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Long-Term Outcomes of Low-Achieving Third Grade Readers

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EXECUTIVE SUMMARY

Research shows that students who demonstrate low reading achievement in 3rd grade have trouble catching back up to grade level and being successful in school, compared to their peers who demonstrate early proficiency (Fiester 2010; Hernandez 2011; Juel 1988). This report seeks to investigate what happens to Arkansas public school students who demonstrate low achievement in reading in 3rd grade. Reading scores from three cohorts of students are followed from 3rd grade until high school, beginning with data from the 2008-09 school year and continuing through 2016-17. We examine the demographic characteristics of the low-achieving group, assess the extent to which these low-performers catch up by high school, and we highlight the subgroups of students who make the most progress in catching up to their higher achieving peers. This report is structured around two main research questions. These research questions and a brief summary of our findings are below:

1. **Who isn't reading on grade level in 3rd grade?**
    - This "low-achieving" group contained 24% of 3rd grade students.
    - We found demographic disparities in each low-achieving group:
        - Students who qualify for free or reduced price lunches were more likely to be low-achieving readers in 3rd grade, compared to their more economically advantaged peers.
        - Black and Hispanic students were more likely to be low-achieving in 3rd grade compared to their White peers.
        - Male students were more likely to be low-achieving readers in 3rd grade compared to their female peers.

2. **Do the students who demonstrate low reading achievement in 3rd grade 'catch up' to their peers over time and what are the characteristics of students who do?**
    - 11.5% of the students in each cohort designated as low-achieving readers in 3rd grade caught up to the state average by high school.
        - Reaching the state average by high school was defined as earning test scores at the state average over 8th, 9th, and 10th grade.
    - Of the students who did catch up to their peers by high school, there were demographic disparities.
        - Students who were white, female, or economically advantaged had a greater likeliness of reaching the state average by high school, compared to their Black, Hispanic, male, and/or economically disadvantaged peers.

I. Introduction

Third grade is a critical point in the educational process where having proficient reading skills begin to affect achievement and continued learning. Research indicates that students who do not read on grade level in third grade are unlikely to match the academic achievement of their peers, achieve grade level reading each year, and face a reduced likelihood of graduating from high school on time.[1] According to the National Assessment of Educational Progress (NAEP), reading proficiency in third grade involves word recognition as well as comprehension; students should be able to read a passage and also identify main ideas and answer questions about its content. Typically after third grade, instructional emphasis shifts from "learning to read" to "reading to learn", and there is less instruction dedicated to simple reading skills.[1] Students that are still struggling to read have increased difficulty at this point attaining those basic skills and then also have trouble achieving in other academic subjects where these skills are required.

Factors unrelated to classroom instruction contribute to a student's reading achievement. Students who feel like they are doing well reading in school will likely be more motivated to read outside of school and thus become better readers, while poor readers are more likely to report that reading is boring and they would rather do other tasks than read. Students who associate reading with personal failure and the social stigma of lagging behind their peers often become less motivated to read 'for fun' or to request to be read to at home. Consequently, the gap in word exposure and reading practice widens over time between high and low achievers.[2]

[1] Hernandez, D. J. (2011). Double jeopardy: How third-grade reading skills and poverty influence high school graduation. *Annie E. Casey Foundation*. Retrieved from: https://files.eric.ed.gov/fulltext/ED518818.pdf

[2] Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, *80*(4), 437-447.
Retrieved from: http://0-eds.b.ebscohost.com.library.uark.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=4bd335dc-8bf7-445f-9578-648d482692f7%40sessionmgr101

These early habits and reading skills have long-term impacts on students' academic success. A report by the Annie E. Casey Foundation (2011) determined that students who are not reading proficiently in third grade drop out of high school at a rate four times greater than their peers who are proficient in third grade. For children who were not proficient and were living in poverty for at least one year, the dropout rate was six times greater than that of all students who were proficient readers in third grade. These are major risks for students who are not reading at a proficient level in early elementary school. High school dropouts are more likely to be arrested or have children while still teenagers, and there is a limited and low-paying pool of jobs open to these students.[3] Increasing the number of high school graduates not only gives these students more opportunities and better lives, but it also provides economic incentives to the state. According to an analysis by the Alliance for Excellent Education, increasing Arkansas' graduation rate from 71% to 90% would result in $64 million in increased annual gross state product, $72 million in increased home sales, and $4.9 million in increased annual state and local tax revenues.[4]

Many schools across the country have taken the initiative to increase the reading proficiency of their 3rd grade students. The Campaign for Grade-Level Reading has partner schools in 43 states and Washington D.C., and it funds and encourages innovative ways to increase the number of 3rd graders reading on grade level by reducing chronic absence, increasing kindergarten readiness, educating parents, providing summer learning opportunities, and

[3] Fiester, L. (2010). Early Warning! Why Reading by the End of Third Grade Matters. *Annie E. Casey Foundation*. Retrieved from: http://www.aecf.org/m/resourcedoc/AECF-Early_Warning_Full_Report-2010.pdf

[4] Alliance for Excellent Education (2013). The Economic Benefits of Increasing the High School Graduation Rate for Public School Students. Retrieved from https://all4ed.org/wp-content/uploads/2014/01/Arkansas_econ.pdf

ensuring that families have the resources necessary for healthy child development.[5] The Arkansas Campaign for Grade-Level Reading was introduced in 2011, and it shares the national campaign's goals as well as sets specific, measurable goals for progress in Arkansas. They hope to increase the percentage of 3rd graders reading on grade-level from its current 38% (according to the ACT Aspire in 2017-18) to 80% by 2030.[6] Alongside this main goal, they have also set goals for reducing chronic absence, increasing access to developmental screenings, increasing quality pre-kindergarten enrollment, and providing more meals during the school year and summer months to eligible children. The Arkansas Campaign for Grade-Level Reading identifies families, educators, business leaders, and policy makers as necessary contributors to ensure these goals are achieved.

In January of 2017, the Arkansas Department of Education launched the Reading Initiative for Student Excellence (R.I.S.E). R.I.S.E is a program committed to establishing community partnerships and initiating school activities that create a positive culture of reading and strengthening reading instruction by training teachers in the science of reading. The science of reading refers to the process of how the brain learns to read based on neuroscience and linguistic research, and it emphasizes systematic introduction of skills, clear and precise instruction, and effective, accurate assessments. So far, more than 350 schools in Arkansas have agreed to participate in the R.I.S.E. initiative. After the first teacher training sessions in summer 2017, three R.I.S.E. elementary schools saw double-digit gains in reading scores[7], but more

[5] The Campaign for Grade-Level Reading: 3rd Grade Reading Success Matters (2018). Retrieved from: https://gradelevelreading.net/

[6] Full Speed Ahead: 2018 Progress Report on Grade-Level Reading in Arkansas (2018). *Arkansas Campaign for Grade-Level Reading*. Retrieved from: http://www.ar-glr.net/media/1779/full-speed-ahead-2018_051818-final.pdf

[7] Arkansas Department of Education: R.I.S.E. Arkansas
Retrieved from: http://arsba.org/wp-content/uploads/2015/07/2-RISE-Arkansas.pdf

recent assessment data did not show similar improvement. Given the great effort Arkansas is making to remedy the problem of low 3rd grade reading levels, we suggest that it is critical to understand the trends of reading proficiency in 3rd grade for Arkansas students, and if reading achievement improves as they progress through the school system. Using historical performance trends as a baseline, we will be better able to evaluate the success of new programs intended to improve student reading achievement and associated long-term outcomes.

The purpose of this report is to provide longitudinal descriptive information about what happens to Arkansas students who are low achieving in reading in third grade. We begin by examining what these "low reading achievement" students "look like" in Arkansas by presenting demographic characteristics compared to that of the general 3rd grade population. These descriptive data indicate which characteristics are associated with greater risk of low reading achievement. We then follow these students through their education to determine if they "catch up" to their peers over time, and if so, when? We further examine these students by demographic characteristics to determine if particular groups of students are more or less likely to demonstrate improved reading skills. By examining three cohorts of students who were continuously enrolled in Arkansas public schools from 3rd grade through early high school, we present a baseline understanding of how students who are not reading on grade level progress through their educational careers in Arkansas public schools. We will address the following research questions concerning Arkansas 3rd graders who demonstrate low reading achievement:

1) Who isn't reading on grade level in 3rd grade?
    a. How many 3rd grade students are demonstrating low reading achievement in 3rd grade?
    b. What percentage of students who demonstrate low reading achievement in each year were Black, Hispanic, White, receiving free or reduced price lunch, or were English Language Learners?

2) Do the students who demonstrate low reading achievement in 3rd grade 'catch up' to their peers over time and what are the characteristics of students who do?
    a. What percentage of students catch up?
    b. Are certain demographic groups over- or under- represented among students who catch up?

II. Definitions

Low reading achievement: In the current report, low reading achievement is determined by comparative achievement on state literacy exams in 3rd grade. The "low-achieving" group is comprised of all students who scored a half standard deviation below the mean (or lower) on the state reading exam in 3rd grade. This score does not necessarily reflect lack of proficiency status, but it is approximately the lowest scoring 20-25% of 3rd graders for each cohort. However, given the relationship between NAEP and Arkansas proficiency standards, it likely that students in the lowest quartile of reading scores in 2008-09, 2009-10, and 2010-11 in Arkansas were reading below NAEP proficiency levels.

Free or Reduced Price Lunch (FRL): This is a program administered by the federal Department of Agriculture, and its goal is to provide access to adequate nutrition for students in need. Qualification for this program is based on family income, and FRL participation is often used as a proxy for socioeconomic status, as actual family income data is not available. Student eligibility is determined annually, so in discussion of student groups who are 'FRL' in the current report, we are referring to their FRL participation in 3rd grade.

English Language Learner (ELL): Classification as an English Language Learner is determined by an English skills test. ELL status is assigned to students who are not native English speakers and are not yet fluent in English. Discussion of ELL students in the current report refers to those who were identified ELL in 3rd grade (unless otherwise specified).

Race: In the current report, analysis of race is limited to White, Black, and Hispanic categories. There are several other categories for race that students may identify with, including Asian, Native Hawaiian/Pacific Islander, Native American/Alaskan Native, and Two or More Races, but these racial subgroups combined make up only 5% of the population and so have not been analyzed individually.

III. Data and Conceptual Challenges

This report is descriptive in nature; it does not tell us what causes the low reading achievement of students or how to solve the problem. Instead, this report presents observed patterns of achievement and demographic information of students who have demonstrated low reading achievement in 3rd grade. We look at data over time to pull out patterns and identify long term effects of low achievement in early elementary school. Consistent with most research, the low-achieving students identified in this report did have more trouble achieving exam scores at the state average as they continued in their educational careers. However, we recognize that there are many factors that can contribute to low scores on standardized tests, especially for young students who do not have much experience with formal testing. Initial low scores in 3rd grade might not always be indicative of ability level. Also, in order to analyze cohorts of students over a period of several years, the analysis only includes students who attended Arkansas public schools for the majority of their educational careers, and there could be inherent differences between these students and those who move states at least once during their school careers. These issues are important to consider as we interpret the apparent impact and outcome of initial low achievement.

Sample

This report uses anonymized student level data from the 2008-09 through 2016-17 school years. The dataset, from the Arkansas Department of Education, includes 2,330,199 observations of student literacy scores on their grade appropriate state assessment, district, school, grade level, free or reduced price lunch (FRL) status, English Language Learner (ELL) status, gender, and race. Of those observations, 587,899 were used to create three cohorts of students for analysis. Students were identified to be included in a cohort based on the following three criteria:

1. Student was enrolled in 3rd grade for the first time in 2008-09, 2009-20, or 2010-11, 2)
2. Student was consistently enrolled through 2015-16 or 2016-17 (depending on initial 3rd grade enrollment year)
3. Student did not repeat a grade during enrollment.

The analysis follows three cohorts of students over several years, beginning in 2008-09 and going through 2016-17. Reading scores were only examined for 3rd through 10th grades. The three cohorts started in 3rd grade in 2008-09, 2009-10, or 2010-11, as illustrated in Table 1 below.

Table 1: Cohort Grade Enrollment by Year.

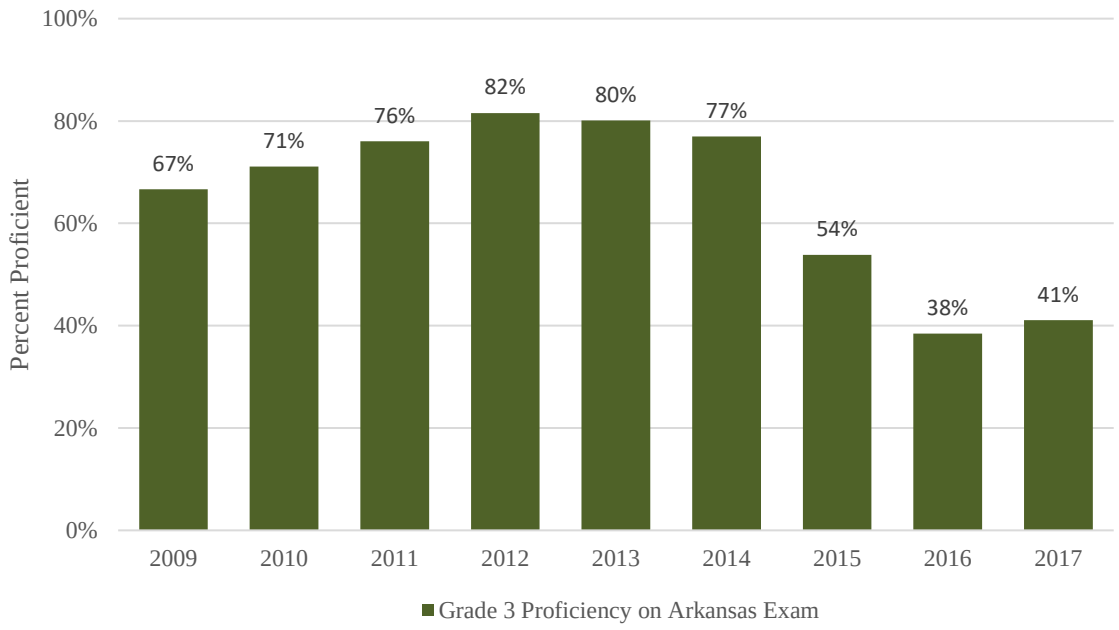
Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Cohort 1	Gr. 3	Gr. 4	Gr. 5	Gr. 6	Gr. 7	Gr. 8	Gr. 9	Gr. 10	*Gr. 11*
Cohort 2	*Gr. 2*	Gr. 3	Gr. 4	Gr. 5	Gr. 6	Gr. 7	Gr. 8	Gr. 9	Gr. 10
Cohort 3	*Gr. 1*	*Gr. 2*	Gr. 3	Gr. 4	Gr. 5	Gr. 6	Gr. 7	Gr. 8	Gr. 9

Note: Shaded cells indicate assessment data unavailable

State Reading Assessments

All Arkansas public schools are required to administer standardized tests annually to students in grades 3-8 and high school, but Arkansas student have taken various tests since 2008. Arkansas students took the Benchmark exam through the spring of 2014; they then took the PARCC exam in the spring of 2015, and then the ACT Aspire Exam beginning in the 2015-16 school year. The ACT Aspire is the current assessment used in Arkansas schools. Figure 1 illustrates the percentage of third graders identified as proficient on the annual reading assessments.

Figure 1: Proportion of Third Grade Students who Achieved Reading Proficiency on Arkansas State Exam



Note: Year indication corresponds to the spring semester of the academic year.

The proportion of Arkansas 3rd graders who are reaching reading proficiency standards on state exams has fluctuated greatly over the past ten years. On Arkansas exams, we see improvement in the first few years, and high reading proficiency rates as students took the Benchmark exam through 2014. Beginning in 2015, there is a significant decrease in reading

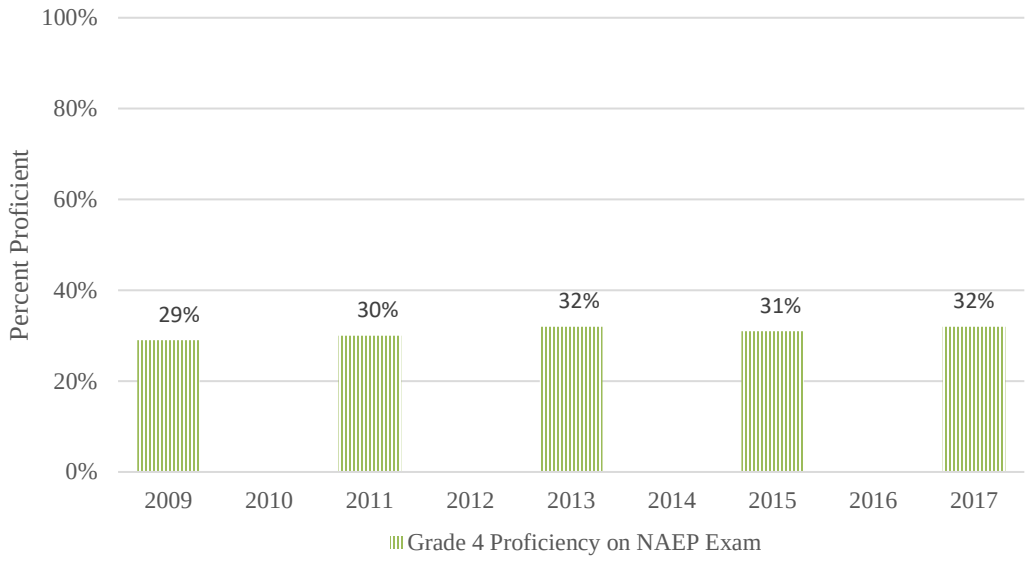
proficiency decrease as the state switched to PARCC and ACT Aspire exams. This indicates volatility in our standard of proficiency.

What is "Grade Level"?

Fluctuations in Arkansas' reading proficiency rates highlight the importance of carefully defining "reading on grade level". Policymakers in each state are given the responsibility of determining the score equivalency for what they think designates a proficient student. Each year, the National Center for Education Statistics compares the proficiency standards set by each state on their state exams to those set by the National Assessment of Educational Progress (NAEP) on its national exams. In its 2015 report, they found that 41 states, including Arkansas, set proficiency scores equivalent to the range designated as "basic" by NAEP, and 4 states set proficiency scores equivalent to the range designated as "below basic" by NAEP.[8] Arkansas, along with most other states, seems to set less rigorous standards for proficiency than this national comparison, NAEP. The following figure displays the percentage of Arkansas 4th graders reading proficiently on NAEP exams from 2008-09 to 2014-15. NAEP reading exams are given to a sample of Arkansas students at grades 4 and 8, and are only administered every other year.

[8] Mapping State Proficiency Standards Onto the NAEP Scales: Results from the 2015 NAEP Reading and Mathematics Assessments (2015). *National Center for Education Statistics.* Retrieved from: http://0-search.proquest.com.library.uark.edu/docview/202763199?accountid=8361

Figure 2: Proportion of Arkansas Fourth Grade Students who Achieved Reading Proficiency on NAEP Exam.



The NAEP results are noticeably more stable over time, and indicate that only one in three Arkansas students are reading proficiently in elementary school. When compared to proficiency rates in Figure 1, it seems as if Arkansas' proficiency expectations are currently more aligned with NAEP's criteria for reading proficiency. To compare student performance over time, however, we set fluctuating proficiency indicators aside and use a standardized measure to identify struggling readers for this analysis.

Identifying "Low-Achieving" Readers

We examined reading scores for three cohorts of students in Arkansas public schools, following them from 3rd grade through 9th or 10th grade, depending on available data. We standardized students' reading scores for each year in order to be compared across time, because the type of test that Arkansas schools administered and associated scoring scales changed twice during the years of data analyzed. These standardized scores, also called z-scores, represent each

student's relative achievement compared to all other students in Arkansas, such that a z-score of 0 represents the state average, any score lower than 0 is below average, and any score higher than 0 is above average.

This means that we evaluated students relative to the Arkansas average, not a national average, and it is important to note that Arkansas average reading scores have been consistently lower than national average scores.[9] Also, the data set used for analysis included only students who attended and tested in Arkansas public schools each year (grade 3 through grade 9 or 10). We designated students as "low-achieving" in reading in the 3rd grade if their reading score was a half standard deviation below the state average, evident by a z-score of -0.5 or lower. This means that approximately 20-25% of the total number of students examined were in the low-achieving group. For reference, the cutoff score to qualify a student as a proficient reader in third grade corresponded to a z-score of -.30 for Cohort 1, -.43 for Cohort 2, and -.55 for Cohort 3. So, for Cohorts 1 and 2, none of the students with "low-achieving" designation were meeting proficiency standards, but for Cohort 3, some students scoring in the lowest 22% were designated proficient by state standards.

IV. Who isn't reading on grade level in 3rd grade?

Our first research question explores the students with low reading scores in grade three. We ask: How many 3rd grade students are not reading on grade level and what are their characteristics?

[9]Arkansas and National score reports retrieved from the National Assessment of Educational Progress Data Explorer, found here: https://nces.ed.gov/nationsreportcard/tdw/database/data_tool.asp

Demographic Makeup of Low-Achieving Groups

The low-achieving group comprised 25% of the total group in Cohort 1, 24% of the total group in Cohort 2, and 22% of the total group in Cohort 3. After separating the lowest-scoring Arkansas students from each total group of third graders, it was evident that there were significant differences in the demographic makeup of each group.

We found that students who qualified for free or reduced lunch in third grade, which is used as a proxy for poverty, were 2.5 times as likely to be in this low achievement group than those students who were not participating in FRL. In addition, Black and Hispanic students were twice as likely as White students to be low achieving in third grade. Students with disabilities were three times as likely as those without to be in this group. There was also a gender disparity, albeit smaller than that of other demographic categories, with male students more likely to be low-achieving in third grade reading than females.

In the following figures, the proportions that students from several demographic categories comprise of the low-achieving group and total data set are compared. These distributions were comparable across the three cohorts, so the figures shown reflect the average proportions of all three groups. These figures clearly illustrate that traditionally under-served groups of students were over-represented in the low-achieving reading groups.

Figure 3: Comparative Demographics of Low-Achieving Group and Total Group by Economic Disadvantage (FRL) Status (Cohorts 1-3 Combined)

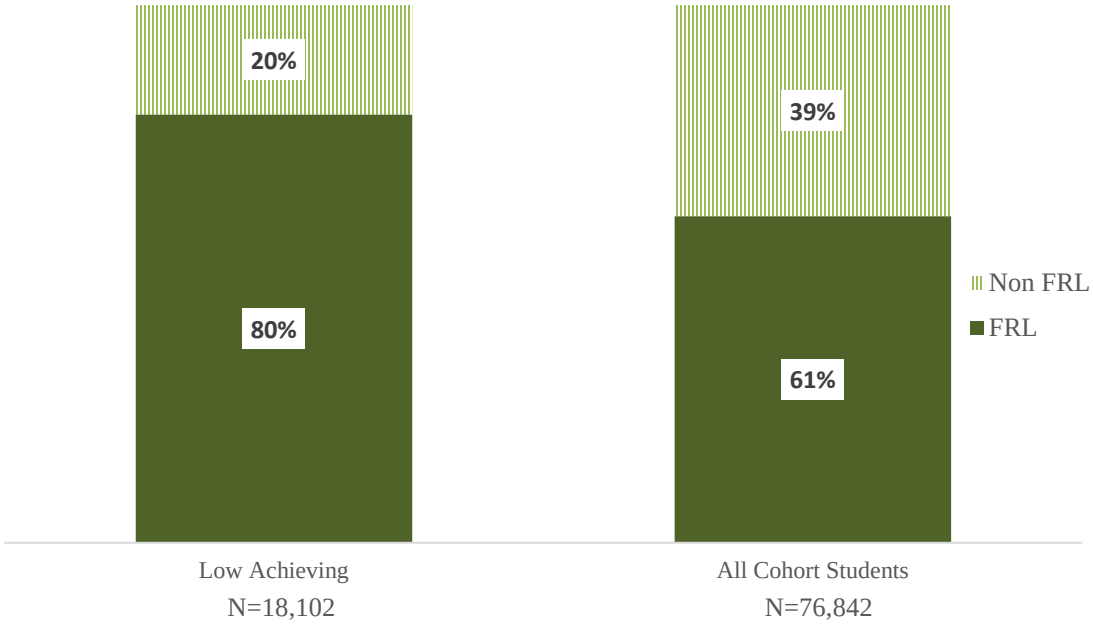


Figure 4: Comparative Demographics of Low-Achieving Group and Total Group by Race (Cohorts 1-3 Combined)

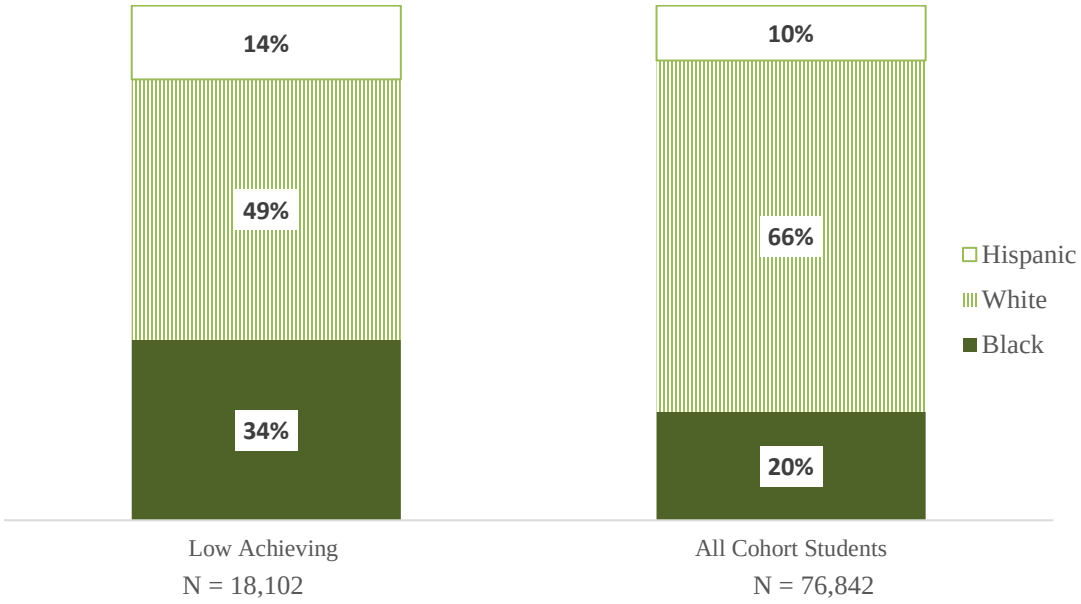
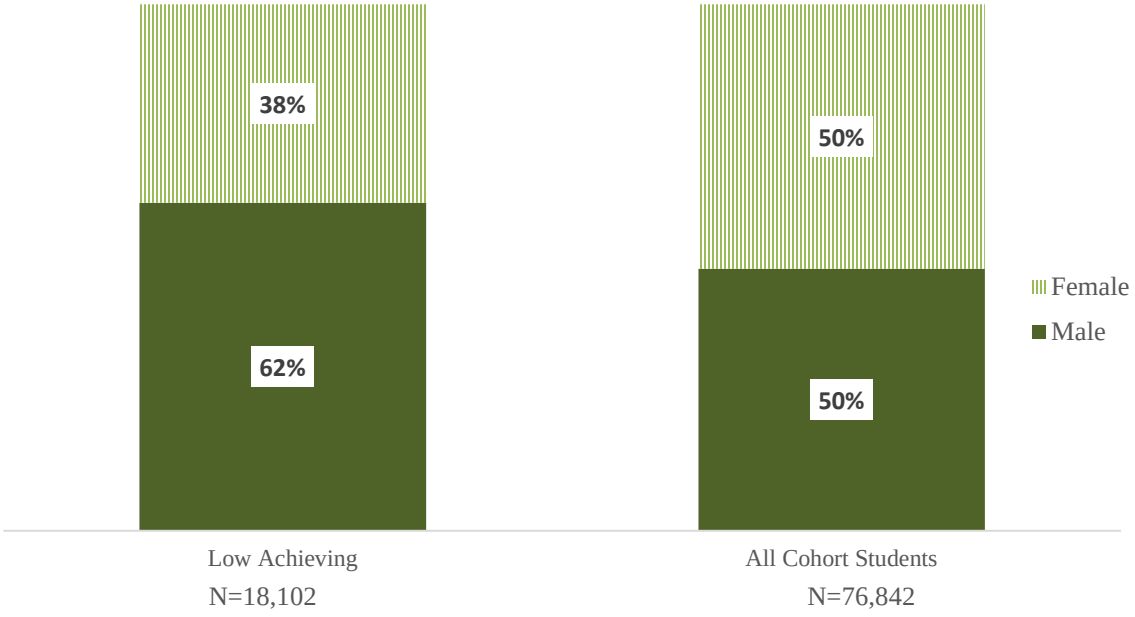


Figure 5: Comparative Demographics of Low-Achieving Group and Total Group by Gender (Cohorts 1-3 Combined)



In the following table, the demographic characteristics of students in each total cohort and each low-achieving group are presented. As presented in Table 2, demographic characteristics of the three cohorts are similar. The low-achieving group in Cohort 1 was comprised of 79% students who qualified for free or reduced price lunch and 21% students who did not, the low-achieving group in Cohort 2 was also comprised of 79% students who qualified for free or reduced price lunch and 21% students who did not, and the low-achieving group in Cohort 3 was comprised of 81% students who qualified for free or reduced price lunch and 19% students who did not. Even though more than half of the total cohort student populations were FRL qualifying students, these are still major overrepresentations of FRL qualifying students in each low-achieving group.

Table 2: Demographic Characteristics of Total Cohorts and Students Demonstrating Low Reading Achievement in Third Grade

		N	FRL	Black	White	Hispanic	Male	ELL
Cohort 1	Total Cohort	24,740	59%	21%	68%	9%	49%	8%
	Low-Achieving	6,078	79%	35%	49%	14%	61%	14%
Cohort 2	Total Cohort	25,265	61%	20%	66%	10%	50%	8%
	Low-Achieving	5,986	79%	33%	50%	13%	64%	12%
Cohort 3	Total Cohort	26,837	63%	20%	65%	11%	50%	9%
	Low-Achieving	6,038	81%	34%	48%	14%	62%	13%

The low-achieving group in Cohort 1 was comprised of 35% Black students, 49% White students, and 14% Hispanic students. In Cohort 2, the low-achieving group was comprised of 33% Black students, 50% white students, and 13% Hispanic students. In Cohort 3, the low-achieving group was comprised of 34% Black students, 48% White students, and 14% Hispanic students. These proportions remained fairly consistent across time and cohort, but Black and Hispanic students remained overrepresented in the low-achieving group, compared to their demographic contribution to the total group, and White students remained underrepresented.

The low-achieving group in Cohort 1 was comprised of 61% male students and 39% female students, the low-achieving group in Cohort 2 was comprised of 64% male students and 36% female student, and the low-achieving group in Cohort 3 was comprised of 62% male students and 38% female students. In each cohort, male students were overrepresented in the low-achieving group compared to their demographic contribution to the total group, while female students were underrepresented.

The low-achieving group in Cohort 1 was comprised of 14% students who were English Language Learners and 76% students who were English fluent, the low-achieving group in Cohort was comprised of 12% students who were English Language Learners and 78% students

who were English fluent, and the low-achieving group in Cohort 3 was comprised of 13% students who were English Language Learners and 77% students who were English fluent. In each cohort, English Language Learners were overrepresented in the low-achieving group compared to their demographic contribution to the total group.

V. Do students who demonstrate low reading achievement in 3rd grade 'catch up' to their peers?

Our second research question explores how students with low reading scores in grade three progress over the subsequent years in Arkansas public schools. We ask two questions:

1) What percentage of students who demonstrate low reading achievement in 3rd grade 'catch up' to their peers over time?
2) Are certain demographic groups over- or under- represented among students who catch up?

Consistent with most research, very few of those designated as low-achieving in third grade caught back up to their peers by the time they reached high school. We define "catching up" as reaching the state average reading performance by high school. In this analysis we identify students as "catching up" if the student achieved an average z-score of 0 (state average) on state reading assessments over 8th, 9th, and 10th grades for Cohort 1 and 2 students, or over 8th and 9th grade for Cohort 3 as their 10th grade assessment scores were not available at the time of publication. We wanted to ensure that we were not using a single year to determine how students had progressed, so this means that not all students that "caught up" necessarily scored at or above the state average in their final year of testing, but they must have scored at or above the state average in at least one of these final years (8th, 9th, or 10th grade).

Overall, 11.5% of students who demonstrated low reading ability in third grade had "caught up" to average reading performance by high school. For Cohort 1, 14% of the initially low-achieving students were scoring at or above the state average in reading in high school. For Cohort 2, that percentage decreased to 11%. For Cohort 3, the percentage again decreased to 10% that scored at or above the state average in high school. It is important to note that the students in Cohort 1 took the Arkansas Benchmark exam in 8th grade, which was an exam that was familiar to them. In Cohorts 2 and 3, students took either the PARCC exam or ACT Aspire exam in 8th, 9th, and 10th grade, which were new and unfamiliar exams. The change in exam type might explain the decrease in the proportion of students who reached the state average, given that this designation was determined by an average of 8th, 9th, and 10th grade achievement.

Given that our sample is limited to students who attended Arkansas public schools for seven years after demonstrating low reading achievement, it is concerning that such a small percentage can read at the state average by high school. Even more concerning is that, according to state proficiency standards, which are arguably less rigorous than those of NAEP, only about half of all the students who had attended from 3rd grade through high school are reading proficiently in these final years. For initially low-achieving students the rates are much lower: in Cohort 1, 10% of students were proficient in 10th grade, in Cohort 2, 11% were proficient in 10th grade, and in Cohort 3, 11% were proficient in 9th grade, their final year of data. These are comparable percentages to those calculated using our "catch up" standard.

Demographic Makeup of Students who "Catch Up"

It is important to analyze how this rigidity of upward movement and pathway to reading proficiency might look different for various groups of students. Even though all students examined in these analyses demonstrated low reading achievement in third grade, some demographic groups have a better chance than others of demonstrating substantial progress in

reading. The following figures illustrate reading improvement by demographic for all three cohorts combined. We see that traditionally underserved populations are not only more likely to be low-achieving initially, but also less likely to catch up to their peers. As presented in Figure 6, 18% of economically advantaged students demonstrate average reading performance by high school, compared to only 10% of economically disadvantaged students. White and Hispanic students are also twice as likely as their Black peers to demonstrate average reading performance by high school (see Figure 7).

Figure 6: Proportion of Initially Low-Achieving Students who Achieved the State Average by High School by Economic Disadvantage (Cohorts 1-3 Combined)

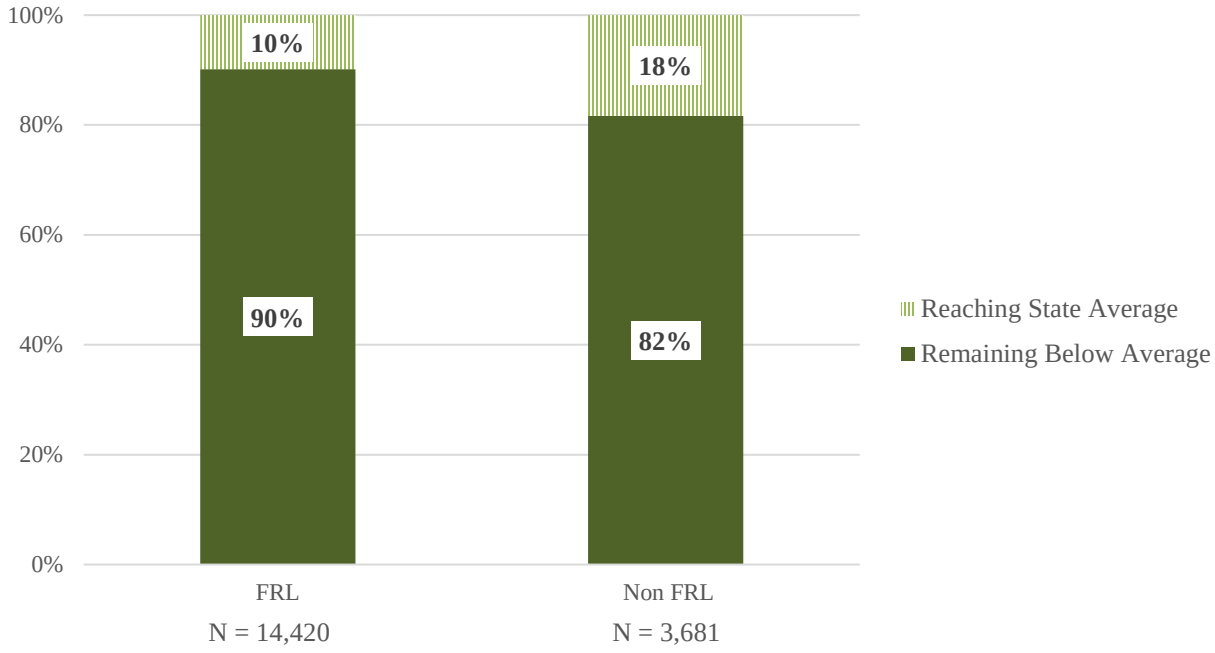
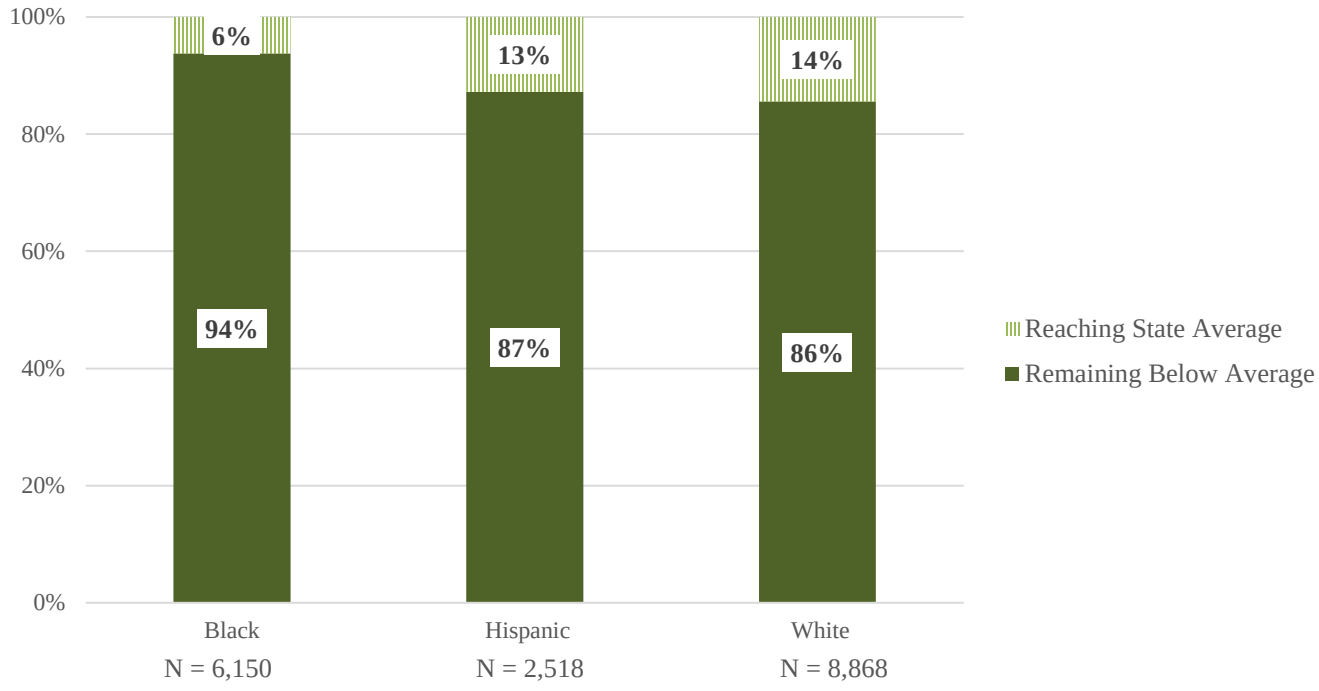


Figure 7: Proportion of Initially Low-Achieving Students who Achieved the State Average by High School by Race (Cohorts 1-3 Combined)



In the following tables, the demographic characteristics of "catch up" students in each low-achieving group are presented by cohort. Table 3 displays information by student FRL and ELL status, while Table 4 presents 'catch up' student characteristics by race and gender. Overall, 14% of low-achieving 3rd graders in Cohort 1, 11% in Cohort 2, and 10% in Cohort 3, caught up to the state average by high school. Table 3 displays information by student FRL and ELL status. Of initially low-achieving students, economically advantaged students were more likely to catch up, compared to their peers who qualify for free or reduced price lunches. Students who were English Language Learners in 3rd grade were equally as likely or more likely to catch up compared to students who were English fluent in 3rd grade.

Table 3: Characteristics of Initially Low-Achieving Students who Achieve State Average in Reading by High School, by FRL and ELL Status

			Overall	FRL	Non-FRL	ELL	Non-ELL
Cohort 1	Low-Achieving	N	6,078	4,802	1,276	844	5,234
	Reaching State Average	N	823	565	258	138	685
		%	14%	12%	20%	16%	13%
Cohort 2	Low- Achieving	N	5,986	4,736	1,249	745	5,241
	Reaching State Average	N	642	415	227	82	560
		%	11%	9%	18%	11%	11%
Cohort 3	Low- Achieving	N	6,038	4,882	1,156	799	5,239
	Reaching State Average	N	612	422	190	90	522
		%	10%	9%	16%	11%	10%

Table 4 displays the demographic characteristics of "catch up" students in each low-achieving group are presented by race and gender for each cohort. Of initially low-achieving students, White and Hispanic students were more likely to catch up, compared to their Black peers. Initially low-achieving female students were consistently more likely to read at the state average by high school than males who demonstrated low reading achievement in third grade.

Table 4: Characteristics of Initially Low-Achieving Students who Achieve State Average in Reading by High School, by Race and Gender

			Overall	Black	White	Hispanic	Male	Female
Cohort 1	Low-Achieving	N	6,078	2,112	2,957	869	3,711	2,367
	Reaching State Average	N	823	172	480	138	358	465
		%	14%	8%	16%	16%	10%	20%
Cohort 2	Low-Achieving	N	5,986	2,004	3,004	786	3,814	2,172
	Reaching State Average	N	642	107	416	86	337	305
		%	11%	5%	14%	11%	9%	14%
Cohort 3	Low-Achieving	N	6,038	2,035	2,907	864	3,752	2,286
	Reaching State Average	N	612	102	382	97	315	297
		%	10%	5%	13%	11%	8%	13%

There are disparities not only in the proportion of students from each group that caught up, but also in the amount of improvement various demographic groups demonstrated from 3rd grade to early high school. Figures 8-10 reflect combined cohort growth trends by economic disadvantage, race, and gender, respectively. In all cases, the average achievement of the student groups remains well below the state average reading performance represented by a z-score value of 0. The amount of growth that each demographic group achieved was comparable across all three cohorts, although cohort 3 is only included through 9th grade as 10th grade assessment results were not yet available.

Figure 8: Average Reading Scores in Grade 3 through 10 by Economic Disadvantage (FRL) Status (Initially Low-Achieving Students, Cohorts 1-3 Combined)

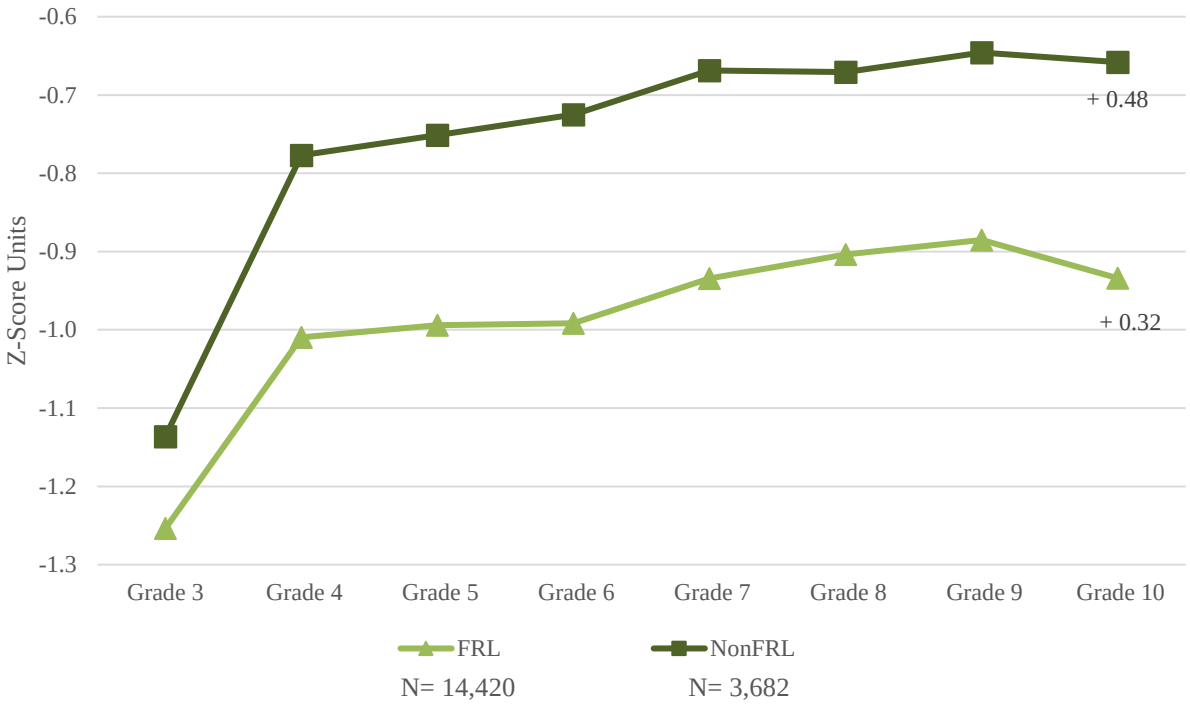


Figure 9: Average Reading Scores in in Grade 3 through 10 by Race (Initially Low-Achieving Students, Cohorts 1-3 Combined)

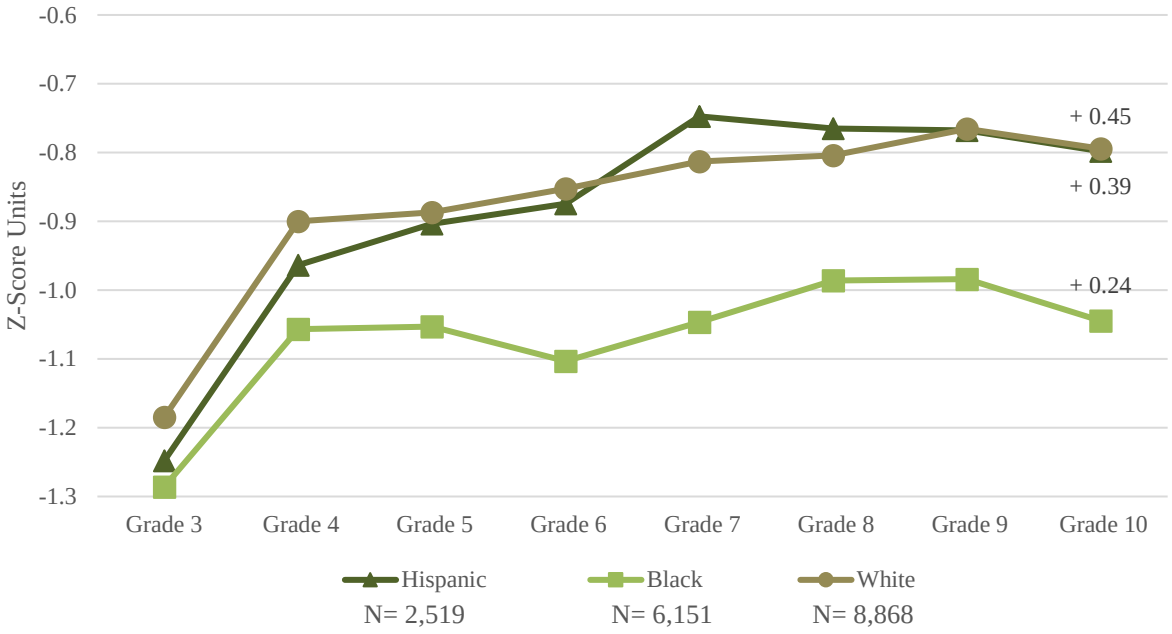
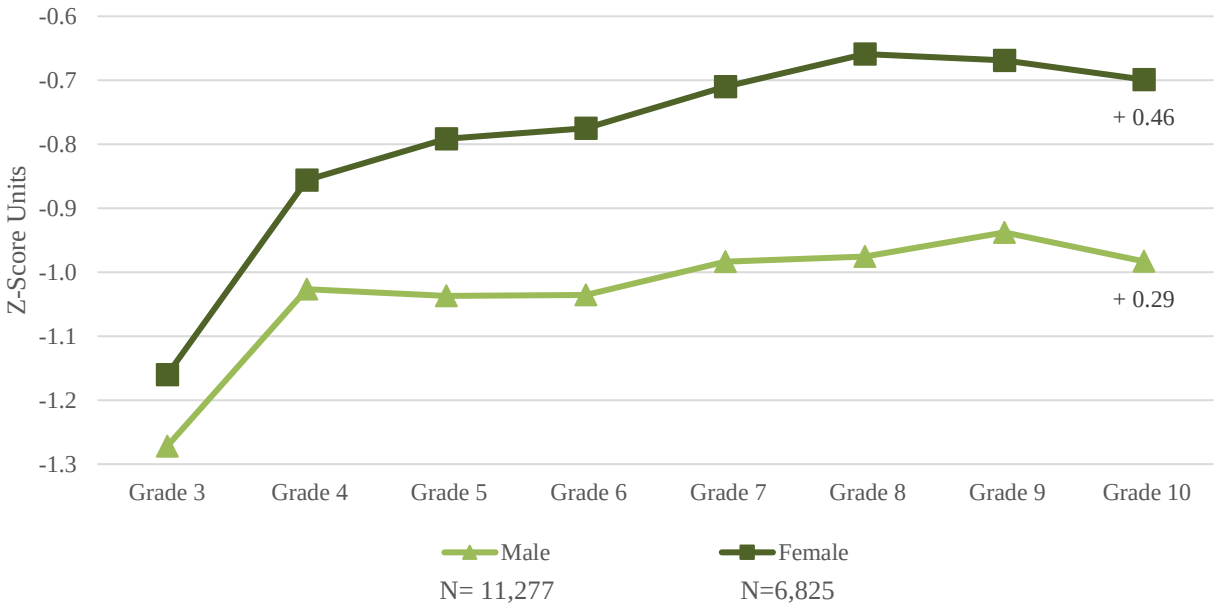


Figure 10: Average Reading Scores in Grade 3 through 10 by Gender (Initially Low-Achieving Students, Cohorts 1-3 Combined)



Figures 8-10 present impressive gains for all student groups between 3rd and 4th grade. Third grade is the assessment on which the low-achieving reading students in this analysis were identified, as well as the first year of formal testing that 'counts' toward school accountability measures. Perhaps these improvements in reading are partly the result of 4th grade teachers and other school staff providing struggling students extra help and focused instruction.

We also see certain groups make more growth than others. Economically advantaged students, Hispanic students, and female students are achieving almost a half standard deviation increase in scores as a group, while Black, male, and low-income students are making about half as much improvement by high school. None of these initially low-achieving groups, even White or economically advantaged students, caught back up to the state average as a group. Of the 12% or less of students that do catch up, economically advantaged, White, and/or female students are overrepresented compared to their economically disadvantaged, Black, and/or male peers.

An interesting trend is that even though the low-achieving Hispanic students initially have very low average scores, these students are able to make advancements comparable to those of White students, the most advantaged group. This is an interesting topic, as most of the research that has been conducted on racial achievement gaps has focused on gaps between White students and their Black and Hispanic counterparts, without looking at differences between the Black and Hispanic subgroups. Arkansas has a growing Hispanic population. According to the U.S. Census Bureau, Hispanic individuals made up 6.4% of our population in 2010, up from 3.2% in 2000. [10] Data from the 2018-19 school year shows that Hispanic students make up 13.1% of our public school population. Given the expanding population, we examine trends among this group of students separate from other racial minority students.

[10] United States Census Bureau (2018). American Fact Finder. Retrieved from: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk

The Narrowing White-Hispanic Gap in Arkansas

National-level research rarely distinguishes between the White-Black and White-Hispanic achievement gaps, probably because they are remaining fairly equal in severity for the country overall. In Arkansas, however, we are seeing the gap between White and Hispanic students narrow. There is an important distinction to be made between Hispanic students who enter public school already fluent in English and those that enter as English Language Learners (ELL). Students who are low achieving in reading in third grade are more likely to have been classified as English Language Learners (ELL), and they are also more likely to maintain this status throughout their school career.

Table 5: Proportion of Hispanic Students with ELL Status for Low-Achieving Group and Total Sample (Cohorts 1-3 Combined)

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
Total Cohort Sample	71%	70%	67%	62%	60%	57%	52%	49%
Low-Achieving in Grade 3	83%	83%	83%	81%	80%	79%	77%	76%

For all Hispanic students, the percent designated as ELL declines from 71% to 49% from grades 3 through 10, but for those who aren't reading proficiently in third grade, that percentage remains relatively consistent, moving from 83% in 3rd grade to 76% by 10th grade. We would expect a dramatic decrease for both groups because the students in this sample were in Arkansas public schools for at least seven consecutive years and we would expect them all to be fluent in English at this point, but it seems that ELL students who are low-achieving in third grade have a particularly hard time becoming identified as fluent in English.

As for achievement on reading and literacy exams, there is not much difference in the group averages over time for students who do or do not have ELL status if they are low achieving in third grade reading. For Hispanic students overall, those with ELL status are achieving lower than their non-ELL Hispanic peers across time.

Figure 11: Change in Reading Achievement from 2008-09 to 2015-16 for Hispanic Students Demonstrating Low Achievement in Third Grade by English Fluency (Cohorts 1-3 Combined)

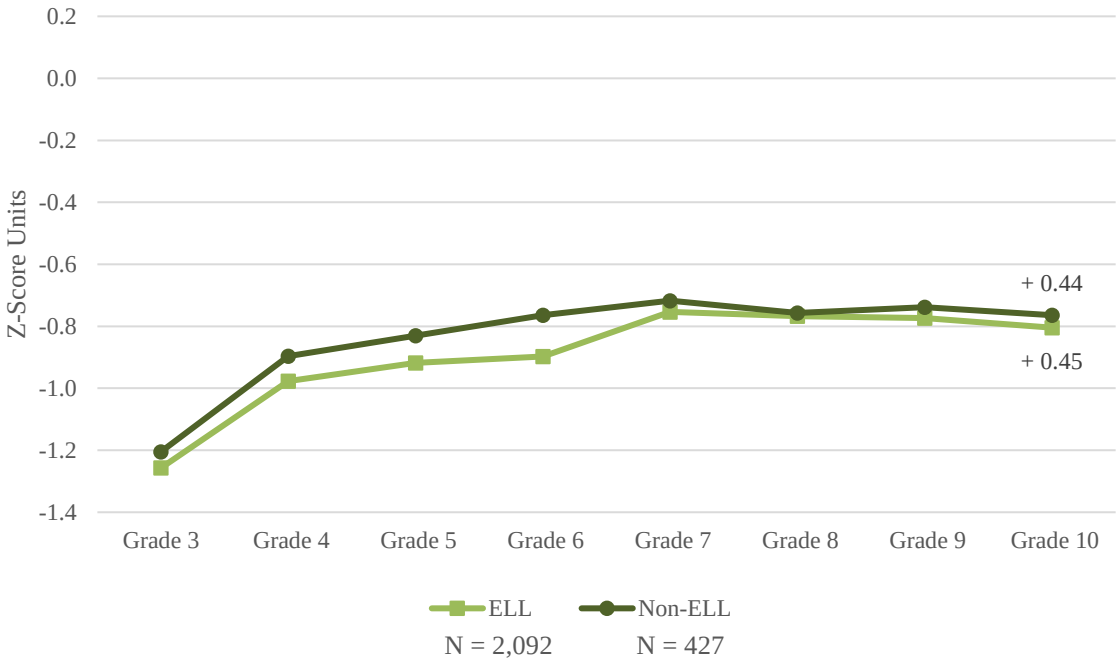
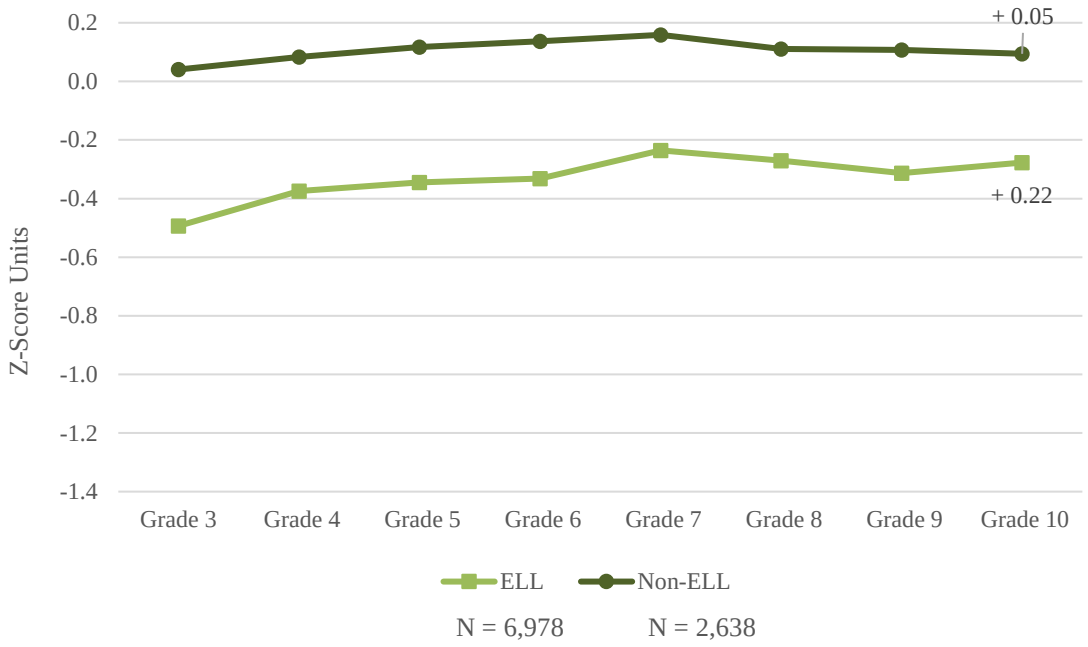


Figure 12: Change in Reading Achievement from 2008-09 to 2015-16 for All Hispanic Students by English Fluency (Cohorts 1-3 Combined)



Hispanic students who are low-achieving in third grade make an impressive amount of growth, almost half a standard deviation closer to the mean, but this growth is comparable between students who enter third grade as English Language Learners and who enter as English fluent. For Hispanic students overall, those who enter third grade as English fluent are scoring consistently higher than those entering as English Language Learner. However, ELL students are achieving much more growth than non-ELL Hispanic students as they progress through school. The discrepancy in scores between all ELL and non-ELL Hispanic students is meaningful, but it does not necessarily indicate that English language knowledge is what determines school achievement. Instead, it implies that there are differences between Hispanic children who already know English in third grade and those that do not, that advantage one group over the other.

In order to suggest that Hispanic students in Arkansas are making growth that we are not seeing nationally, it is important to compare Arkansas' White-Hispanic achievement gaps to those of the nation. Fourth grade students nationwide are assessed in reading and math every two years by the National Assessment of Educational Progress (NAEP). NAEP reports scores which can be broken down and compared across state and demographic categories. In the following figures, Arkansas' White-Black and White-Hispanic score gaps on the NAEP 4th grade reading exam are reported alongside national score gaps.

Figure 13: National and Arkansas Scale Score Gaps between Hispanic and White Students on the NAEP Fourth Grade Reading Exam

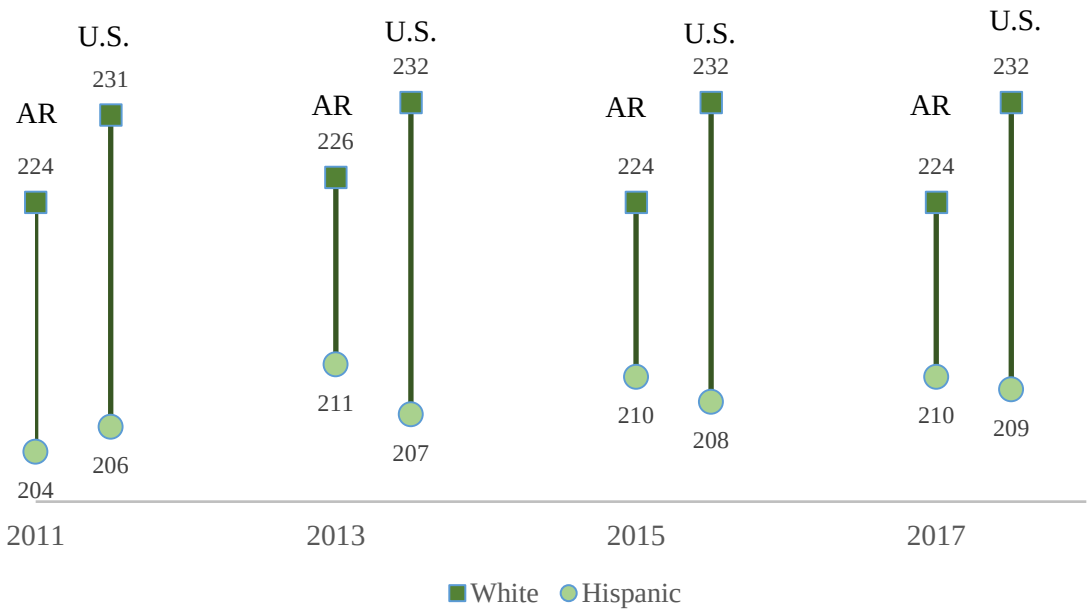


Figure 14: National and Arkansas Scale Score Gaps between Black and White Students on the NAEP Fourth Grade Reading Exam

National score gaps between Black and White students are comparable to those of Arkansas, but national gaps between Hispanic and White students remain consistently wider than those of Arkansas, and Arkansas gaps between White and Hispanic students have decreased from 20 points to 14 points since 2011. Scale scores for White students in Arkansas are consistently lower than national scores for White students, while Hispanic students in Arkansas have been scoring similarly to or higher than Hispanic students nationally, which leads to the decreased White-Hispanic score gap in Arkansas. It will be exciting to search for possible causes of this narrowing achievement gap in hopes that it can help us narrow gaps for other disadvantaged groups.

VI. Conclusion and Implications

The goal of this report was to determine the characteristics of Arkansas students who are low level readers in 3rd grade, and to examine the extent to which these students are able to catch back up to their peers. Here is a summary of our findings:

- The proficiency levels of 3rd graders in Arkansas have fluctuated greatly with the changing state exams. Proficiency rates increased as students took the Arkansas Benchmark Exam, and then decreased sharply beginning in 2015 as students took the PARCC exam and the ACT Aspire.

- Students who were economically disadvantaged, Black or Hispanic, and/or male were more likely to be low-achieving readers in 3rd grade, compared to their economically advantaged, White, and/or female peers.

- The proportion of students who were low-achieving readers in 3rd grade that reached the state average by high school was less than 11.5% overall—14% of students from Cohort 1, 11% of students from Cohort 2, and 10% of students from Cohort 3.

- Economically advantaged students were more likely to catch up to the state average, compared to their less advantaged peers.

- White students were more likely to "catch up", compared to their Black and Hispanic peers. However, Hispanic students were more likely to "catch up" compared to their Black peers, and further analysis revealed that the White-Hispanic achievement gap in Arkansas is smaller than that of the nation and is continuing to narrow.

Our hope is that Arkansas' average reading scores will continue to increase and all students will grow to read proficiently, but it is evident that special attention needs to be given to low income and racial minority students and students who are struggling with basic reading skills in third grade. Programs, including the Arkansas Campaign for Grade Level Reading and the R.I.S.E. initiative, are fighting to close these achievement gaps and increase reading proficiency for 3rd graders in the state. The results of these programs must be carefully monitored to

determine what, if any, impact they are having on changing the long-terms outcomes for students who, as demonstrated in this research, are likely to continue to struggle to read proficiently throughout their educational experience. We must continue to work to ensure that all students, especially racial minority students and those living in poverty, are leaving elementary school as competent readers, equipped with the literacy foundation necessary for future academic success.