0.43802	0.70535	-0.09483	-0.26122	0.09715
DFU	-0.43802	1.00000	-0.41234	-0.06648	-0.04681	0.14205
DMU	0.70535	-0.41234	1.00000	-0.19460	-0.21817	0.03572
OL	-0.09483	-0.06648	-0.19460	1.00000	0.70174	0.66018
SRA	-0.26122	-0.04681	-0.21817	0.70174	1.00000	0.54432
SOI	0.09715	0.14205	0.03572	0.66018	0.54432	1.00000

Probability Matrix

Variable Label	1	2	3	4	5	6
DSR	0.00000	0.00011	0.00000	0.42486	0.02560	0.41355
DFU	0.00011	0.00000	0.00029	0.57631	0.69410	0.23061
DMU	0.00000	0.00029	0.00000	0.09899	0.06369	0.76419
OL	0.42486	0.57631	0.09899	0.00000	0.00000	0.00000
SRA	0.02560	0.69410	0.06369	0.00000	0.00000	0.00000
SOI	0.41355	0.23061	0.76419	0.00000	0.00000	0.00000

Table 2

Subjects Scoring in the Gifted Range

	OL	SRA	SOI-LA				
				Creativity			
Subjects	Composite Score	Composite Score	Composite Score	DSR	DFU	DMU	Other Subtests
2	X						
4	X	X					4
7	X						
8	X						
12	X						
15	X						6
19							6
21	X						4
24							10
25	X						8
26	X					X	3
28							4
29						X	6
30						X	8
32		X				X	3
33						X	5
34	X	X				X	3
36							4
38						X	6
40							6
43							4
46						X	5
47							6
50						X	5
52							4
54						X	5
55							7
56							5
58							4
62							4
63							(3)
65		X					6
66		X					4
68							(3)
70		X					5
72							5
73							