A COMPARISON OF KINDERGARTEN METROPOLITAN READINESS TEST AND THIRD GRADE STANFORD ACHIEVEMENT TEST SCORES

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A COMPARISON OF KINDERGARTEN METROPOLITAN READINESS TEST AND THIRD GRADE STANFORD ACHIEVEMENT TEST SCORES

An Abstract

Presented to

the Graduate Council of

Austin Peay State University

In Partial Fulfillment

of the Requirements for the Degree

Education Specialist

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by

Rhonda Jo Ross

July, 1984

ABSTRACT

Auditory, visual, language, pre-reading, and quantitative scores of Level II, Form P of the 1976 edition of the Metropolitan Readiness Test (MRT) and total reading, math, and auditory scores from the Primary III level, form A of the 1976 edition of the Stanford Achievement Test (SAT) were analyzed. The sample group consisted of 68 third-grade students who had taken the MRT during the latter half of kindergarten and the SAT during the spring of 1983. Pearson correlations for the total group were significantly and positively related as were correlations for both girls and boys.

Results support previous studies, suggesting that the MRT is a predictor of future achievement. As such it may be of benefit to teachers in determining readiness levels and to teachers and other staff in assisting with child find programs.

A COMPARISON OF KINDERGARTEN METROPOLITAN READINESS TEST AND THIRD GRADE STANFORD ACHIEVEMENT TEST SCORES

A Field Study

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Rhonda Jo Ross

July, 1984

To the Graduate Council:

I am submitting herewith a Field Study written by Rhonda Jo Ross entitled "A Comparison of Kindergarten Metropolitan Readiness Test and Third Grade Stanford Achievement Test Scores." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Education Specialist.

Garland E. Blair
Major Professor

We have read this field study
and recommend its acceptance:

Donald L. Lambert
Second Committee Member

Elizabeth H. Stokes
Third Committee Member

Accepted for the
Graduate Council:

William H. Ellis
Dean of the Graduate School

ACKNOWLEDGEMENTS

I want to thank Dr. Elizabeth Stokes for her continuing guidance and concern. It is due to her exceptional skills in the study of psychology, her concern for students, and her encouragement given to students to stay current in their profession that I feel competent and confident in the field of school psychology.

Appreciation is extended to Dr. Garland Blair for his most needed assistance in the completion of the statistics in this study and to Dr. Donald Lambert for his support.

I wish to thank Mr. Van Riggins, Superintendent of Stewart County Schools, for allowing this study to be completed. Appreciation is extended to Mr. Mike Baskins, Mr. Terry Burkhart, and Mr. Phillip Wallace, principals of the schools involved in the study. Finally, I want to thank the kindergarten teachers of Stewart County who expressed the initial interest in the research.

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Chapter 1

INTRODUCTION

A major responsibility facing school systems is the early identification of handicapped children as mandated by Public Law 94-142. The law is explicit. All children ages four through twenty-one and three-year old deaf children are to receive a free, appropriate education.

In order that the schooling be appropriate, it is necessary that problems be found early and plans made for any alterations which may be needed in the school program. Indeed, the law clearly addresses this point by stating that there should be ongoing child find procedures for the purpose of identifying special needs children.

An argument for the screening of young children was made by Nicholas Hobbs (1975) in which he stated that there is more efficiency and economy in preventing a problem than in attempting to repair one. He indicated that a delay in the identification of some difficulties may indeed lead to irreversible consequences

John Meier (1975) summarized the recommendations of authorities in the area of screening. These recommendations indicated that screening should take into account the rights of children and their families and that priority should be given to conditions with the greatest severity. Recommendations indicated that those handicaps of highest incidence should also be

included. The recommendations were very clear in saying that it would be detrimental and fruitless to provide screening procedures without intervention.

Considering the basic tenets of Public Law 94-142 and the ideas and findings of experts in the field, it can be clearly seen that there is a purpose for early childhood screening. It is necessary for professionals to use instruments which will be of value to the screening process.

Maitland, Nadeau, and Nadeau (1974) studied the presence of kindergarten screening programs and the frequency of the use of the Metropolitan Readiness Test (MRT) in the evaluation of young children. The researchers found that 55% of the 581 school districts did conduct academic readiness testing. Thirty-six percent of those districts which had screening programs used the MRT. The measure was the most often used readiness test in the schools which were surveyed. Another researcher, Rubin (1974), referred to the MRT as one of the two most widely used tests of readiness.

The MRT has been used as a part of the kindergarten screening program by Stewart County, the school system involved in the current study, for many years. In fact, many of the kindergarten teachers in this county have recently asked whether the MRT is a good predictor of later achievement. It is in an attempt to provide an answer to those Stewart County teachers that this study was begun.

Over the years, the MRT has been the subject of considerable

research. Two reviews of an earlier edition of the test stress some of the differences in opinion regarding whether the MRT provides new and meaningful information regarding young children.

Dykstra (1972) reported that the MRT is a well constructed measure which is concerned with school-related abilities. The instructional significance of test results is considered by Dykstra to be very specific. The reviewer reported that school systems administering readiness tests would find it to be a useful tool. Harry Singer (1972), on the other hand, reported the underlying assumption of the MRT to be that the present performance of the child, which is based on past learning and maturation, is the best predictor of future achievement. The reviewer indicated that MRT results should be supplemented with activities designed to give an indication of present ability to learn. Singer expressed the view that the MRT gives no information which the teacher would not recognize for himself or herself during the first weeks of school.

Research has been undertaken to determine correlations between teacher ratings and the MRT. An examination of this research may tend to add to the information regarding the validity of the test. Further, if there is a close correlation between teacher ratings and the MRT, the measure could still be of use. If the teacher sees a relationship between his or her observations and the results of the MRT the teacher may be more confident in making needed referrals. The use of readiness test results may lessen the time between the teacher's

first observation of difficulty and a referral for further evaluation.

Tokar and Holthouse (1977) completed a validity study which compared subtest scores on the 1976 edition of the MRT to teacher ratings in areas similar to those measured by the subtests. Twenty-nine of the 30 correlations were significant at the .05 level. The researchers indicated that such results tended to prove the concurrent validity of the MRT.

In a study designed to determine the validity of teacher judgement in readiness, Kermoian (1962) studied 276 first-grade children. Teachers rated students according to areas similar to those evaluated by the MRT. The MRT was then administered to the students. The correlations between teacher ratings and MRT scores were .73 in reading and number readiness and .77 in total readiness. When teacher ratings varied from those of the MRT, teacher ratings were higher 80% of the time in reading and 56% of the time in mathematics readiness. The researchers concluded that the MRT correlated significantly with teacher ratings.

Bolig and Fletcher (1973) studied both MRT results and teacher ratings as predictors of first grade Stanford Achievement Test (SAT) scores. Pearson-product moment correlations were computed for each variable with each other variable. All coefficients were significant beyond the .01 level.

Several studies have examined the correlation of the MRT with various achievement measures. In their study, Randel,

Fry, and Ralls (1977) conducted research which looked at the MRT as a predictor of first and third grade reading achievement as measured by the SAT. The researchers found performance on the MRT to account for 11% of the variance in first grade achievement scores and to account for 26% of the variance in third grade reading scores on the SAT. The researchers concluded the MRT was the best predictor among those included in the investigation.

Nurss and McGauvran (1976) reported results of a validity study conducted with the MRT norm group. In the study, correlations between the SAT and MRT scores were obtained. Correlations were reported as ranging from .48 between the language skill area of the MRT and total reading on the SAT to .76 between the pre-reading composite of the MRT and the total battery score of the SAT.

A 1978 study by Rubin, Barlow, Dorle, and Rosen examined the MRT as a predictor of low achievement. The SAT was used as the achievement measure. Findings indicated that greater reliance may be placed in high readiness scores than in low readiness scores as predictors of achievement. Movement to other groups was noted more often in students who scored low in readiness measures. The investigators stated that it would not be appropriate to make individual predictions regarding which pre-school children will later encounter academic problems.

It should be added that a major reason for administering tests such as the MRT is to obtain information about special

needs children. When test scores indicate the presence of a difficulty, further evaluations are the likely result. As a result of further testing, the child may or may not be determined to need special intervention. In either case, the MRT would have served its purpose by alerting professionals to a possible problem. Indeed, other research has shown evidence that the MRT does predict learning problems. Lessler & Bridges (1973) studied several readiness tests, including the MRT, as predictors of learning problems at the first and second grade level. Achievement measures included the CAT and a teacher rating of performance. A Pearson correlation between the MRT and the CAT was .76. The correlation between the MRT and teacher ratings was .58 at the first grade level. In terms of second grade achievement, the number of correct predictions of second grade performance was calculated. Ninety-one percent of the children predicted to have learning problems were classified as such. Sixty-one percent of those predicted to have no learning problems were completing work adequately.

In their study of the MRT as a predictor of achievement, Moore, Martin, and Mundy (1982) attributed the high predictive validity of the MRT to self-fulfilling prophecy. Moore et al. stated that future performance predictions are accurate because children who are determined to be at risk are placed into groups and generally stay there. They indicated that such children are not allowed to progress at a rate other than that set for the high risk group.

In order to counterbalance what the researchers called a self-fulfilling prophecy, Moore et al. (1982) administered the MRT to 658 first graders. Children were placed into reading groups on the basis of this testing. All classrooms contained all reading levels. During the year, children were moved to different programs within their classrooms on the basis of individual assessments for the purpose of lessening the effects of a self-fulfilling prophecy. Of the 658 children, 14.6% were moved to different programs. The researchers indicated that this movement demonstrated the flexibility of the reading program. The results of end-of-the-year testing indicated that the students had been correctly placed as most had mastered the reading skills which had been presented. The SRA Achievement Series was also administered at the end of the year. A Pearson correlation of .59 with a significance level beyond .01 was obtained.

Moore et al. (1982) stated that the steps which were taken may not have been sufficient to counteract a self-fulfilling prophecy. They concluded that the act of grouping children may set their future reading achievement to a large extent.

In a study of 910 subjects, Rubin (1974) correlated pre-first grade MRT scores with late first grade Wide Range Achievement Test (WRAT) results. Pearson correlations were .54 in reading and spelling and .56 in mathematics. Rubin concluded that the MRT is a reliable measure of readiness. She noted

that the usefulness of MRT results was in such areas as identification of gaps in readiness and the establishment of readiness levels.

Nagle's (1979) study included information regarding the MRT as a predictor for males and females. A significant difference was found on the MRT pre-reading skills test as compared with the SAT total reading. The probability was significant at the .05 level. Nagle concluded that the MRT may be a more valid predictor for males than for females in the area of reading. The MRT quantitative score was found to be significantly correlated with the SAT total mathematics for males and females. Sex differences were not significant.

Bolig and Fletcher (1973) noted that the MRT was a better predictor for girls than for boys. The MRT, however, was a better predictor for both boys and girls than were teacher ratings.

Blythe Mitchell (1962) studied the MRT as a predictor of achievement as measured by the Metropolitan Achievement Test (MAT). The examiner found no significant sex differences in the validity of the MRT as a predictor of achievement.

Purpose of the Study

The purpose of this study was to add to the body of knowledge regarding the MRT as a predictor of future achievement. This was accomplished by correlating kindergarten MRT scores with the third grade SAT scores of the sample group.

Such information may be of benefit to the Stewart County School System in its attempt to provide appropriate education for its students and continue its child find screening.

Hypotheses

The following hypotheses were proposed:

1. There will be a significant positive correlation between the pre-reading composite of the MRT and the SAT total reading score. The correlation will be higher for girls than for boys.

2. There will be a significant positive correlation between the pre-reading composite score of the MRT and the SAT total auditory score. The correlation will be higher for girls than for boys.

3. There will be a significant positive correlation between the auditory score of the MRT and the SAT total auditory score. The correlation will be higher for girls than for boys.

4. There will be a significant positive correlation between the quantitative score of the MRT and the SAT total mathematics score. The correlation will be higher for boys than for girls.

5. There will be a significant positive correlation between the visual score of the MRT and the SAT total mathematics score. The correlation will be higher for boys than for girls.

Chapter 2

METHOD

Subjects

The sample group was obtained from the Stewart County School System, a small, rural county in middle Tennessee. The subjects included all students who completed the SAT during third grade in the spring of 1983 and who also took the MRT during the spring of their kindergarten year in 1980. The sample included 68 children.

Children omitted from the study included those who did not take one or more of the subtests of either the MRT or SAT. Other omitted students included those who were retained. Achievement data were not available for retained students and in many cases readiness scores had been purged from records.

The 1979-80 kindergarten class was used as more MRT data are still available for this class than for any other. Further, the most current third-grade achievement data are available for these children. All scores were coded in as case numbers in order to preserve confidentiality.

Instruments

Metropolitan Readiness Test. The 1976 edition of the MRT, which consists of two levels, is designed to provide information regarding a wide range of skills for kindergarten and beginning first-grade students. Level II yields scores

in auditory, visual, language and quantitative areas. The pre-reading composite summarizes the scores for visual, language and auditory areas (Nurss & McGauvran, 1976).

Split-half reliabilities corrected with the Spearman-Brown formula range from .72 to .94 for the subtest areas of form P. Kuder-Richardson Formula 20 (KR20) reliabilities range from .73 to .93 for the subtests. Content and predictive validity are considered to be appropriate elements of the MRT (Nurss & McCauvran, 1976).

Stanford Achievement Test. The 1973 edition of the SAT consists of six levels and two forms which evaluate grade levels ranging from middle first grade to middle ninth grade. This research is concerned with the Primary III level, form A. The Primary III level contains subtests in vocabulary, reading comprehension, word study skills, math concepts, computation and application, spelling, language, social science and listening comprehension. Total scores in reading, auditory, mathematics and battery areas are also reported (Madden, Gardner, Rudman, Karlsen, & Merwin, 1975).

Reliability is reported in terms of split-half estimates corrected by the Spearman-Brown formula. These coefficients range from .87 to .96 for subtests of Primary III level for the end of third grade. Coefficients for this level and age group are also reported in terms of KR20. These range from .85 to .95. With regard to validity, content validity is considered to have special relevance for the achievement test (Madden et al., 1975).

Procedure

Total reading, auditory and mathematics stanine scores from the May, 1983, administration of the Primary level III, form A of the SAT were obtained for all Stewart County students who took this level of the test. April, 1980, MRT stanine scores in auditory, visual, language, pre-reading, and quantitative areas of level II, form P were obtained for the same group of students. The scores were entered manually into a computer. MRT scores were then compared with SAT results in terms of Pearson-Product Moment correlations (Blair, Note 1).

Chapter 3

RESULTS

Means and standard deviations were computed for MRT and SAT scores of the total group. These data are summarized in Table 1. Means ranged from a low of 5.3 for SAT total reading and MRT language to 6.6 for SAT mathematics.

Pearson-product moment correlations for the total group are also summarized in Table 1. Probabilities were significant beyond the .01 level.

Means and standard deviations were computed for males and females. These results which are summarized in Table 2 indicate that mean scores for boys ranged from a low of 5.1 in SAT reading to 6.5 in SAT mathematics. Means for girls ranged from a low of 5.2 in MRT language to a high of 6.7 in SAT mathematics.

Pearson-product moment correlations for females and males are summarized in Table 3. Probabilities for females range from .14 between the MRT visual score and the SAT auditory score to .0004 between the MRT quantitative score and the SAT total reading area as well as between the MRT quantitative score and SAT auditory area score. Probabilities for boys range from .0060 between MRT language and SAT total reading to .0000 in all SAT content areas compared to MRT pre-reading and the MRT visual score as compared with the SAT mathematics score.

An examination of the results in terms of the hypotheses indicates that a high positive correlation between the pre-reading composite of the MRT and SAT total reading was in evidence, $r(66) = .62, p < .01$. The correlation, however, was significant for both girls, $r(29) = .48$, $p < .01$, and boys, $r(35) = .70$, $p < .01$.

Second, a high positive correlation was found between the MRT pre-reading composite and the SAT total auditory score, $r(66) = .62$, $p < .01$. The correlation was not higher for girls, $r(29) = .49$, $p < .01$, than for boys $r(35) = .71$, $p < .01$.

Third, a high positive correlation was seen between the auditory score of the MRT and SAT total auditory score, $r(66) = .60$, $p < .01$. Again, the correlation was not higher for girls, $r(29) = .48$, $p < .01$, than for boys, $r(35) = .68$, $p < .01$.

Fourth, a high positive correlation was in evidence between the MRT quantitative score and SAT mathematics, $r(66) = .54$, $p < .01$. The correlation was not higher for boys, $r(35) = .51$, $p < .01$, than for girls, $r(29) = .56$, $p < .01$.

Fifth, a high positive correlation between the visual score of the MRT and the SAT total mathematics score was obtained, $r(66) = .57$, $p < .01$. The correlation coefficient, in this instance was higher for boys, $r(35) = .67$, $p < .01$, than for girls, $r(29) = .44$, $p < .01$, but the correlation was significant for both groups.

The hypotheses relating to MRT and SAT total group scores are accepted. Hypotheses relating to differences in predictions between the sexes are rejected.

Differences in the level of significance were found between several of the variables. The MRT auditory and SAT reading correlations for males and females showed a correlation which was higher for boys, $r(35) = .72$, $p < .01$, than for girls, $r(29) = .41$, $p < .05$.

A comparison of the MRT visual and SAT reading correlation shows a higher level of significance for boys, $r(35) = .51$, $p < .01$, than for girls, $r(29) = .28$, $p > .05$. A similar result was seen in comparisons of the MRT visual score with the SAT auditory score. The correlation for boys was $r(35) = .58$, $p < .01$, and for girls was, $r(29) = .26$, $p > .05$.

Chapter 4

DISCUSSION

The data support the findings of previous studies which indicate that the MRT is a predictor of future achievement. Further, the MRT predicted achievement beyond those grades most often researched, first and second grade. Correlations beyond the .01 level were obtained for total group performance for each of the five hypotheses. The five hypotheses relating to differences between girls and boys performance are rejected, however. In each instance, there was indeed a difference in the size of the correlation coefficient. However, in each hypothesis, except the one comparing the MRT visual score and the total mathematics score, the findings were the opposite of the hypothesis. In terms of overall significance of the correlations, there were no real sex differences. All coefficients for both groups were significant beyond the .01 level. For this sample group, the MRT seems to have predicted equally well for boys and girls.

The purpose of the study, as stated earlier, was to add to what is known about the predictive value of the MRT. It was necessary to look at predictions of third-grade achievement as no standardized group achievement measure is given during either first or second grades in Stewart County. The MRT did, indeed, predict future achievement on the SAT at a high level of significance. The question of why this occurs is still to

be answered. Researchers such as Moore et al. (1982) have indicated that the act of grouping children based on tests such as the MRT insures that they will achieve as predicted by decreasing their chances to be exposed to material and techniques which might increase their skills. The reasons for the high predictive nature of the MRT are beyond the scope of this study. The argument made by the researchers, however, is a good one and should serve as a caution to those who work with children. It is imperative that the child not be conveniently placed in the system and left there. This is why timely reevaluation and test-teach-retest models are valuable and necessary.

Another purpose of the study was to answer teacher questions regarding the need and value of such screening. New demands are placed upon teachers each year. With the recent advent of the basic skills program in Tennessee, many elementary teachers, in particular, are finding themselves completing more and more evaluations of their classes' progress. Naturally, they are curious whether another test is beneficial. Regarding such tests as the MRT, the answer does seem to be yes. As previously discussed, the time needed for a teacher to decide to refer a child for special services may be lessened by the knowledge of low or uneven scores on the readiness test.

Research which supports the view that teacher ratings are parallel with MRT results (Bolig & Fletcher, 1973; Kermoian, 1959; Tokar & Holthouse, 1976) do not lessen the need for the

MRT. After the teacher sees agreement between the MRT scores and her or his own assessment of the child, the teacher may have added confidence in the need for a referral.

Research has been completed which found that MRT predictions can be incorrect, particularly for those children who scored lower on the test (Rubin et al., 1978). If the purpose of testing with the MRT is kept in mind, it is clear that a child will not be placed on the basis of the one test score alone. A child referred on the basis of test scores, classroom performance, or for other reasons would be given a complete evaluation containing several types of tests. It is most likely that a child whose scores on the MRT did not reflect his or her true skills would be accurately identified with other testing. The MRT would have served its purpose by alerting teachers and staff of a possible difficulty.

Chapter 5

SUMMARY

The purpose of the study was to add to the body of knowledge regarding the MRT as a predictor of future achievement. Kindergarten MRT scores from the sample group were compared with their third-grade SAT scores. Pearson-product moment correlations were computed.

Five hypotheses were examined: First, a significant positive correlation was anticipated between the pre-reading score of the MRT and the SAT total reading score. This hypothesis was accepted. It was further expected that the correlation would be higher for girls than for boys. This portion of the hypothesis was rejected.

Second, a significant positive correlation was expected between the pre-reading composite of the MRT and the SAT total auditory score. This aspect of the hypothesis was accepted. It was expected that the correlation would be higher for girls than for boys. This portion of the hypothesis was rejected.

Third, a significant positive correlation was anticipated between the MRT auditory score and the SAT total auditory area. This hypothesis was accepted. It was further expected that the correlation would be higher for girls than for boys. This hypothesis was rejected.

Fourth, a significant positive relationship was expected between the MRT quantitative score of the MRT and the SAT

total mathematics score. This hypothesis is accepted. It was anticipated that the correlation would be higher for boys than for girls. This hypothesis was rejected.

Finally, a significant positive relationship was expected between the visual score of the MRT and the SAT total mathematics area. This hypothesis is accepted. The hypothesis which indicated the correlation would be higher for boys than for girls is rejected, however.

Results from this study support those of previous research which indicate that the MRT is a predictor of future achievement. Further, it seems to predict for both boys and girls. The MRT appears to be worthy of consideration by professionals who are searching for early childhood screening instruments.

A major difficulty with this study has been the lack of test data for those children who have been retained since kindergarten. In order to carry out meaningful research of this kind, it is imperative that school systems recognize the need for retaining group test data over a number of years. This is not to say that all old test results should be kept in each child's cumulative folder but that group results should be accessible for the purpose of completing research which may be of benefit to the school system.

In the future, studies completed on this topic may gain meaningful information by looking at the age of children as a variable in the prediction of future achievement. It is widely thought and accepted that the younger the child, the

less reliable are his or her test scores. There are certainly many young five-year olds in kindergarten and such information may be of help in determining their readiness needs.

The main use of tests such as the MRT, and indeed, the reason for screening programs of all kinds is to answer the need established by Public Law 94-142. All children are guaranteed a free, appropriate education in the least restrictive environment. In order to complete this challenge, the law also mandated the need for on-going child find programs. The proper use of the MRT may be of great assistance to school systems by providing information which has been shown by this study and others to be accurate in the prediction of the future academic performance of children.

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TABLES

Table 1

Pearson Correlations, Means, and Standard Deviations

Between the MRT and SAT Content Areas

MRT	SAT			MRT	
	Reading	Auditory	Math	M	SD
Auditory	.59*	.60*	.62*	5.5	1.6
Visual	.43*	.45*	.57*	6.0	2.1
Language	.44*	.44*	.44*	5.3	1.8
Pre-Reading	.62*	.62*	.71*	5.6	1.6
Quantitative	.52*	.55*	.54*	5.3	1.9
M	5.3	5.7	6.6		
SD	1.5	1.3	1.6		

*p < .01

Table 2

Means and Standard Deviations of Males and Females in MRT and SAT Content Areas

Content Areas	Male M	Male SD	Female M	Female SD
MRT				
Auditory	5.4	1.7	5.5	1.5
Visual	5.8	2.2	6.3	2.1
Language	5.4	1.8	5.2	1.8
Pre-Reading	5.4	1.7	5.7	1.5
Quantitative	5.2	1.8	5.4	1.9
SAT				
Reading	5.1	1.5	5.7	1.3
Auditory	5.7	1.3	5.9	1.3
Math	6.5	1.6	6.7	1.6

Note. Male n = 37

Female n = 31

Table 3

Pearson Correlations of Males and Females

in MRT and SAT Content Areas

MRT	SAT					
	Reading		Auditory		Math	
	Male	Female	Male	Female	Male	Female
Auditory	.72**	.41*	.68**	.48**	.70**	.51**
Visual	.51**	.28	.58**	.26	.67**	.44**
Language	.44**	.50**	.41**	.49**	.45**	.45**
Pre-Reading	.70**	.48**	.71**	.49**	.78**	.61**
Quantitative	.46**	.62**	.49**	.62**	.51**	.56**

Note. Male n = 37

Female n = 31

*p < .05

**p < .01