

Accelerated Reading Instruction/ Accelerated Math Instruction (ARI/AMI) Program: Updated Performance Review

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**Joseph Shields; Amie S. Rapaport, PhD; Eishi Adachi, PhD; Ellen W. Montgomery,
PhD; and Linda J. Adams**



Program Staff:
Susan Barnes
George Rislov
Sharon Jackson
Jana Bland
Kelly Callaway

**Office for Planning, Grants, and Evaluation
Texas Education Agency
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Texas Education Agency

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Accelerated Reading Instruction/ Accelerated Math Instruction (ARI/AMI) Program: Updated Performance Review

Overview

The Accelerated Reading Instruction/Accelerated Mathematics Instruction (ARI/AMI) program, which is a major component of the Student Success Initiative (SSI), provides immediate, targeted instruction to students identified as struggling in reading or mathematics.¹ Originated by Senate Bill (SB) 4 of the 76th Texas Legislature, and expanded during the 77th, 78th and 79th Texas Legislatures, the SSI aims to provide students with comprehensive research-based instruction to prepare them for academic success. Annual evaluations of the ARI/AMI program conducted by the Texas Education Agency's (TEA's) Office for Planning, Grants and Evaluation (OPGE) have shown evidence of program success using statewide reports by grantee school districts.

This report expands the analysis of the ARI/AMI program to include cohort analyses of students who failed the first administration of the Grade 3 Texas Assessment of Knowledge and Skills (TAKS) exams in reading and mathematics in Spring 2004. Separate analyses are conducted for a cohort of students who did not pass the first administration of the TAKS exam in reading and a cohort of students who did not pass the first administration of the TAKS exam in mathematics. The analysis includes student TAKS and grade retention results following the cohorts from the 2003-2004 school year through the 2004-2005 and 2005-2006 school years.

Scope of ARI/AMI Program

The ARI/AMI grant program is available to nearly every local education agency (LEA) in the state. During the 2005-2006 school year, a total of 1,112 school districts and

¹ Student identification as "struggling" in reading may be based on results of diagnostic tests and/or TAKS test results. Additionally, teachers may have other reasons to identify a student as struggling. LEAs report to TEA the aggregate number of children identified as struggling for the LEA as a whole.

charter schools, or 99% of the eligible LEAs, received ARI/AMI grant awards. These LEAs provided services to struggling students enrolled at 4,159 campuses in Texas.

The results reported by LEAs through the agency’s eGrants system (summarized below) indicate that the large majority of students served by the program (Grades K-6) were on grade level in reading (66%) and math (69%)² at the end of the school year.³

Reading

Out of the nearly 2.4 million Texas students enrolled in Grades K-6 during the 2005-2006 school year, 692,200 (29%) were identified as struggling readers. A total of 563,559 students in Grades K-6 were subsequently served with ARI funds during the 2005-2006 school year. Statewide ARI data for the 2005-2006 school year are provided below.

Table 1
Struggling Reading Students, 2005-2006 School Year

	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
2005-2006 Enrollment	349,277	358,568	344,256	339,803	329,064	336,224	322,605	2,379,797
Students Identified as Struggling Readers	86,717	119,262	110,308	116,345	91,550	103,658	64,360	692,200
% Identified as Struggling Readers	25%	33%	32%	34%	28%	31%	20%	29%
Struggling Readers Participating in ARI	68,110	92,170	88,470	100,066	74,860	89,141	50,742	563,559
% of Struggling Readers Participating in ARI	79%	77%	80%	86%	82%	86%	79%	81%

Source: Texas Education Agency, eGrant Database Consolidated Reading Initiative Report, 2005-2006.

- Of these students served by the ARI program, 66% were reading on grade level by the end of the year. The large majority of students served by ARI in Grades 3-5 passed the first administration of the TAKS Reading exam (76% of Grade 3 students – N=91,829, 65% of Grade 4 students – N=84,469, and 68% of Grade 5 students – N=92,215).

² “On Grade Level” is determined by diagnostic instruments for Grades K-2, and TAKS passing rates on the first administration of the TAKS for Grades 3-6.

³ These data are excerpted from a draft evaluation report related to the ARI/AMI program for the 2005-2006 school year. The report will be published by TEA in April 2007.

Mathematics

During the 2005-2006 school year, approximately one quarter (24%) of the students enrolled in Grades K-6 were identified as struggling in mathematics. A total of 474,067 students in Grades K-6 were subsequently served through AMI funds during the 2005-2006 school year. Statewide AMI data for the 2005-2006 school year are provided below.

**Table 2:
Struggling Mathematics Students, 2005-2006 School Year**

	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
2005-2006 Enrollment	349,277	358,568	344,256	339,803	329,064	336,224	322,605	2,379,797
Students Identified as Struggling in Math	51,097	66,070	73,306	106,687	97,722	102,457	76,105	573,444
% Identified as Struggling in Math	15%	18%	21%	31%	30%	30%	24%	24%
Struggling Math Students Participating in AMI	40,089	50,656	56,758	91,829	84,469	92,215	58,051	474,067
% Struggling Math Students Participating in AMI	78%	77%	77%	86%	86%	90%	76%	83%

Source: Texas Education Agency, eGrant Database Consolidated Reading Initiative Report, 2005-2006..

- Of these students served by the AMI program, 69% were on grade level in mathematics by the end of the year. Over two-thirds of students served by AMI in Grades 3-5 passed the first administration of the TAKS Mathematics exam (69% of Grade 3 students – N=91,829, 68% of Grade 4 students – N=84,469, and 74% of Grade 5 students – N=92,215).

Remaining Questions

Though the results presented above are promising, it is still unclear the extent to which the ARI/AMI program addresses the needs of students most in need of intensive interventions (i.e., those who fail to meet state standards on the first administration of the TAKS in a given year). This evaluation focuses on the first administration of TAKS results because that provides the best measure of content area (i.e., reading or mathematics) proficiency for all students at a single point in time. Is TAKS performance improved over time for those students who may have received intervention services? Currently, TEA does not collect individual student-level data for each student served

through the program;⁴ therefore, this evaluation addresses this question through the creation of cohorts of students who are *likely* candidates for ARI or AMI services.

Analytic Approach

To better understand the true impact of grant services on individual students, subsets of students who failed to meet state standards on the first administration of the reading or math portions of the Grade 3 TAKS tests in Spring 2004 were identified, and two student cohorts were created for the purposes of this analysis. Not meeting standards on the Spring 2004 Grade 3 TAKS exam made these students likely candidates to receive ARI or AMI services during the following 2004-2005 school year, in preparation for the Spring 2005 TAKS exam. Grade 3 students in 2004 were selected for these analyses in order to allow two years of follow-up study through the Spring 2005 and Spring 2006 TAKS tests, all critical years for developing fundamental math and reading skills, and all grades with TAKS exams to measure performance. The TAKS experience of this 2003-2004 cohort of Grade 3 students (failing the first administration of the TAKS in Spring 2004) is analyzed for two years (2005 and 2006), and their grade retention experience is analyzed for three years (2004-2006).

Separate student cohorts were created for students who failed the reading portion of the Grade 3 TAKS exam (and were assumed to be served through ARI) and students who failed the mathematics portion of the Grade 3 TAKS exam (and were assumed to be served through AMI). In order to be included in a cohort, a student must have failed to meet the state standard on the first administration of the applicable 2004 Grade 3 TAKS exam (i.e., math or reading), and have valid TAKS records for the 2004 to 2006 period.⁵

⁴ Aggregate, district-level data are collected by TEA through the agency's eGrants system. These data include the total number of students identified as struggling in reading or math, the number of students served by the program, the number of students on grade level at the end of the year (among other variables), by grade level. It is therefore, not currently possible to conduct a true cohort analysis of the ARI/AMI program in which each student is flagged as having received services and followed over time. The approach used in this report is a necessary alternative due to this limitation of the data.

⁵ The TAKS passing standard for Grade 3 TAKS was set at one standard error of measurement (-1 SEM) below the panel recommended passing standard of 2100 for the 2004 TAKS exam to allow for phase-in of an increasingly rigorous standard. In 2005 and 2006, the passing standard was increased to the panel recommended score of 2100.

The final dataset consisted of 19,964 students in the reading cohort, and 23,831 students in the math cohort.⁶

It is important to note that these students represent those that are highly likely to receive services under ARI/AMI. However, because data on individual students is not collected by TEA, it is unknown whether these students actually did receive services. The statewide average per-student expenditure in the 2003-2004 school year was \$103 for reading and \$116 for mathematics; \$89 for reading and \$107 for mathematics during the 2004-2005 school year, and \$121 for reading and \$148 for mathematics for the 2005-2006 school year. Given the relatively small amount of money available to serve all the needy students on the campus, it is possible that not all students in our cohort were served by the grant, or not provided with the intensity of ARI/AMI services necessary to provide them with the skills to pass the TAKS.

Findings from Cohort Analyses – Reading

Disaggregated TAKS Reading Results

Table 1 presents 2005 and 2006 first administration TAKS results for the cohort of 19,964 students who failed the first administration of the 2004 Grade 3 TAKS Reading exam. These results are broken down by gender, race/ethnicity, limited English proficient (LEP) status, economically disadvantaged status (i.e., eligible for free or reduced priced lunch), and special education status.

⁶ It should be noted that there is an overrepresentation of Hispanic and LEP students in these cohorts when compared to the general Texas Grade 3 student population (i.e., 65% Hispanic in the reading cohort and 61% Hispanic in the math cohort vs. 46% Hispanic in the Grade 3 as a whole, and 43% LEP in the reading cohort and 36% in the math cohort versus 23% of students in Grade 3 as a whole).

**Table 3
Accelerated Reading Instruction (ARI),
TAKS Reading Passing Rates (First Administration) for Cohort Students,
Disaggregated by Student Groups, 2004-2006**

Passed TAKS Reading First Administration	BASELINE (2004)		YEAR 1 (2005)				YEAR 2 (2006)			
	Grade 3 TAKS		Grade 3 TAKS <i>(2005 Grade 3 Repeaters)</i>		Grade 4 TAKS		Grade 4 TAKS <i>(2005 Grade 3 Repeaters and 2006 Grade 4 Repeaters)</i>		Grade 5 TAKS	
	Total N	% Pass	Total N	% Pass	Total N	% Pass	Total N	% Pass	Total N	% Pass
Gender:										
Female	9,229	0%	1912	70.6%	7,317	24.8%	2,429	47.1%	6,800	29.3%
Male	10,731	0%	2420	69.0%	8,311	24.3%	3,068	43.4%	7,663	29.3%
Economically Disadvantaged:										
Yes	16,361	0%	3,702	68.3%	12,659	22.8%	4,725	43.5%	11,636	26.3%
No	3576	0%	626	78.4%	2,950	32.1%	767	54.8%	2,809	41.7%
Ethnicity:										
African American	3,866	0%	890	67.3%	2,976	21.8%	1,140	43.0%	2,726	25.2%
Hispanic	13,068	0%	2,890	68.2%	10,178	23.5%	3,663	43.3%	9,405	26.5%
White	2,742	0%	495	81.6%	2,247	31.9%	629	57.7%	2,113	46.2%
LEP Status:										
LEP	8,513	0%	1,927	64.7%	6,586	23.4%	2,417	42.0%	6,096	25.6%
Not LEP	11,433	0%	2,405	73.7%	9,028	25.3%	3,079	47.4%	8,354	32.0%
Special Ed. Status:										
Yes	1,021	0%	191	78.0%	830	23.5%	240	48.3%	781	27.8%
No	18,923	0%	4,138	69.3%	14,785	24.6%	5,252	44.8%	13,671	29.4%
Overall	19,964	0%	4,334	69.7%	15,630	24.5%	5,498	45.0%	14,466	29.3%

Source: Texas Education Agency, TAKS Reading Results 2004-2006, First Administration.

Notes: For the 2005 TAKS, Grade 3 TAKS Reading exam results represent students retained in Grade 3 for the 2004-2005 school year who are taking the exam for the second year in a row, and Grade 4 TAKS Reading exam results represent students taking the exam as a first time Grade 4 student. For the 2006 TAKS, Grade 4 TAKS Reading exam results represent students retained in Grade 3 for the 2004-2005 school year who were promoted to the Grade 4 in 2005-2006 and are taking the exam for the first time, plus students who were retained in Grade 4 for the 2005-2006 school year and are taking the exam for the second year in a row. 2006 TAKS results for Grade 5 TAKS Reading represent students who were not retained in grade during the analysis period and are taking the exam for the first time.

Key findings from the disaggregated analysis of TAKS Reading performance among cohort students (i.e. students who do not meet state standards on the first administration of the Grade 3 TAKS Reading exam in Spring 2004) are as follows:

- Students who failed the first administration Grade 3 TAKS Reading exam in Spring 2004 *and were retained in grade* for the 2003-2004 school year had generally high rates of passage on the Grade 3 TAKS Reading exam in Spring 2005. Overall, 70% of these retained students passed the Grade 3 TAKS Reading exam on the first administration in Spring 2005, and the large majority of students in each of the aforementioned student groups (e.g., economically disadvantaged, African American, Hispanic, LEP, special education) met the state standard on the first administration of this exam during their second year in Grade 3.
- Students who failed the Grade 3 TAKS Reading exam in Spring 2004 (first administration) and were *not* retained in grade during the analysis period continued to struggle on the first administration of the Grades 4 and 5 TAKS Reading exam. Only a quarter (25%) of these students passed the first administration of the Grade 4 TAKS Reading exam in Spring 2005, and 29% passed the first administration of the Grade 5 TAKS Reading exam in Spring 2006.

The disaggregated TAKS data for the cohort of students also reveal a number of key findings related to disparity in TAKS Reading results by race/ethnicity, LEP, and economically disadvantaged status.⁷ These are the same performance gaps observed among student groups in statewide TAKS passing rates in Texas. Key findings are as follows:

- Regardless of TAKS year (2005 or 2006) or grade level (TAKS Reading exam for Grades 3, 4 or 5), passing rates on the first administration of the TAKS Reading exam were substantially lower for Hispanic and African American students than White students.

⁷ Inconsistent results were observed for special education students; due to relatively small sample sizes for some tests (i.e., Grades 3 and 4 TAKS Reading exams for grade repeaters), the results should be interpreted with caution.

- Students identified as economically disadvantaged experienced significantly lower passing rates than students not identified as economically disadvantaged.
- Disparity in TAKS passing rates (first administration) was greatest on the first administration of the Grade 5 TAKS Reading exam (for students who were not retained in grade during the period of analysis). One quarter (25%) of African American students and 27% of Hispanic students passed the first administration of the Grade 5 TAKS Reading exam in Spring 2006, compared to 46% of White students. Similarly, 26% of economically disadvantaged students passed the first administration of the TAKS Reading exam versus 42% of students not classified as economically disadvantaged.
- Though the differences were not as profound as those observed for the race/ethnicity and economically disadvantaged student subgroups, LEP students and special education students generally underperformed their counterparts on the first administration of the TAKS Reading exam in Spring 2005 and Spring 2006.
- TAKS Reading results for male and female students revealed little difference.

TAKS Reading Results by Grade Retention Patterns

Grade retention patterns over the 2003-2004 to 2005-2006 period are reported below for the 19,964 students who failed to meet the state standard on the first administration of the Grade 3 TAKS Reading exam in Spring 2004 and had valid TAKS Reading records for the complete 2004-2006 period.⁸ It is assumed that these struggling students were likely candidates for ARI services during the 2004-2005 and 2005-2006 school years. The following three grade retention patterns are observed in the student cohort:

⁸ It is important to note that the majority of students in the cohort who failed the first administration of the Grade 3 TAKS for Reading most likely went on to pass either the second or third administration of the TAKS Reading exam in order to meet the SSI grade promotion requirements, or may have been promoted to the next grade by the local grade placement committee.

- **No Grade Retention:** Student was in Grade 3 in 2003-2004, in Grade 4 in 2004-2005, and Grade 5 in 2005-2006. This subset of students accounts for 72% of the students in the reading cohort.
- **Retained in Grade 3** (for the 2004-2005 school year): Student was in Grade 3 in 2003-2004, in Grade 3 again in 2004-2005, and Grade 4 in 2005-2006. This subset of students accounts for 22% of the students in the reading cohort.
- **Retained in Grade 4** (for the 2005-2006 school year): Student was in Grade 3 in 2003-2004, in Grade 4 in 2004-2005, and in Grade 4 again in 2005-2006. This subset of students accounts for 6% of the students in the reading cohort.

Tables 2 through 4 present the TAKS Reading results for the 2004-2006 period for the reading cohort students in each of the three grade retention pattern groups:

- Table 2 (Group 1): Students not retained in grade (Grade 3 in 2003-2004, Grade 4 in 2004-2005, Grade 5 in 2005-2006)
- Table 3 (Group 2): Students retained in Grade 3 for the 2004-2005 school year (Grade 3 in 2003-2004, Grade 3 in 2004-2005, Grade 4 in 2005-2006)
- Table 4 (Group 3): Students retained in Grade 4 in 2004-2005 (Grade 3 in 2003-2004, Grade 4 in 2004-2005, Grade 4 in 2005-2006)

Group 1: No Grade Retention. Table 2 presents the 72% of reading cohort students who failed the first administration of the TAKS Reading exam in Spring 2004, and were *not retained* in either Grades 3 or 4 during the 2004-2006 period. This analysis reveals that among students who did not meet the state standard on the Grade 3 TAKS reading exam in 2004 (and were not retained in grade), the majority (59%) went on to fail the first administration of both the Grades 4 and 5 TAKS Reading exams.

Table 4
Accelerated Reading Instruction (ARI)
TAKS First Administration Reading Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Not Retained in Grade,
2004-2006

Grade 3 TAKS Reading Results (2004)	Grade 4 TAKS Reading Results (2005)	Grade 5 TAKS Reading Results (2006)	Percent of Students in Pattern
Failed (Mean=1968)	Failed (Mean=1962)	Failed (Mean=1929)	59% (N=8516)
Failed (Mean=1989)	Failed (Mean=2006)	Passed (Mean=2153)	15% (N=2157)
Failed (Mean=1989)	Passed (Mean=2149)	Failed (Mean=1981)	12% (N=1691)
Failed (Mean=1995)	Passed (Mean=2175)	Passed (Mean=2183)	14% (N=2078)
			100% (N=14,442)

Source: Texas Education Agency, TAKS Reading Results 2004-2006, First Administration.

Note: Results are based on 14,442 students who did not meet the state standard on the first administration of the 2004 TAKS Reading exam, had TAKS records for the 2004-2006 period, and were not retained in grade during the 2004-2006 period. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

A relatively small proportion (14%) of these students were successful (as measured by TAKS Reading passing rates) on the Grade 4 (Spring 2005) and Grade 5 (Spring 2006) TAKS Reading exams.

Group 2: Retained in Grade 3 for the 2004-2005 School Year. Table 3 presents data for the 22% of cohort students who failed the first administration of the Spring 2004 Grade 3 TAKS Reading exam and were subsequently retained in Grade 3 for the 2004-2005 school year. After repeating Grade 3 in 2004-2005, approximately 4 out of every 10 students (38%) went on to pass *both* the first administration of the Grade 3 TAKS Reading exam in Spring 2005 and the Grade 4 TAKS Reading exam in Spring 2006.

Table 5
Accelerated Reading Instruction (ARI)
TAKS First Administration Reading Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Retained in Grade 3
for the 2004-2005 School Year (TAKS 2005), 2004-2006

Grade 3 TAKS Reading Results (2004)	Grade 3 TAKS Reading Results (2005)	Grade 4 TAKS Reading Results (2006)	Percent of Students in Pattern
Failed (Mean=1892)	Failed (Mean=1996)	Failed (Mean=1971)	24% (N=1,017)
Failed (Mean=1907)	Failed (Mean=2020)	Passed (Mean=2164)	7% (N=287)
Failed (Mean=1935)	Passed (Mean=2179)	Failed (Mean=2012)	32% (N=1,383)
Failed (Mean=1951)	Passed (Mean=2230)	Passed (Mean=2182)	38% (N= 1,623)
			100% (N=4,310)

Source: Texas Education Agency, TAKS Reading Results 2004-2006, First Administration.

Note: Results are based on 4,310 students who did not meet the state standard on the first administration of the 2004 TAKS Reading exam, had TAKS records for the 2004-2006 period, and were retained in Grade 3 for the 2004-2005 school year. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

Among this subset of students who repeated Grade 3 in 2004-2005, it is important to note that 70% passed the first administration of the Grade 3 TAKS Reading exam in 2005, and 45 percent went on to pass the first administration of the Grade 4 TAKS in 2006. This compares favorably to just 25 percent of the cohort students who did not repeat third grade and passed the Grade 4 TAKS Reading exam in 2005.

Group 3: Retained in Grade 4 for the 2005-2006 School Year. Table 4 presents results for the fairly small proportion (6%) of students in the cohort who failed the first administration of the Grade 3 TAKS Reading exam, were promoted to Grade 4 for the 2004-2005 school year, but were subsequently retained in Grade 4 for the 2005-2006 school year.

The overwhelming majority (95%) of these students, who were retained in Grade 4 for the 2005-2006 school year, failed the first administration of the Grade 4 TAKS Reading exam in Spring 2005 (their first year in the Grade 4). After repeating Grade 4 in 2005-2006, less than half (48%) of these students passed the Grade 4 TAKS Reading exam on

the first administration in Spring 2006. In contrast, a much higher percentage (70%) of repeat Grade 3 students passed the Grade 3 TAKS Reading exam in Spring 2005 (see Table 3).

Table 6
Accelerated Reading Instruction (ARI)
TAKS First Administration Reading Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Retained in Grade 4
for the 2005-2006 School Year (TAKS 2006), 2004-2006

Grade 3 TAKS Reading Results (2004)	Grade 4 TAKS Reading Results (2005)	Grade 4 TAKS Reading Results (2006)	Percent of Students in Pattern
Failed (Mean=1951)	Failed (Mean=1920)	Failed (Mean=1999)	51% (N=606)
Failed (Mean=1975)	Failed (Mean=1961)	Passed (Mean=2170)	44% (N=520)
Failed (Mean=1987)	Passed (Mean=2134)	Failed (Mean=2001)	1% (N=16)
Failed (Mean=1994)	Passed (Mean=2137)	Passed (Mean=2208)	4% (N=46)
			100% (N=1,188)

Source: Texas Education Agency, TAKS Reading Results 2004-2006, First Administration.

Note: Results are based on 1,118 students who did not meet the state standard on the first administration of the 2004 TAKS Reading exam, had TAKS records for the 2004-2006 period, and were retained in Grade 4 for the 2005-2006 school year. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

Reading Summary

This analysis of students who did not meet state standards on the first administration of the Grade 3 TAKS Reading exam reveals some very important information regarding the progress made by students most in need of intensive instruction in reading. Key observations from this analysis are as follows:

The majority of students who failed to meet the state standard on the first administration of the Grade 3 TAKS Reading exam in Spring 2004 were subsequently promoted to Grade 4 for the 2004-2005 school year and to Grade 5 for the 2005-2006 school year.

- Of the 19,964 students in the reading cohort, 72% were not retained in grade over the 2004-2006 period.
- A substantial proportion (22%) of students who failed the Grade 3 TAKS Reading exam were retained in grade for the 2004-2005 school year.
- Only 6% of the students in the reading cohort were promoted to Grade 4 for the 2004-2005 school year, and were retained in Grade 4 for the 2005-2006 school year.

Students who failed the first administration of the Grade 3 TAKS Reading exam in Spring 2004 and were retained in grade for the 2004-2005 school year had generally high rates of passage on the Grade 3 TAKS Reading exam in Spring 2005.

- Overall, 70% of these retained students passed the Grade 3 TAKS Reading exam on the first administration in Spring 2005, their second year in Grade 3 (see Table 1).
- The large majority of students in each of the student groups under review (e.g., economically disadvantaged, African American, Hispanic, LEP, special education) met the state standard on the first administration of this exam in Spring 2005 during their second year in Grade 3 (see Table 1).

For students who were not retained in either Grades 3 or 4, the passing rates on the first administration of the Spring 2005 (Grade 4) and Spring 2006 (Grade 5) TAKS Reading exams were poor.

- Among students not retained in either Grades 3 or 4, only 25% of the students passed the Grade 4 TAKS Reading exam on the first administration in Spring 2005, and 29% passed the Grade 5 TAKS Reading exam on the first administration in Spring 2006 (see Table 1).
- Further, the majority of these students (59%) failed both the Grades 4 and 5 TAKS Reading exams on the first administration (see Table 2).

Appropriately retaining students in Grade 3 may lead to higher rates of success on subsequent first administrations of TAKS Reading exams for these students. Data

suggest higher first time Grade 4 TAKS Reading passing rates for these retained students than those of their counterparts who were promoted to Grade 4 for the 2004-2005 school year.

- Among students who repeated Grade 3 in 2004-2005, 45% went on to pass the first administration of the Grade 4 TAKS Reading in 2006. This compared favorably to just 25% of the reading cohort students who did not repeat third grade and passed the first administration of the Grade 4 TAKS Reading exam in 2005 (see Tables 1 and 2).

Among the students in this analysis, African American and Hispanic students fail the first administration of TAKS Reading at higher rates than White students for all years and in all grades. Similar results are observed for economically disadvantaged and LEP students.

- Disparity in passing rates was greatest on the first administration of the Grade 5 TAKS Reading exam (for students who were not retained in grade during the period of analysis). One quarter (25%) of African American students and 27% of Hispanic students passed the first administration of the Grade 5 TAKS Reading exam in Spring 2006, compared to 46% of White students (see Table 1).
- Similarly, 26% of economically disadvantaged students passed the first administration of the TAKS Reading exam versus 42% of students not classified as economically disadvantaged (see Table 1).

These findings point to the need for more targeted and intensive instruction for these students most at risk of failure on the TAKS Reading exam in order to better prepare them for success at the middle school and high school levels.

Findings from Cohort Analyses – Mathematics

Disaggregated TAKS Mathematics Results

Table 5 presents 2005 and 2006 TAKS results, for the cohort of 23,831 students who failed the first administration of the 2004 TAKS Mathematics exam in Spring 2004, stratified by gender, race/ethnicity, LEP status, economically disadvantaged status, and special education status.

Table 7
Accelerated Math Instruction (AMI)
TAKS Mathematics Passing Rates (First Administration) for Cohort Students,
Disaggregated by Student Groups, 2004-2006

Passed TAKS Math First Administration	BASELINE (2004)		YEAR 1 (2005)				YEAR 2 (2006)			
	Grade 3 TAKS		Grade 3 TAKS (2005 Grade 3 Repeaters)		Grade 4 TAKS		Grade 4 TAKS (2005 Grade 3 Repeaters and 2006 Grade 4 Repeaters)		Grade 5 TAKS	
	Total N	% Pass	Total N	% Pass	Total N	% Pass	Total N	% Pass	Total N	% Pass
Gender:										
Female	13,100	0%	1,741	56.7%	11,359	26.5%	2,496	47.9%	10,604	29.6%
Male	10,726	0%	1,891	58.3%	8,835	28.1%	2,723	51.3%	8,003	31.3%
Economically Disadvantaged:										
Yes	18,856	0%	3,050	56.6%	15,806	25.2%	4,430	48.7%	14,426	27.9%
No	4,943	0%	574	62.4%	4,369	34.4%	780	55.4%	4,163	38.6%
Ethnicity:										
African American	5,596	0%	829	50.3%	4,767	22.5%	1,208	43.3%	4,388	25.7%
Hispanic	14,444	0%	2,319	57.4%	12,125	26.5%	3,327	49.8%	11,117	29.1%
White	3,488	0%	440	70.5%	3,048	36.5%	629	60.1%	2,859	40.9%
LEP Status:										
LEP	8,538	0%	1,462	55.5%	7,076	26.2%	2,076	50.6%	6,462	28.0%
Not LEP	15,263	0%	2,165	59.0%	13,098	27.8%	3,135	49.1%	12,128	31.5%
Special Ed Status:										
Yes	1,294	0%	132	52.2%	1,162	28.3%	196	48.0%	1,098	28.8%
No	22,507	0%	3,493	57.8%	19,014	27.2%	5,015	49.7%	17,492	30.4%
Overall	23,831	0%	3,632	57.5%	20,199	27.2%	5,219	49.6%	18,612	30.3%

Source: Texas Education Agency, TAKS Mathematics Results 2004-2006, First Administration.

Notes: For the 2005 TAKS, Grade 3 TAKS Mathematics exam results represent students retained in Grade 3 for the 2004-2005 school year who are taking the exam for the second year in a row, and Grade 4 TAKS Mathematics exam results represent students taking as a first time Grade 4 student.

For the 2006 TAKS, Grade 4 TAKS Mathematics exam results represent students retained in Grade 3 for the 2004-2005 school year who were promoted to the Grade 4 in 2005-2006 and are taking the exam for the first time, plus students who were retained in Grade 4 for the 2005-2006 school year and are taking the exam for the second year in a row. Results for Grade 5 TAKS Mathematics represent students who were not retained in grade during the analysis period and are taking the exam for the first time.

Key findings from the disaggregated analysis of TAKS Mathematics performance among cohort students (i.e. students who did not meet state standards on the first administration of the Grade 3 TAKS Mathematics exam in Spring 2004) are as follows:

- Approximately 58% of all students who failed the first administration Grade 3 TAKS Mathematics exam in Spring 2004 *and were retained in grade* for the 2003-2004 school year passed the first administration of the Grade 3 TAKS Mathematics exam the subsequent year in Spring 2005 (Table 5). This passing rate is somewhat lower than the 70% of Grade 3 repeaters who passed the 2005 TAKS Reading exam on the first administration (Table 1).
- When analyzed by subgroup (e.g., economically disadvantaged, African American, Hispanic, LEP, special education) over half of students who repeated Grade 3 in 2004-2005 met the state standard on the first administration of the Grade 3 TAKS Mathematics exam in Spring 2005.
- Similar to the results for struggling readers, students who failed the Grade 3 TAKS Mathematics exam in Spring 2004 (first administration) and were *not* retained in grade during the analysis period continued to struggle on the first administration of the Grade 4 (Spring 2005) and Grade 5 (Spring 2006) TAKS Mathematics exams. Approximately one out of four (27%) of these students passed the first administration of the Grade 4 TAKS Mathematics Exam in Spring 2005, and 30% passed the first administration of the Grade 5 TAKS Mathematics Exam in Spring 2006.

The disaggregated TAKS data for the cohort students also reveal a number of key disparities in TAKS Mathematics results by race/ethnicity, LEP status, and economically

disadvantaged status.⁹ These are the same performance gaps observed among student groups in statewide TAKS passing rates in Texas. Key findings are as follows:

- Regardless of TAKS year (2005 or 2006) or grade level (TAKS Mathematics exam for Grades 3, 4, or 5), the proportions of students who passed the first administration of the TAKS Mathematics exam were substantially lower for Hispanic and African American students than White students.
- Students identified as economically disadvantaged had significantly lower passing rates than students not identified as economically disadvantaged.
- While non-LEP students tended to outperform their LEP counterparts on the TAKS Reading exam, very small differences were observed between LEP and non-LEP students on the first administration of the TAKS Mathematics exam. This is especially true for the Grades 4 and 5 TAKS exams administered to students who were not retained in either Grades 3 or 4 during the period of analysis.
- Male students outperformed female students on the TAKS Mathematics exam by a very small (one to two percentage point) margin.

TAKS Mathematics Results by Grade Retention Patterns

Grade retention patterns over the 2003-2004 to 2005-2006 period are as follows for the 23,831 students who failed to meet the state standard on the first administration of the Grade 3 TAKS Math exam in Spring 2004 and had valid TAKS Mathematics records for

⁹ Very little variation was observed when the data were disaggregated by gender and special education status.

the complete 2004-2006 period.¹⁰ It is assumed that these struggling math students were likely candidates for AMI services during the 2004-2005 and 2005-2006 school years:

- **No Grade Retention:** Student was in Grade 3 in 2003-2004, in Grade 4 in 2004-2005, and Grade 5 in 2005-2006. This subset of students accounts for 78% of the students in the mathematics cohort.
- **Retained in Grade 3** (for the 2004-2005 school year): Student was in Grade 3 in 2003-2004, in Grade 3 again in 2004-2005, and Grade 4 in 2005-2006. This subset of students accounts for 15% of the students in the mathematics cohort.
- **Retained in Grade 4** (for the 2005-2006 school year): Student was in Grade 3 in 2003-2004, in Grade 4 in 2004-2005, and in Grade 4 again in 2005-2006. This subset of students accounts for 7% of the students in the mathematics cohort.

Tables 6 through 8 present the TAKS Mathematics results for the 2004-2006 period for the math student cohort students in each of the three grade retention pattern groups:

- Table 6 (Group 1): Students not retained in grade (Grade 3 in 2003-2004, Grade 4 in 2004-2005, Grade 5 in 2005-2006)
- Table 7 (Group 2): Students retained in Grade 3 for the 2004-2005 school year (Grade 3 in 2003-2004, Grade 3 in 2004-2005, Grade 4 in 2005-2006)
- Table 8 (Group 3): Students retained in Grade 4 in 2004-2005 (Grade 3 in 2003-2004, Grade 4 in 2004-2005, Grade 4 in 2005-2006)

Group 1: No Grade Retention. Table 6 presents data related to the majority (78%) of math cohort students who failed the first administration of the TAKS Mathematics exam in Spring 2004, and were *not* retained in either Grades 3 or 4 during the 2004-2006 period. This analysis reveals comparable results to the TAKS Reading analysis. If a student did not meet the state standard on the Grade 3 TAKS Mathematics exam in 2004 (and was not retained in grade), the majority (57%) also failed the first administration of

¹⁰ It is important to note that students were not required to pass the Grade 3 TAKS Mathematics exam as part of the SSI grade promotion requirements. However, they are required to pass both the reading and mathematics TAKS exams as part of the Grade 5 SSI grade promotion requirements.

the Grade 4 (Spring 2005) and Grade 5 (Spring 2006) TAKS Mathematics exams. These data further illustrate the low passing rates on the Grades 4 and 5 TAKS Mathematics exams that were outlined in the disaggregated analysis.

Just 17% of the students not retained in either Grades 3 or 4 experienced a positive academic outcome of passing the first administration of the Grade 4 (Spring 2005) and Grade 5 (Spring 2006) TAKS Mathematics exam.

Table 8
Accelerated Math Instruction (AMI)
TAKS First Administration Mathematics Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Not Retained in Grade,
2004-2006

Grade 3 TAKS Math Results (2004)	Grade 4 TAKS Math Results (2005)	Grade 5 TAKS Math Results (2006)	Percent of Students in Pattern
Failed (Mean=1955)	Failed (Mean=1951)	Failed (Mean=1924)	57% (N=10,627)
Failed (Mean=1978)	Failed (Mean=2009)	Passed (Mean=2170)	14% (N=2,543)
Failed (Mean=1982)	Passed (Mean=2151)	Failed (Mean=1990)	13% (N=2,332)
Failed (Mean=1987)	Passed (Mean=2180)	Passed (Mean=2208)	17% (N=3,092)
			100% (N=18,594)

Source: Texas Education Agency, TAKS Mathematics Results 2004-2006, First Administration.

Notes: Totals may not sum to 100% due to rounding. Results are based on 18,594 students who did not meet the state standard on the first administration of the 2004 TAKS Mathematics exam, had TAKS records for the 2004-2006 period, and were not retained in grade during the 2004-2006 period. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

Group 2: Retained in Grade 3 for the 2004-2005 School Year. Table 7 presents data for the 15% of math cohort students who failed the first administration of the 2004 TAKS Mathematics exam and were subsequently retained in Grade 3 for the 2004-2005 school year. After repeating Grade 3 in 2004-2005, 58% of the students passed the first administration of the Grade 3 TAKS Mathematics exam in Spring 2005. Almost half (49%) of all students in this subset eventually went on to pass the first administration of the Grade 4 TAKS Mathematics exam in Spring 2006. This compares favorably to the student subgroup of 2004 Grade 3 TAKS Mathematics first administration failers who were not retained the Grade 3; only 27% of this subset of students went on to pass the first administration of the Grade 4 TAKS Mathematics exam in Spring 2005 (see Table 5).

Table 9
Accelerated Math Instruction (AMI)
TAKS First Administration Mathematics Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Retained in Grade 3
for the 2004-2005 School Year (TAKS 2005), 2004-2006

Grade 3 TAKS Math Results (2004)	Grade 3 TAKS Math Results (2005)	Grade 4 TAKS Math Results (2006)	Percent of Students in Pattern
Failed (Mean=1888)	Failed (Mean=1978)	Failed (Mean=1967)	31% (N=1,137)
Failed (Mean=1932)	Failed (Mean=2015)	Passed (Mean=2161)	11% (N=398)
Failed (Mean=1937)	Passed (Mean=2154)	Failed (Mean=2009)	20% (N=709)
Failed (Mean=1961)	Passed (Mean=2193)	Passed (Mean=2205)	38% (N=1,370)
			100% (N=3,614)

Source: Texas Education Agency, TAKS Mathematics Results 2004-2006, First Administration.

Note: Results are based on 3,614 students who did not meet the state standard on the first administration of the 2004 TAKS Mathematics exam, had TAKS records for the 2004-2006 period, and were retained in Grade 3 for the 2004-2005 school year. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

Group 3: Retained in Grade 4 for the 2005-2006 School Year. Table 8 presents results for 1,605 students, or 7% of the student math cohort, who failed the first administration of the Grade 3 TAKS Mathematics exam, were promoted to Grade 4 for the 2004-2005 school year, but were subsequently retained in Grade 4 for the 2005-2006 school year.

The overwhelming majority of these students (95%), who were retained in Grade 4 for the 2005-2006 school year, had failed the first administration of the TAKS Mathematics exam in Spring 2005. After repeating the Grade 4 in 2005-2006, approximately half (51%) of students in this subgroup of Grade 4 retainees met the state standard on the Grade 4 TAKS Mathematics exam on the first administration in Spring 2006. This compares to 58% of repeat Grade 3 students who passed the Grade 3 TAKS Mathematics exam in Spring 2005 (see Table 5).

Table 10
Accelerated Math Instruction (AMI)
TAKS First Administration Mathematics Performance Patterns
and Mean TAKS Scale Scores Among Cohort Students Retained in Grade 4 for the
2005-2006 School Year (TAKS 2006), 2004-2006

Grade 3 TAKS Math Results (2004)	Grade 4 TAKS Math Results (2005)	Grade 4 TAKS Math Results (2006)	Percent of Students in Pattern
Failed (Mean=1927)	Failed (Mean=1885)	Failed (Mean=1990)	48% (N=767)
Failed (Mean=1959)	Failed (Mean=1955)	Passed (Mean=2187)	47% (N=761)
Failed (Mean=1969)	Passed (Mean=2148)	Failed (Mean=2048)	1% (N=14)
Failed (Mean=1977)	Passed (Mean=2147)	Passed (Mean=2224)	4% (N=63)
			100% (N=1,605)

Source: Texas Education Agency, TAKS Mathematics Results 2004-2006, First Administration.

Note: Results are based on 1,605 students who did not meet the state standard on the first administration of the 2004 TAKS Mathematics exam, had TAKS records for the 2004-2006 period, and were retained in Grade 4 for the 2005-2006 school year. Scale score of 2100 represents meeting passing standards for the 2005 and 2006 TAKS years.

Mathematics Summary

Analyzing a cohort of students who did not meet state standards on the first administration of the Grade 3 TAKS Mathematics exam has revealed important information regarding the progress made by students most in need of mathematics remediation services. The trends observed in the analysis of struggling readers tend to hold for struggling math students as well. Key observations from this analysis are as follows:

The majority of students who failed to meet the state standard on the first administration of the Grade 3 TAKS Mathematics exam in Spring 2004 were subsequently promoted to Grade 4 for the 2004-2005 school year and to Grade 5 for the 2005-2006 school year.

- Of the 23,831 students in the mathematics cohort, over three-quarters (78%) were not retained in grade over the 2004-2006 period.
- A minority of students (15%) who failed the Grade 3 TAKS Mathematics exam were retained in grade for the 2004-2005 school year.¹¹
- A small proportion of the math cohort (7%) were promoted to Grade 4 for the 2004-2005 school year, and were retained in Grade 4 for the 2005-2006 school year.

Similar to the reading results, students who failed the first administration Grade 3 TAKS Mathematics exam in Spring 2004 and were retained in grade for the 2004-2005 school year had relatively high rates of passage on the Grade 3 TAKS Mathematics exam in Spring 2005.

- While lower than the 70% of retained students in the reading cohort who passed the Grade 3 TAKS Reading exam on the first administration in Spring 2005, a significant proportion (58%) of math cohort students retained in Grade 3 for the 2004-2005 school year were successful in passing the first administration of the Grade 3 TAKS Mathematics exam the following year in Spring 2005 (see Table 5).
- The large majority of students in each of the student subgroups under review (e.g., economically disadvantaged, African American, Hispanic, LEP, special education) met the state standard on the first administration of this exam during their second year in Grade 3 (Spring 2005) (see Table 5).

For students who were *not* retained in either Grades 3 or 4 during the period of analysis (2004-2006), passing rates on the first administration of the Spring 2005 (Grade 4) and Spring 2006 (Grade 5) TAKS Mathematics exams were very low.

- Less than one-third of math cohort students who were not retained in either Grades 3 or 4 passed the first administration of the Grade 4 (27%) or Grade 5 (30%) TAKS Mathematics exams (see Table 5).

¹¹ Most likely due to reading SSI grade promotion requirements, this proportion is somewhat lower than the 22% of students in the reading cohort who were retained in Grade 3 for the 2004-2005 school year.

- Similar to the pattern found for struggling readers, the majority of these non-retained math cohort students (57%) failed to meet the state standard on *both* the Grades 4 and 5 TAKS Mathematics exams (first administration) (see Table 6).

Consistent with reading, there appears to be some benefit to appropriately retaining students in Grade 3 who have not mastered the math content for that grade level, as the rate of success on subsequent first administration of TAKS Mathematics exams for these students (retained in Grade 3) was higher than their counterparts who were promoted to Grade 4 for the 2004-2005 school year.

- Almost half (49%) of the math cohort students who repeated Grade 3 in 2004-2005 went on to pass the first administration of the Grade 4 TAKS Mathematics exam in Spring 2006. In comparison, only 27% of the cohort students who did not repeat third grade passed the first administration of the Grade 4 TAKS Mathematics exam in Spring 2005 (see Tables 5 and 6).

Among students who failed the first administration of the Grade 3 TAKS Mathematics exam in Spring 2004, African American and Hispanic students are much more likely than White students to fail the first administration of the TAKS Mathematics exam in Grades 4 and 5. Similar results are observed for economically disadvantaged and LEP students. These results are consistent with those found for the reading cohort and tend to mirror statewide disaggregated TAKS passing rates.

- For non-retained math cohort students, 22% of African American students and 27% of Hispanic students passed the first administration of the Grade 4 TAKS Mathematics exam in Spring 2005, compared to 37% of White students (see Table 5).
- For non-retained math cohort students, 26% of African American students and 29% of Hispanic students passed the first administration of the Grade 5 TAKS Mathematics exam in Spring 2006, compared to 41% of White students (see Table 5).
- Similarly, 25% of non-retained economically disadvantaged students (compared to 34% of non-economically disadvantaged students) passed the first

administration of the Grade 4 TAKS Mathematics exam in Spring 2005, and 28% of non-retained economically disadvantaged students (compared to 39% of non-economically disadvantaged students) passed the first administration of the Grade 5 TAKS Mathematics exam in Spring 2006 (see Table 5).

Conclusion

It is clear from this analysis that a large proportion of students who fail critical TAKS exams in third grade continue to struggle, despite the high likelihood that they are receiving intervention services through the ARI/AMI program. Among those who are not retained in grade, large proportions of students continue to fail the first administration of the TAKS exams in Grades 4 and 5. Some improve in Grade 4, but then again fail the first administration in Grade 5. For those students who are retained in Grade 3, pass rates are improved for the second year in 3rd grade, and also for the first administration of the 4th grade test. Clearly, there is need for more targeted intervention instruction for students at risk of failure on the TAKS exams, as well as continued monitoring and available support for students who once struggled, may have improved, but continue to be at risk for falling behind.