

CHAPTER IV

RESULTS

Chapter IV contains the findings. Descriptive statistics comparing the treatment and control schools are reported in one table to allow the reader ease in using the information. The results of the three four-way ANOVAs are reported in tabular form and interpreted.

Treatment, Gender, Race, and Previous Achievement

Effects on Reading, Mathematics, and Language

All statistics were conducted using the Statistical Package for the Social Sciences (Norusis, 1994). There were 78 fourth-grade students in the study, 41 from School A and 37 from School B. Differences in the students' achievement scores on the Stanford Achievement Test were examined for the dependent variables of reading, mathematics, and language. Gender, race, previous achievement and treatment were the independent variables. Mean scaled scores, standard deviations, and maximums and minimums were calculated for the posttest in mathematics, reading, and language for different race, gender, and previous achievement groups.

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Table 9

Reading, Math, and Language Posttest Means and Standard Deviations by Gender, Race, and Previous Achievement in Reading, Math, and Language

School A (Treatment)

Variable	Reading					Mathematics					Language				
	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>
Gender															
Male (M)	24	629.50	40.75	528	732	24	624.13	28.75	558	671	24	608.00	34.47	539	676
Female (F)	17	636.18	33.51	558	706	17	614.88	27.76	558	653	17	612.00	34.99	553	676
Race															
Black (B)	24	630.42	28.21	575	706	24	616.33	25.03	558	653	24	606.08	27.67	553	676
White (W)	17	634.88	48.79	528	732	17	625.88	32.48	558	671	17	614.71	47.37	539	676
Pre/Ach/Read															
Low(L)	20	611.85	29.62	528	603										
High (H)	21	651.71	34.38	607	732										
Total	41	632.27	37.58	528	732										
Pre/Ach/Math															
Low						21	603.14	23.72	558	587					
High						20	638.30	20.87	594	671					
Total						41	620.29	28.37	558	671					
Pre/Ach/Lang															
Low											20	590.35	28.60	539	580
High											21	628.05	29.13	592	676
Total											41	609.66	34.31	539	676

(table continues)

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Table 9 (continued)

Reading, Math, and Language Posttest Means and Standard Deviations by Gender, Race, and Previous Achievement in Reading, Math, and Language

School B (Control)

Variable	Reading					Mathematics					Language				
	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>Min</u>	<u>Max</u>
Gender															
Male (M)	20	626.40	35.49	558	684	20	609.00	34.93	540	658	20	603.75	31.60	556	660
Female (F)	17	620.35	31.49	569	668	17	607.00	24.27	561	644	17	612.35	32.93	566	676
Race															
Black (B)	29	619.28	30.35	558	673	29	606.93	33.03	540	658	29	606.55	30.87	556	676
White (W)	8	639.38	41.05	571	684	8	612.25	16.54	590	635	8	611.88	38.05	560	660
Pre/Ach/Read															
Low(L)	18	602.22	23.83	558	602										
High (H)	19	643.89	28.31	607	684										
Total	37	623.62	33.39	558	684										
Pre/Ach/Math															
Low						19	588.11	25.12	540	587					
High						18	629.17	18.32	590	658					
Total						37	608.08	30.11	540	658					
Pre/Ach/Lang															
Low											20	588.30	23.70	556	580
High											17	630.53	24.92	583	676
Total											37	607.70	32.06	556	676

Table 10

Cell Numbers, Means, and Standard Deviations for Reading, Mathematics and Language used in the Four-Way ANOVAs

School A (Treatment Group)									
CELL	n	Reading		n	Mathematics		n	Language	
		M	SD		M	SD		M	SD
MBLT	11	616.82	20.33	8	608.50	27.52	8	596.25	30.35
MWLT	2	569.50	58.69	4	609.25	20.60	5	584.20	34.54
MBHT	3	658.00	34.07	6	632.50	21.04	6	619.00	19.72
MWHT	8	651.25	43.25	6	646.50	28.14	5	637.40	35.99
FBLT	5	621.80	13.01	6	602.00	19.96	3	583.33	16.26
FWLT	2	602.00	62.23	3	583.00	23.26	4	591.50	32.54
FBHT	5	652.40	31.92	4	629.25	17.71	7	616.00	27.91
FWHT	5	648.00	31.46	4	643.75	6.13	3	658.67	14.43
TOTAL	41	632.27	37.62	41	620.29	28.37	41	609.66	34.31
School B (Control Group)									
CELL	n	Reading		n	Mathematics		n	Language	
		M	SD		M	SD		M	SD
MBLC	8	598.00	24.17	7	574.71	25.62	8	581.50	18.98
MWLC	2	613.50	33.23	2	594.50	6.32	3	592.00	37.32
MBHC	7	647.43	23.66	8	637.25	21.88	7	630.43	23.94
MWHC	3	661.67	29.67	3	623.33	10.21	2	617.00	22.63
FBLC	7	608.29	21.71	9	596.67	25.90	8	595.75	24.61
FWLC	1	571.00		1	592.00		1	572.00	
FBHC	7	626.43	29.30	5	622.00	17.28	6	626.50	28.81
FWHC	2	666.00	2.83	2	623.50	2.12	2	656.50	4.95
TOTAL	37	623.62	33.39	37	608.08	30.11	37	607.70	32.06

Note: M=male, F=female, W=white, B=black, T=treatment, and C=control

Results of the Analysis of Variance for Reading

There were no significant main effects of gender, race, or treatment on posttest reading scores at the .05 alpha level between School A and School B. Significant main effects were found for previous achievement (see Table 11). Those students who were in the low group on the reading pretest scored lower on the reading posttest than those students in the high group on the reading pretest.

There was one significant interaction effect among gender, race, previous achievement, and treatment on posttest reading scores. Race interacted with previous achievement; however, because the treatment was not part of the interaction, this finding was not explored further.

Results of the Analysis of Variance for Mathematics

There were no significant main effects of gender, race, or treatment on the posttest mathematics scores at the .05 alpha level between School A and School B. Significant main effects were found for previous achievement (see Table 12). Those students who were in the low group on the mathematics pretest scored lower on the mathematics posttest than those students in the high group on the mathematics pretest. There were no significant interactions among race, gender, previous achievement, or treatment on the posttest mathematics scores.

Table 11

Analysis of Variance Data for Relationships Between Reading Mean Scores and Gender, Race, Previous Achievement, and Treatment

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Treatment	1	149.72	149.72	.17	.68
Gender	1	81.42	81.42	.10	.76
Race	1	424.64	424.64	.49	.49
Previous achievement	1	33422.66	33422.66	38.47	.00
Treatment x gender	1	1193.02	1193.02	1.37	.25
Treatment x race	1	2415.40	2415.40	2.78	.10
Gender x race	1	1.16	1.16	.00	.97
Treatment x gender x race	1	652.41	652.41	.76	.39
Treatment x pre ach	1	24.94	24.94	.03	.87
Gender x pre ach	1	188.18	188.18	.22	.64
Treatment x gender x pre ach	1	760.32	760.32	.88	.36
Race x pre ach	1	3436.94	3436.94	3.96	.05
Treatment x race x pre ach	1	76.50	76.50	.09	.77
Gender x race x pre ach	1	556.73	556.73	.64	.43
Treatment x gender x race x pre ach	1	2118.34	2118.34	2.44	.12
Error	62	53877.67	868.10		
Total	78	30876461.00			

Table 12

Analysis of Variance Data for Relationships Between Math Mean Scores and Gender, Race, Previous Achievement, and Treatment

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Treatment	1	1783.75	1783.75	3.57	.06
Gender	1	255.82	255.82	.51	.48
Race	1	36.30	36.30	.08	.79
Previous achievement	1	19148.43	19148.43	38.32	.00
Treatment x gender	1	402.38	402.38	.81	.38
Treatment x race	1	12.33	12.33	.03	.88
Gender x race	1	173.16	173.16	.35	.56
Treatment x gender x race	1	22.58	22.58	.05	.83
Treatment x pre ach	1	.24	.24	.00	.10
Gender x pre ach	1	13.19	13.19	.03	.88
Treatment x gender x pre ach	1	812.87	812.87	1.63	.21
Race x pre ach	1	79.90	79.90	.16	.69
Treatment x race x pre ach	1	1194.29	1194.29	2.40	.13
Gender x race x pre ach	1	782.21	782.21	1.57	.22
Treatment x gender x race x pre ach	1	83.30	83.30	.17	.69
Error	62	30977.85	499.64		
Total	78	29521337.00			

Results of the Analysis of Variance for Language

There were no significant main effects of gender, race, or treatment on posttest language scores at the .05 alpha level between School A and School B. Significant main effects were found for previous achievement (see Table 12). Those students who were in the low group on the language pretest scored lower on the language posttest than those students in the higher group on the language pretest. There were no significant interactions among race, gender, previous achievement, or treatment on the posttest mathematics scores.

Table 13

Analysis of Variance Data for Relationships Between Language Mean Scores and Gender, Race, Previous Achievement and Treatment

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Treatment	1	46.35	46.35	.07	.80
Gender	1	388.42	388.42	.54	.47
Race	1	788.29	788.29	1.10	.30
Previous achievement	1	28681.28	28681.28	39.69	.00
Treatment x gender	1	63.50	63.50	.09	.77
Treatment x race	1	624.70	624.70	.87	.36
Gender x race	1	620.06	620.06	.86	.36
Treatment x gender x race	1	268.40	268.40	.38	.55
Treatment x pre ach	1	38.64	38.64	.06	.82
Gender x pre ach	1	915.51	915.51	1.27	.27
Treatment x gender x pre ach	1	65.48	65.48	.10	.77
Race x pre ach	1	1934.01	1934.01	2.68	.11
Treatment x race x pre ach	1	265.72	265.72	.37	.55
Gender x race x pre ach	1	1438.31	1438.31	1.10	.16
Treatment x gender x race x pre ach	1	1167.34	1167.34	1.62	.21
Error	62	44813.05	722.80		
Total	78	28987289.00			