

**EDA/Edikasyon a Distans pou Ayiti Project**  
*Distance Education Inside and Beyond the Classroom*

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**2003-2004 Final Student Assessment Report**

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## **Executive Summary**

### **Purpose of the Evaluation Effort**

As was the case in previous years, the purpose of the 2003-2004 evaluation is to determine if second, third and fourth grade Haitian students receiving an interactive radio instruction treatment (called FAD) would make greater gains in reading and math performance than students receiving a traditional educational experience (Control).

### **Sampling Procedures**

The development of the school sampling plan occurred in October, 2003. The plan was developed by Nicole Racine the EDC Chief of Party, William Michel, the Measurement and Evaluation consultant who had participated in previous evaluation efforts, and by staff from FONHEP. The process of selecting schools to be part of the sample began with the goal of including as many schools as possible from the previous year's project so as to be able to monitor progress from year to year. Another goal was to increase the sample size so as to reflect the increase in the number of schools participating in the distance education project (an increase of approximately 350 schools)

Considerations mentioned in the above section led to the decision to test 22 schools, 12 receiving the EDA/Edikasyon treatment and 10 serving as controls for the treatment schools. This sampling plan provided a sample of approximately 670 students tested at each grade level (total approximately 2000 students tested). These students would be divided such that approximately 4 students in FAD schools would be tested for every 3 students tested in Control schools.

### **Measures and Participating Students**

Students from the two treatment groups were administered pre and post reading and math tests written in Haitian Creole. The reading and math tests were developed in a workshop held the week of August 26, 2002 at the University of Massachusetts. Separate tests were developed for grades 2, 3 and 4. The workshop was directed by James Royer, and was attended by Yverose Luberisse, a Haitian educator who had previously worked on the predecessor to the current project (ED2004), and by Abdoul Houssien, an EDC employee who works on the Haiti project.

The content of the tests was based on a review of reading and math (in Creole) textbooks in use in Haitian schools, reviews of curriculum materials, and on Ms. Luberisse's long experience as a Haitian educator. Both Mr. Houssien and Ms. Luberisse also contributed to the development of posttests for the project and examined the posttests before they were administered in the Spring of 2003.

- The **reading and math pretests** were administered to 554 2nd grade students, 550 3rd grade students, and 586 4th grade students in November 2003. Broken down by treatment, 280 of the 2nd grade students taking the pretest were from the FAD group and 264 from the Control group, 329 of the 3rd grade students were from the FAD group and

221 from the Control group, and 321 of the 4th grade students were from the FAD group and 265 were from the Control group.

- The **reading and math posttests** were administered to 457 2nd grade students, 437 3rd grade students and 465 4th grade students in June and June of 2004. The distribution of students by treatments was that there were 290 2nd grade FAD students and 167 2nd grade Control students, 275 3rd grade FAD students and 161 3rd grade Control students, and 289 grade 4 FAD students and 176 grade 4 Control students.
- A total of 325 2nd grade students, 295 3rd grade students, and 384 4th grade students completed **both the math and reading pretest and posttest**.

### **Test Scoring**

The tests were hand-scored in Haiti and item level data was transferred to machine scorable answer sheets. These data sheets also contained demographic information about individual students and information about the characteristics of the schools participating in the evaluation effort. The answer sheets were sent to the University of Massachusetts where they were electronically scored and the data was then entered into a statistical analysis program.

### **Results Associated with the FAD and Control Treatments**

The results reported in this summary will focus on the gain from pretest to posttest. Details about performance on pretests and posttests separately can be found in the body of the report. The outcomes reported below are reported first for overall reading and math scores, followed by results that pertain to performance on separate math and reading skills. The math tests contained items that measured number recognition, addition, subtraction, multiplication, division and decimal skills. The reading tests contained items that measured letter recognition, word recognition and sentence understanding.

#### **Overall Math and Reading Performance**

- **2nd Grade Overall Math:** The Control group made significantly more gain on the overall math tests than did the FAD group.
- **2nd Grade Overall Reading:** The FAD and Control groups did not differ in the amount of pretest to posttest gain on the overall reading test.
- **3rd Grade Math:** The FAD and Control groups did not differ in the amount of pretest to posttest gain on the overall math test.
- **3rd Grade Overall Reading:** The Control group made significantly more gain on the overall reading tests than did the FAD group.
- **4th Grade Overall Math:** The FAD and Control groups did not differ in the amount of pretest to posttest gain on the overall math test.
- **4th Grade Overall Reading:** The Control group made significantly more pretest to posttest gain than did the FAD group.

#### **Performance on Individual Math Skills**

- **2nd Grade Number Recognition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the number recognition items.
- **2nd Grade Addition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the addition items.
- **2nd Grade Subtraction:** The Control group made significantly more gain on the subtraction items than did the FAD group.
- **2nd Grade Multiplication:** The Control group made significantly more gain on the multiplication items than did the FAD group.
- **2nd Grade Division:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the division items.
- **2nd Grade Decimals:** The Control group made significantly greater gains on the decimal items than did the FAD group.
- **3rd Grade Number Recognition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the number items.
- **3rd Grade Addition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the addition items.
- **3rd Grade Subtraction:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the subtraction items.
- **3rd Grade Multiplication:** The Control group made significantly greater gains on the multiplication items than did the FAD group.
- **3rd Grade Division:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the division items.
- **3rd Grade Decimals:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the decimal items.
- **4th Grade Number Recognition:** The FAD group made significantly greater pretest to posttest gain than did the Control group.
- **4th Grade Addition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the addition items.
- **4th Grade Subtraction:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the subtraction items.
- **4th Grade Multiplication:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the multiplication items.
- **4th Grade Division:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the division items.
- **4th Grade Decimals:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the decimal items.

### **Performance on Individual Reading Skills**

- **2nd Grade Letter Recognition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the letter recognition items.
- **2nd Grade Word Recognition:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the word recognition items.
- **2nd Grade Sentence Understanding:** The FAD and Control groups did not differ in the amount of pretest to posttest gain they made on the sentence understanding items.

- **3rd Grade Letter Recognition:** The FAD made significantly greater gains on the letter recognition items than did the Control group.
- **3rd Grade Word Recognition:** The Control group made significantly greater gains on the word recognition items than did the FAD group.
- **3rd Grade Sentence Understanding:** The Control group made significantly greater gains on the sentence items than did the FAD group.
- **4th Grade Word Recognition:** The Control group made significantly greater gains on the word recognition items than did the FAD group.
- **4th Grade Sentence Understanding:** The Control group made significantly greater gains on the sentence items than did the FAD group.
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In addition to results regarding the treatment conditions, analyses were conducted that examined differences associated with gender, with whether the schools were Catholic, Independent, or Protestant, school location (urban or rural) and geographical region of the school. Some differences attributable to these variables were found, but these differences were not consistent across the two types of tests, and they did not systematically relate to the treatment conditions.

## **Final Project Results for the EDA/Edikasyon a Distans pou Ayiti 2003-2004 Project**

### **Goals**

The goals of the 2003-2004 student learning evaluation are the same as those for evaluations in previous years. Specifically, to determine if students receiving the distance education treatment make greater academic gains than do students enrolled in schools not receiving the treatments. The EDA/Edikasyon a Distans pou Ayiti educational intervention consists of a distance education intervention that provides instruction over the radio in reading and math. Children who listen to the radio programs will henceforth be referred to as being in the FAD (intervention) condition. Performance of students enrolled in FAD schools will be compared to the performance of students enrolled in Control schools that do not receive the FAD treatments.

A secondary goal of the evaluation effort is to determine if the impact of the radio intervention varies as a function of characteristics of children and schools. The evaluation design allows an examination of the reading and math performance of participating children as a function of the following factors:

- ❑ Treatment Condition (FAD, Control)
- ❑ Sex of Student
- ❑ Type of School (Catholic, Protestant, Independent)
- ❑ School (22 participating schools)
- ❑ School Setting (urban v. rural)
- ❑ Political Department (Ouest, Nord)
- ❑ Grade (2nd, 3rd or 4th)

In addition to examining the impact of each of the above factors, where possible, the evaluation effort will also examine the interaction between geographical and demographic factors, and treatment conditions (FAD, Control).

### **Reading and Math Tests**

The reading and math tests that were used in the 2003-2004 evaluation were developed in Creole during a test development workshop held the week of August 26, 2002 at the University of Massachusetts. Separate tests were developed for grades 2, 3 and 4. The workshop was directed by James Royer, and was attended by Yverose Luberisse, a Haitian educator who had previously worked on the predecessor to the current project (ED2004), and by Abdoul Houssien, an EDC employee who works on the Haiti project. Dr. Royer was assisted by Rachel Wing, one of Royer's graduate students. The workshop was conducted in English, though a good deal of the interaction between Ms. Luberisse and Mr. Houssien occurred in French.

The content of the tests was based on a review of reading and math (in Creole) textbooks in use in Haitian schools, reviews of curriculum materials, and on Ms. Luberisse's long experience as a Haitian educator. Both Mr. Houssien and Ms. Luberisse also contributed to the development of

posttests for the project and examined the posttests before they were administered initially administered in the Spring of 2003.

### **Pilot Testing the Reading and Math Tests**

The tests developed in the August 2002 workshop were initially pilot tested by Ludfort Ulysse in September 2002. The primary purpose of the pilot effort was to evaluate several psychometric properties of the tests. In particular, we were interested in the relative difficulty of the items and the distribution of scores that resulted from a test administration. Ideally, tests should contain items that span a range of difficulty from very difficult to relatively easy, and the distribution of scores from a score administration should be relatively normal. Graphs showing each of these properties for the piloted tests were appended to the pretest report which was submitted in March 2003. In general, the piloted tests showed an excellent distribution of performance with an appropriate mix of items that were in the low, medium and high difficulty range.

The reliability of the tests was evaluated in the 2002-2003 evaluation effort. The evaluation report for 2002-2003 reported coefficient alpha reliabilities for both the pre and post version of the reading and math tests at each grade level. The reliabilities ranged from a low of .782 to a high of .928. As might be anticipated, the reliabilities of the posttests were higher than the reliabilities of the pretests. The reliabilities were judged to be acceptable for the purposes of evaluating student learning gains.

### **Sampling of Schools to Participate in Evaluation Effort**

The development of the school sampling plan occurred in October, 2003. The plan was developed by Nicole Racine the EDC Chief of Party, William Michel, the Measurement and Evaluation consultant who had participated in previous evaluation efforts, and by staff from FONHEP. The process of selecting schools to be part of the sample began with the goal of including as many schools as possible from the previous year's project so as to be able to monitor progress from year to year. Another goal was to increase the sample size so as to reflect the increase in the number of schools participating in the distance education project (an increase of approximately 350 schools). The process of identifying participating schools is described below.

### **Sampling Considerations**

Several factors were considered when selecting the schools that participated in the evaluation effort:

- The primary goal of the evaluation effort; which is to determine if students receiving the EDA/Edikasyon treatment made greater educational gains than students enrolled in control schools.
- The possibility of including other factors in the analysis plan that were thought to be related to student performance. Factors that were thought to be important were: 1) School type, whether schools were Catholic, Protestant, or Independent. This year's evaluation expanded the school type to include Nationale schools, 2) Location, whether the schools were in an urban or rural setting, and 3)

Geographical region, whether the schools were in the North, South, West, or in the Atribonite section of the country.

- The evaluation budget. The EDA/Edikasyon effort targeted children in grades 2, 3, and 4. Then number of schools sampled during the evaluation effort was constrained by the amount of money that was available to conduct the evaluation.
- Distribution of treatment and control schools. Where possible, an attempt was made to balance out treatment conditions and the "additional factors" such as, school type, school location, and geographical region. However, this was not always possible.

### **Sampling Process**

Considerations mentioned in the above section led to the decision to test 22 schools, 12 receiving the EDA/Edikasyon treatment and 10 serving as controls for the treatment schools. This sampling plan provided a sample of approximately 550 students tested at each grade level (total approximately 2000 students tested). These students would be divided such that approximately 4 students in FAD schools would be tested for every 3 students tested in Control schools.

The sampling process began with an examination of a list of approximately 500 schools receiving the EDA/Edikasyon treatment. This project year was different than previous project years in that Public (Nationale) schools received the distance education interventions as well as the private sector schools receiving the treatment in the past. This list divided the schools by school type, school location, and geographical region. The selection team also examined enrollment at each grade level for each school and whether the schools were mixed or single sexed. Single sex schools were eliminated from consideration so that the relative impact of the EDA/Edikasyon treatment could be determined separately for boys and girls. The FONHEP staff was particularly helpful in the selection process given their knowledge of the characteristics of both treatment and potential control schools.

The restrictions imposed by the considerations listed in the above section resulted in the initial decision to sample representative schools according to criteria listed in the table below:

Table Showing the Demographic Properties of Sampled Schools

	Catholic		Protestant		Independent		Nationale	
Treatment	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Fad	1 Nord	1 Ouest 1 Sud	1 Ouest	2 Ouest 1 Sud	1 Ouest 1 Nord	1 Ouest	1 Arbonite	1 Ouest
Control	1 Nord	1 Ouest	1 Nord	1 Ouest 1 Arbonite	1 Nord	1 Ouest	1 Ouest 1 Sud	1 Ouest

As can be seen, the above sampling plan is unbalanced with respect to the geographical region the school is located in. This means that it is not possible to separate the impact of region from the other variables coded in the data files. This confounding was unavoidable given the fact that

fully crossing region with the other variables would have required a minimum sample of 64 schools, a number well beyond the available evaluation resources.

### **Test Administration**

#### **Pretest Administration.**

The pretests were administered in the period November 3, 2003 to November 21, 2003. The reading and math tests developed for the project were administered to 544 second grade students, to 550 third grade students, and to 586 4th grade students. These students came from 22 participating schools. The breakdown of the students with respect to treatment condition is presented in the table below:

**Number of Students per Treatment Condition Taking the Pretest**

<b>Treatment Condition</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>
FAD	280	329	321
Control	264	221	265

The math tests were administered by having the test administrator read the instructions for completing the tests and then having the students complete the test which took approximately one hour to complete. The reading test was administered somewhat differently in that the test administrator read the instructions for the test and then turned on a tape recorded version of the test. Audio tape was used to administer the reading portion of the test to assure standardization of the testing conditions for all students.

*Test Scoring and Data Processing.* The students marked their answers on printed tests and a team of Haitian scorers corrected the tests and coded item level information onto machine scorable answer forms. Information regarding the factors described in the above section was also coded onto the answer forms.

The completed answer forms were sent to the University of Massachusetts where they were machine scored and transformed into digital files that were entered into a statistical analysis program (SPSS 12.0).

#### **Posttest Administration.**

The posttests were administered in the period June 16 to July 2, 2004. The test administrators had lists of the names of students who had completed the pretest when they went to the schools to administer posttests. They then asked to administer posttests to as many of the previously tested students as possible. This procedure provided the strongest possible conditions for determining program impact (i.e., comparing the performance of FAD and Control students who had taken both the pretest and the posttest) and it greatly facilitated the matching of pretest and posttest data for students who had taken both tests.

The test administration procedures were identical to those used to administer the pretests. The procedures for scoring the tests and for converting the test data into electronic data analysis files was also identical to that used for the pretest.

#### **Number of Students per Treatment Condition Taking the Posttest**

<b>Treatment Condition</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>
FAD	290	275	289
Control	167	161	176

*Creation of Data Files Containing Both Pretest and Posttest Data.* The final versions of the data files were created in August 2004, by Rachel Wing, the University of Massachusetts graduate research assistant working on the project. The files consisted of a pretest file, a posttest file, and a joined pretest and posttest file that contained both pre and post test score for all participants who completed both tests.

#### **Study Participants**

Tables 1 and 2, show the number of male and female participants from each school that completed pre and post tests. The tables also show the distribution of the schools with respect to whether they were part of the FAD group, or the Control group and they indicate whether the schools were Protestant, Catholic, Independent, or Nationale. They also indicate which schools were urban or rural, and what geographic region the schools come from. An examination of the tables shows that, as mentioned earlier, the groups are not balanced with respect to the representation of geographic region over the four school types.

Table 1

2003-2004

**FAD Group Showing Distribution of Students by Location,  
School Type, Region, School, Grade and Gender**

Location	School Type	Region	School	Sex	Number Taking Pretest			Number Taking Posttest		
					2nd	3rd	4th	2nd	3rd	4th
Urban	Catholic	Nord	Notre-Dame de Lamerchie	Male	14	19	17	13	17	17
				Female	17	12	13	15	13	12
Urban	Protestant	Ouest	Eben-Ezer La Fraternite	Male	4	5	7	3	3	8
				Female	6	5	8	5	5	9
Urban	Independent	Ouest	Dio School	Male	10	11	12	6	6	11
				Female	11	13	14	6	10	10
Urban	Independent	Nord	Le Normalien	Male	16	9	14	13	10	8
				Female	15	22	16	16	19	8
Urban	National	Artibonite	Ecole Catherine Flon	Male	0	13	17	16	16	14
				Female	0	17	15	10	15	17
Rural	Catholic	Ouest	Saint Antoine de Padoue	Male	10	10	7	8	9	6
				Female	9	10	11	8	8	9
Rural	Catholic	Sud	Saint Joseph de Cote de Fer	Male	13	15	16	11	11	14
				Female	14	17	20	13	14	20
Rural	Protestant	Ouest	Bon Samaritain	Male	17	7	12	15	9	9
				Female	11	23	15	21	11	20
Rural	Protestant	Ouest	Siloe	Male	17	14	14	15	16	13
				Female	15	16	16	14	13	16
Rural	Protestant	Sud	Siloe	Male	11	18	8	17	20	8
				Female	10	14	10	16	14	10
Rural	Independent	Ouest	Mixte Evangelique de Nazareth	Male	15	14	10	16	12	4
				Female	15	16	20	13	10	8
Rural	National	Ouest	Institution Joyau de Salem	Male	14	19	13	14	19	13
				Female	16	10	16	16	11	16
Rural	National	Ouest	Nationale Saint Pierre	Male	14	19	13	14	19	13
				Female	16	10	16	16	11	16

Table 2

2003-2004

Control Group Showing Distribution of Students by Location,  
School Type, Region, School, Grade and Gender

Location	School Type	Region	School	Sex	Number Taking Pretest			Number Taking Posttest		
					2nd	3rd	4th	2nd	3rd	4th
Rural	Protestant	Ouest	Methodiste Libre de Violet	Male	7	8	14	4	5	12
				Female	6	7	11	7	6	7
Rural	Catholic	Ouest	Notre-Dame du Mont Carmel	Male	10	10	8	7	8	7
				Female	6	11	12	4	7	7
Urban	Catholic	Nord	Saint Joseph de Bahon	Male	20	14	13	10	6	6
				Female	10	16	13	5	13	3
Urban	Independent	Nord	Mixte Belle etoile	Male	11	8	11	9	5	9
				Female	3	12	11	1	10	10
Urban	Protestant	Nord	Baptiste de la Grace	Male	14	14	13	8	7	6
				Female	18	16	21	10	8	7
Rural	Independent	Ouest		Male	19	15	15	10	6	7
				Female	12	15	14	3	5	8
Urban	National	Ouest	Inst. Classique de Latemblay	Male	30	31	30	28	29	27
				Female	0	0	0	0	2	0
Urban	National	Sud	Nationale	Male	21	14	13	19	15	11
				Female	14	16	17	11	15	16
Rural	National	Ouest	Nationale de Fonds des Blancs	Male	5	1	6	6	2	2
				Female	6	5	7	8	4	2
Rural	Protestant	Artibonite	Nationale Fond Parisien	Male	25	5	12	8	5	9
				Female	27	3	19	9	4	20
			Ecole Evangelique de Niel							

## Results

The results of the analysis of the pre and post data will be divided into two sections. The first section will report on the psychometric properties of the tests, and the second will describe pre and posttest performance as a function of whether students were in the FAD or Control groups, and as a function of the demographic variables collected in the study.

### Test Reliability

The reliability of the tests was evaluated using the coefficient alpha procedure. The reliability for each of the tests is listed in Table 3 below. The reliabilities in the table below are almost all in quite good range (.85 and above).

Table 3  
Test Reliability (coefficient alpha) For Each of the Tests  
Administered in the Evaluation

<u>Test</u>	<u>Alpha</u>	<u># of test items</u>	<u># of students</u>
<b>Grade 2 Pre Reading</b>	.872	40	544
<b>Grade 2 Pre Math</b>	.920	56	544
<b>Grade 3 Pre Reading</b>	.845	45	550
<b>Grade 3 Pre Math</b>	.886	49	550
<b>Grade 4 Pre Reading</b>	.832	49	586
<b>Grade 4 Pre Math</b>	.885	40	586
<b>Grade 2 Post Reading</b>	.863	40	461
<b>Grade 2 Post Math</b>	.906	56	461
<b>Grade 3 Post Reading</b>	.851	45	444
<b>Grade 3 Post Math</b>	.898	49	444
<b>Grade 4 Post Reading</b>	.870	49	469
<b>Grade 4 Post Math</b>	.885	40	469

### **Data Analysis Procedures**

Two forms of analyses will be reported in the sections to follow. In the first form, all of the students who have taken either the pretest or the posttest will be included in the analysis. This type of analysis will address the question of whether student performance on a particular pretest or posttest differed as a function of treatment or school characteristics.

The second form of analysis asks the question of whether students in the treatment groups differed in the amount of academic gain they made in the interval between pre and post tests, and whether those gains varied as a function of characteristics of the schools. Historically, gain score analysis has been a highly controversial topic in educational research. The straightforward procedure would be to analyze a difference score calculated by subtracting pre score from post score. There are, however, serious problems associated with the analysis of gain scores, the foremost of which is that gain scores are much less reliable than the pre and post tests that are used to create the gain scores. More specifically, the reliability of a gain score is the product of the reliabilities of the pre and post tests. So for example, if the reliability of the pre and post tests were both .9, the reliability of the gain score would be .82. The drop from .9 to .82 is not that substantial, but with slightly lower reliabilities the drop is substantial. So, for example, the reliability of a gain score created by pre and post tests with reliabilities of .7 is only .49.

Because of the unreliability of gain scores we used a procedure where pretest scores were used as a covariate in an analysis of covariance framework and posttest score was used as the criterion or dependent variable. This analysis will be referred to in subsequent sections as the analysis of pretest to posttest gain, but the reader should understand that it is actually the analysis of posttest performance with the impact of pretest performance covaried out of posttest performance. This procedure is not ideal in situations where there are significant differences between groups at the time of pretest, but it is the best alternative relative to other possibilities. In addition to using pretest scores as a covariate, the analysis of pre to post gain also included the type of school (Catholic, Protestant, Independent and Nationale) and location (Urban, Rural) as factors in the some of the analyses. The results for school type and school location will be reported later in this report.

Gain from pretest to posttest on the matched samples of students taking both pretests and posttests are shown in the Tables to follow, but again it is important to emphasize that the analyses of treatment impact in the matched samples involve an analysis of posttest performance with the impact of pretest performance covaried out. Given this, in order to make inspection of the Tables easier, in cases where there are significant differences associated with the analysis of gain as described here, differences will be signaled by starring differences in the amount of gain. The reader is again cautioned though that gain scores were not analyzed. Rather, posttest performance with pretest performance covaried out was analyzed.

### **Overall Math Results by Treatment**

The analyses in the section to follow report the results of performance on all of the items contained on the math tests. Analyses of pretest performance and posttest performance were performed on data from all of the examinees who took either the pretest or the posttest. The gain

score analyses included only students who took *both* the pretest and the posttest. The form of the gain score analyses was to use posttest performance as the criterion variable and pretest performance as a covariate.

**What the overall analyses to follow show:**

- **2nd Grade:** The FAD and Control group did not differ from one another on the math pretest that included all of the 2nd grade students taking the pretest. There were also no significant differences between the FAD and Control group on the posttest. There were, however, significant differences between the groups in the analysis of pretest to posttest gain. In the gain analysis, the Control group made significantly more gain than the FAD group.
- **3rd Grade:** There were no differences between the FAD and Control groups on the pretest analysis, the posttest analysis, and the analysis of pretest to posttest gain.
- **4th Grade:** The 4th grade analysis indicated that the FAD group performed significantly better than the Control group on the pretest and on the posttest. There were no differences between the FAD and Control groups on the amount of gain made from pre to posttest.

**The analyses of math performance as a function of treatment condition.** The descriptive statistics for overall math performance are reported in Tables 4 (2nd grade results), 5 (3rd grade results) and 6 (4th grade results).

The analysis of grade 2 math performance indicated that the FAD and Control groups did not differ on either the pretest,  $F(1,542) = 1.58$ , NS, or the posttest,  $F(1,455) = .68$ , NS. The analysis of gain between pre and posttest did show a significant difference between groups though with the Control group making significantly greater gain than the FAD group,  $F(1,309) = 4.23$ ,  $p < .05$ .

The analysis of the grade 3 data indicated again that treatment was not a significant source of variance in the pretest analysis,  $F(1,548) = 3.5$ , NS, and the posttest analysis,  $F(1,435) = 3.29$ , NS. In addition, treatment was not a significant source of variance in the analysis of pretest to posttest gain,  $F(1,278) = .59$ , NS.

Finally, the analysis of grade 4 data showed that there were significant differences favoring the FAD group on both pretest math performance,  $F(1,584) = 6.7$ ,  $p = .01$ , and on posttest math performance,  $F(1,463) = 19.8$ ,  $p < .01$ . However, the analysis of pretest to posttest gain indicated there was no statistical difference between the gain made by the FAD group and the gain made by the Control group,  $F(1,367) = .561$ , NS.

**Table 4**

**Second Grade Mean Percent Correct on Math Test  
as a Function of Treatment Group.  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>53.19</b> N=280 SD=17.30	<b>59.35</b> N=290 SD=15.21	<b>6.16</b>
Control Total Sample	<b>54.95</b> N=264 SD=15.23	<b>60.58</b> N=167 SD=15.65	<b>5.63</b>
Totals for Total Sample	<b>54.05</b> N=544 SD=16.34	<b>59.80</b> N=457 SD=15.37	<b>5.75</b>
FAD Taking Both Pre & Post Tests	<b>54.56</b> N=198 SD=16.64	<b>58.96</b> N=198 SD=15.27	<b>4.40*</b>
Control Taking Both Pre & Post Tests	<b>54.94</b> N=127 SD=15.84	<b>62.03</b> N=127 SD=15.50	<b>7.09**</b>
Totals Taking Both Pre & Post Tests	<b>54.71</b> N=325 SD=16.31	<b>60.16</b> N=325 SD=15.41	<b>5.45</b>

Table 5

**Third Grade Mean Percent Correct on Math Test  
as a Function of Treatment Group.  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>47.55</b> N=329 SD=13.64	<b>53.76</b> N=275 SD=15.34	<b>6.21</b>
Control Total Sample	<b>49.87</b> N=221 SD=15.06	<b>50.97</b> N=162 SD=15.88	<b>1.10</b>
Totals for Total Sample	<b>48.48</b> N=550 SD=14.26	<b>52.72</b> N=437 SD=15.58	<b>4.24</b>
FAD Taking Both Pre & Post Tests	<b>48.54</b> N=199 SD=13.49	<b>52.58</b> N=199 SD=14.83	<b>4.04</b>
Control Taking Both Pre & Post Tests	<b>49.21</b> N=96 SD=13.89	<b>53.35</b> N=96 SD=15.25	<b>4.14</b>
Totals Taking Both Pre & Post Tests	<b>48.76</b> N=295 SD=13.60	<b>52.83</b> N=295 SD=14.95	<b>4.07</b>

Table 6

**Fourth Grade Mean Percent Correct on Math Test  
as a Function of Treatment Group.  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>46.16**</b> N=321 SD=16.53	<b>55.70**</b> N=289 SD=17.06	<b>9.54</b>
Control Total Sample	<b>42.36*</b> N=265 SD=18.85	<b>48.13*</b> N=176 SD=18.88	<b>5.77</b>
Totals for Total Sample	<b>44.44</b> N=586 SD=17.70	<b>52.84</b> N=465 SD=18.12	<b>8.40</b>
FAD Taking Both Pre & Post Tests	<b>46.97</b> N=244 SD=16.72	<b>56.72</b> N=244 SD=17.30	<b>9.75</b>
Control Taking Both Pre & Post Tests	<b>36.55</b> N=140 SD=18.32	<b>48.01</b> N=140 SD=19.03	<b>11.46</b>
Totals Taking Both Pre & Post Tests	<b>43.17</b> N=384 SD=18.01	<b>53.55</b> N=384 SD=18.41	<b>10.38</b>

### **Math Results for Individual Math Skills**

The math tests contained test items that could be categorized as number identification, addition, subtraction, multiplication, division and decimal items. The results to be reported in the following section describe the results of analyses that examine whether the FAD and Control groups differed on the different item types.

#### **What the Analyses to Follow Show:**

- **Grade 2:** The FAD and Control group did not differ in the ability to recognize numbers on the pretest, the posttest, and the amount of gain from pretest to posttest. Likewise, there was no difference between the FAD and Control group in division performance on the pretest, the posttest and on the amount of gain made from pretest to posttest. In addition performance, the Control group scored higher than the FAD group on the pretest, but did not differ from the FAD group on the posttest and on pretest to posttest gain. In subtraction, the two groups did not differ on the analysis of pretest and posttest performance, but there was a

difference in the analysis of pretest to posttest gain where the Control group made greater gains than did the FAD group. The multiplication analysis indicated that the Control group scored higher on the pretest, the posttest, and on the amount of gain made from pretest to posttest. Finally, the analysis of the decimal performance indicated that the FAD and Control group did not differ in the pretest and posttest analyses. There was, however, a significant advantage for the Control group on the analysis of pretest to posttest gain

- **Grade 3:** There were no differences between the FAD and Control group on the number identification and addition items on the pretest, the posttest, and the analysis of pretest to posttest gain. In subtraction, the Fad group did not differ from the Control group on the pretest, and on the amount of gain made from pretest to posttest. The FAD group did perform significantly better than the Control group on the subtraction posttest. In multiplication the Control group performed significantly better than the Fad group on the pretest and on the analysis of pretest to posttest gain. The groups did not differ in posttest performance. There were no differences between the groups in the analysis of division performance but there were differences in the analysis of decimal performance. There, the Control group outscored the FAD group on the pretest, but the pattern was reversed on the posttest where the Fad group scored higher than the Control group. The groups did not differ in the amount of gain made from pretest to posttest.
- **Grade 4:** The Fad and Control groups did not differ in performance on the number pretest but there was a difference favoring the FAD group on both the posttest and the amount of gain made from pretest to posttest. In addition, the FAD group scored significantly higher than the Control group on both the pretest and the posttest, but there were no differences between the groups on the amount of pretest to posttest gain. In subtraction, the FAD and Control groups did not differ on the pretest, but again the FAD group performed better than the Control group on the posttest. The groups did not differ, however, in the analysis of pretest to posttest gain. The pattern of FAD advantages on the pretest and posttest was continued on the analysis of multiplication performance where the FAD group performed significantly better than the Control group on both the pretest and the posttest analysis. The groups did not differ though in the amount of gain made from pretest to posttest on the multiplication items. In division, the FAD and Control groups did not differ on the pretest but the FAD group did outperform the Control group on the posttest. There were no differences though in the analysis of pretest to posttest gain. Finally, the analysis of decimal performance indicated that the FAD group performed better than the Control group on the posttest but did not differ from the Control group on the pretest and on the analysis of pretest to posttest gain.

**The analyses of math individual skills as a function of treatment condition.** The descriptive statistics for the math individual skills are presented in tables 7 (performance on the number items), 8 (performance on the addition items), 9 (performance on the subtraction items), 10 (performance on the multiplication items), 11 (performance on the division items) and 12 (performance on the decimal items).

## Grade 2

The analysis of grade two data indicated that the FAD and Control groups did not differ on number recognition performance on the pretest,  $F(1, 542) = .875$ , NS, and on the posttest,  $F(1, 455) = .01$ , NS. In addition, the two groups did not differ in the analysis of pretest to posttest gain,  $F(1,309) = 2.73$ , NS.

On the addition test items, the Control group scored significantly higher than the FAD group on the pretest,  $F(1,542) = 4.97$ ,  $p < .05$ , but there was no difference between the groups on the addition posttest,  $F(1,455) = .135$ , NS. There was also no difference between the FAD and Control group on the analysis of pretest to posttest gain,  $F(1,309) = .302$ , NS.

The analysis of subtraction performance indicated that the two groups did not differ on the subtraction pretest items,  $F(1,542) = .25$ , NS, and on the subtraction posttest items,  $F(1,455) = 1.41$ , NS. There was a difference, however, on the analysis of pretest to posttest gain where the Control group made significantly greater gains than did the FAD group,  $F(1,309) = 8.09$ ,  $p < .01$ .

The analysis of multiplication performance did show differences between the groups where the Control group scored significantly higher than the FAD group on both the pretest,  $F(1,542) = 3.95$ ,  $p < .05$ , and the posttest,  $F(1,455) = 7.09$ ,  $p < .01$ . The Control group also made significantly greater pretest to posttest gains than the FAD group,  $F(1,309) = 6.12$ ,  $p < .05$ .

The division item analyses indicated that the FAD and Control groups did not differ on both the pretest,  $F(1,542) = 2.72$ , NS, and on the posttest,  $F(1,455) = .12$ , NS. They also did not differ on the analysis of pretest to posttest gain,  $F(1,309) = .08$ , NS.

Finally, the analysis of decimal performance indicated that again the FAD and Control groups did not differ from one another on either the pretest,  $F(1,542) = .38$ , NS, or the posttest,  $F(1,455) = .16$ , NS. There was, however, a difference on the analysis of pretest to posttest gain where the Control group made significantly greater gains than the FAD group,  $F(1, 309) = 4.03$ ,  $p < .05$ .

## Grade 3

The analysis of grade three data indicated that there were no differences between FAD and Control students on the number recognition pretest,  $F(1, 548) = 509$ , NS, and on the number items on the posttest,  $F(1,435) = 1.41$ , NS. There was also no difference between the FAD and Control groups on the analysis of pretest to posttest gain,  $F(1,278) = .938$ , NS.

The analysis of addition performance indicated that there were no differences between the FAD and treatment groups on the pretest analysis,  $F(1,548) = 1.25$ , NS, and on the posttest analysis,  $F(1,435) = 1.98$ , NS. There were also no differences between the groups on the analysis of pretest to posttest gain,  $F(1,278) = .75$ , NS.

The analysis of subtraction pretest performance indicated that the FAD and Control groups did not differ,  $F(1,548) = .69$ , NS, but there was a difference in the analysis of posttest performance

where the FAD group scored significantly higher than the Control group,  $F(1,435) = 4.72$ ,  $p < .05$ . There was not, however, a difference between the groups on the analysis of pretest to posttest gain,  $F(1,278) = .007$ , NS.

The analysis of grade 3 multiplication performance indicated that the Control group scored significantly higher than the FAD group on the pretest,  $F(1,548) = 8.10$ ,  $p < .01$ , but the differences between the two groups were nonsignificant on the posttest,  $F(1,435) = .72$ , NS. However, the analysis of pretest to posttest gain again showed an advantage for the Control group over the FAD group,  $F(1, 278) = 12.6$ ,  $P < .01$ .

The division analyses indicated that the FAD group and Control groups did not differ on either the pretest analysis,  $F(1,548) = 3.73$ , NS, or the posttest analysis,  $F(1,435) = 3.63$ , NS. The analysis of pretest to posttest gain was also consistent with these results in that the two groups did not differ in the amount of gain they made,  $F(1,278) = .46$ , NS.

The analyses of performance on the decimal items indicated that the Control group scored significantly higher than the FAD group on the pretest,  $F(1,548) = 6.42$ ,  $p < .05$ , but that pattern was reversed on the posttest where the Fad group scored significantly higher than the Control group,  $F(1,535) = 4.13$ ,  $p < .05$ . There were no differences between the groups on the amount of pretest to posttest gain,  $F(1,278) = .22$ , NS.

#### **Grade 4**

The analysis of grade 4 performance on the number task indicated that the FAD and Control groups did not differ on pretest performance,  $F(1,584) = .258$ , NS, but there was a difference favoring the FAD group on the posttest,  $F(1,463) = 19.2$ ,  $p < .01$ . There was also a significant advantage for the FAD group in the analysis of pretest to posttest gain,  $F(1,367) = 20.7$ ,  $p < .01$ .

On the addition items, the FAD group outperformed the Control group on both the pretest,  $F(1,584) = 23.3$ ,  $p < .01$ , and on the posttest,  $F(1, 463) = 16.0$ ,  $p < .01$ . However, there were no differences between the groups on the analysis of pretest to posttest gain,  $F(1,367) = .273$ , NS.

There were no differences between the FAD and Control group on the subtraction items on the pretest,  $F(1,584) = 3.41$ , NS, but there were differences favoring the FAD group on the subtraction posttest,  $F(1,463) = 8.9$ ,  $p < .01$ . As was the case in the analysis of addition performance, there were no differences between the two groups on the analysis of pretest to posttest gain,  $F(1,367) = 1.26$ , NS.

In multiplication, the FAD group performed significantly better than the Control group on both the pretest,  $F(1,584) = 5.76$ ,  $p < .05$ , and on the posttest,  $F(1,463) = 9.58$ ,  $p < .01$ . However, there were no differences between the groups on the analysis of pretest to posttest gains,  $F(1,367) = 1.20$ , NS.

The FAD group did not perform better than the Control group on the division pretest,  $F(1,584) = 3.37$ , NS, but the FAD group did perform better than the Control group on the division posttest,

$F(1,463) = 9.39, p < .01$ . Again it was the case though that the FAD and Control group did not differ on the analysis of pretest to posttest gain,  $F(1, 367) = 3.49, NS$ .

Finally, the two groups did not differ on the decimal pretest,  $F(1, 584) = .02, NS$ , but again the FAD group performed significantly higher than the Control group on the posttest,  $F(1,463) = 7.77, p < .01$ . The FAD group did not differ though from the Control group on the analysis of pretest to posttest gain,  $F(1,367) = .02, NS$ .

**Table 7**  
**Second, Third and Fourth Grade Mean Percent Correct on Number Section**  
**of Math Test as a Function of Treatment Group.**  
 Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3			Grade 4		
	Number Pretest	Number Posttest	Gain	Number Pretest	Number Posttest	Gain	Number Pretest	Number Posttest	Gain
FAD Total Sample	<b>84.33</b> N=280 SD=17.74	<b>89.61</b> N=290 SD=13.11	<b>5.28</b>	<b>92.97</b> N=329 SD=11.84	<b>94.31</b> N=275 SD=10.26	<b>1.34</b>	<b>87.61</b> N=321 SD=15.19	<b>95.58**</b> N=289 SD=10.41	<b>7.97</b>
Control Total Sample	<b>85.70</b> N=264 SD=16.35	<b>89.59</b> N=167 SD=15.60	<b>3.89</b>	<b>93.71</b> N=221 SD=12.03	<b>92.93</b> N=162 SD=13.83	<b>-.78</b>	<b>86.88</b> N=265 SD=19.58	<b>89.48*</b> N=176 SD=19.53	<b>2.60</b>
FAD Pre & Post	<b>85.95</b> N=198 SD=15.94	<b>89.67</b> N=198 SD=13.14	<b>3.72</b>	<b>93.69</b> N=199 SD=11.94	<b>94.15</b> N=199 SD=10.37	<b>.46</b>	<b>87.39</b> N=244 SD=15.29	<b>96.20</b> N=244 SD=10.06	<b>8.81**</b>
Control Pre & Post	<b>86.36</b> N=127 SD=17.09	<b>90.74</b> N=127 SD=15.26	<b>4.38</b>	<b>94.56</b> N=96 SD=10.06	<b>94.21</b> N=96 SD=11.73	<b>-.35</b>	<b>81.60</b> N=140 SD=21.95	<b>90.35</b> N=140 SD=18.13	<b>8.75*</b>

**Table 8**  
**Second, Third and Fourth Grade Mean Percent Correct on Addition Section**  
**of Math Test as a Function of Treatment Group.**  
 Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3			Grade 4		
	Addition Pretest	Addition Posttest	Gain	Addition Pretest	Addition Posttest	Gain	Addition Pretest	Addition Posttest	Gain
FAD Total Sample	<b>60.73*</b> N=280 SD=23.65	<b>64.89</b> N=290 SD=20.93	<b>4.16</b>	<b>64.38</b> N=329 SD=21.60	<b>69.26</b> N=275 SD=21.51	<b>4.88</b>	<b>70.18**</b> N=321 SD=24.42	<b>76.66**</b> N=289 SD=22.06	<b>6.48</b>
Control Total Sample	<b>65.05**</b> N=264 SD=21.38	<b>65.64</b> N=167 SD=20.89	<b>.59</b>	<b>66.44</b> N=221 SD=20.28	<b>66.21</b> N=162 SD=22.37	<b>-.23</b>	<b>59.94*</b> N=265 SD=26.77	<b>67.61*</b> N=176 SD=25.97	<b>7.67</b>
FAD Pre & Post	<b>62.59</b> N=198 SD=23.26	<b>64.56</b> N=198 SD=21.10	<b>1.97</b>	<b>65.87</b> N=199 SD=20.81	<b>68.15</b> N=199 SD=21.72	<b>2.28</b>	<b>71.42</b> N=244 SD=23.61	<b>77.21</b> N=244 SD=22.12	<b>5.79</b>
Control Pre & Post	<b>63.98</b> N=127 SD=22.43	<b>67.09</b> N=127 SD=20.89	<b>3.11</b>	<b>65.62</b> N=96 SD=19.31	<b>68.58</b> N=96 SD=20.89	<b>2.96</b>	<b>54.69</b> N=140 SD=27.35	<b>67.04</b> N=140 SD=26.59	<b>12.35</b>

**Table 9**  
**Second, Third and Fourth Grade Mean Percent Correct on Subtraction Section of Math Test as a Function of Treatment Group.**  
 Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3			Grade 4		
	Subtr Pretest	Subtr Posttest	Gain	Subtr Pretest	Subtr Posttest	Gain	Subtr Pretest	Subtr Posttest	Gain
FAD Total Sample	<b>33.24</b> N=280 SD=23.83	<b>42.75</b> N=290 SD=23.23	<b>9.51</b>	<b>43.82</b> N=329 SD=22.01	<b>52.02**</b> N=275 SD=23.71	<b>8.20</b>	<b>54.33</b> N=321 SD=27.91	<b>60.65**</b> N=289 SD=26.41	<b>6.32</b>
Control Total Sample	<b>32.28</b> N=264 SD=20.59	<b>45.37</b> N=167 SD=21.45	<b>13.09</b>	<b>45.49</b> N=221 SD=24.35	<b>46.88*</b> N=162 SD=24.17	<b>1.39</b>	<b>50.03</b> N=265 SD=28.07	<b>52.84*</b> N=176 SD=28.80	<b>2.81</b>
FAD Pre & Post	<b>34.26</b> N=198 SD=23.52	<b>41.80</b> N=198 SD=23.28	<b>7.54*</b>	<b>45.72</b> N=199 SD=21.67	<b>50.79</b> N=199 SD=22.69	<b>5.07</b>	<b>55.32</b> N=244 SD=28.56	<b>62.00</b> N=244 SD=26.32	<b>6.68</b>
Control Pre & Post	<b>32.58</b> N=127 SD=20.86	<b>47.66</b> N=127 SD=21.25	<b>15.08**</b>	<b>44.31</b> N=96 SD=22.59	<b>49.86</b> N=96 SD=23.93	<b>5.55</b>	<b>43.57</b> N=140 SD=27.17	<b>52.85</b> N=140 SD=29.09	<b>9.28</b>

**Table 10**  
**Second, Third and Fourth Grade Mean Percent Correct on Multiplication Section of Math Test as a Function of Treatment Group.**  
 Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3			Grade 4		
	Mult Pretest	Mult Posttest	Gain	Mult Pretest	Mult Posttest	Gain	Mult Pretest	Mult Posttest	Gain
FAD Total Sample	10.71* N=280 SD=21.03	20.80* N=290 SD=25.86	10.09	22.24* N=329 SD=22.38	28.50 N=275 SD=24.85	6.26	45.35** N=321 SD=27.27	52.73** N=289 SD=27.07	7.38
Control Total Sample	14.26** N=264 SD=20.61	27.54** N=167 SD=26.38	13.28	27.96** N=221 SD=24.08	30.61 N=162 SD=25.3	2.65	39.77* N=265 SD=28.89	44.43* N=176 SD=29.56	4.66
FAD Pre & Post	10.77 N=198 SD=20.61	20.53 N=198 SD=25.44	9.76*	22.71 N=199 SD=22.97	25.92 N=199 SD=23.67	3.21*	46.47 N=244 SD=26.95	53.60 N=244 SD=27.03	7.13
Control Pre & Post	14.69 N=127 SD=20.42	28.60 N=127 SD=26.13	13.91**	25.62 N=96 SD=23.87	34.16 N=96 SD=25.28	8.54**	33.71 N=140 SD=27.77	43.28 N=140 SD=29.04	9.57

**Table 11**  
**Second, Third and Fourth Grade Mean Percent Correct on Division Section of Math Test as a Function of Treatment Group.**  
 Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3			Grade 4		
	Division Pretest	Division Posttest	Gain	Division Pretest	Division Posttest	Gain	Division Pretest	Division Posttest	Gain
FAD Total Sample	1.60 N=280 SD=8.83	5.68 N=290 SD=18.42	4.08	14.89 N=329 SD=17.68	23.12 N=275 SD=21.95	8.23	37.29 N=321 SD=23.80	48.79** N=289 SD=26.43	11.50
Control Total Sample	.56 N=264 SD=5.30	5.08 N=167 SD=17.03	4.52	18.00 N=221 SD=19.71	19.01 N=162 SD=21.35	1.01	33.63 N=265 SD=24.21	41.15* N=176 SD=25.51	7.52
FAD Pre & Post	2.02 N=198 SD=9.87	6.06 N=198 SD=19.21	4.04	15.47 N=199 SD=18.46	20.90 N=199 SD=20.23	5.43	38.46 N=244 SD=24.14	49.66 N=244 SD=26.67	11.20
Control Pre & Post	.78 N=127 SD=6.24	4.72 N=127 SD=15.97	3.94	17.50 N=96 SD=19.73	20.62 N=96 SD=21.80	3.12	27.75 N=140 SD=23.54	41.73 N=140 SD=25.3	13.98

**Table 12**  
**Second, Third and Fourth Grade Mean Percent Correct on Decimal Section**

**of Math Test as a Function of Treatment Group.**  
Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	<u>Grade 2</u>			<u>Grade 3</u>			<u>Grade 4</u>		
	Decimal Pretest	Decimal Posttest	Gain	Decimal Pretest	Decimal Posttest	Gain	Decimal Pretest	Decimal Posttest	Gain
FAD Total Sample	<b>2.73</b> N=280 SD=9.16	<b>9.08</b> N=290 SD=18.12	<b>6.35</b>	<b>7.55*</b> N=329 SD=11.8	<b>17.35**</b> N=275 SD=16.87	<b>9.80</b>	<b>20.45</b> N=321 SD=17.13	<b>32.21**</b> N=289 SD=21.15	<b>11.76</b>
Control Total Sample	<b>2.27</b> N=264 SD=8.41	<b>9.77</b> N=167 SD=17.66	<b>7.50</b>	<b>10.40**</b> N=221 SD=14.4	<b>14.11*</b> N=162 SD=14.67	<b>3.71</b>	<b>20.25</b> N=265 SD=18.21	<b>26.65*</b> N=176 SD=20.29	<b>6.40</b>
FAD Pre & Post	<b>3.03</b> N=198 SD=9.60	<b>7.74</b> N=198 SD=16.67	<b>4.71*</b>	<b>7.32</b> N=199 SD=11.0	<b>16.44</b> N=199 SD=16.35	<b>9.12</b>	<b>20.93</b> N=244 SD=17.72	<b>33.44</b> N=244 SD=21.63	<b>12.51</b>
Control Pre & Post	<b>3.41</b> N=127 SD=10.14	<b>10.76</b> N=127 SD=18.72	<b>7.35**</b>	<b>9.97</b> N=96 SD=14.5	<b>16.37</b> N=96 SD=15.22	<b>6.40</b>	<b>14.34</b> N=140 SD=15.87	<b>26.42</b> N=140 SD=20.96	<b>12.08</b>

**Summary of the Math Results.** In the overall analysis of the grade 2 math data the FAD and Control groups did not differ on the pretest and the posttests. However, the analysis of pretest to posttest gain for those students who took both the pretest and the posttest indicated that the Control group gained more than the FAD group. This means that there was no evidence in the grade 2 overall math data to suggest a positive impact of the FAD experience.

The analysis of the math part skills provides some indication of why the grade 2 Control group made greater overall gains than did the FAD group. There were no differences between FAD and Control on the number test items and on the division test items. In subtraction, however, the Control group made greater pretest to posttest gain than did the FAD group. This finding was also replicated on the multiplication and decimal test items.

The overall math analysis for grade 3 students found there were no differences between the FAD and Control groups on the pretest, the posttest, and the amount of gain from pretest to posttest. There were, however, several differences favoring the Control group in the analysis of part skill math test items. Specifically, the analysis of the subtraction items found that the grade 3 Control students performed better on the posttest than their FAD counterparts, and that the Control students made more gain than the FAD students on the multiplication items. Finally, the Control group performed better than the FAD group on both the decimal pretest and posttest, though the groups did not differ in the amount of pretest to posttest gain that they made.

There were some indications of a positive impact of the FAD treatment in the analysis of grade 4 math data. First, in the overall analysis the FAD and Control groups did not differ on the pretest,

but the FAD group scored higher on the posttest. This advantage did not carry over though in the gain analysis for those students taking both the pretest and the posttest.

The analysis of the different item types provides an indication of where the grade 4 FAD students had an advantage. First, the analysis of the number test items indicated that the FAD group scored higher than the Controls on the posttest, and they made greater pretest to posttest gain than did the Controls. In fact, the FAD group scored significantly higher than the Control group on all of the posttest part score analyses, though the number analysis was the only one that showed an advantage for the FAD group in pretest to posttest gain.

### **Overall Reading Results by Treatment**

The analyses of the overall reading results took the same form as the analyses of math performance. Three separate analyses were performed, one on pretest performance, one on posttest performance, and one on posttest performance with pretest performance used as a covariate in the analyses. School type (e.g., Catholic, Independent, etc.) and school location (urban or rural) were also factors in the analysis of pretest to posttest gain. The analyses of pretest and posttest performance included all students who had taken either test and the analyses of posttest performance with pretest as a covariate included only those students who had taken both the pretest and the posttest. The analysis included the covariate will be referred to as the analysis of pre to post gain.

#### **What the overall analyses to follow show:**

- **Grade 2:** There were no differences between the FAD and Control group on the reading pretest, and the analysis of pretest to posttest gain. There was, however, a significant advantage of the FAD group over the Control group on the reading posttest.
- **Grade 3:** The FAD group scored significantly higher than the Control group on the pretest, but did not differ from the Control group on the posttest. The Control group made significantly more pretest to posttest gain than did the FAD group.
- **Grade 4:** The FAD group scored significantly higher than the Control group on both the pretest and the posttest. However, the analysis of pretest to posttest gain showed an advantage for the Control group.

**The results of the overall reading analyses.** The descriptive data for each of the grades on the overall reading analyses are contained in tables 13 (grade 2), 14 (grade 3), and 15 (grade 4).

The analysis of the grade 2 data indicated that there were no differences between the FAD and Control groups on the reading pretest,  $F(1,542) = .95$ , NS. There was, however, a significant difference favoring the FAD group on the reading posttest,  $F(1,455) = 8.67$ ,  $p < .01$ . The analysis of pretest to posttest gain on overall grade 2 reading performance indicated there were no differences between the groups,  $F(1, 309) = .05$ , NS.

The analysis of overall grade 3 reading performance indicated that the FAD group scored higher on the pretest than the Control group,  $F(1,548) = 4.43$ ,  $p < .05$ , but there were no differences

between the two groups on the posttest,  $F(1,435) = 3.49$ , NS. There was, however, a significant advantage favoring the Control group in the amount of pretest to posttest gain,  $F(1,278) = 6.73$ ,  $p < .05$ .

Finally, the grade 4 analysis indicated that the FAD group scored higher than the Control group on both the pretest,  $F(1, 584) = 10.55$ ,  $p < .01$ , and on the posttest,  $F(1,463) = 4.66$ ,  $p < .05$ . As was the case with the grade 3 data though, the analysis of pretest to posttest gain indicated that the Control group made significantly greater gain than did the FAD group,  $F(1, 367) = 10.6$ ,  $p < .01$ .

**Table 13**

**Second Grade Mean Percent Correct on Reading Test  
as a Function of Treatment Group  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>70.68</b> N=280 SD=17.68	<b>77.00**</b> N=290 SD=14.48	<b>6.32</b>
Control Total Sample	<b>69.29</b> N=264 SD=15.34	<b>72.58*</b> N=167 SD=16.92	<b>3.29</b>
Totals for Total Sample	<b>70.01</b> N=544 SD=16.59	<b>75.38</b> N=457 SD=15.54	<b>5.37</b>
FAD Taking Both Pre & Post Tests	<b>71.47</b> N=198 SD=16.85	<b>77.82</b> N=198 SD=14.73	<b>6.35</b>
Control Taking Both Pre & Post Tests	<b>69.17</b> N=127 SD=15.93	<b>74.80</b> N=127 SD=16.66	<b>5.63</b>
Totals Taking Both Pre & Post Tests	<b>70.57</b> N=325 SD=16.51	<b>76.64</b> N=325 SD=15.56	<b>6.07</b>

Table 14

**Third Grade Mean Percent Correct on Reading Test  
as a Function of Treatment Group  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>78.98**</b> N=329 SD=12.54	<b>80.31</b> N=275 SD=12.25	<b>1.33</b>
Control Total Sample	<b>76.62*</b> N=221 SD=13.46	<b>78.00</b> N=162 SD=12.90	<b>1.38</b>
Totals for Total Sample	<b>78.03</b> N=550 SD=12.96	<b>79.45</b> N=437 SD=12.55	<b>1.42</b>
FAD Taking Both Pre & Post Tests	<b>80.18</b> N=199 SD=11.43	<b>79.45</b> N=199 SD=12.37	<b>-.73*</b>
Control Taking Both Pre & Post Tests	<b>77.38</b> N=96 SD=12.12	<b>80.07</b> N=96 SD=11.06	<b>2.69**</b>
Totals Taking Both Pre & Post Tests	<b>79.27</b> N=295 SD=11.71	<b>79.65</b> N=295 SD=11.94	<b>.38</b>

Table 15

**Fourth Grade Mean Percent Correct on Reading Test  
as a Function of Treatment Group  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Pretest Mean</b>	<b>Posttest Mean</b>	<b>Percent Gain</b>
FAD Total Sample	<b>75.97**</b> N=321 SD=12.46	<b>76.05**</b> N=289 SD=14.76	<b>.08</b>
Control Total Sample	<b>72.42*</b> N=265 SD=13.93	<b>73.00*</b> N=176 SD=14.72	<b>.58</b>
Totals for Total Sample	<b>74.37</b> N=586 SD=13.25	<b>74.89</b> N=465 SD=14.81	<b>.52</b>
FAD Taking Both Pre & Post Tests	<b>76.17</b> N=244 SD=12.45	<b>77.36</b> N=244 SD=14.30	<b>1.19*</b>
Control Taking Both Pre & Post Tests	<b>70.49</b> N=140 SD=14.85	<b>73.73</b> N=140 SD=15.11	<b>3.24**</b>
Totals Taking Both Pre & Post Tests	<b>74.10</b> N=384 SD=13.63	<b>76.04</b> N=384 SD=14.68	<b>1.94</b>

### **Reading Results for Individual Reading Skills**

The reading tests contained items that measured knowledge of letter names, the ability to read and identify words, and the ability to comprehend sentences. The tests at each grade level contained these three item types, but the tasks were somewhat more difficult at each grade level. For example, the grade 2 tests asked students to identify upper case letters from among a set of letters that were visually distinct from one another (e.g., T, M, O, B), to identify relatively short words, and to comprehend relatively short sentences. In contrast, the grade 3 tests mixed upper case and lower case letters that were visually similar to one another (e.g., p, q, M, N), asked students to identify relatively long words, and asked students to comprehend longer sentences than second grade students were asked to comprehend. The grade 4 tests did not contain letter items, consisting of only word and sentence items.

### **What the analyses of separate reading skills to follow show:**

- **Grade 2:** The analysis of letter performance indicated that the FAD and Control group did not differ on the pretest, but there was a significant advantage for the FAD group on the posttest. The groups did not differ in the amount of pretest to

posttest gain on the letter task. There were no differences associated with treatment group on the word pretest, the word posttest, and the amount of gain made from pretest to posttest. On the sentence test, the FAD group performed better than the Control group on the pretest and the posttest, but there were no differences between the groups on the amount of pretest to posttest gain.

- **Grade 3:** The analysis of letter performance showed a consistent advantage for the FAD group where they outperformed the Control group on the pretest, the posttest, and on the analysis of pretest to posttest gain. The FAD group outperformed the Control group on the word pretest, but did not differ from the Control group on the word posttest. The Control group made significantly greater pretest to posttest gain on the word test compared to the gain for the FAD group. On the sentence test, the two groups did not differ on the pretest and the posttest, but the Control group did exhibit significantly more gain than did the FAD group.
- **Grade 4:** The grade 4 students did not have any letter recognition items on their tests. The FAD group scored higher than the Control group on the word pretest, but did not differ from the Control group on the word posttest. The Control group made significantly larger gains on the word task than did the FAD group. The FAD group scored significantly higher than the Control group on both the sentence pretest and the sentence posttest. However, the Control group made significantly more pretest to posttest gain than did the FAD group.

**The results of the reading individual skill analyses.** The descriptive statistics for the reading individual skill analyses are contained in tables 16 (letter recognition skill), 17 (word recognition skill) and 18 (sentence understanding skill).

The analysis of grade 2 reading part scores indicated that the FAD and treatment groups did not differ on letter performance on the pretest,  $F(1,542) = 1.28$ , NS, but there was a significant advantage on the posttest for the FAD group,  $F(1,455) = 5.45$ ,  $p < .05$ . There were no differences between the FAD and Control group on the pretest to posttest gain on the letter test items.

There also were no differences between the 2nd grade FAD and Control groups on the word pretest,  $F(1,542) = .32$ , NS, the word posttest,  $F(1,455) = 3.6$ , NS, and on the word pretest to posttest gain,  $F(1, 309) = .06$ , NS.

There were, however, significant differences between the grade 2 groups on the sentence test items. The FAD group outperformed the Control group on both the pretest,  $F(1,542) = 6.3$ ,  $p < .05$ , and the posttest,  $F(1,455) = 9.2$ ,  $p < .01$ . However, there were no differences between the groups on the analysis of pretest to posttest sentence gain,  $F(1,309) = .03$ , NS.

The analyses of the grade 3 data indicated that the FAD group scored higher than the Control group on the letter pretest,  $F(1,548) = 11.84$ ,  $p < .01$ , and on the letter posttest,  $F(1,435) = 10.5$ ,  $p < .01$ . There was also a significant advantage for the FAD group on the amount of pretest to posttest gain,  $F(1,278) = 4.17$ ,  $p < .05$ .

The analysis of grade 3 word performance indicated that the FAD group performed higher than the Control group on the pretest,  $F(1, 548) = 4.54$ ,  $p < .05$ , but did not differ from the Control group on the posttest,  $F(1,435) = 3.56$ , NS. There was a significant effect of group on the analysis of word pretest to posttest gain with the Control group making significantly more gain than the FAD group,  $F(1,278) = 7.25$ ,  $p < .01$ .

On the sentence task, the grade 3 analyses indicated that there were no differences between the FAD and Control groups on the pre and posttests, but there was a significant advantage for the Control group on the amount of pretest to posttest gain,  $F(1,278) = 6.3$ ,  $p < .05$ .

The grade 4 analyses indicated that the FAD group outperformed the Control group on both the pretest of word performance,  $F(1,584) = 5.80$ ,  $p < .05$ , and the analysis of sentence understanding,  $F(1,584) = 11.65$ ,  $p < .01$ . The analysis of word posttest performance indicated that there were no differences between the two groups on the word task,  $F(1,463) = 2.96$ , NS, but there was a significant difference favoring the FAD group on the sentence understanding task,  $F(1,463) = 3.97$ ,  $p < .05$ . The analysis of pretest to posttest gain on the word test also produced a significant effect for group, but this time the advantage went to the Control group that made more gain than did the FAD group,  $F(1,367) = 5.93$ ,  $p < .05$ . There was a similar result on the sentence test items where the Control group made significantly greater gains than did the FAD group,  $F(1, 367) = 7.5$ ,  $p < .01$ .

**Table 16**

**Second and Third Grade Mean Percent Correct on Letter Section  
of Reading Test as a Function of Treatment Group**  
Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	Grade 2			Grade 3		
	Letter Pretest	Letter Posttest	Gain	Letter Pretest	Letter Posttest	Gain
FAD Total Sample	<b>89.64</b> N=280 SD=17.59	<b>93.00**</b> N=290 SD=12.12	<b>3.36</b>	<b>93.58**</b> N=329 SD=7.95	<b>94.87**</b> N=275 SD=8.55	<b>1.29</b>
Control Total Sample	<b>91.13</b> N=264 SD=12.58	<b>90.00*</b> N=167 SD=14.92	<b>-1.13</b>	<b>90.90*</b> N=221 SD=10.27	<b>91.85*</b> N=162 SD=10.6	<b>.95</b>
FAD Pre & Post	<b>89.74</b> N=198 SD=16.32	<b>93.03</b> N=198 SD=11.43	<b>3.29</b>	<b>94.12</b> N=199 SD=7.79	<b>95.22</b> N=199 SD=8.27	<b>1.10**</b>
Control Pre & Post	<b>90.47</b> N=127 SD=12.33	<b>92.12</b> N=127 SD=12.51	<b>1.65</b>	<b>92.18</b> N=96 SD=10.28	<b>92.29</b> N=96 SD=10.90	<b>.11*</b>

**Table 17**

**Second, Third and Fourth Grade Mean Percent Correct on Word Section  
of Reading Test as a Function of Treatment Group**  
Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	<u>Grade 2</u>			<u>Grade 3</u>			<u>Grade 4</u>		
	Word Pretest	Word Posttest	Gain	Word Pretest	Word Posttest	Gain	Word Pretest	Word Posttest	Gain
FAD Total Sample	<b>66.93</b> N=280 SD=22.17	<b>72.82</b> N=290 SD=18.59	<b>5.89</b>	<b>76.08**</b> N=329 SD=15.94	<b>77.95</b> N=275 SD=15.54	<b>1.87</b>	<b>80.65**</b> N=321 SD=14.33	<b>80.92</b> N=289 SD=16.69	<b>.27</b>
Control Total Sample	<b>65.89</b> N=264 SD=20.33	<b>69.23</b> N=167 SD=20.73	<b>3.34</b>	<b>73.00*</b> N=221 SD=17.51	<b>75.02</b> N=162 SD=15.78	<b>2.02</b>	<b>77.63*</b> N=265 SD=15.95	<b>78.18</b> N=176 SD=16.51	<b>.55</b>
FAD Pre & Post	<b>67.98</b> N=198 SD=21.07	<b>73.23</b> N=198 SD=19.18	<b>5.25</b>	<b>77.85</b> N=199 SD=14.70	<b>76.50*</b> N=199 SD=15.65	<b>-1.35</b>	<b>80.85</b> N=244 SD=14.68	<b>82.60</b> N=244 SD=15.94	<b>1.75*</b>
Control Pre & Post	<b>65.24</b> N=127 SD=20.61	<b>71.05</b> N=127 SD=20.58	<b>5.81</b>	<b>73.81</b> N=96 SD=16.31	<b>77.76**</b> N=96 SD=13.20	<b>3.95</b>	<b>75.76</b> N=140 SD=17.25	<b>78.96</b> N=140 SD=16.92	<b>3.20**</b>

**Table 18**

**Second, Third and Fourth Grade Mean Percent Correct on Sentence Section  
of Reading Test as a Function of Treatment Group**  
Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	<u>Grade 2</u>			<u>Grade 3</u>			<u>Grade 4</u>		
	Sent Pretest	Sent Posttest	Gain	Sent Pretest	Sent Posttest	Gain	Sent Pretest	Sent Posttest	Gain
FAD Total Sample	<b>58.37**</b> N=280 SD=25.87	<b>68.96**</b> N=290 SD=25.44	<b>10.59</b>	<b>68.69</b> N=329 SD=26.87	<b>67.37</b> N=275 SD=21.52	<b>-1.32</b>	<b>67.91**</b> N=321 SD=15.62	<b>67.33**</b> N=289 SD=17.41	<b>-.58</b>
Control Total Sample	<b>52.98*</b> N=264 SD=24.05	<b>61.07*</b> N=167 SD=28.70	<b>8.09</b>	<b>70.28</b> N=221 SD=23.93	<b>69.34</b> N=162 SD=20.17	<b>-.94</b>	<b>63.45*</b> N=265 SD=15.83	<b>64.07*</b> N=176 SD=16.58	<b>.62</b>
FAD Pre & Post	<b>59.31</b> N=198 SD=25.58	<b>71.66</b> N=198 SD=25.59	<b>12.35</b>	<b>68.25</b> N=199 SD=25.65	<b>67.30</b> N=199 SD=21.74	<b>-.95*</b>	<b>68.12</b> N=244 SD=15.24	<b>67.96</b> N=244 SD=17.39	<b>-.16*</b>
Control Pre & Post	<b>54.68</b> N=127 SD=25.10	<b>64.30</b> N=127 SD=28.60	<b>9.62</b>	<b>69.96</b> N=96 SD=22.63	<b>71.00</b> N=96 SD=18.92	<b>1.04**</b>	<b>61.42</b> N=140 SD=15.39	<b>64.72</b> N=140 SD=16.49	<b>3.30**</b>

**Table 18**

**Second, Third and Fourth Grade Mean Percent Correct on Sentence Section  
of Reading Test as a Function of Treatment Group**  
Cells with \*\* are Significantly Higher than Cells with \*

Treatment Group	<u>Grade 2</u>			<u>Grade 3</u>			<u>Grade 4</u>		
	Sent Pretest	Sent Posttest	Gain	Sent Pretest	Sent Posttest	Gain	Sent Pretest	Sent Posttest	Gain
FAD Total Sample	<b>58.37**</b> N=280 SD=25.87	<b>68.96**</b> N=290 SD=25.44	<b>10.59</b>	<b>68.69</b> N=329 SD=26.87	<b>67.37</b> N=275 SD=21.52	<b>-1.32</b>	<b>67.91**</b> N=321 SD=15.6	<b>67.33**</b> N=289 SD=17.41	<b>-.58</b>
Control Total Sample	<b>52.98*</b> N=264 SD=24.05	<b>61.07*</b> N=167 SD=28.70	<b>8.09</b>	<b>70.28</b> N=221 SD=23.93	<b>69.34</b> N=162 SD=20.17	<b>-.94</b>	<b>63.45*</b> N=265 SD=15.8	<b>64.07*</b> N=176 SD=16.58	<b>.62</b>
FAD Pre & Post	<b>59.31</b> N=198 SD=25.58	<b>71.66</b> N=198 SD=25.59	<b>12.35</b>	<b>68.25</b> N=199 SD=25.65	<b>67.30</b> N=199 SD=21.74	<b>-.95*</b>	<b>68.12</b> N=244 SD=15.2	<b>67.96</b> N=244 SD=17.39	<b>-.16*</b>
Control Pre & Post	<b>54.68</b> N=127 SD=25.10	<b>64.30</b> N=127 SD=28.60	<b>9.62</b>	<b>69.96</b> N=96 SD=22.63	<b>71.00</b> N=96 SD=18.92	<b>1.04**</b>	<b>61.42</b> N=140 SD=15.3	<b>64.72</b> N=140 SD=16.49	<b>3.30**</b>

**Summary of the Reading Results.** The overall analyses of reading performance for second grade students indicated there were no differences between the FAD and Control students on the pretest, but the FAD group did score significantly higher than the Control group on the posttest. There were no differences between the groups on the amount of pretest to posttest gain.

The reading skill analyses for grade 2 indicated that the FAD and Control group did not differ on the letter pretest, and on the analysis of pretest to posttest gain, but there was a significant advantage for the FAD group on the letter posttest. There were no differences associated with treatment group on the word pretest, the word posttest, and the amount of gain made from pretest to posttest. On the sentence test, the FAD group performed better than the Control group on the pretest and the posttest, but there were no differences between the groups on the amount of pretest to posttest gain.

The overall analysis for grade 3 students indicated that the FAD group scored significantly higher than the Control group on the pretest, but did not differ from the Control group on the posttest. The analysis of pretest to posttest gain showed that the Control group made significantly more pretest to posttest gain than did the FAD group.

The analysis of reading skills for grade 3 showed that the letter analysis indicated a consistent advantage for the FAD group where they outperformed the Control group on the pretest, the posttest, and on the analysis of pretest to posttest gain. The FAD also group outperformed the Control group on the word pretest, but did not differ from the Control group on the word posttest. The Control group made significantly greater pretest to posttest gain on the word test compared to the gain for the FAD group. Finally, on the sentence test, the two groups did not differ on the pretest and the posttest, but the Control group did exhibit significantly more gain than did the FAD group.

The overall analysis for grade 4 students indicated that the FAD group scored significantly higher than the Control group on both the pretest and the posttest. However, the analysis of pretest to posttest gain showed an advantage for the Control group.

The grade 4 analyses of reading skills showed that the FAD group scored higher than the Control group on the word pretest, but did not differ from the Control group on the word posttest. The Control group made significantly larger pretest to posttest gains on the word task than did the FAD group. On the sentence task, the FAD group scored significantly higher than the Control group on both the pretest and the posttest. However, the Control group made significantly greater pretest to posttest gain than did the FAD group.

### **Math Performance for Boys and Girls**

The examination of the math performance of boys and girls involved separate analyses of each grade in analysis frameworks that examined the impact of both student sex and treatment. These analyses indicated whether there were performance differences between boys and girls, and they indicated whether the performance of boys and girls varied as a function of whether the students were enrolled in FAD schools or Control schools.

#### **What the analyses of math performance for boys and girls shows:**

- **Grade 2:** Boys scored significantly higher than girls on the math pretest and on the math posttest. However, there was not a significant difference between boys and girls on the amount of gain made from pretest to posttest. There was also no interaction between gender and treatment indicating that the gain for boys and girls was consistent across treatments.
- **Grade 3:** There were no overall differences between boys and girls on the math pretest, but there was an interaction between treatment and gender. The nature of this interaction was that boys scored higher than girls in the FAD treatment, but girls scored higher than boys in the Control treatment. The analysis of posttest performance indicated that boys scored higher than girls overall, and there was no interaction between gender and treatment. The analysis of pretest to posttest gain indicated there were no gender differences and there was not an interaction between gender and treatment.
- **Grade 4:** The grade 4 analyses showed that boys scored higher than girls on both the pretest and the posttest, with no interaction between gender and treatment in either analysis. The analysis of pretest to posttest gain also indicated that boys

and girls did not differ overall. However, there was a significant interaction between treatment and gender with boys making greater gains than girls in the Control treatment, but girls making greater gains than boys in the FAD treatment.

**The results of the math analyses of male and female performance.** The math performance of 2nd grade boys and girls is shown in Table 19, 3rd grade performance is shown in Table 20, and 4th grade performance is shown in Table 21.

The analysis of second grade math performance indicated that boys scored higher than girls on both the math pretest,  $F(1,542) = 20.1$ ,  $p < .01$ , and the math posttest,  $F(1,455) = 8.65$ ,  $P < .01$ . Boys scored higher than girls in both the FAD and Control treatments. The analysis of the amount of pretest to posttest gain indicated that boys and girls did not differ in the amount of gain they made, and it indicated that the amount of gain made by boys and girls did not differ in the FAD and Control groups.

In the 3rd grade analysis, boys and girls did not differ in performance on the pretest,  $F(1,546) = .844$ , NS. However, there was a significant interaction between treatment and gender,  $F(1,546) = 10.69$ ,  $p < .01$ . An inspection of the means in Table 20 shows that the nature of this interaction was that boys scored higher on the pretest than girls in the FAD treatment, but girls scored higher than boys in the Control treatment. The analysis of posttest perform indicated that boys scored higher than girls,  $F(1,433) = 6.49$ ,  $p < .05$ , but there was no interaction between treatment and gender. The analysis of pretest to posttest gain indicated that there were no differences between boys and girls in the amount of gain they made,  $F(1,290) = .36$ , NS, and there was also no interaction between treatment and gender.

The 4th grade analysis indicated that boys scored higher than girls on the math pretest,  $F(1,582) = 10.46$ ,  $p < .01$ , and that the advantage for boys was consistent in both treatment groups. The same result occurred in the analysis of math posttest performance where again the boys scored higher than girls,  $F(1,461) = 14.5$ ,  $p < .01$ , and the interaction between treatment and gender was nonsignificant. Finally, the analysis of math pretest to posttest gain indicated that there were no overall differences between boys and girls in the amount of gain they made from pretest to posttest. However, there was a significant interaction between treatment and gender,  $F(1,379) = 6.2$ ,  $p < .05$ . As can be seen in Table 21, the nature of this interaction was that boys made more gain than girls in the Control condition, but the reverse was true in the FAD condition where girls made more gain than boys.

Table 19

**Second Grade Mean Percent Correct on Math and Reading Tests  
as a Function of Treatment Group and Gender  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Gender</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Female	<b>50.12*</b> N=139 SD=16.67	<b>57.14*</b> N=151 SD=15.37	<b>7.02</b>	<b>69.80</b> N=139 SD=17.27	<b>76.78</b> N=151 SD=13.26	<b>6.98</b>
	Male	<b>56.21**</b> N=141 SD=17.44	<b>61.75**</b> N=139 SD=14.71	<b>5.54</b>	<b>71.56</b> N=141 SD=18.10	<b>77.23</b> N=139 SD=15.74	<b>5.67</b>
Control Total Sample	Female	<b>51.20*</b> N=102 SD=16.72	<b>58.49*</b> N=58 SD=14.63	<b>7.29</b>	<b>68.21</b> N=102 SD=15.41	<b>70.34</b> N=58 SD=16.85	<b>2.13</b>
	Male	<b>57.31**</b> N=162 SD=13.74	<b>61.69**</b> N=109 SD=16.12	<b>4.48</b>	<b>69.98</b> N=162 SD=15.30	<b>73.78</b> N=109 SD=16.91	<b>3.80</b>
FAD Pre & Post	Female	<b>51.14</b> N=100 SD=16.28	<b>56.82</b> N=100 SD=15.49	<b>5.68</b>	<b>70.72</b> N=100 SD=15.37	<b>76.92</b> N=100 SD=13.88	<b>6.20</b>
	Male	<b>58.05</b> N=98 SD=16.35	<b>61.15</b> N=98 SD=14.81	<b>3.10</b>	<b>72.24</b> N=98 SD=18.29	<b>78.75</b> N=98 SD=15.58	<b>6.51</b>
Control Pre & Post	Female	<b>51.53</b> N=42 SD=18.45	<b>58.97</b> N=42 SD=15.46	<b>7.44</b>	<b>67.85</b> N=42 SD=16.65	<b>71.72</b> N=42 SD=16.77	<b>3.87</b>
	Male	<b>56.63</b> N=85 SD=14.19	<b>63.55</b> N=85 SD=15.39	<b>6.92</b>	<b>69.82</b> N=85 SD=15.62	<b>76.32</b> N=85 SD=16.50	<b>6.50</b>

Table 20

**Third Grade Mean Percent Correct on Math and Reading Tests  
as a Function of Treatment Group and Gender  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Gender</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Female	<b>45.14*</b> N=175 SD=14.02	<b>50.61*</b> N=135 SD=14.85	<b>5.47</b>	<b>78.03</b> N=175 SD=13.14	<b>80.15</b> N=135 SD=12.77	<b>2.12</b>
	Male	<b>50.29**</b> N=154 SD=12.70	<b>56.81**</b> N=140 SD=15.24	<b>6.52</b>	<b>80.07</b> N=154 SD=11.78	<b>80.48</b> N=140 SD=11.77	<b>.41</b>
Control Total Sample	Female	<b>51.44**</b> N=101 SD=16.49	<b>50.11*</b> N=74 SD=16.57	<b>-1.33</b>	<b>78.75</b> N=101 SD=12.69	<b>79.40</b> N=74 SD=12.81	<b>.65</b>
	Male	<b>48.55*</b> N=120 SD=13.68	<b>51.69**</b> N=88 SD=15.34	<b>3.14</b>	<b>74.83</b> N=120 SD=13.89	<b>76.82</b> N=88 SD=13.05	<b>1.99</b>
FAD Pre & Post	Female	<b>46.13</b> N=104 SD=13.73	<b>49.96</b> N=104 SD=14.04	<b>3.83</b>	<b>79.38</b> N=104 SD=11.53	<b>80.11</b> N=104 SD=12.02	<b>.73</b>
	Male	<b>51.19</b> N=95 SD=12.79	<b>55.47</b> N=95 SD=15.21	<b>4.28</b>	<b>81.08</b> N=95 SD=11.32	<b>78.74</b> N=95 SD=12.76	<b>-2.34</b>
Control Pre & Post	Female	<b>47.96</b> N=46 SD=14.83	<b>52.88</b> N=46 SD=16.84	<b>4.92</b>	<b>78.36</b> N=46 SD=12.97	<b>81.50</b> N=46 SD=11.21	<b>3.14</b>
	Male	<b>50.37</b> N=50 SD=13.01	<b>53.80</b> N=50 SD=13.80	<b>3.43</b>	<b>76.49</b> N=50 SD=11.35	<b>78.77</b> N=50 SD=10.88	<b>2.28</b>

Table 21

**Fourth Grade Mean Percent Correct on Math and Reading Tests  
as a Function of Treatment Group and Gender  
Cells with \*\* are Significantly Higher than Cells with \***

Treatment Group	Gender	Math Pretest	Math Posttest	Math Gain	Read Pretest	Read Posttest	Read Gain
FAD Total Sample	Female	<b>42.95*</b> N=174 SD=15.82	<b>54.13*</b> N=162 SD=16.47	<b>11.18</b>	<b>75.24</b> N=174 SD=11.97	<b>75.74</b> N=162 SD=14.69	<b>.50</b>
	Male	<b>49.98**</b> N=147 SD=16.60	<b>57.72**</b> N=127 SD=17.65	<b>7.74</b>	<b>76.84</b> N=147 SD=13.01	<b>76.45</b> N=127 SD=14.91	<b>-.39</b>
Control Total Sample	Female	<b>41.17*</b> N=130 SD=18.30	<b>43.09*</b> N=80 SD=18.15	<b>1.92</b>	<b>72.86</b> N=130 SD=13.31	<b>71.20</b> N=80 SD=15.48	<b>-1.66</b>
	Male	<b>43.52**</b> N=135 SD=19.38	<b>52.34**</b> N=96 SD=18.53	<b>8.82</b>	<b>72.02</b> N=135 SD=14.54	<b>74.51</b> N=96 SD=13.96	<b>2.49</b>
FAD Pre & Post	Female	<b>44.24</b> N=138 SD=15.76	<b>55.30</b> N=138 SD=16.79	<b>11.06**</b>	<b>75.90</b> N=138 SD=11.77	<b>77.03</b> N=138 SD=14.06	<b>1.13</b>
	Male	<b>50.54</b> N=106 SD=17.35	<b>58.60</b> N=106 SD=17.86	<b>8.06*</b>	<b>76.55</b> N=106 SD=13.33	<b>77.81</b> N=106 SD=14.67	<b>1.26</b>
Control Pre & Post	Female	<b>32.73</b> N=65 SD=15.87	<b>42.31</b> N=65 SD=17.98	<b>9.58</b>	<b>70.49</b> N=65 SD=14.67	<b>72.25</b> N=65 SD=15.24	<b>1.76</b>
	Male	<b>39.87</b> N=75 SD=19.71	<b>52.97</b> N=75 SD=18.63	<b>13.10</b>	<b>70.50</b> N=75 SD=15.12	<b>75.02</b> N=75 SD=14.98	<b>4.52</b>

**Summary of the Math Results for Boys and Girls.** Boys started out performing better than girls in grade 2 and grade 4, though there were no overall differences between boys and girls on the math pretest in grade 3. There was, however, a significant interaction between treatment and gender in the grade 3 pretest analysis. The nature of this interaction was that boys scored higher than girls in the FAD treatment, but girls scored higher than boys in the Control treatment.

The posttest analyses indicated that boys consistently scored higher than girls at each of the grade levels. There were no interactions between treatment and gender in the analyses.

The analyses of pretest to posttest gain indicated that there were no differences between boys and girls in the amount of gain in grades 2 and 3. There were also no overall differences between boys and girls in the grade 4 analysis. There was, however, a significant interaction in the grade 4 analysis where boys made greater gains than girls in the Control condition, but girls made greater gains than boys in the FAD condition.

### **Reading Performance for Boys and Girls**

The general framework for the analysis of the reading performance of boys and girls was similar to that for math performance. Separate analyses were performed for each grade and treatment was a factor in each analysis to allow for the detection of interactions between student gender and treatment effects.

#### **What the analyses to follow show:**

- **Grade 2:** Girls and boys did not differ on pretest performance, posttest performance, and amount of pretest to posttest gain. There were also no interactions between gender and treatment in any of the analyses.
- **Grade 3:** There were no sex differences on any of the tests.
- **Grade 4:** There were no sex differences on any of the tests.

**The results of the reading analyses of male and female performance.** The descriptive statistics for the performance of boys and girls on the reading tests are contained in Tables 19 (2nd grade performance), 20 (3rd grade performance) and 21 (4th grade performance) which appear in the section above.

The analyses of grade 2 data indicated that boys and girls did not differ on the pretest,  $F(1,540) = 1.2$ , NS, and there was no interaction between gender and treatment. Likewise, the analysis of posttest performance indicated there were no gender differences in reading performance, and there was no interaction between treatment and gender. Finally, the analysis of pretest to posttest gain indicated that again there was not difference between boys and girls and that there was no interaction between treatment and gender.

The grade 3 analyses showed that there were no gender differences in the analysis of pretest performance,  $F(1,546) = .696$ , NS, and that there was no interaction between treatment and gender. There was also no effect for gender on the analysis of posttest performance, and again, there was no interaction between treatment and gender. Finally, the analysis of pretest to posttest gain also indicated that girls and boys did not differ, and the performance of boys and girls did not differ as a function of treatment.

**Summary of the Reading Results for Boys and Girls.** There were no significant differences between boys and girls on any of the tests. There were also no interactions between treatment and gender in any of the analyses.

### **Math Performance Comparisons between Urban and Rural Schools (Location)**

The comparison of the math performance of students enrolled in urban and rural schools took a form similar to the analyses reported in the previous section. That is, each grade was analyzed separately, and treatment was included as a variable in every analysis to allow for the detection of interactions between treatment and school location.

#### **What the analyses to follow show:**

- **Grade 2:** The rural students performed better overall than their urban counterparts on the math pretest, but this generalization was moderated by the fact that there was an interaction between treatment and location such that the rural students performed better than urban students in FAD schools, but the reverse was true in Control schools. There were no differences between urban and rural students on the math posttest. There were no overall differences between urban and rural schools on the amount of pretest to posttest gain, but there was a significant interaction between treatment and location in the gain analysis. The nature of this interaction was that rural students made the greatest gain in the Control schools, whereas the urban students made the greatest gain in the FAD schools.
- **Grade 3:** Rural students outscored their urban counterparts in the pretest analysis, but there were no differences between the two school locations on the posttest. The analysis of pretest to posttest gain indicated that urban students made greater gains than did rural students.
- **Grade 4:** Urban students scored higher than rural students on the math pretest, but there was no overall difference between the two school locations on the math posttest. There was, however, an interaction between treatment and location on the posttest. The nature of this interaction was that rural students scored higher in the FAD treatment, but the reverse occurred in the Control treatment where the urban students scored higher than the rural students. The analysis of pretest to posttest gain indicated that overall, the rural students gained more than the urban students. There was also a significant interaction in the analysis of pretest to posttest gain. The nature of the interaction was that in the FAD group the Rural students made greater gains than the Urban students, but in the Control group, the Urban students made more gain than the Rural students.

### **The results of analyses on the math performance of students in rural and urban schools.**

The descriptive statistics broken down by urban and rural schools is presented in Tables 22 (2nd grade), 23 (3rd grade) and 24 (4th grade).

The analyses of grade 2 math data indicated that school location was a significant effect in the pretest analyses where Rural students significantly outperformed their Urban counterparts,  $F(1,540) = 7.14, p < .01$ . There was also a significant interaction between treatment and location in the analysis,  $F(1,540) = 42.7, p < .01$ . An examination of Table 22 shows that the Rural students outperformed the Urban students in the FAD sample, but the reverse was true in the Control sample where the urban students scored higher than the Rural students. In contrast to the pretest analysis, the analysis of math posttest performance indicated that location was not a significant source of variance and that there was not an interaction between treatment and school location. The analysis of pretest to posttest gain indicated that location was not a significant source of variance,  $F(1,320) = .418, NS$ . However, there was a significant interaction between location and treatment,  $F(1,4.33, p < .05)$ . As Table 22 shows, the nature of this interaction was that the Urban students made the most gain in the FAD condition whereas the Rural students made the most gain in the Control condition.

The grade 3 analyses indicated that location was a significant source of variance in the math pretest analysis where the Rural students significantly outperformed the Urban students,  $F(1,546) = 39.8, p < .01$ . There was no interaction between treatment and location in the analysis. The analysis of math posttest performance indicated that Rural and Urban students did not differ on the posttest and that there was no interaction between treatment and location. The analysis of pretest to posttest gain indicated that location was a significant source of variance with the Urban students making significantly greater overall gain than the Rural students,  $F(1,290) = 6.15, p < .05$ .

The grade 4 analysis of pretest performance indicated that the Urban students performed significantly better than Rural students,  $F(1,582) = 5.96, p < .05$ , and that there was no interaction between treatment and location. The analysis of posttest performance indicated that location was not a significant source of variance,  $F(1,461) = .82, NS$ . However, there was a significant interaction between location and treatment,  $F(1,461) = 12.2, p < .01$ . The nature of the interaction, which can be seen in Table 24, was that the Rural students scored higher in the FAD treatment, but the reverse occurred in the Control treatment where the Urban students scored higher than the Rural students. The analysis of pretest to posttest gain indicated that overall, the Rural students gained more than the Urban students,  $F(1, 379) = 9.99, p < .01$ , but that there was also a significant interaction between treatment and location,  $F(1,379) = 14.1, p < .01$ . The nature of the interaction, was that in the FAD group, the Rural students made greater gains than the Urban students, but in the Control group, the Urban students made more gain than the Rural students.

**Table 22**  
**Second Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and Location**  
**Cells with \*\* are Significantly Higher than Cells with \***

Treatment Group	Location	Math Pretest	Math Posttest	Math Gain	Read Pretest	Read Posttest	Read Gain
FAD Total Sample	Urban	<b>44.72*</b> N=93 SD=19.38	<b>59.71</b> N=103 SD=16.00	<b>14.99</b>	<b>62.02*</b> N=93 SD=20.62	<b>74.66*</b> N=103 SD=16.65	<b>12.64</b>
	Rural	<b>57.41**</b> N=187 SD=14.48	<b>59.16</b> N=187 SD=14.81	<b>1.75</b>	<b>75.00**</b> N=187 SD=14.24	<b>78.29**</b> N=187 SD=13.0	<b>3.29</b>
Control Total Sample	Urban	<b>57.50**</b> N=141 SD=15.62	<b>61.10</b> N=101 SD=16.71	<b>3.60</b>	<b>70.28**</b> N=141 SD=16.24	<b>74.70**</b> N=101 SD=17.73	<b>4.42</b>
	Rural	<b>52.05*</b> N=123 SD=14.28	<b>59.79</b> N=66 SD=13.98	<b>7.74</b>	<b>68.17*</b> N=123 SD=14.23	<b>69.36*</b> N=66 SD=15.18	<b>1.19</b>
FAD Pre & Post	Urban	<b>48.12</b> N=59 SD=20.08	<b>56.36**</b> N=59 SD=16.53	<b>8.24</b>	<b>63.52</b> N=59 SD=20.31	<b>75.59*</b> N=59 SD=17.93	<b>12.07**</b>
	Rural	<b>57.30</b> N=139 SD=14.17	<b>60.07*</b> N=139 SD=14.64	<b>2.77</b>	<b>74.86</b> N=139 SD=13.92	<b>78.78**</b> N=139 SD=13.11	<b>3.92*</b>
Control Pre & Post	Urban	<b>56.53</b> N=79 SD=17.02	<b>61.57*</b> N=79 SD=17.00	<b>5.04</b>	<b>68.58</b> N=79 SD=16.92	<b>75.89**</b> N=79 SD=18.07	<b>7.31**</b>
	Rural	<b>52.34</b> N=48 SD=13.46	<b>62.80**</b> N=48 SD=12.81	<b>10.46</b>	<b>70.16</b> N=48 SD=14.27	<b>73.02*</b> N=48 SD=14.07	<b>2.86*</b>

Note: A convention is used in this table to signal main effects and interactions involving the analysis of pretest to posttest gain. If there is a main effect, the advantaged group will be identified by starring the amount of gain occurring from pretest to posttest. The presence of an interaction will be signaled by starring the posttest means for the FAD and Control students who took both the pretest and the posttest.

Table 23

**Third Grade Mean Percent Correct on Math and Reading Tests  
as a Function of Treatment Group and Location  
Cells with \*\* are Significantly Higher than Cells with \***

<b>Treatment Group</b>	<b>Location</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Urban	<b>43.54*</b> N=126 SD=13.68	<b>51.57</b> N=104 SD=16.69	<b>8.03</b>	<b>73.23*</b> N=126 SD=13.46	<b>78.48*</b> N=104 SD=13.66	<b>5.25</b>
	Rural	<b>50.05**</b> N=203 SD=13.05	<b>55.10</b> N=171 SD=14.35	<b>5.05</b>	<b>82.56**</b> N=203 SD=10.47	<b>81.43**</b> N=171 SD=11.20	<b>-1.13</b>
Control Total Sample	Urban	<b>46.56*</b> N=141 SD=12.93	<b>51.41</b> N=110 SD=15.42	<b>4.85</b>	<b>75.15*</b> N=141 SD=13.30	<b>78.73**</b> N=110 SD=13.22	<b>3.58</b>
	Rural	<b>55.71**</b> N=80 SD=16.77	<b>50.04</b> N=52 SD=16.94	<b>-5.67</b>	<b>79.22**</b> N=80 SD=13.46	<b>76.45*</b> N=52 SD=12.38	<b>-2.77</b>
FAD Pre & Post	Urban	<b>44.13</b> N=74 SD=13.34	<b>49.28</b> N=74 SD=15.92	<b>5.15**</b>	<b>74.59</b> N=74 SD=11.49	<b>77.72</b> N=74 SD=12.87	<b>3.13</b>
	Rural	<b>51.17</b> N=125 SD=12.94	<b>54.54</b> N=125 SD=13.85	<b>3.37*</b>	<b>83.50</b> N=125 SD=10.06	<b>80.48</b> N=125 SD=12.00	<b>-3.02</b>
Control Pre & Post	Urban	<b>46.87</b> N=62 SD=10.70	<b>54.97</b> N=62 SD=14.34	<b>8.10**</b>	<b>76.59</b> N=62 SD=11.63	<b>81.26</b> N=62 SD=10.87	<b>4.67</b>
	Rural	<b>53.48</b> N=34 SD=17.74	<b>50.42</b> N=34 SD=16.62	<b>-3.06*</b>	<b>78.82</b> N=34 SD=13.04	<b>77.91</b> N=34 SD=11.25	<b>-0.91</b>

Table 24

**Fourth Grade Mean Percent Correct on Math and Reading Tests  
as a Function of Treatment Group and Location  
Cells with \*\* are Significantly Higher than Cells with \***

Treatment Group	Location	Math Pretest	Math Posttest	Math Gain	Read Pretest	Read Posttest	Read Gain
FAD Total Sample	Urban	<b>47.63**</b> N=133 SD=15.62	<b>51.19*</b> N=114 SD=16.48	<b>5.56</b>	<b>75.36*</b> N=133 SD=13.89	<b>72.02*</b> N=114 SD=17.57	<b>-3.34</b>
	Rural	<b>45.13*</b> N=188 SD=17.11	<b>58.65**</b> N=175 SD=16.83	<b>13.52</b>	<b>76.41**</b> N=188 SD=11.36	<b>78.68**</b> N=175 SD=11.96	<b>2.27</b>
Control Total Sample	Urban	<b>44.46**</b> N=147 SD=18.73	<b>50.16**</b> N=95 SD=17.89	<b>5.70</b>	<b>71.64*</b> N=147 SD=13.10	<b>73.47**</b> N=95 SD=15.37	<b>1.83</b>
	Rural	<b>39.77*</b> N=118 SD=18.77	<b>45.77*</b> N=81 SD=19.83	<b>6.00</b>	<b>73.42**</b> N=118 SD=14.90	<b>72.46*</b> N=81 SD=14.00	<b>-.96</b>
FAD Pre & Post	Urban	<b>48.09</b> N=89 SD=16.25	<b>51.66*</b> N=89 SD=17.05	<b>3.57*</b>	<b>75.01</b> N=89 SD=14.26	<b>73.77*</b> N=89 SD=17.46	<b>-1.24</b>
	Rural	<b>46.34</b> N=155 SD=17.01	<b>59.64**</b> N=155 SD=16.83	<b>13.30**</b>	<b>76.85</b> N=155 SD=11.28	<b>79.43**</b> N=155 SD=11.70	<b>2.58</b>
Control Pre & Post	Urban	<b>39.53</b> N=79 SD=18.39	<b>50.54**</b> N=79 SD=17.89	<b>11.01*</b>	<b>70.96</b> N=79 SD=14.56	<b>74.63**</b> N=79 SD=15.33	<b>3.67</b>
	Rural	<b>32.70</b> N=61 SD=17.64	<b>44.75*</b> N=61 SD=20.10	<b>12.05**</b>	<b>69.89</b> N=61 SD=15.34	<b>72.57*</b> N=61 SD=14.87	<b>2.68</b>

Note: A convention is used in this table to signal main effects and interactions involving the analysis of pretest to posttest gain. If there is a main effect, the advantaged group will be identified by starring the amount of gain occurring from pretest to posttest. The presence of an interaction will be signaled by starring the posttest means for the FAD and Control students who took both the pretest and the posttest.

**Summary of math performance for urban and rural students.** The rural students consistently outperformed their rural counterparts on the math pretests, scoring significantly higher than urban students in all three grades. The analyses were also consistent in indicating that there were no overall differences between urban and rural students on the math posttest.

These overall conclusions were moderated to some degree by interactions between treatment and school location. In grades 2 and 4, the nature of this interaction was that rural students performed better than urban students on the math pretests in the FAD treatment, but urban students tended to perform better than rural students in the Control treatment. There was also a significant interaction on the 4th grade posttest. The pattern of this interaction was the same as the one for the pretest. Namely, rural students performed better than urban students in the FAD condition, but the reverse was true in the Control condition.

The pattern of results involving the analysis of pretest to posttest gain was mixed across the different grades. In grade 2, there were no overall differences between the amount of gain made by rural and urban students. In grade 3, urban students made greater gains than their rural counterparts. However, in grade 4, the rural students made greater gains than urban students. There were also interactions between treatment and school location in the analyses of gain in grades 2 and 4. In grade 2, the urban students performed better than rural students in the FAD treatment, but the reverse pattern held in the Control treatment. The opposite pattern was true in the grade 4 analysis where the rural students made greater gains than the urban students in the FAD treatment, but the urban students made greater gains than the rural students in the Control treatment.

### **Reading Performance Comparisons between Urban and Rural Schools**

The comparison of the reading performance of students enrolled in urban and rural schools took a form similar to that in the previous section. That is, each grade was analyzed separately, and treatment was included as a variable in every analysis to allow for the detection of interactions between treatment and school location.

#### **What the analyses to follow show:**

- **Grade 2:** Overall, the rural group performed better than the urban group on the reading pretest. There were no overall differences between school locations on the posttest. The analysis of pretest to posttest gain indicated that the urban group made significantly greater gain than did the rural group. There were also several interactions in the analyses. In both the pretest and the posttest analyses the rural group outperformed the urban group in the FAD treatment, but the urban group scored higher than the rural group in the Control condition.
- **Grade 3:** The only significant overall advantage in the grade 3 analyses was on the pretest where the rural group scored higher than the urban group. There were significant interaction in both the analysis of pretest performance and the analysis of posttest performance. In both analyses the rural group scored higher than the urban group in FAD condition, but the urban group scored higher than the rural group in the Control condition.
- **Grade 4:** There were two significant overall results involving location in the grade 4 analyses. The pretest analysis indicated that the rural group scored higher than the urban group. The analysis of pretest to posttest gain indicated that the urban group made significantly greater gains than the rural group. There were significant interactions in both the pretest analysis and the posttest analysis where in both cases the rural students scored higher than the urban students in the FAD condition but the opposite was true in the Control condition.

#### **The results of analyses on the reading performance of students in rural and urban schools.**

The descriptive statistics broken down by urban and rural schools is presented in Tables 22 (2nd grade), 23 (3rd grade) and 24 (4th grade) above.

The analysis of 2nd grade performance on the reading pretest indicated that overall, the rural group performed significantly better than the urban group,  $F(1,540) = 14.7, p < .01$ . There was also a significant interaction in the analysis,  $F(1,540) = 28.3, p < .01$ . The form of this interaction was the same as that occurring in the math analysis. Specifically, the rural group performed better than the urban group in the FAD condition, but the urban group performed better than the rural group in the Control condition. The analysis of the posttest data indicated that there were no significant effects associated with school location, but there was a significant interaction between treatment and location,  $F(1,457) = 8.5, p < .01$ . The nature of this interaction was the same as that occurring on the pretest in that the FAD rural group performed better than the urban group, but the reverse pattern was present in the Control group. The analysis of pretest to posttest gain indicated that the urban group made significantly more overall gain than did the rural group,  $F(1,320) = 8.4, p < .01$ . There was not a significant interaction between location and treatment.

The analysis of the grade 3 reading pretest data indicated that the rural students performed better than the urban students in the overall comparison,  $F(1,546) = 36.0, p < .01$ . There was also a significant interaction with the advantage for the rural students being much larger in the FAD condition than it was in the Control condition,  $F(1,546) = 5.5, p < .05$ . The analysis of posttest performance indicated that location was not a significant source of variance in the analysis but there was a significant interaction between location and treatment,  $F(1,433) = 4.0, p < .05$ . The nature of this interaction was that rural group scored higher than the urban group in the FAD condition, but the urban group scored higher than the rural group in the Control condition. The analysis of pretest to posttest gain indicated that there were no differences or interactions involving school location.

The grade 4 analyses were similar to those for the other grades in that the pretest analysis showed that the rural group scored significantly higher than the urban group,  $F(1,540) = 14.7, p < .01$ , and there was a significant interaction between treatment and school location,  $F(1,540) = 28.3, p < .01$ . This interaction followed the same pattern as other interactions involving treatment and location in that the rural group outscored the urban group in the FAD condition, but the urban group outscored the rural group in the Control condition. The posttest analysis indicated that there were no differences between groups overall,  $F(1,453) = .31, NS$ , but there was a significant interaction between treatment and location,  $F(1,453) = 8.5, p < .01$ . Again this interaction followed the familiar pattern of the rural group scoring best in the FAD condition and the urban group scoring best in the Control condition. The analysis of pretest to posttest gain indicated that the urban group made significantly greater gains than did the rural group,  $F(1,320) = 8.48, p < .01$ .

**Summary of reading performance for urban and rural students.** In grade 2, the rural group performed better than the urban group on the reading pretest, but there were no differences between rural and urban students on the posttest. The analysis of pretest to posttest gain indicated that the urban group made significantly greater gain than did the rural group. There were also several interactions in the analyses. In both the pretest and the posttest analyses the rural group outperformed the urban group in the FAD treatment, but the urban group scored higher than the rural group in the Control condition.

The third grade analyses indicated that the rural group scored higher than the urban group on the pretest. The analysis of the posttest data and the analysis of pretest to posttest gain indicated that the rural and urban students did not differ. There were significant interaction in both the analysis of pretest performance and the analysis of posttest performance. In both analyses the rural group scored higher than the urban group in FAD condition, but the urban group scored higher than the rural group in the Control condition.

There were two significant overall results involving location in the grade 4 analyses. The pretest analysis indicated that the rural group scored higher than the urban group. The analysis of pretest to posttest gain indicated that the urban group made significantly greater gains than the rural group. There were significant interactions in both the pretest analysis and the posttest analysis where in both cases the rural students scored higher than the urban students in the FAD condition but the opposite was true in the Control condition.

### **Math Performance Comparisons between Catholic, Protestant, Independent and Nationale Schools**

Of the 22 schools participating in the evaluation study, five were Catholic, seven were Protestant, five were Independent and five were Nationale. The analyses reported in this section examine differences between each of these school types, and they examine whether the FAD experience had differential impact in the school types. Each of the analyses to be reported examines both treatment impact and school type impact.

#### **What the analyses show:**

- **Grade 2:** The pretest analysis indicated there were significant differences between the school types with the Catholic school performing the best and the Independent schools performing the worst. This pattern continued on the posttest where again the schools differed in performance and again the Catholic schools were the best and the Independent schools the worst. There was no difference between the schools in the amount of gain they made from pretest to posttest.
- **Grade 3:** The grade 3 analysis of the pretest data indicated that school type was a significant source of variance with Catholic schools again scoring highest and Nationale schools scoring lowest. There were also differences between the school types on the analysis of posttest data with the ordering of school types being the same as it was on the pretest. The analysis of pretest to posttest gain showed a significant effect for school type with the Catholic schools showing the greatest gain and the Nationale Schools the least amount of gain.
- **Grade 4:** School type was a significant source of variance on the analysis of pretest data with the Catholic schools performed the best on the pretest and the Nationale schools the worst. The school types also differed on the posttest with Catholic schools again performing the best and Protestant schools performing the worst. There were no differences between the school types in the amount of pretest to posttest gain they made. In addition, there was not an interaction between school type and treatment.

**The results of analyses on the math performance of students in Catholic, Protestant, Independent and Nationale schools.** The descriptive statistics for the analyses to follow are presented in Tables 25 (Grade 2), 26 (Grade 3) and 27 (Grade 4).

The analysis of the grade 2 data indicated that school type was a significant source of variance in the pretest analysis,  $F(3,536) = 6.73$ ,  $p < .01$ . An examination for the overall means of the school types indicated that the Catholic schools had the highest pretest percent correct (57% correct) and the Independent schools the lowest pretest percent correct (49%). The analysis of posttest performance also indicated that the school types differed,  $F(3,449) = 3.2$ ,  $p < .05$ . In this comparison the Catholic schools again had the highest posttest average (63%) and the Independent schools the lowest average (55%). The analysis of pretest to posttest gain indicated that the school types did not differ from one another and there were no interactions between school type and the FAD or Control treatment.

The grade 3 analysis of the pretest data indicated that again school type was a significant source of variance,  $F(3,542) = 11.1$ ,  $p < .01$ . The Catholic schools again scored highest on the pretest (52%), but for grade 3 the lowest scoring school type was the Nationale schools (44%). There were also differences between the school types on the analysis of the math posttest data,  $F(3,429) = 9.98$ ,  $p < .01$ . The ordering of the schools was the same as on the pretest with the Catholic schools scoring highest (59%) and the Nationale schools scoring lowest (48%). The analysis of pretest to posttest gain showed a significant effect for school type,  $F(3,286) = 3.41$ ,  $p < .05$ , with the Catholic schools showing the greatest gain and the Nationale Schools the least amount of gain.

The analysis of grade 4 pretest performance indicated that school type was a significant source of variance,  $F(3,578) = 23.2$ ,  $p < .01$ . Similar to grade 3, the Catholic schools performed the best on the pretest (54%) and the Nationale schools performed the worst (39%). There was also a significant effect for school type in the posttest analysis,  $F(3, 457) = 10.6$ ,  $p < .01$ , but this time there was a slight shift in the ordering of the schools. The Catholic schools again performed the best (59%) but on the posttest the Protestant schools performed the worst (47%). The analysis of pretest to posttest gain indicated that there were no differences between the schools,  $F(3,375) = .611$ , NS. In addition, there was not an interaction between school type and treatment.

**Table 25**  
**Second Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and School Type**

<b>Treatment Group</b>	<b>School Type</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Catholic	<b>55.19**</b> N=77 SD=16.26	<b>58.43**</b> N=68 SD=15.80	<b>3.24</b>	<b>70.88</b> N=77 SD=18.42	<b>81.76**</b> N=68 SD=13.02	<b>10.88</b>
	Protestant	<b>58.08</b> N=91 SD=15.11	<b>59.70</b> N=102 SD=14.79	<b>1.62</b>	<b>71.98</b> N=91 SD=14.80	<b>77.75</b> N=102 SD=13.70	<b>5.77</b>
	Independent	<b>45.91</b> N=82 SD=19.67	<b>54.71</b> N=64 SD=15.96	<b>8.80</b>	<b>67.50</b> N=82 SD=21.18	<b>75.23</b> N=64 SD=16.75	<b>7.73</b>
	National	<b>53.15</b> N=30 SD=12.79	<b>65.15</b> N=56 SD=12.58	<b>12.00</b>	<b>75.00</b> N=30 SD=11.62	<b>71.88</b> N=56 SD=13.04	<b>-3.12</b>
Control Total Sample	Catholic	<b>59.90**</b> N=46 SD=14.45	<b>67.58**</b> N=26 SD=14.41	<b>7.68</b>	<b>73.48</b> N=46 SD=13.99	<b>77.69**</b> N=26 SD=15.44	<b>4.21</b>
	Protestant	<b>53.35</b> N=97 SD=14.02	<b>61.41</b> N=46 SD=10.60	<b>8.06</b>	<b>69.15</b> N=97 SD=14.08	<b>72.55</b> N=46 SD=16.42	<b>3.40</b>
	Independent	<b>52.10</b> N=45 SD=15.09	<b>56.91</b> N=23 SD=13.50	<b>4.81</b>	<b>69.17</b> N=45 SD=15.47	<b>69.67</b> N=23 SD=15.60	<b>.50</b>
	National	<b>55.71</b> N=76 SD=16.71	<b>58.70</b> N=72 SD=18.60	<b>2.99</b>	<b>67.04</b> N=76 SD=17.27	<b>71.70</b> N=72 SD=18.07	<b>4.66</b>
FAD Pre & Post	Catholic	<b>56.07</b> N=60 SD=15.70	<b>58.21</b> N=60 SD=15.91	<b>2.14</b>	<b>72.04</b> N=60 SD=16.35	<b>82.13</b> N=60 SD=12.60	<b>10.09**</b>
	Protestant	<b>58.51</b> N=68 SD=15.15	<b>61.90</b> N=68 SD=13.81	<b>3.39</b>	<b>71.40</b> N=68 SD=15.49	<b>78.42</b> N=68 SD=14.06	<b>7.02</b>
	Independent	<b>46.73</b> N=42 SD=20.04	<b>54.34</b> N=42 SD=16.60	<b>7.61</b>	<b>68.51</b> N=42 SD=21.95	<b>75.36</b> N=42 SD=17.73	<b>6.85</b>
	National	<b>53.51</b> N=28 SD=12.73	<b>60.39</b> N=28 SD=14.11	<b>6.88</b>	<b>74.91</b> N=28 SD=11.64	<b>70.89</b> N=28 SD=13.00	<b>-4.02</b>
Control Pre & Post	Catholic	<b>59.62</b> N=18 SD=14.24	<b>68.55</b> N=18 SD=12.76	<b>8.93</b>	<b>71.81</b> N=18 SD=10.77	<b>78.61</b> N=18 SD=16.09	<b>6.80**</b>
	Protestant	<b>53.53</b> N=39 SD=13.40	<b>62.73</b> N=39 SD=10.44	<b>9.20</b>	<b>71.41</b> N=39 SD=14.39	<b>75.90</b> N=39 SD=14.76	<b>4.49</b>
	Independent	<b>49.22</b> N=16 SD=14.00	<b>58.71</b> N=16 SD=12.52	<b>9.49</b>	<b>63.28</b> N=16 SD=18.30	<b>73.28</b> N=16 SD=15.88	<b>10.00</b>
	National	<b>56.12</b> N=54 SD=18.09	<b>60.35</b> N=54 SD=19.39	<b>4.23</b>	<b>68.43</b> N=54 SD=17.49	<b>73.19</b> N=54 SD=18.46	<b>4.76</b>

**Table 26**  
**Third Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and School Type**

<b>Treatment Group</b>	<b>School Type</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Catholic	<b>52.47**</b> N=83 SD=14.66	<b>59.86**</b> N=72 SD=14.80	<b>7.39</b>	<b>83.00</b> N=83 SD=10.86	<b>85.28**</b> N=72 SD=9.09	<b>2.28</b>
	Protestant	<b>45.96</b> N=102 SD=13.17	<b>52.77</b> N=79 SD=14.57	<b>6.81</b>	<b>79.54</b> N=102 SD=10.95	<b>77.87</b> N=79 SD=13.38	<b>-1.67</b>
	Independent	<b>47.59</b> N=85 SD=11.77	<b>54.16</b> N=63 SD=14.55	<b>6.57</b>	<b>78.46</b> N=85 SD=11.89	<b>82.57</b> N=63 SD=11.90	<b>4.11</b>
	National	<b>43.34</b> N=59 SD=13.77	<b>47.44</b> N=61 SD=15.31	<b>4.10</b>	<b>73.15</b> N=59 SD=15.83	<b>75.30</b> N=61 SD=11.86	<b>2.15</b>
Control Total Sample	Catholic	<b>53.38**</b> N=51 SD=11.87	<b>58.58**</b> N=34 SD=13.80	<b>5.20</b>	<b>79.17</b> N=51 SD=11.17	<b>83.27**</b> N=34 SD=9.30	<b>4.10</b>
	Protestant	<b>47.52</b> N=53 SD=15.85	<b>46.82</b> N=35 SD=19.51	<b>-0.70</b>	<b>76.31</b> N=53 SD=13.23	<b>79.30</b> N=35 SD=13.79	<b>2.99</b>
	Independent	<b>55.43</b> N=50 SD=15.83	<b>49.84</b> N=26 SD=13.92	<b>-5.59</b>	<b>79.47</b> N=50 SD=12.57	<b>75.49</b> N=26 SD=11.77	<b>-3.98</b>
	National	<b>44.93</b> N=67 SD=14.26	<b>49.71</b> N=67 SD=14.48	<b>4.78</b>	<b>72.80</b> N=67 SD=15.12	<b>75.62</b> N=67 SD=13.88	<b>2.82</b>
FAD Pre & Post	Catholic	<b>51.38</b> N=57 SD=15.16	<b>58.65</b> N=57 SD=14.75	<b>7.27**</b>	<b>82.81</b> N=57 SD=10.27	<b>85.30</b> N=57 SD=9.04	<b>2.49**</b>
	Protestant	<b>47.98</b> N=55 SD=13.84	<b>53.13</b> N=55 SD=13.60	<b>5.15</b>	<b>80.32</b> N=55 SD=9.98	<b>77.38</b> N=55 SD=13.32	<b>-2.94</b>
	Independent	<b>48.24</b> N=47 SD=10.52	<b>51.41</b> N=47 SD=14.41	<b>3.17</b>	<b>79.81</b> N=47 SD=10.64	<b>79.76</b> N=47 SD=11.90	<b>-0.05</b>
	National	<b>45.66</b> N=40 SD=13.36	<b>44.59</b> N=40 SD=13.51	<b>-1.07</b>	<b>76.72</b> N=40 SD=14.78	<b>73.61</b> N=40 SD=12.48	<b>-3.11</b>
Control Pre & Post	Catholic	<b>51.50</b> N=17 SD=11.33	<b>58.10</b> N=17 SD=12.89	<b>6.60**</b>	<b>77.39</b> N=17 SD=10.16	<b>84.84</b> N=17 SD=6.39	<b>7.45**</b>
	Protestant	<b>45.88</b> N=25 SD=14.62	<b>50.12</b> N=25 SD=19.42	<b>4.24</b>	<b>75.82</b> N=25 SD=13.32	<b>81.33</b> N=25 SD=11.35	<b>5.51</b>
	Independent	<b>51.02</b> N=19 SD=14.04	<b>51.56</b> N=19 SD=13.15	<b>.54</b>	<b>76.96</b> N=19 SD=12.04	<b>77.69</b> N=19 SD=11.19	<b>.73</b>
	National	<b>49.50</b> N=35 SD=14.52	<b>54.34</b> N=35 SD=13.87	<b>4.84</b>	<b>78.73</b> N=35 SD=12.51	<b>78.16</b> N=35 SD=12.09	<b>-0.57</b>

**Table 27**  
**Fourth Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and School Type**

<b>Treatment Group</b>	<b>School Type</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Catholic	<b>52.86**</b> N=84 SD=16.70	<b>62.98**</b> N=78 SD=17.27	<b>10.12</b>	<b>79.13**</b> N=84 SD=11.89	<b>82.50**</b> N=78 SD=10.47	<b>3.37**</b>
	Protestant	<b>41.92</b> N=90 SD=15.33	<b>52.03</b> N=87 SD=14.97	<b>10.11</b>	<b>72.95</b> N=90 SD=13.95	<b>74.39</b> N=87 SD=15.89	<b>1.44</b>
	Independent	<b>45.61</b> N=86 SD=16.99	<b>55.86</b> N=64 SD=16.46	<b>10.25</b>	<b>77.91</b> N=86 SD=12.19	<b>77.93</b> N=64 SD=15.09	<b>.02</b>
	National	<b>44.02</b> N=61 SD=14.81	<b>51.43</b> N=60 SD=17.53	<b>7.41</b>	<b>73.37</b> N=61 SD=9.68	<b>68.07</b> N=60 SD=13.52	<b>-5.03</b>
Control Total Sample	Catholic	<b>56.57**</b> N=51 SD=17.36	<b>56.20**</b> N=23 SD=19.73	<b>-.37</b>	<b>77.51**</b> N=51 SD=11.77	<b>82.52**</b> N=23 SD=9.94	<b>5.01**</b>
	Protestant	<b>38.94</b> N=90 SD=18.69	<b>42.46</b> N=61 SD=19.93	<b>3.52</b>	<b>69.07</b> N=90 SD=14.25	<b>69.79</b> N=61 SD=14.26	<b>.72</b>
	Independent	<b>44.31</b> N=51 SD=13.29	<b>55.22</b> N=34 SD=17.48	<b>10.91</b>	<b>77.51</b> N=51 SD=10.54	<b>78.09</b> N=34 SD=13.47	<b>.58</b>
	National	<b>35.31</b> N=73 SD=18.15	<b>46.77</b> N=58 SD=16.02	<b>11.46</b>	<b>69.47</b> N=73 SD=15.10	<b>69.63</b> N=58 SD=15.30	<b>.16</b>
FAD Pre & Post	Catholic	<b>54.82</b> N=69 SD=16.24	<b>64.49</b> N=69 SD=17.47	<b>9.67</b>	<b>80.39</b> N=69 SD=11.98	<b>82.71</b> N=69 SD=10.79	<b>2.32</b>
	Protestant	<b>41.14</b> N=70 SD=15.45	<b>53.06</b> N=70 SD=14.32	<b>11.92</b>	<b>72.59</b> N=70 SD=13.42	<b>76.13</b> N=70 SD=15.02	<b>3.54</b>
	Independent	<b>46.59</b> N=55 SD=16.88	<b>56.73</b> N=55 SD=16.71	<b>10.14</b>	<b>78.18</b> N=55 SD=12.37	<b>80.04</b> N=55 SD=14.09	<b>1.86</b>
	National	<b>44.75</b> N=50 SD=15.20	<b>51.16</b> N=50 SD=18.16	<b>6.41</b>	<b>73.18</b> N=50 SD=9.51	<b>68.78</b> N=50 SD=13.83	<b>-4.40</b>
Control Pre & Post	Catholic	<b>54.38</b> N=16 SD=17.43	<b>60.47</b> N=16 SD=18.10	<b>6.09</b>	<b>82.14</b> N=16 SD=8.18	<b>86.35</b> N=16 SD=6.49	<b>4.21</b>
	Protestant	<b>32.45</b> N=54 SD=18.87	<b>43.10</b> N=54 SD=20.63	<b>10.65</b>	<b>67.08</b> N=54 SD=14.45	<b>69.96</b> N=54 SD=14.62	<b>2.88</b>
	Independent	<b>44.43</b> N=22 SD=12.00	<b>55.57</b> N=22 SD=17.34	<b>11.14</b>	<b>77.83</b> N=22 SD=11.59	<b>81.17</b> N=22 SD=13.18	<b>3.34</b>
	National	<b>31.61</b> N=48 SD=15.76	<b>45.94</b> N=48 SD=15.51	<b>14.33</b>	<b>67.09</b> N=48 SD=15.48	<b>70.37</b> N=48 SD=15.34	<b>3.28</b>

**Summary of math performance for Independent, Catholic, Protestant and Nationale schools.**

There were consistent differences between the school types on the pretests and the posttests with the Catholic schools always performing the highest on the tests, but with some variation in which type of school performed the worst. In grade 2, the Independent schools performed more poorly than the other school types. In grade 3 it was the Nationale schools that scored the lowest on the pretests and the posttests, and in grade 4 the Nationale schools performed lowest on the pretest but the Protestant schools performed lowest on the posttest. There were no differences between the amount of pretest to posttest gain that the school types made on the grade 2 and the grade 4 analyses. There was, however, a significant difference in the amount of gain made in grade 3 where the Catholic schools made the most gain and the Nationale schools the least amount of gain. There were no interactions between school type and the FAD and Control treatments in any of the analyses.

**Reading Performance Comparisons between Catholic, Protestant, Independent and Nationale Schools**

The analyses of reading performance as a function of school type were identical in form to the analyses of math performance.

**What the analyses to follow show:**

- **Grade 2:** The analysis of the pretest data indicated that there were no differences between the schools and there was not an interaction between school type and treatment. There were differences though in the posttest analyses where the Catholic schools outperformed the other school types, but again there was no interaction between school type and treatment. The analysis of pretest to posttest gain showed advantages in gain for the Catholic schools with the Nationale schools having the lowest amount of gain. There was also an interesting interaction in this analysis where the Catholic, Protestant and Independent schools made more gain in the FAD condition than they did in the Control condition. The Nationale schools though performed worse in the Fad condition than they did in the Control condition.
- **Grade 3:** The results of the analysis of reading pretest performance indicated that the school types did not differ on the pretest, and there was not an interaction between treatment and school type. There were significant effects for school type though in the posttest analysis where Catholic schools recorded the highest percent correct performance and the Nationale schools the lowest percent correct performance. As was the case with the pretest analysis, there was no interaction between school type and treatment. The analysis of pretest to posttest gain followed the pattern in the other analyses where the different school types differed from one another (Catholic best, Nationale worst) and there was no interaction between school type and treatment.
- **Grade 4:** The analysis of grade 4 reading pretest performance indicated that the school types did differ with the usual pattern of high performance on the part of the catholic schools and low performance on the Protestant and Nationale school. There was not an interaction between school type and treatment. The analysis of

posttest performance produced a pattern of outcomes that was identical to the pattern for the pretest. The analysis of pretest to posttest gain showed again that there were differences between the school types with the Catholic schools tending to outgain the other schools, and with the Nationale schools making the least amount of gain. There was also an interaction in the analysis that was primarily attributable to the Nationale schools making larger gains in the Control condition than they did in the FAD condition.

**The results of analyses on the reading performance of students in Catholic, Protestant, Independent and Nationale schools.** The descriptive statistics for the analyses to follow are contained in Tables 25 (Grade 2), 26 (Grade 3) and 27 (Grade 4) which are presented in the above section.

The analysis of grade 2 reading pretest performance indicated that there were no differences between the school types,  $F(3,536) = 1.13$ , NS, and that there was not an interaction between school type and treatment,  $F(3,536) = 2.14$ , NS.

The analysis of 2nd grade reading performance on the posttest did show there were significant differences between the school types,  $F(3,449) = 5.53$ ,  $P < .01$ . The Catholic schools had the highest average percent correct on the test (79%) while the Nationale schools had the lowest percent correct (71%). There was no interaction between treatment and school type.

The analysis of pretest to posttest gain indicated that the school types did differ overall in the amount of gain that they made from pretest to posttest,  $F(3,316) = 6.39$ ,  $p < .01$ , with the Catholic schools making the largest gains and the Nationale schools making the smallest gain. There was also a significant interaction between school type and treatment,  $F(3, 316) = 2.89$ ,  $p < .05$ . The nature of this interaction can be seen in Table 25 where the Catholic, Protestant and Independent schools make greater gains in the FAD condition than they do in the Nationale condition. Notice, though, that the Nationale schools have the opposite pattern where they make greater gains in the Control condition than they do in the FAD condition.

As was the case in the grade 2 analysis, the analysis of grade 3 reading pretest performance indicated that the school types did not differ on the pretest, and there was not an interaction between treatment and school type. Again similar to the grade 2 analysis, there was a significant effect of school type on the posttest analysis,  $F(3,429) = 9.56$ ,  $p < .01$ , where the Catholic schools recorded the highest percent correct performance (84%) and the Nationale schools the lowest percent correct performance (75%). There was no interaction between school type and treatment.

The analysis of grade 3 pretest to posttest gain on the reading test indicated that school type was a significant effect in the analysis,  $F(3,286) = 6.27$ ,  $p < .01$ , with the Catholic schools recording the largest gains and the Nationale schools the smallest gains. The interaction between school type and treatment was not significant.

The analysis of grade 4 reading pretest performance indicated that school type was a significant source of variance,  $F(3,578) = 13.4$ ,  $p < .01$ , with the usual pattern of high performance on the part of the catholic schools (78%) and low performance on the Protestant and Nationale schools (both at 71% correct). There was not an interaction between school type and treatment.

The analysis of posttest performance showed the same pattern as the analysis of pretest performance with a significant effect of school type,  $F(3,457) = 17.4$ ,  $p < .01$ , and no interaction between treatment and school type. The school type effect was attributable to high performance by the Catholic schools (85%) and low performance by the Nationale schools (68%).

The analysis of pretest to posttest gain indicated that school type was a significant source of variance,  $F(3,375) = 6.38$ ,  $p < .01$ . There was also a significant interaction between school type and treatment,  $F(3,375) = 2.69$ ,  $p < .05$ . The nature of the school type main effect was that the Catholic schools made the largest gain and the Nationale schools the smallest. The significant interaction between school type and treatment was primarily attributable to the Nationale schools making more gain in the Control condition than they did in the FAD condition.

**Summary of reading performance for Independent, Catholic, Nationale and Protestant schools.** The analyses indicated there were differences between school types on all of the analyses except for the grade 2 pretest analysis. The outcomes in the significant analyses were consistent in that the Catholic schools always scored highest on the tests and the Nationale schools generally scoring the lowest. There was also an interesting interaction in the grade 2 pretest to posttest gain analysis where the Catholic, Protestant and Independent schools made more gain in the FAD condition than they did in the Control condition. The Nationale schools though performed worse in the Fad condition than they did in the Control condition.

### **Math and Reading Results for Geographic Region**

The FAD and Control schools participating in the study were from the Ouest, Nord, Sud and Artibonite regions of Haiti. Given that regional differences were not a critical aspect of the study the results associated with region will not be discussed in detail. The descriptive statistics for regional differences are presented in Tables 28 (2nd grade), 29 (3rd grade) and 30 (4th grade).

**Table 28**  
**Second Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and Geographic Region**

<b>Treatment Group</b>	<b>Region</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Ouest	<b>53.05</b> N=170 SD=16.95	<b>58.34</b> N=154 SD=15.42	<b>5.29</b>	<b>71.24</b> N=170 SD=17.92	<b>75.05</b> N=154 SD=14.79	<b>3.81</b>
	Nord	<b>45.97</b> N=62 SD=18.21	<b>58.49</b> N=57 SD=16.47	<b>12.52</b>	<b>64.27</b> N=62 SD=18.40	<b>78.73</b> N=57 SD=14.78	<b>14.46</b>
	Sud	<b>63.06</b> N=48 SD=12.08	<b>58.36</b> N=53 SD=14.25	<b>-4.70</b>	<b>77.03</b> N=48 SD=12.94	<b>83.16</b> N=53 SD=11.58	<b>6.13</b>
	Artibonite	---	<b>69.30</b> N=26 SD=8.79	---	---	<b>72.21</b> N=26 SD=13.53	---
Control Total Sample	Ouest	<b>54.70</b> N=101 SD=13.42	<b>60.09</b> N=77 SD=15.86	<b>5.39</b>	<b>70.40</b> N=101 SD=14.64	<b>73.44</b> N=77 SD=15.74	<b>3.04</b>
	Nord	<b>59.45</b> N=76 SD=14.28	<b>64.49</b> N=43 SD=12.71	<b>5.04</b>	<b>74.21</b> N=76 SD=14.91	<b>78.14</b> N=43 SD=15.74	<b>3.93</b>
	Sud	<b>53.62</b> N=35 SD=20.23	<b>55.77</b> N=30 SD=19.91	<b>2.15</b>	<b>61.43</b> N=35 SD=17.00	<b>68.75</b> N=30 SD=19.10	<b>7.32</b>
	Artibonite	<b>49.79</b> N=52 SD=14.55	<b>61.45</b> N=17 SD=10.97	<b>11.66</b>	<b>65.29</b> N=52 SD=13.31	<b>61.47</b> N=17 SD=15.44	<b>-3.82</b>
FAD Pre & Post	Ouest	<b>53.69</b> N=118 SD=16.87	<b>58.81</b> N=118 SD=15.19	<b>5.12</b>	<b>71.10</b> N=118 SD=17.83	<b>74.94</b> N=118 SD=14.73	<b>3.84</b>
	Nord	<b>50.38</b> N=42 SD=17.57	<b>58.84</b> N=42 SD=16.35	<b>8.46</b>	<b>67.38</b> N=42 SD=16.89	<b>79.46</b> N=42 SD=15.14	<b>12.08</b>
	Sud	<b>61.89</b> N=38 SD=12.46	<b>59.59</b> N=38 SD=14.70	<b>-2.30</b>	<b>77.17</b> N=38 SD=11.77	<b>85.00</b> N=38 SD=11.57	<b>7.83</b>
	Artibonite	---	---	---	---	---	---
Control Pre & Post	Ouest	<b>56.92</b> N=55 SD=12.90	<b>63.47</b> N=55 SD=15.37	<b>6.55</b>	<b>72.41</b> N=55 SD=13.68	<b>77.77</b> N=55 SD=14.05	<b>5.36</b>
	Nord	<b>58.56</b> N=34 SD=14.95	<b>63.97</b> N=34 SD=12.83	<b>5.41</b>	<b>70.81</b> N=34 SD=17.51	<b>79.41</b> N=34 SD=15.99	<b>8.60</b>
	Sud	<b>50.86</b> N=23 SD=22.37	<b>55.59</b> N=23 SD=20.38	<b>4.70</b>	<b>60.65</b> N=23 SD=17.34	<b>67.61</b> N=23 SD=20.54	<b>6.96</b>
	Artibonite	<b>45.83</b> N=15 SD=11.84	<b>62.26</b> N=15 SD=11.29	<b>16.43</b>	<b>66.67</b> N=15 SD=13.88	<b>64.50</b> N=15 SD=13.73	<b>-2.17</b>

**Table 29**  
**Third Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and Geographic Region**

<b>Treatment Group</b>	<b>Region</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Ouest	<b>50.55</b> N=173 SD=11.69	<b>50.24</b> N=148 SD=13.95	<b>-0.31</b>	<b>83.65</b> N=173 SD=10.36	<b>79.34</b> N=148 SD=12.67	<b>-4.31</b>
	Nord	<b>43.22</b> N=62 SD=13.84	<b>58.31</b> N=49 SD=14.52	<b>15.09</b>	<b>73.83</b> N=62 SD=10.72	<b>85.13</b> N=49 SD=8.39	<b>11.30</b>
	Sud	<b>46.59</b> N=64 SD=15.99	<b>63.09</b> N=47 SD=15.48	<b>16.50</b>	<b>79.27</b> N=64 SD=10.42	<b>81.18</b> N=47 SD=13.56	<b>1.91</b>
	Artibonite	<b>41.29</b> N=30 SD=14.16	<b>49.24</b> N=31 SD=15.46	<b>7.95</b>	<b>62.15</b> N=30 SD=13.57	<b>76.06</b> N=31 SD=11.31	<b>13.91</b>
Control Total Sample	Ouest	<b>53.14</b> N=103 SD=15.61	<b>51.71</b> N=74 SD=15.21	<b>-1.43</b>	<b>77.82</b> N=103 SD=13.10	<b>76.31</b> N=74 SD=12.99	<b>-1.51</b>
	Nord	<b>49.92</b> N=80 SD=13.43	<b>54.56</b> N=49 SD=16.70	<b>4.64</b>	<b>78.28</b> N=80 SD=11.44	<b>83.59</b> N=49 SD=11.10	<b>5.31</b>
	Sud	<b>42.11</b> N=30 SD=13.12	<b>46.40</b> N=30 SD=13.40	<b>4.29</b>	<b>68.67</b> N=30 SD=16.94	<b>73.85</b> N=30 SD=13.63	<b>5.18</b>
	Artibonite	<b>36.48</b> N=8 SD=14.61	<b>40.59</b> N=9 SD=18.88	<b>4.11</b>	<b>74.45</b> N=8 SD=14.25	<b>75.31</b> N=9 SD=11.73	<b>.86</b>
FAD Pre & Post	Ouest	<b>51.96</b> N=111 SD=10.96	<b>49.91</b> N=111 SD=13.07	<b>-2.05</b>	<b>84.90</b> N=111 SD=9.36	<b>78.50</b> N=111 SD=12.70	<b>-6.40</b>
	Nord	<b>42.97</b> N=37 SD=15.26	<b>56.10</b> N=37 SD=14.61	<b>13.13</b>	<b>74.95</b> N=37 SD=7.78	<b>83.84</b> N=37 SD=7.97	<b>8.89</b>
	Sud	<b>46.10</b> N=34 SD=16.22	<b>61.46</b> N=34 SD=16.08	<b>15.36</b>	<b>78.50</b> N=34 SD=9.81	<b>80.13</b> N=34 SD=14.70	<b>1.63</b>
	Artibonite	<b>43.34</b> N=17 SD=12.94	<b>44.66</b> N=17 SD=14.94	<b>1.32</b>	<b>64.18</b> N=17 SD=13.58	<b>74.77</b> N=17 SD=10.97	<b>10.59</b>
Control Pre & Post	Ouest	<b>52.86</b> N=40 SD=15.97	<b>53.98</b> N=40 SD=16.24	<b>1.12</b>	<b>78.50</b> N=40 SD=13.21	<b>77.39</b> N=40 SD=10.99	<b>-1.11</b>
	Nord	<b>47.96</b> N=32 SD=11.12	<b>56.12</b> N=32 SD=15.77	<b>8.16</b>	<b>76.39</b> N=32 SD=11.45	<b>85.43</b> N=32 SD=9.01	<b>9.04</b>
	Sud	<b>46.26</b> N=18 SD=11.69	<b>51.36</b> N=18 SD=9.98	<b>5.10</b>	<b>76.29</b> N=18 SD=11.98	<b>77.90</b> N=18 SD=11.00	<b>1.61</b>
	Artibonite	<b>40.48</b> N=6 SD=14.40	<b>40.48</b> N=6 SD=14.80	<b>0.00</b>	<b>78.52</b> N=6 SD=10.39	<b>75.93</b> N=6 SD=13.80	<b>-2.59</b>

**Table 30**  
**Fourth Grade Mean Percent Correct on Math and Reading Tests**  
**as a Function of Treatment Group and Geographic Region**

<b>Treatment Group</b>	<b>Region</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
FAD Total Sample	Ouest	<b>39.77</b> N=175 SD=14.94	<b>52.35</b> N=167 SD=15.20	<b>12.58</b>	<b>72.62</b> N=175 SD=12.60	<b>72.76</b> N=167 SD=15.07	<b>.14</b>
	Nord	<b>55.58</b> N=60 SD=13.47	<b>58.44</b> N=45 SD=14.45	<b>2.86</b>	<b>82.48</b> N=60 SD=10.10	<b>86.21</b> N=45 SD=8.69	<b>3.73</b>
	Sud	<b>56.20</b> N=54 SD=16.50	<b>71.82</b> N=46 SD=13.89	<b>15.62</b>	<b>80.65</b> N=54 SD=11.83	<b>85.25</b> N=46 SD=8.56	<b>4.60</b>
	Artibonite	<b>46.56</b> N=32 SD=13.39	<b>45.90</b> N=31 SD=18.69	<b>-.66</b>	<b>74.24</b> N=32 SD=9.57	<b>65.38</b> N=31 SD=12.38	<b>-8.86</b>
Control Total Sample	Ouest	<b>40.38</b> N=117 SD=18.50	<b>50.66</b> N=79 SD=19.01	<b>10.28</b>	<b>72.54</b> N=117 SD=15.61	<b>74.01</b> N=79 SD=15.24	<b>1.47</b>
	Nord	<b>54.31</b> N=87 SD=14.61	<b>56.89</b> N=41 SD=19.10	<b>2.58</b>	<b>74.99</b> N=87 SD=11.01	<b>79.79</b> N=41 SD=13.08	<b>4.80</b>
	Sud	<b>36.42</b> N=30 SD=12.42	<b>43.33</b> N=27 SD=13.46	<b>6.91</b>	<b>72.38</b> N=30 SD=12.23	<b>68.10</b> N=27 SD=15.92	<b>-4.28</b>
	Artibonite	<b>22.10</b> N=31 SD=12.48	<b>33.36</b> N=29 SD=12.38	<b>11.26</b>	<b>64.84</b> N=31 SD=13.98	<b>65.24</b> N=29 SD=8.49	<b>.40</b>
FAD Pre & Post	Ouest	<b>40.73</b> N=137 SD=15.05	<b>53.25</b> N=137 SD=15.19	<b>12.52</b>	<b>72.80</b> N=137 SD=12.75	<b>74.20</b> N=137 SD=14.47	<b>1.40</b>
	Nord	<b>58.50</b> N=35 SD=13.25	<b>59.64</b> N=35 SD=15.01	<b>1.14</b>	<b>84.02</b> N=35 SD=10.04	<b>88.11</b> N=35 SD=7.96	<b>4.09</b>
	Sud	<b>57.34</b> N=46 SD=15.81	<b>71.82</b> N=46 SD=13.89	<b>14.48</b>	<b>81.46</b> N=46 SD=10.74	<b>85.25</b> N=46 SD=8.56	<b>3.79</b>
	Artibonite	<b>46.06</b> N=26 SD=14.18	<b>44.44</b> N=26 SD=18.65	<b>-1.62</b>	<b>74.10</b> N=26 SD=8.52	<b>65.63</b> N=26 SD=12.57	<b>-8.47</b>
Control Pre & Post	Ouest	<b>35.18</b> N=57 SD=17.90	<b>50.48</b> N=57 SD=18.89	<b>15.30</b>	<b>68.89</b> N=57 SD=16.98	<b>74.76</b> N=57 SD=16.64	<b>5.87</b>
	Nord	<b>51.91</b> N=34 SD=14.95	<b>58.53</b> N=34 SD=18.56	<b>6.62</b>	<b>76.47</b> N=34 SD=11.59	<b>81.45</b> N=34 SD=12.51	<b>4.98</b>
	Sud	<b>36.82</b> N=22 SD=12.11	<b>44.09</b> N=22 SD=14.28	<b>7.27</b>	<b>72.63</b> N=22 SD=12.92	<b>69.94</b> N=22 SD=14.91	<b>-2.69</b>
	Artibonite	<b>19.91</b> N=27 SD=10.08	<b>32.78</b> N=27 SD=12.41	<b>12.87</b>	<b>64.63</b> N=27 SD=12.73	<b>64.93</b> N=27 SD=8.57	<b>.30</b>

**Math and Reading Results for Individual Schools**

The final set of Tables in the report (Tables 31-36) show the pretest performance, the posttest performance, and the amount of pretest to posttest gain for each school in the sample, broken down by grade. Again, no analyses were conducted on differences between schools, but many differences are obvious when inspecting the descriptive statistics in the Tables.

Table 31

**Second Grade Mean Percent Correct on  
Math and Reading Tests for FAD Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Bon Samaritain Total Sample	<b>53.63</b> N=28 SD=13.51	<b>53.87</b> N=36 SD=13.95	<b>.24</b>	<b>72.77</b> N=28 SD=12.53	<b>74.79</b> N=36 SD=13.33	<b>2.02</b>
Saint Antoine de Padoue Total Sample	<b>53.85</b> N=19 SD=14.75	<b>57.15</b> N=16 SD=17.70	<b>3.30</b>	<b>64.08</b> N=19 SD=17.84	<b>70.47</b> N=16 SD=12.69	<b>6.39</b>
Institution Joyau de Salem Total Sample	<b>56.43</b> N=30 SD=16.23	<b>54.35</b> N=23 SD=13.40	<b>-2.08</b>	<b>80.17</b> N=30 SD=13.23	<b>80.22</b> N=23 SD=12.97	<b>.05</b>
Le Normalien Total Sample	<b>41.01</b> N=31 SD=17.40	<b>57.14</b> N=29 SD=17.47	<b>16.13</b>	<b>62.98</b> N=31 SD=17.20	<b>75.17</b> N=29 SD=15.78	<b>12.19</b>
Notre-Dame de Lamerzie Total Sample	<b>50.92</b> N=31 SD=17.92	<b>59.88</b> N=28 SD=15.56	<b>8.96</b>	<b>65.56</b> N=31 SD=19.71	<b>82.41</b> N=28 SD=12.92	<b>16.85</b>
Dio school Total Sample	<b>38.10</b> N=21 SD=21.55	<b>49.55</b> N=12 SD=16.65	<b>11.45</b>	<b>56.07</b> N=21 SD=26.64	<b>65.83</b> N=12 SD=22.11	<b>9.76</b>
Eben-Ezer la Fraternite Total Sample	<b>50.89</b> N=10 SD=20.16	<b>52.46</b> N=8 SD=16.05	<b>1.57</b>	<b>60.50</b> N=10 SD=18.81	<b>66.88</b> N=8 SD=22.63	<b>6.38</b>
Mixte Evangelique de Nazareth Total Sample	<b>65.65</b> N=21 SD=8.91	<b>58.99</b> N=29 SD=13.57	<b>-6.66</b>	<b>70.95</b> N=21 SD=12.31	<b>78.71</b> N=29 SD=12.58	<b>7.76</b>
Siloe Total Sample	<b>59.26</b> N=32 SD=16.13	<b>69.64</b> N=29 SD=11.66	<b>10.38</b>	<b>75.55</b> N=32 SD=15.54	<b>83.45</b> N=29 SD=9.44	<b>7.90</b>
Nationale Saint Pierre Total Sample	<b>53.15</b> N=30 SD=12.79	<b>61.55</b> N=30 SD=14.31	<b>8.40</b>	<b>75.00</b> N=30 SD=11.62	<b>71.58</b> N=30 SD=12.82	<b>-3.42</b>
Ecole Catherine Flon Total Sample		<b>69.30</b> N=26 SD=8.79			<b>72.21</b> N=26 SD=13.53	
Saint Joseph de Cote de Fer Total Sample	<b>61.04</b> N=27 SD=13.90	<b>57.59</b> N=24 SD=15.30	<b>-3.45</b>	<b>81.76</b> N=27 SD=11.54	<b>88.54</b> N=24 SD=7.44	<b>6.78</b>
Total Total Sample	<b>53.19</b> N=280 SD=17.30	<b>59.35</b> N=290 SD=15.21	<b>6.16</b>	<b>70.69</b> N=280 SD=17.68	<b>77.00</b> N=290 SD=14.48	<b>6.31</b>
Bon Samaritain Pre & Post	<b>54.85</b> N=21 SD=13.29	<b>57.06</b> N=21 SD=12.20	<b>2.21</b>	<b>72.38</b> N=21 SD=13.64	<b>75.71</b> N=21 SD=12.05	<b>3.33</b>
Saint Antoine de Padoue Pre & Post	<b>55.10</b> N=14 SD=16.69	<b>56.12</b> N=14 SD=18.78	<b>1.02</b>	<b>65.89</b> N=14 SD=18.90	<b>69.82</b> N=14 SD=12.58	<b>3.93</b>
Institution Joyau de Salem Pre & Post	<b>55.58</b> N=16 SD=15.89	<b>54.69</b> N=16 SD=14.68	<b>-.89</b>	<b>82.81</b> N=16 SD=8.84	<b>82.81</b> N=16 SD=12.17	<b>0.00</b>
Le Normalien	<b>43.91</b>	<b>57.25</b>	<b>13.34</b>	<b>65.44</b>	<b>73.68</b>	<b>8.24</b>

Pre & Post	N=17 SD=16.84	N=17 SD=18.52		N=17 SD=18.14	N=17 SD=18.27	
Notre-Dame de Lamerchie Pre & Post	<b>54.78</b> N=25 SD=16.99	<b>59.93</b> N=25 SD=15.00	<b>5.15</b>	<b>68.70</b> N=25 SD=16.24	<b>83.40</b> N=25 SD=11.36	<b>14.70</b>
Dio school Pre & Post	<b>36.31</b> N=9 SD=26.86	<b>48.21</b> N=9 SD=16.20	<b>11.90</b>	<b>48.89</b> N=9 SD=28.31	<b>65.28</b> N=9 SD=20.86	<b>16.39</b>
Eben-Ezer la Fraternite Pre & Post	<b>49.55</b> N=8 SD=22.22	<b>52.46</b> N=8 SD=16.05	<b>2.91</b>	<b>59.69</b> N=8 SD=21.15	<b>66.88</b> N=8 SD=22.63	<b>7.19</b>
Mixte Evangelique de Nazareth Pre & Post	<b>66.39</b> N=17 SD=8.98	<b>62.08</b> N=17 SD=13.68	<b>-4.31</b>	<b>73.53</b> N=17 SD=11.46	<b>80.29</b> N=17 SD=14.06	<b>6.76</b>
Siloe Pre & Post	<b>59.17</b> N=22 SD=15.60	<b>69.81</b> N=22 SD=10.76	<b>10.64</b>	<b>73.07</b> N=22 SD=16.71	<b>83.75</b> N=22 SD=8.96	<b>10.68</b>
Nationale Saint Pierre Pre & Post	<b>53.51</b> N=28 SD=12.73	<b>60.39</b> N=28 SD=14.11	<b>6.88</b>	<b>74.91</b> N=28 SD=11.64	<b>70.89</b> N=28 SD=13.00	<b>-4.02</b>
Ecole Catherine Flon Pre & Post	---	---		---	---	
Saint Joseph de Cote de Fer Pre & Post	<b>58.25</b> N=21 SD=13.84	<b>57.57</b> N=21 SD=15.50	<b>-.68</b>	<b>80.12</b> N=21 SD=11.44	<b>88.81</b> N=21 SD=7.44	<b>8.69</b>
Total Pre & Post	<b>54.56</b> N=198 SD=16.64	<b>58.96</b> N=198 SD=15.28	<b>4.40</b>	<b>71.48</b> N=198 SD=16.85	<b>77.83</b> N=198 SD=14.74	<b>6.35</b>

Table 32

**Third Grade Mean Percent Correct on  
Math and Reading Tests for FAD Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Bon Samaritain Total Sample	<b>46.60</b> N=30 SD=9.06	<b>52.63</b> N=20 SD=10.56	<b>6.03</b>	<b>76.52</b> N=30 SD=8.71	<b>81.92</b> N=20 SD=8.96	<b>5.40</b>
Saint Antoine de Padoue Total Sample	<b>61.63</b> N=20 SD=9.07	<b>51.26</b> N=17 SD=12.28	<b>-10.37</b>	<b>93.78</b> N=20 SD=5.08	<b>80.00</b> N=17 SD=11.00	<b>-13.78</b>
Institution Joyau de Salem Total Sample	<b>51.29</b> N=30 SD=7.98	<b>55.25</b> N=28 SD=9.83	<b>3.96</b>	<b>79.63</b> N=30 SD=10.26	<b>85.79</b> N=28 SD=6.90	<b>6.16</b>
Le Normalien Total Sample	<b>44.30</b> N=31 SD=14.02	<b>60.80</b> N=19 SD=14.88	<b>16.50</b>	<b>73.19</b> N=31 SD=12.92	<b>86.08</b> N=19 SD=9.54	<b>12.89</b>
Notre-Dame de Lamerzie Total Sample	<b>42.13</b> N=31 SD=13.81	<b>56.74</b> N=30 SD=14.31	<b>14.61</b>	<b>74.48</b> N=31 SD=8.11	<b>84.52</b> N=30 SD=7.69	<b>10.04</b>
Dio school Total Sample	<b>47.19</b> N=24 SD=11.67	<b>44.39</b> N=16 SD=16.60	<b>-2.80</b>	<b>83.80</b> N=24 SD=9.84	<b>72.78</b> N=16 SD=15.89	<b>-11.02</b>
Eben-Ezer la Fraternite Total Sample	<b>43.47</b> N=10 SD=15.87	<b>33.67</b> N=8 SD=14.51	<b>-9.80</b>	<b>77.33</b> N=10 SD=13.03	<b>58.61</b> N=8 SD=17.74	<b>-18.72</b>
Mixte Evangelique de Nazareth Total Sample	<b>36.42</b> N=32 SD=12.37	<b>55.84</b> N=22 SD=16.20	<b>19.42</b>	<b>74.03</b> N=32 SD=9.02	<b>71.41</b> N=22 SD=12.52	<b>-2.62</b>
Siloe Total Sample	<b>56.33</b> N=30 SD=8.12	<b>55.81</b> N=29 SD=12.03	<b>-.52</b>	<b>89.19</b> N=30 SD=7.80	<b>85.29</b> N=29 SD=6.35	<b>-3.90</b>
Nationale Saint Pierre Total Sample	<b>45.46</b> N=29 SD=13.26	<b>45.58</b> N=30 SD=15.18	<b>.12</b>	<b>84.52</b> N=29 SD=8.05	<b>74.52</b> N=30 SD=12.54	<b>-10.00</b>
Ecole Catherine Flon Total Sample	<b>41.29</b> N=30 SD=14.16	<b>49.24</b> N=31 SD=15.46	<b>7.95</b>	<b>62.15</b> N=30 SD=13.57	<b>76.06</b> N=31 SD=11.31	<b>13.91</b>
Saint Joseph de Cote de Fer Total Sample	<b>56.76</b> N=32 SD=12.38	<b>69.47</b> N=25 SD=11.80	<b>12.71</b>	<b>84.51</b> N=32 SD=9.09	<b>89.78</b> N=25 SD=7.12	<b>5.27</b>
Total Total Sample	<b>47.55</b> N=329 SD=13.64	<b>53.76</b> N=275 SD=15.34	<b>6.21</b>	<b>78.99</b> N=329 SD=12.54	<b>80.32</b> N=275 SD=12.25	<b>1.33</b>
Bon Samaritain Pre & Post	<b>50.65</b> N=11 SD=10.32	<b>57.47</b> N=11 SD=8.37	<b>6.82</b>	<b>77.98</b> N=11 SD=8.34	<b>82.88</b> N=11 SD=9.99	<b>4.90</b>
Saint Antoine de Padoue Pre & Post	<b>60.97</b> N=16 SD=9.48	<b>51.66</b> N=16 SD=12.57	<b>-9.31</b>	<b>93.33</b> N=16 SD=5.20	<b>79.44</b> N=16 SD=11.11	<b>-13.89</b>
Institution Joyau de Salem Pre & Post	<b>50.75</b> N=23 SD=7.67	<b>55.28</b> N=23 SD=9.69	<b>4.53</b>	<b>79.90</b> N=23 SD=10.90	<b>84.54</b> N=23 SD=6.05	<b>4.64</b>
Le Normalien	<b>46.73</b>	<b>56.74</b>	<b>10.01</b>	<b>73.33</b>	<b>81.11</b>	<b>7.78</b>

Pre & Post	N=10 SD=17.14	N=10 SD=16.82		N=10 SD=10.21	N=10 SD=10.33	
Notre-Dame de Lamerchie	<b>41.57</b>	<b>55.86</b>	<b>14.29</b>	<b>75.56</b>	<b>84.86</b>	<b>9.30</b>
Pre & Post	N=27 SD=14.60	N=27 SD=14.05		N=27 SD=6.81	N=27 SD=6.86	
Dio school	<b>45.19</b>	<b>41.25</b>	<b>-3.94</b>	<b>84.29</b>	<b>70.95</b>	<b>-13.34</b>
Pre & Post	N=14 SD=8.12	N=14 SD=14.85		N=14 SD=8.56	N=14 SD=15.48	
Eben-Ezer la Fratemite	<b>51.02</b>	<b>39.12</b>	<b>-11.90</b>	<b>79.26</b>	<b>64.08</b>	<b>-15.18</b>
Pre & Post	N=6 SD=11.90	N=6 SD=12.34		N=6 SD=7.26	N=6 SD=17.18	
Mixte Evangelique de Nazareth	<b>36.84</b>	<b>54.08</b>	<b>17.24</b>	<b>74.11</b>	<b>71.22</b>	<b>-2.89</b>
Pre & Post	N=20 SD=13.56	N=20 SD=15.72		N=20 SD=7.94	N=20 SD=12.83	
Siloe	<b>57.71</b>	<b>54.08</b>	<b>-3.63</b>	<b>89.01</b>	<b>85.31</b>	<b>-3.70</b>
Pre & Post	N=18 SD=6.63	N=18 SD=11.91		N=18 SD=7.75	N=18 SD=6.38	
Nationale Saint Pierre	<b>47.38</b>	<b>44.54</b>	<b>-2.84</b>	<b>85.99</b>	<b>72.76</b>	<b>-13.23</b>
Pre & Post	N=23 SD=13.69	N=23 SD=12.69		N=23 SD=6.48	N=23 SD=13.67	
Ecole Catherine Flon	<b>43.34</b>	<b>44.66</b>	<b>1.32</b>	<b>64.18</b>	<b>74.77</b>	<b>10.59</b>
Pre & Post	N=17 SD=12.94	N=17 SD=14.94		N=17 SD=13.58	N=17 SD=10.97	
Saint Joseph de Cote de Fer	<b>59.33</b>	<b>72.01</b>	<b>12.68</b>	<b>84.76</b>	<b>92.86</b>	<b>8.10</b>
Pre & Post	N=14 SD=8.86	N=14 SD=9.59		N=14 SD=8.97	N=14 SD=3.40	
Total	<b>48.55</b>	<b>52.59</b>	<b>4.04</b>	<b>80.19</b>	<b>79.46</b>	<b>-0.73</b>
Pre & Post	N=199 SD=13.50	N=199 SD=14.84		N=199 SD=11.43	N=199 SD=12.37	

Table 33

**Fourth Grade Mean Percent Correct on  
Math and Reading Tests for FAD Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Bon Samaritain Total Sample	<b>39.72</b> N=27 SD=14.16	<b>45.60</b> N=29 SD=13.93	<b>5.88</b>	<b>70.82</b> N=27 SD=11.71	<b>70.72</b> N=29 SD=9.94	<b>-1.10</b>
Saint Antoine de Padoue Total Sample	<b>35.69</b> N=18 SD=17.67	<b>53.00</b> N=15 SD=15.73	<b>17.31</b>	<b>67.69</b> N=18 SD=9.13	<b>71.43</b> N=15 SD=11.39	<b>3.74</b>
Institution Joyau de Salem Total Sample	<b>36.92</b> N=30 SD=13.51	<b>52.31</b> N=27 SD=15.28	<b>15.39</b>	<b>78.37</b> N=30 SD=6.60	<b>80.50</b> N=27 SD=8.27	<b>2.13</b>
Le Normalien Total Sample	<b>58.67</b> N=30 SD=15.02	<b>69.22</b> N=16 SD=11.24	<b>10.55</b>	<b>84.01</b> N=30 SD=8.34	<b>89.16</b> N=16 SD=7.55	<b>5.15</b>
Notre-Dame de Lamerce Total Sample	<b>52.50</b> N=30 SD=11.12	<b>52.50</b> N=29 SD=12.55	<b>.00</b>	<b>80.95</b> N=30 SD=11.54	<b>84.59</b> N=29 SD=8.97	<b>3.64</b>
Dio school Total Sample	<b>40.58</b> N=26 SD=13.63	<b>50.24</b> N=21 SD=16.18	<b>9.66</b>	<b>70.33</b> N=26 SD=16.40	<b>66.08</b> N=21 SD=18.12	<b>-4.25</b>
Eben-Ezer la Fraternite Total Sample	<b>30.33</b> N=15 SD=10.97	<b>42.79</b> N=17 SD=9.14	<b>12.46</b>	<b>57.96</b> N=15 SD=10.71	<b>53.90</b> N=17 SD=15.07	<b>-4.06</b>
Mixte Evangelique de Nazareth Total Sample	<b>45.14</b> N=18 SD=17.18	<b>59.11</b> N=12 SD=12.35	<b>13.97</b>	<b>75.28</b> N=18 SD=13.89	<b>84.23</b> N=12 SD=10.44	<b>8.95</b>
Siloe Total Sample	<b>47.75</b> N=30 SD=13.96	<b>60.95</b> N=29 SD=13.72	<b>13.20</b>	<b>80.95</b> N=30 SD=10.78	<b>86.00</b> N=29 SD=7.33	<b>5.05</b>
Nationale Saint Pierre Total Sample	<b>41.21</b> N=29 SD=16.00	<b>57.33</b> N=29 SD=14.27	<b>16.12</b>	<b>72.41</b> N=29 SD=9.89	<b>70.94</b> N=29 SD=14.30	<b>-1.47</b>
Ecole Catherine Flon Total Sample	<b>46.56</b> N=32 SD=13.39	<b>45.90</b> N=31 SD=18.69	<b>-.66</b>	<b>74.24</b> N=32 SD=9.57	<b>65.38</b> N=31 SD=12.38	<b>-8.86</b>
Saint Joseph de Cote de Fer Total Sample	<b>61.74</b> N=36 SD=13.21	<b>76.31</b> N=34 SD=11.51	<b>14.57</b>	<b>83.33</b> N=36 SD=9.80	<b>85.61</b> N=34 SD=7.94	<b>2.28</b>
Total Total Sample	<b>46.17</b> N=321 SD=16.53	<b>55.71</b> N=289 SD=17.06	<b>9.54</b>	<b>75.97</b> N=321 SD=12.46	<b>76.05</b> N=289 SD=14.77	<b>.08</b>
Bon Samaritain Pre & Post	<b>35.88</b> N=17 SD=13.92	<b>43.53</b> N=17 SD=12.60	<b>7.65</b>	<b>68.43</b> N=17 SD=10.36	<b>69.51</b> N=17 SD=9.31	<b>1.08</b>
Saint Antoine de Padoue Pre & Post	<b>39.29</b> N=14 SD=18.51	<b>53.04</b> N=14 SD=16.33	<b>13.75</b>	<b>67.64</b> N=14 SD=9.96	<b>70.84</b> N=14 SD=11.58	<b>3.20</b>
Institution Joyau de Salem Pre & Post	<b>39.04</b> N=26 SD=12.94	<b>52.69</b> N=26 SD=15.46	<b>13.65</b>	<b>79.04</b> N=26 SD=6.70	<b>79.98</b> N=26 SD=7.98	<b>.94</b>
Le Normalien	<b>64.82</b>	<b>69.64</b>	<b>4.82</b>	<b>84.40</b>	<b>91.40</b>	<b>7.00</b>

Pre & Post	N=14 SD=13.46	N=14 SD=11.76		N=14 SD=9.36	N=14 SD=4.68	
Notre-Dame de Lamerchie	<b>54.29</b>	<b>52.98</b>	<b>-1.31</b>	<b>83.77</b>	<b>85.91</b>	<b>2.14</b>
Pre & Post	N=21 SD=11.57	N=21 SD=13.29		N=21 SD=10.69	N=21 SD=8.99	
Dio school	<b>42.67</b>	<b>51.67</b>	<b>9.00</b>	<b>70.89</b>	<b>69.52</b>	<b>-1.37</b>
Pre & Post	N=15 SD=13.28	N=15 SD=17.26		N=15 SD=18.21	N=15 SD=19.61	
Eben-Ezer la Fratemite	<b>30.38</b>	<b>44.62</b>	<b>14.24</b>	<b>57.30</b>	<b>56.36</b>	<b>-.94</b>
Pre & Post	N=13 SD=10.70	N=13 SD=8.22		N=13 SD=8.23	N=13 SD=13.58	
Mixte Evangelique de Nazareth	<b>45.42</b>	<b>59.11</b>	<b>13.69</b>	<b>75.51</b>	<b>84.23</b>	<b>8.72</b>
Pre & Post	N=12 SD=16.65	N=12 SD=12.35		N=12 SD=10.83	N=12 SD=10.44	
Siloe	<b>47.50</b>	<b>60.18</b>	<b>12.68</b>	<b>80.98</b>	<b>85.86</b>	<b>4.88</b>
Pre & Post	N=28 SD=14.43	N=28 SD=13.31		N=28 SD=10.89	N=28 SD=7.43	
Nationale Saint Pierre	<b>43.33</b>	<b>58.44</b>	<b>15.11</b>	<b>72.19</b>	<b>72.19</b>	<b>.00</b>
Pre & Post	N=24 SD=16.43	N=24 SD=14.76		N=24 SD=10.58	N=24 SD=14.58	
Saint Joseph de Cote de Fer	<b>46.06</b>	<b>44.44</b>	<b>-1.62</b>	<b>74.10</b>	<b>65.63</b>	<b>-8.47</b>
Pre & Post	N=26 SD=14.18	N=26 SD=18.65		N=26 SD=8.52	N=26 SD=12.57	
Total	<b>61.54</b>	<b>76.31</b>	<b>14.77</b>	<b>83.55</b>	<b>85.61</b>	<b>2.06</b>
Pre & Post	N=34 SD=13.36	N=34 SD=11.51		N=34 SD=10.04	N=34 SD=7.94	
	<b>46.98</b>	<b>56.73</b>	<b>9.75</b>	<b>76.18</b>	<b>77.37</b>	<b>1.19</b>
	N=244 SD=16.73	N=244 SD=17.31		N=244 SD=12.45	N=244 SD=14.30	

Table 34

**Second Grade Mean Percent Correct on  
Math and Reading Tests for Control Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Methodiste Libre de Violet Total Sample	<b>49.18</b> N=13 SD=10.09	<b>56.17</b> N=11 SD=13.61	<b>6.99</b>	<b>62.88</b> N=13 SD=11.76	<b>71.14</b> N=11 SD=14.20	<b>8.26</b>
Notre-Dame du Mont Carmel Total Sample	<b>51.34</b> N=16 SD=16.08	<b>62.99</b> N=11 SD=16.13	<b>11.65</b>	<b>63.91</b> N=16 SD=14.89	<b>72.05</b> N=11 SD=14.35	<b>8.14</b>
St Joseph de Bahon Total Sample	<b>64.46</b> N=30 SD=11.33	<b>70.95</b> N=15 SD=12.49	<b>6.49</b>	<b>78.58</b> N=30 SD=10.56	<b>81.83</b> N=15 SD=15.34	<b>3.25</b>
Mixte La Belle Etoile Total Sample	<b>45.54</b> N=14 SD=17.25	<b>54.64</b> N=10 SD=15.64	<b>9.10</b>	<b>56.25</b> N=14 SD=15.99	<b>62.25</b> N=10 SD=14.55	<b>6.00</b>
Baptiste de la Grace Total Sample	<b>60.83</b> N=32 SD=11.60	<b>64.58</b> N=18 SD=6.86	<b>3.75</b>	<b>77.97</b> N=32 SD=12.14	<b>83.89</b> N=18 SD=10.51	<b>5.92</b>
Institution Classique Latremblay Total Sample	<b>55.07</b> N=31 SD=13.25	<b>58.65</b> N=13 SD=11.95	<b>3.58</b>	<b>75.00</b> N=31 SD=11.27	<b>75.38</b> N=13 SD=14.36	<b>.38</b>
Nationale Total Sample	<b>57.08</b> N=30 SD=11.98	<b>61.61</b> N=28 SD=17.53	<b>4.53</b>	<b>70.67</b> N=30 SD=15.00	<b>75.80</b> N=28 SD=18.09	<b>5.13</b>
Nationale de Fonds des Blancs Total Sample	<b>53.62</b> N=35 SD=20.23	<b>55.77</b> N=30 SD=19.91	<b>2.15</b>	<b>61.43</b> N=35 SD=17.00	<b>68.75</b> N=30 SD=19.10	<b>7.32</b>
Nationale Fond Parisien Total Sample	<b>58.61</b> N=11 SD=16.03	<b>59.18</b> N=14 SD=18.14	<b>.57</b>	<b>75.00</b> N=11 SD=19.56	<b>69.82</b> N=14 SD=15.11	<b>-5.18</b>
Ecole Evangelique de Niel Total Sample	<b>49.79</b> N=52 SD=14.55	<b>61.45</b> N=17 SD=10.97	<b>11.66</b>	<b>65.29</b> N=52 SD=13.31	<b>61.47</b> N=17 SD=15.44	<b>-3.82</b>
Total Total Sample	<b>54.96</b> N=264 SD=15.23	<b>60.59</b> N=167 SD=15.66	<b>5.63</b>	<b>69.30</b> N=264 SD=15.35	<b>72.59</b> N=167 SD=16.92	<b>3.29</b>
Methodiste Libre de Violet Pre & Post	<b>50.45</b> N=8 SD=11.76	<b>58.48</b> N=8 SD=14.05	<b>8.03</b>	<b>65.00</b> N=8 SD=12.32	<b>75.63</b> N=8 SD=12.52	<b>10.63</b>
Notre-Dame du Mont Carmel Pre & Post	<b>54.76</b> N=9 SD=13.51	<b>67.86</b> N=9 SD=9.94	<b>13.10</b>	<b>68.89</b> N=9 SD=8.94	<b>75.28</b> N=9 SD=12.40	<b>6.39</b>
St Joseph de Bahon Pre & Post	<b>64.48</b> N=9 SD=13.96	<b>69.25</b> N=9 SD=15.69	<b>4.77</b>	<b>74.72</b> N=9 SD=12.15	<b>81.94</b> N=9 SD=19.28	<b>7.22</b>
Mixte La Belle Etoile Pre & Post	<b>46.03</b> N=9 SD=16.43	<b>56.35</b> N=9 SD=15.57	<b>10.32</b>	<b>52.22</b> N=9 SD=16.18	<b>63.89</b> N=9 SD=14.42	<b>11.67</b>
Baptiste de la Grace Pre & Post	<b>62.28</b> N=16 SD=10.67	<b>65.29</b> N=16 SD=6.93	<b>3.01</b>	<b>79.06</b> N=16 SD=12.94	<b>86.72</b> N=16 SD=6.94	<b>7.66</b>
Institution Classique Latremblay	<b>53.32</b>	<b>61.74</b>	<b>8.42</b>	<b>77.50</b>	<b>85.36</b>	<b>7.86</b>

Pre & Post	N=7 SD=9.75	N=7 SD=7.06		N=7 SD=8.29	N=7 SD=7.13	
Nationale	<b>59.34</b>	<b>64.12</b>	<b>4.78</b>	<b>73.41</b>	<b>79.09</b>	<b>5.68</b>
Pre & Post	N=22 SD=12.25	N=22 SD=18.02		N=22 SD=12.85	N=22 SD=16.21	
Nationale de Fonds des Blancs	<b>50.86</b>	<b>55.59</b>	<b>4.73</b>	<b>60.65</b>	<b>67.61</b>	<b>6.96</b>
Pre & Post	N=23 SD=22.37	N=23 SD=20.38		N=23 SD=17.34	N=23 SD=20.54	
Nationale Fond Parisien	<b>61.71</b>	<b>63.29</b>	<b>1.58</b>	<b>76.11</b>	<b>73.06</b>	<b>-3.05</b>
Pre & Post	N=9 SD=15.95	N=9 SD=19.56		N=9 SD=21.36	N=9 SD=14.88	
Ecole Evangelique de Niel	<b>45.83</b>	<b>62.26</b>	<b>16.43</b>	<b>66.67</b>	<b>64.50</b>	<b>-2.17</b>
Pre & Post	N=15 SD=11.84	N=15 SD=11.29		N=15 SD=13.88	N=15 SD=13.73	
Total	<b>54.95</b>	<b>62.04</b>	<b>7.09</b>	<b>69.17</b>	<b>74.80</b>	<b>5.63</b>
Pre & Post	N=127 SD=15.84	N=127 SD=15.51		N=127 SD=15.93	N=127 SD=16.67	

Table 35

**Third Grade Mean Percent Correct on  
Math and Reading Tests for Control Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Methodiste Libre de Violet Total Sample	<b>43.95</b> N=15 SD=17.57	<b>38.22</b> N=11 SD=15.94	<b>-5.73</b>	<b>65.48</b> N=15 SD=14.37	<b>71.11</b> N=11 SD=16.84	<b>5.63</b>
Notre-Dame du Mont Carmel Total Sample	<b>51.51</b> N=21 SD=11.40	<b>56.33</b> N=15 SD=14.34	<b>4.82</b>	<b>76.72</b> N=21 SD=10.97	<b>81.04</b> N=15 SD=8.56	<b>4.32</b>
St Joseph de Bahon Total Sample	<b>54.69</b> N=30 SD=12.21	<b>60.36</b> N=19 SD=13.47	<b>5.67</b>	<b>80.89</b> N=30 SD=11.17	<b>85.03</b> N=19 SD=9.71	<b>4.14</b>
Mixte La Belle Etoile Total Sample	<b>39.29</b> N=20 SD=8.58	<b>44.90</b> N=15 SD=14.98	<b>5.61</b>	<b>68.45</b> N=20 SD=10.66	<b>77.67</b> N=15 SD=14.16	<b>9.22</b>
Baptiste de la Grace Total Sample	<b>52.24</b> N=30 SD=13.66	<b>56.87</b> N=15 SD=18.64	<b>4.63</b>	<b>82.22</b> N=30 SD=8.21	<b>87.70</b> N=15 SD=6.50	<b>5.48</b>
Institution Classique Latremblay Total Sample	<b>66.19</b> N=30 SD=8.70	<b>56.59</b> N=11 SD=9.13	<b>-9.60</b>	<b>86.81</b> N=30 SD=7.26	<b>72.52</b> N=11 SD=6.98	<b>-14.29</b>
Nationale Total Sample	<b>42.20</b> N=31 SD=8.34	<b>51.28</b> N=31 SD=14.23	<b>9.08</b>	<b>73.33</b> N=31 SD=11.46	<b>75.77</b> N=31 SD=13.67	<b>2.44</b>
Nationale de Fonds des Blancs Total Sample	<b>42.11</b> N=30 SD=13.12	<b>46.40</b> N=30 SD=13.40	<b>4.29</b>	<b>68.67</b> N=30 SD=16.94	<b>73.85</b> N=30 SD=13.63	<b>5.18</b>
Nationale Fond Parisien Total Sample	<b>73.13</b> N=6 SD=14.80	<b>58.16</b> N=6 SD=18.56	<b>-14.97</b>	<b>90.74</b> N=6 SD=8.71	<b>83.70</b> N=6 SD=15.75	<b>-7.04</b>
Ecole Evangelique de Niel Total Sample	<b>36.48</b> N=8 SD=14.61	<b>40.59</b> N=9 SD=18.88	<b>4.11</b>	<b>74.45</b> N=8 SD=14.25	<b>75.31</b> N=9 SD=11.73	<b>.86</b>
Total Total Sample	<b>49.88</b> N=221 SD=15.06	<b>50.97</b> N=162 SD=15.88	<b>1.09</b>	<b>76.62</b> N=221 SD=13.47	<b>78.00</b> N=162 SD=12.96	<b>1.38</b>
Methodiste Libre de Violet Pre & Post	<b>37.90</b> N=7 SD=15.03	<b>39.36</b> N=7 SD=15.66	<b>1.46</b>	<b>62.86</b> N=7 SD=14.67	<b>73.33</b> N=7 SD=8.32	<b>10.47</b>
Notre-Dame du Mont Carmel Pre & Post	<b>53.74</b> N=9 SD=12.07	<b>55.10</b> N=9 SD=16.17	<b>1.36</b>	<b>78.27</b> N=9 SD=5.86	<b>82.72</b> N=9 SD=7.76	<b>4.45</b>
St Joseph de Bahon Pre & Post	<b>48.98</b> N=8 SD=10.63	<b>61.48</b> N=8 SD=7.51	<b>12.50</b>	<b>76.39</b> N=8 SD=13.95	<b>87.22</b> N=8 SD=3.51	<b>10.83</b>
Mixte La Belle Etoile Pre & Post	<b>42.01</b> N=12 SD=8.55	<b>47.45</b> N=12 SD=14.22	<b>5.44</b>	<b>70.74</b> N=12 SD=10.42	<b>80.97</b> N=12 SD=12.02	<b>10.23</b>
Baptiste de la Grace Pre & Post	<b>53.23</b> N=12 SD=11.56	<b>61.23</b> N=12 SD=18.19	<b>8.00</b>	<b>82.04</b> N=12 SD=8.23	<b>88.70</b> N=12 SD=6.39	<b>6.66</b>
Institution Classique Latremblay	<b>66.47</b>	<b>58.60</b>	<b>-7.87</b>	<b>87.62</b>	<b>72.06</b>	<b>-15.56</b>

Pre & Post	N=7 SD=4.06	N=7 SD=7.52		N=7 SD=5.11	N=7 SD=7.24	
Nationale	<b>44.90</b>	<b>57.31</b>	<b>12.41</b>	<b>77.59</b>	<b>75.18</b>	<b>-2.41</b>
Pre & Post	N=12 SD=8.21	N=12 SD=15.94		N=12 SD=12.52	N=12 SD=11.40	
Nationale de Fonds des Blancs	<b>46.26</b>	<b>51.36</b>	<b>5.10</b>	<b>76.29</b>	<b>77.90</b>	<b>1.61</b>
Pre & Post	N=18 SD=11.69	N=18 SD=9.98		N=18 SD=11.98	N=18 SD=11.00	
Nationale Fond Parisien	<b>72.24</b>	<b>57.96</b>	<b>-14.28</b>	<b>90.22</b>	<b>86.22</b>	<b>-4.00</b>
Pre & Post	N=5 SD=16.37	N=5 SD=20.74		N=5 SD=9.64	N=5 SD=16.21	
Ecole Evangelique de Niel	<b>40.48</b>	<b>40.48</b>	<b>.00</b>	<b>78.52</b>	<b>75.93</b>	<b>-2.59</b>
Pre & Post	N=6 SD=14.40	N=6 SD=14.80		N=6 SD=10.39	N=6 SD=13.80	
Total	<b>49.21</b>	<b>53.36</b>	<b>4.15</b>	<b>77.38</b>	<b>80.08</b>	<b>2.70</b>
Pre & Post	N=96 SD=13.89	N=96 SD=15.26		N=96 SD=12.12	N=96 SD=11.07	

Table 36

**Fourth Grade Mean Percent Correct on  
Math and Reading Tests for Control Schools**

<b>School</b>	<b>Math Pretest</b>	<b>Math Posttest</b>	<b>Math Gain</b>	<b>Read Pretest</b>	<b>Read Posttest</b>	<b>Read Gain</b>
Methodiste Libre de Violet Total Sample	<b>38.00</b> N=25 SD=14.47	<b>42.50</b> N=19 SD=20.95	<b>4.50</b>	<b>64.98</b> N=25 SD=14.04	<b>66.70</b> N=19 SD=16.52	<b>1.72</b>
Notre-Dame du Mont Carmel Total Sample	<b>48.75</b> N=20 SD=18.75	<b>48.04</b> N=14 SD=18.14	<b>-.71</b>	<b>80.51</b> N=20 SD=13.75	<b>80.47</b> N=14 SD=10.46	<b>-.04</b>
St Joseph de Bahon Total Sample	<b>61.61</b> N=31 SD=14.57	<b>68.89</b> N=9 SD=15.42	<b>7.28</b>	<b>75.58</b> N=31 SD=10.06	<b>85.71</b> N=9 SD=8.66	<b>10.13</b>
Mixte La Belle Etoile Total Sample	<b>42.95</b> N=22 SD=13.27	<b>47.24</b> N=19 SD=17.12	<b>4.29</b>	<b>72.73</b> N=22 SD=10.53	<b>73.79</b> N=19 SD=13.49	<b>1.06</b>
Baptiste de la Grace Total Sample	<b>55.00</b> N=34 SD=10.71	<b>62.69</b> N=13 SD=18.07	<b>7.69</b>	<b>75.93</b> N=34 SD=12.19	<b>84.46</b> N=13 SD=11.86	<b>8.53</b>
Institution Classique Latremblay Total Sample	<b>45.34</b> N=29 SD=13.44	<b>65.33</b> N=15 SD=12.13	<b>19.99</b>	<b>81.14</b> N=29 SD=9.14	<b>83.54</b> N=15 SD=11.69	<b>2.40</b>
Nationale Total Sample	<b>23.92</b> N=30 SD=13.58	<b>46.76</b> N=27 SD=16.80	<b>22.84</b>	<b>61.16</b> N=30 SD=14.41	<b>69.24</b> N=27 SD=15.04	<b>8.08</b>
Nationale de Fonds des Blancs Total Sample	<b>36.42</b> N=30 SD=12.42	<b>43.33</b> N=27 13.46	<b>6.91</b>	<b>72.38</b> N=30 SD=12.23	<b>68.10</b> N=27 SD=15.92	<b>-4.28</b>
Nationale Fond Parisien Total Sample	<b>59.04</b> N=13 SD=14.88	<b>70.00</b> N=4 SD=6.12	<b>10.96</b>	<b>81.95</b> N=13 SD=11.93	<b>82.65</b> N=4 SD=6.35	<b>.70</b>
Ecole Evangelique de Niel Total Sample	<b>22.10</b> N=31 SD=12.48	<b>33.36</b> N=29 SD=12.38	<b>11.26</b>	<b>64.84</b> N=31 SD=13.98	<b>65.24</b> N=29 SD=8.49	<b>.40</b>
Total Total Sample	<b>42.37</b> N=265 SD=18.86	<b>48.14</b> N=176 SD=18.88	<b>5.77</b>	<b>72.43</b> N=265 SD=13.93	<b>73.01</b> N=176 SD=14.73	<b>.58</b>
Methodiste Libre de Violet Pre & Post	<b>34.64</b> N=14 SD=16.11	<b>44.82</b> N=14 SD=22.75	<b>10.18</b>	<b>62.25</b> N=14 SD=14.80	<b>66.18</b> N=14 SD=17.79	<b>3.93</b>
Notre-Dame du Mont Carmel Pre & Post	<b>46.25</b> N=8 SD=15.24	<b>52.50</b> N=8 SD=16.96	<b>6.25</b>	<b>81.89</b> N=8 SD=8.89	<b>85.46</b> N=8 SD=5.17	<b>3.57</b>
St Joseph de Bahon Pre & Post	<b>62.50</b> N=8 SD=16.37	<b>68.44</b> N=8 SD=16.42	<b>5.94</b>	<b>82.40</b> N=8 SD=8.01	<b>87.24</b> N=8 SD=7.85	<b>4.84</b>
Mixte La Belle Etoile Pre & Post	<b>41.15</b> N=13 SD=11.66	<b>48.27</b> N=13 SD=16.28	<b>7.12</b>	<b>71.90</b> N=13 SD=10.35	<b>74.88</b> N=13 SD=13.24	<b>2.98</b>
Baptiste de la Grace Pre & Post	<b>56.15</b> N=13 SD=10.14	<b>62.69</b> N=13 SD=18.07	<b>6.54</b>	<b>77.39</b> N=13 SD=13.34	<b>84.46</b> N=13 SD=11.86	<b>7.07</b>
Institution Classique Latremblay	<b>49.17</b>	<b>66.11</b>	<b>16.94</b>	<b>86.40</b>	<b>90.25</b>	<b>3.85</b>

Pre & Post	N=9 SD=11.46	N=9 SD=13.41		N=9 SD=7.22	N=9 SD=6.02	
Nationale	<b>23.80</b>	<b>44.89</b>	<b>21.09</b>	<b>61.22</b>	<b>69.03</b>	<b>7.81</b>
Pre & Post	N=23 SD=14.88	N=23 SD=15.80		N=23 SD=15.55	N=23 SD=16.10	
Nationale de Fonds des Blancs	<b>36.82</b>	<b>44.09</b>	<b>7.27</b>	<b>72.63</b>	<b>69.94</b>	<b>-2.69</b>
Pre & Post	N=22 SD=12.11	N=22 SD=14.28		N=22 SD=12.92	N=22 SD=14.91	
Nationale Fond Parisien	<b>53.33</b>	<b>67.50</b>	<b>14.17</b>	<b>71.43</b>	<b>83.67</b>	<b>12.24</b>
Pre & Post	N=3 SD=12.58	N=3 SD=4.33		N=3 SD=21.30	N=3 SD=7.36	
Ecole Evangelique de Niel	<b>19.91</b>	<b>32.78</b>	<b>12.87</b>	<b>64.63</b>	<b>64.93</b>	<b>.30</b>
Pre & Post	N=27 SD=10.08	N=27 SD=12.41		N=27 SD=12.73	N=27 SD=8.57	
Total	<b>36.55</b>	<b>48.02</b>	<b>11.47</b>	<b>70.50</b>	<b>73.73</b>	<b>3.23</b>
Pre & Post	N=140 SD=18.32	N=140 SD=19.03		N=140 SD=14.86	N=140 SD=15.11	