DOCUMENT RESUME

ED 044 181 24 PS 003 857

TITLE	Developmental Skill and Achievement Differences of Children Identified as Excellent, Good, and Average in Reading and Arithmetic Achievement. Study Number Three.
INSTITUTION	University City School District, Mo.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO	BR-6-1328
PUB DATE	Apr 70
CONTRACT	OEC-3-7-061328-0322
NOTE	23p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.25
DESCRIPTORS	*Academic Achievement, Achievement, Achievement Rating, Achievement Tests, *Arithmetic, Grade 1, High Achievers, Preschool Children, *Reading, Sex Differences, Skill Development, *Skills, Student Ability, *Success Factors

ABSTRACT

This study sought to identify: (1) specific developmental skills or patterns of skills which contributed significantly to success and nonsuccess in reading and arithmetic, and (2) relationships of excellent, good, and average achievers in reading and arithmetic to success in other aspects of achievement. A complete assessment battery (ITPA, PPVT and tests of auditory discrimination, visual-motor integration and motor coordination) was given individually to 103 boys and girls before they entered kindergarten. The children were identified as excellent, good, or average achievers by a tabulation of grade equivalent scores on the Stanford Achievement Test given at the end of the first primary year. Analysis indicates that ITPA-3 which measures ability to complete verbal analogies, differentiates between achievers in 11 of 12 comparisons. There appears to be a threshold in certain reading and arithmetic skills which separates the excellent and good achievers from the average, and for which sex differences are shown. More developmental skills tests differentiated the three groups of achievers in arithmetic than in reading, and differentiated among boys more than girls. Girls who rated average in one aspect of achievement tended to maintain an average level in other aspects of achievement. (Author/NH)

DEVELOPMENTAL SKILL AND ACHIEVEMENT DIFFERENCES OF CHILDREN IDENTIFIED AS EXCELLENT, GOOD, AND AVERAGE IN READING AND ARITHMETIC ACHIEVEMENT

Study Number Three

Test data from the 1966-1970 U.S.O.E. prekindergarten-kindergarten research study (1, 2, 3) were examined to discover the relationship, if any, between levels of skills development prior to entering kindergarten and achievement at the end of the first primary year. Specifically, the purposes of the study were to identify

1. Specific developmental skills or patterns of skills which contributed significantly to success and non-success in reading and arithmetic.

2. Relationships of excellent, good, and average achievers in reading and arithmetic to their success in other aspects of achievement.

METHODS

Instruments.

A Complete Assessment Battery was given individually in May 1967 to determine strengths and weaknesses of children's developmental skills before entering kindergarten. At the end of the first primary year, the same children were given the Stanford Achievement Test in April 1969. These instruments are listed in Table 1.

Office of
Research and Testing

SCHOOL DISTRICT OF UNIVERSITY CITY
University City, Missouri

April 1970

Table 1. Complete Assessment Battery and Achievement Test

Test	Major Area Measured
COMPLETE ASSESSMENT BATTERY	
Illinois Test of Psycholinguistic Abilities LQ (ITPA-LQ) (4)	Total Language Quotient
Auditory Decoding (ITPA-1)	Auditory Reception
Visual Decoding (ITPA-2)	Visual Reception
Auditory-Vocal Association (ITPA-3)	Auditory Association
Visual-Motor Association (ITPA-4)	Visual Association
Vocal Encoding (ITPA-5)	Verbal Expression
Motor Encoding (ITPA-6)	Manual Expression
Auditory-Vocal Automatic (ITPA-7)	Grammatic Expression
Auditory-Vocal Sequencing (ITPA-8)	Auditory Sequential Memory
Visual-Motor Sequencing (ITPA-9)	Visual Sequential Memory
Peabody Picture Vocabulary Test, IQ (PPVT-IQ) (5)	Vocabulary
Three-Dimensional Auditory Discrimination (3-D) (Devised locally)	Auditory Discrimination
Developmental Test of Visual-Motor Integration (VMI) (6)	Visual-Motor Integration
Gross Motor Observations (GMO) (Devised locally)	Motor Coordination
STANFORD ACHIEVEMENT TEST (7)	
Word Reading, g.e. (S-WR)	
Paragraph Meaning, g.e. (S-PM)	
Vocabulary, g.e. (S-VOC)	
Spelling, g.e. (S-SPELL)	
Word Study Skills, g.e. (S-WSS)	
Arithmetic, g.e. (S-ARITH)	

Identification of Children.

All children for whom complete test data were available in the four testing periods during the three year span were included in the study. Due to attrition, the number of children was reduced to 103 from 229 of the initial experimental and control groups. The experimental and control groups were combined in this study in order to increase the size of the child population. The criteria used to identify children who were excellent, good, and average in reading (Paragraph Meaning) and arithmetic achievement were determined from a tabulation of grade equivalent scores obtained on the Stanford Achievement Test. Average achievers included some children one month or more below grade placement. Hereafter, these categories will be designated as

Group E: Excellent achievers

Group G: Good achievers

Group A: Average achievers.

The criteria, which are slightly different for boys and girls, are given in Table 2. In examining grade equivalent scores, the actual grade placement of 1.7 at the time of testing (April 1969) should be kept in mind.

Table 2. Grade Equivalent Criteria for Identifying Excellent, Good, and Average Achievers in Reading and Arithmetic

ACHIEVEMENT LEVEL	READING		ARITHMETIC	
	Boys	Girls	Boys	Girls
Excellent	2.9 & above	3.0 & above	2.7 & above	2.7 & above
Good	2.0 - 2.8	2.0 - 2.9	2.2 - 2.6	2.2 - 2.6
Average	1.4 - 1.9	1.0 - 1.9	1.3 - 2.1	1.4 - 2.1

The number and percentage of children identified at the three achievement levels are shown in Table 3.

Table 3. Number and Percentage of Children Studied

ACHIEVEMENT LEVEL	READING				ARITHMETIC			
	Boys		Girls		Boys		Girls	
	No.	%	No.	%	No.	%	No.	%
Excellent	15	31	15	27	13	27	13	24
Good	15	31	25	46	21	44	25	45
Average	18	38	15	27	14	29	17	31
TOTAL	48	100	55	100	48	100	55	100

Analysis of Data.

Univariate F tests and appropriate t-tests* were computed separately by sex for all tests in the Complete Assessment Battery, the six subtests of the Stanford Achievement Test, and age. F tests appear in Appendix A.

RESULTS

Findings are reported separately by sex for developmental skills and subtests of the Stanford Achievement Test by level of achievement in reading and in arithmetic. Only statistically significant findings are reported.

*t-Tests were computed only if F tests indicated significance.

Level of Developmental Skills

Skills Development of Boys Related to Reading.

Five of the 14 measures included in the Complete Assessment Battery showed statistically significant differences among boys which differentiated one or more of the three groups. Table 4 reports these differences.

For example, on the Illinois Test of Psycholinguistic Abilities, language quotient (ITPA-LQ), the mean LQ's for excellent, good, and average readers were 123.3, 113.9, and 104.6 respectively. A t-test of 3.03 gave a significant difference between Groups E and A at the <.01 level of confidence and the mean scores showed E was greater than A (E>A). No other differences between the groups were significant on ITPA-LQ. The graph at the right shows the approximate relationship of mean scores of each group while the letters show which were significant.

Other significant differences were:

ITPA-1, Auditory Decoding, G > A and E > A;

ITPA-3, Auditory-Vocal Association, E > G, G > A, and E > A;

ITPA-4, Visual-Motor Association, E > G and E > A;

ITPA-9, Visual-Motor Sequencing, E > A.

Table 4. Significant Differences in Skills Development of Boys Identified as Excellent, Good, and Average in Reading

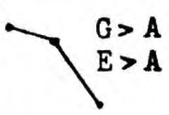
VARIABLE	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean	t	Group/ Mean	t	Group/ Mean	t	
ITPA-LQ	E(123.3)	ns	G(113.9)	ns	E 123.3 A 104.6	3.03***	E > A
ITPA-1	E (21.4)	ns	G 21.5 A 17.6	2.47**	E 21.4 A 17.6	2.34*	G > A E > A
ITPA-3	E 19.5 G 17.4	2.21*	G 17.4 A 14.1	2.50**	E 19.5 A 14.1	4.67***	E > G G > A E > A
ITPA-4	E 15.1 G 12.0	2.52**	G (12.0)	ns	E 15.1 A 12.1	2.10*	E > G E > A
ITPA-9	E (12.9)	ns	G (10.1)	ns	E 12.9 A 9.5	3.69***	E > A

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

Skills Development of Girls
Related to Reading.

Of the 14 measures of the complete battery, only one measure, ITPA-3 (Auditory-Vocal Association) showed a difference for girls in the three groups. Table 5 shows this difference.

Table 5. Significant Differences in Skills Development of Girls Identified as Excellent, Good, and Average in Reading

VARIABLE	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean	t	Group/ Mean	t	Group/ Mean	t	
ITPA-3	E (18.1)	ns	G 17.5 A 15.1	2.26*	E 18.1 A 15.1	2.54**	 G > A E > A

NOTE: Significance level: * < .05, ** < .02, ns - not significant.

Skills Development of Boys
Related to Arithmetic.

Ten of the 14 tests in the Complete Assessment Battery (rather than five tests as in reading) showed statistically significant differences for boys in one or more pairs of groups. Table 6 shows these differences.

Significant differences were:

ITPA-LQ, Language Quotient, G > A and E > A;

PPVT-IQ, Intelligence Quotient, G > A and E > A;

ITPA-1, Auditory Decoding, E > G and E > A;

ITPA-3, Auditory-Vocal Association, E > G, G > A, and E > A;

ITPA-4, Visual-Motor Association, E > A;

ITPA-5, Vocal Encoding, E > A;

ITPA-7, Auditory-Vocal Automatic, G > A;

ITPA-8, Auditory-Vocal Sequencing, G > A and E > A;

ITPA-9, Visual-Motor Sequencing, E > G and E > A;

VMI, Visual-Motor Integration, E > G and E > A.

Table 6. Significant Differences in Skills Development of Boys Identified as Excellent, Good, and Average in Arithmetic

VARIABLE	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean	t	Group/ Mean	t	Group/ Mean	t	
ITPA-LQ	E(124.7)	ns	G 115.5	2.59**	E 124.7	4.51***	G > A E > A
			A 99.7		A 99.7		
PPVT-IQ	E(119.6)	ns	G 115.3	2.45*	E 119.6	3.11***	G > A E > A
			A 105.6		A 105.6		
ITPA-1	E 22.9	2.13*	G (19.9)	ns	E 22.9	3.12***	E > G E > A
	G 19.9				A 17.5		
ITPA-3	E 20.1	3.51***	G 17.1	3.23***	E 20.1	5.32***	E > G G > A E > A
	G 17.1		A 13.4		A 13.4		
ITPA-4	E (14.9)	ns	G (13.1)	ns	E 14.9	2.98***	E > A
					A 11.1		
ITPA-5	E (16.8)	ns	G (15.2)	ns	E 16.8	2.46*	E > A
					A 12.1		
ITPA-7	E (11.9)	ns	G 12.4	2.52**	A (9.5)	ns	G > A
			A 9.5				
ITPA-8	E (21.3)	ns	G 20.2	2.75***	E 21.3	3.20***	G > A E > A
			A 13.9		A 13.9		
ITPA-9	E 13.1	2.22*	G (10.2)	ns	E 13.1	3.76***	E > G E > A
	G 10.2				A 9.4		
VMI	E 9.5	3.31***	G (7.6)	ns	E 9.5	4.98***	E > C E > A
	G 7.6				A 6.5		

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

Skills Development of Girls
Related to Arithmetic.

Six of the 14 tests in the complete battery (rather than one test as in reading) showed statistically significant differences for girls in one or more pairs of groups. Table 7 reports these differences.

Significant differences were:

ITPA-LQ, Language Quotient, G > A and E > A;

ITPA-2, Visual Decoding, G > A and E > A;

ITPA-3, Auditory-Vocal Association, G > A and E > A;

ITPA-6, Motor Encoding, E > A;

ITPA-7, Auditory-Vocal Automatic, G > A;

ITPA-8, Auditory-Vocal Sequencing, G > A and E > A.

Table 7. Significant Differences in Skills Development of Girls Identified as Excellent, Good, and Average in Arithmetic

VARIABLE	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean	t	Group/ Mean	t	Group/ Mean	t	
ITPA-LQ	E(118.4)	ns	116.8	2.83***	E 118.4	2.69**	G > A E > A
			A 103.3		A 103.3		
ITPA-2	E (12.8)	ns	G 11.3	2.11*	E 12.8	3.08***	G > A E > A
			A 8.8		A 8.8		
ITPA-3	E (18.3)	ns	G 18.0	3.24***	E 18.3	3.06***	G > A E > A
			A 14.7		A 14.7		
ITPA-6	E (14.2)	ns	G (12.9)	ns	E 14.2	2.27*	E > A
					A 10.2		
ITPA-7	E (12.4)	ns	G 12.8	2.49**	A (10.7)	ns	G > A
			A 10.7				
ITPA-8	E (20.6)	ns	G 21.3	3.21***	E 20.6	2.50**	G > A E > A
			A 16.4		A 16.4		

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

Level of Achievement

Remembering that Excellent, Good, and Average achievement in reading and arithmetic (designated as groups E G, A) were identified by the Paragraph Meaning or the Arithmetic subtests of the Stanford Achievement Test, the performance of each group in the remaining five subtests was examined. In the Tables which follow, reading or arithmetic achievement is reported first with the other subtests listed in the order they appear on the test face sheet.

Reading Level of Boys Compared with Other Achievement Subtests.

Table 8 gives the findings for boys. In Paragraph Meaning (S-PM), the basis for identification, the mean grade equivalents (g.e.) for excellent, good, and average readers were 3.3, 2.3, and 1.7 respectively. Corresponding t-tests of 8.52, 7.72, and 16.80 showed significant differences between groups: E > G, G > A, and E > A, all at the <.01 level of confidence. The graph at the right and the letters following also indicated these relationships. The remainder of the table is interpreted in the same manner.

Other significant differences were:

Word Reading (S-WR), G > A and E > A;

Vocabulary (S-VOC), E > A;

Spelling (S-SPELL), G > A and E > A;

Word Study Skills (S-WSS), G > A and E > A;

Arithmetic (S-ARITH), E > G and E > A.

Table 8. Significant Differences among Boys Identified as Excellent, Good, and Average in Reading Compared with Their Performance on Other Stanford Achievement Test Measures

STANFORD ACHIEVE. TEST	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean ge	t	Group/ Mean ge	t	Group/ Mean ge	t	
BASIS OF IDENTIFICATION							
S-PM	E 3.3 G 2.3	8.52***	G 2.3 A 1.7	7.72***	E 3.3 A 1.7	16.80***	E > G G > A E > A
OTHER SUBTESTS							
S-WR	E (3.2)	ns	G 2.9 A 2.2	3.59***	E 3.2 A 2.2	5.57***	G > A E > A
S-VOC	E (3.7)	ns	G (3.0)	ns	E 3.7 A 2.5	2.77***	E > A
S-SPELL	E (2.9)	ns	G 2.6 A 2.3	2.11*	E 2.9 A 2.3	4.51***	G > A E > A
S-WSS	E (4.4)	ns	G 4.1 A 2.5	3.64***	E 4.4 A 2.5	4.97***	G > A E > A
S-ARITH	E 3.1 G 2.4	2.65**	G (2.4)	ns	E 3.1 A 2.1	3.63***	E > G E > A

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

Reading Level of Girls Compared with Other Achievement Subtests.

Table 9 gives the findings for girls. Significant differences between groups were:

Paragraph Meaning (S-PM), E > G, G > A, and E > A;

Word Reading (S-WR), E > G, G > A, and E > A;

Vocabulary (S-VOC), G > A and E > A;

Spelling (S-SPELL), E > G, G > A, and E > A;

Word Study Skills (S-WSS), E > G, G > A, and E > A;

Arithmetic (S-ARITH), E > G, G > A, and E > A.

Table 9. Significant Differences among Girls Identified as Excellent, Good, and Average in Reading Compared with Their Performance on Other Stanford Achievement Test Measures

STANFORD ACHIEVE. TEST	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean ge	t	Group/ Mean ge	t	Group/ Mean ge	t	
BASIS OF IDENTIFICATION							
S-PM	E 3.5 G 2.4	10.41***	G 2.4 A 1.6	9.79***	E 3.5 A 1.6	16.19***	E > G G > A E > A
OTHER SUBTESTS							
S-WR	E 3.1 G 2.7	3.16***	G 2.7 A 2.2	3.14***	E 3.1 A 2.2	5.60***	E > G G > A E > A
S-VOC	E (3.3)	ns	G 2.8 A 1.9	3.34***	E 3.3 A 1.9	4.01***	G > A E > A
S-SPELL	E 3.1 G 2.7	3.54***	G 2.7 A 2.3	3.51***	E 3.1 A 2.3	5.77***	E > G G > A E > A
S-WSS	E 4.8 G 3.8	2.73**	G 3.8 A 2.3	4.87***	E 4.8 A 2.3	8.40***	E > G G > A E > A
S-ARITH	E 2.8 G 2.4	2.91***	G 2.4 A 2.0	3.11***	E 2.8 A 2.0	4.91***	E > G G > A E > A

NOTE: Significance level: * <.05, ** <.02, *** <.01, ns - not significant.

Arithmetic Achievement of Boys Compared With Other Achievement Subtests.

Table 10 gives the findings for Boys. In the Arithmetic (S-ARITH) subtest, the basis for identification of the arithmetic groups, the mean grade equivalents for excellent, good, and average achievers were 3.4, 2.5, and 1.7 respectively. Corresponding t-tests of 4.96, 10.32, and 6.97 showed significant differences between groups: E > G, G > A, and E > A, all at the < .01 level of confidence. The graphs and letters at the right also show these relationships.

Other significant differences were:

Word Reading (S-WR), E > G and E > A;

Paragraph Meaning (S-PM), E > G and E > A;

Vocabulary (S-VOC), E > G, G > A, and E > A;

Spelling (S-SPELL), E > G, G > A, and E > A;

Word Study Skills (S-WSS), E > G and E > A.

Table 10. Significant Differences among Boys Identified as Excellent, Good, and Average in Arithmetic Compared with Their Performance on Other Stanford Achievement Test Measures

STANFORD ACHIEVE. TEST	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean ge	t	Group/ Mean ge	t	Group/ Mean ge	t	
BASIS OF IDENTIFICATION							
S-ARITH	E 3.4 G 2.5	4.96***	G 2.5 A 1.7	10.32***	E 3.4 A 1.7	6.97***	E > G G > A E > A
OTHER SUBTESTS							
S-WR	E 3.2 G 2.7	2.96***	G (2.7)	ns	E 3.2 A 2.4	3.61***	E > G E > A
S-PM	E 3.1 G 2.3	3.40***	G (2.3)	ns	E 3.1 A 1.9	4.83***	E > G E > A
S-VOC	E 4.3 G 2.8	4.40***	G 2.8 A 2.2	2.28*	E 4.3 A 2.2	6.43***	E > G G > A E > A
S-SPELL	E 3.0 G 2.6	2.88***	G 2.6 A 2.2	2.26*	E 3.0 A 2.2	4.56***	E > G G > A E > A
S-WSS	E 4.5 G 3.6	2.28*	G (3.6)	ns	E 4.5 A 2.8	3.16***	E > G E > A

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

Arithmetic Achievement of Girls Compared With Other Achievement Subtests.

Table 11 gives the findings for girls. Significant differences between groups were:

Arithmetic (S-ARITH), E > G, G > A, and E > A;

Word Reading (S-WR), G > A and E > A;

Paragraph Meaning (S-PM), G > A and E > A;

Vocabulary (S-VOC), G > A and E > A;

Spelling (S-SPELL), E > G, G > A, and E > A;

Word Study Skills (S-WSS), G > A and E > A.

Table 11. Significant Differences among Girls Identified as Excellent, Good, and Average in Arithmetic Compared with Their Performance on Other Stanford Achievement Test Measures

STANFORD ACHIEVE. TEST	EXCELLENT WITH GOOD		GOOD WITH AVERAGE		EXCELLENT WITH AVERAGE		SIGNIF. SUPERIOR GROUP
	Group/ Mean ge	t	Group/ Mean ge	t	Group/ Mean ge	t	
BASIS OF IDENTIFICATION							
S-ARITH	E 3.0 G 2.4	10.19***	G 2.4 A 1.9	10.87***	E 3.0 A 1.9	14.80***	E > G G > A E > A
OTHER SUBTESTS							
S-WR	E (2.9)	ns	G 2.8 A 2.4	2.47**	E 2.9 A 2.4	2.72**	G > A E > A
S-PM	E (3.0)	ns	G 2.6 A 1.9	3.54***	E 3.0 A 1.9	4.72***	G > A E > A
S-VOC	E (3.4)	ns	G 2.8 A 1.9	3.76***	E 3.4 A 1.9	4.80***	G > A E > A
S-SPELL	E 3.0 G 2.7	2.06*	G 2.7 A 2.4	2.08*	E 3.0 A 2.4	3.23***	E > G G > A E > A
S-WSS	E (4.3)	ns	G 4.0 A 2.8	3.14***	E 4.3 A 2.8	3.53***	G > A E > A

NOTE: Significance level: * < .05, ** < .02, *** < .01, ns - not significant.

CONCLUSIONS

An analysis of the findings points to the following five tentative conclusions:

1. ITPA-3, the test measuring the ability to complete verbal analogies differentiates between the excellent, good, and average achievement groups in eleven of the twelve comparisons. The only exception was the difference between the excellent and good groups of girls in reading which was not significant.

2. There appears to be a threshold in certain skills which separates the excellent and good achievers from the average. For boys in reading, this threshold was identified in auditory comprehension (ITPA-1) and verbal analogies (ITPA-3). For girls in reading, only the verbal analogies skill (ITPA-3) suggested a threshold point. For boys in arithmetic, the four skills which may have threshold points are a composite language ability (ITPA-LQ), vocabulary (PPVT-IQ), verbal analogies (ITPA-3), and immediate memory for digits (ITPA-8). For girls in arithmetic, thresholds seem to exist in a composite language ability (ITPA-LQ), visual comprehension (ITPA-2), verbal analogies (ITPA-3), and immediate memory for digits (ITPA-8).

3. More developmental skills tests differentiated the excellent, good, and average groups in arithmetic than in reading.

4. More developmental skills tests differentiated the excellent, good, and average achievement groups of boys than of girls.

5. Girls rated average compared with the excellent and good groups in one aspect of achievement tended to maintain an average level in other aspects of achievement.

DISCUSSION

It would seem important to analyze the various facets making up the verbal analogies test. Such a study might yield information concerning specific components necessary to master this kind of task and point to ways in which programs could be oriented to build strength in these components for both boys and girls.

Additional investigation is needed to ascertain if skills levels or specific combinations of skills levels of attainment are necessary to master beginning reading and arithmetic. Results of tests in which the two superior groups significantly out-performed the average group should be examined to see if such threshold points exist.

A greater number of arithmetically oriented activities may be needed at the prekindergarten and kindergarten levels calling for those skills necessary for success in the tests which differentiated the groups in arithmetic. In general, individual progress should be evaluated in auditory comprehension and language skills for boys, and visual comprehension for girls, in addition to cognitive skills for both boys and girls. Evidence from such an evaluation should result in greater personalization of programs.

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APPENDIX A

UNIVARIATE F TESTS

VARIABLE	READING		ARITHMETIC	
	Boys	Girls	Boys	Girls
Age	1.91	.09	1.00	.88
PPVT-IQ	1.77	2.91	5.46***	2.88
ITPA-LQ	4.89**	1.71	8.29****	4.95**
ITPA-1	4.37**	.59	5.52***	1.61
ITPA-2	2.87	1.04	.63	5.34***
ITPA-3	11.42****	4.03*	16.78****	7.82****
ITPA-4	3.46*	.08	3.27*	1.44
ITPA-5	2.66	.18	3.40*	1.39
ITPA-6	1.79	.92	.76	3.28*
ITPA-7	.75	1.00	3.77*	3.37*
ITPA-8	1.22	1.88	5.62***	5.84***
ITPA-9	4.71**	.09	4.83**	1.99
THREE-D	2.87	.40	.70	.80
VMI	2.10	.16	11.96****	2.75
GMO	.27	.52	2.81	1.39
S-WR	17.53****	15.83****	6.86****	4.64**
S-PM	141.38****	153.86****	11.97****	11.04****
S-VOC	4.35**	8.91****	27.03****	11.03****
S-SPELL	8.23****	18.88****	10.65****	6.28****
S-WSS	12.11****	25.34****	5.74***	6.81****
S-ARITH	8.60****	13.81****	42.15****	152.22****

NOTE: Significance level: * < .05, ** < .025, *** < .01, **** < .005.

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