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Performance of All Student Subgroups in Arkansas: Moving Beyond Achievement Gaps

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PERFORMANCE OF ALL STUDENT SUBGROUPS IN ARKANSAS: MOVING BEYOND ACHIEVEMENT GAPS

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EXECUTIVE SUMMARY

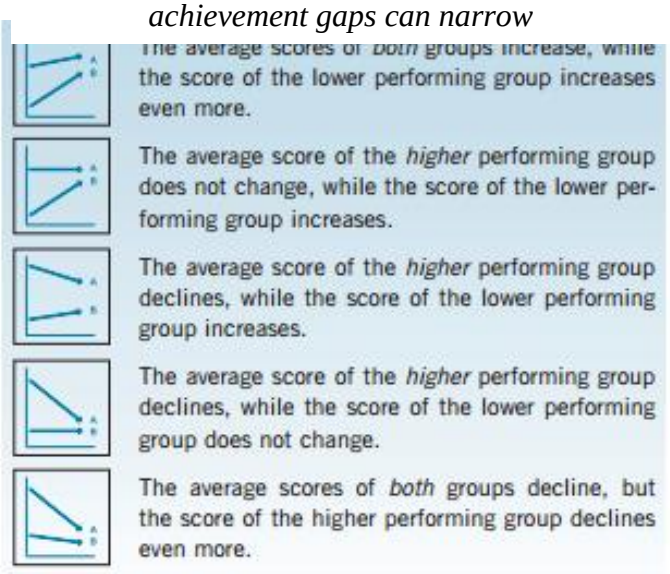
The 2013-14 school year marks ten years since the Arkansas General Assembly passed legislation to construct a new K-12 funding system in response to a 2002 Arkansas Supreme Court ruling in the decades-long court case, *Lake View School District No. 25 v. Huckabee*. The post-*Lake View* funding structure allocates funding for adequacy and equity purposes to equalize educational opportunities for all students. Thus, the purpose of this report is to measure the performance of all of Arkansas' students and the subsequent existing achievement gaps between subgroups of students over the past ten years. In doing so, we hope that this report will provide evidence regarding performance and growth of Arkansas' students, so that we can continue to work together to move all of Arkansas' students forward.

In 2012-13, 36% of Arkansas' K-12 students were identified as minority students, while 61% of students were identified as low-income. Thus, as we analyze the achievement gaps between students of different races and incomes, it is important to remember that these student subgroups compose a significant proportion of our student population.

National research over time reveals that minority and low-income students perform less well than non-minority and non-low-income students. However, in the discussion regarding performance of subgroups of students, often achievement gaps are presented without the context of actual performance and growth over time. For instance, a media outlet might report that a school decreased an achievement gap between two subgroups of students by 3 percentage points. Without additional data, it may be assumed that the school is doing a better job with its students, as the gap between two subgroups of students has decreased. *However, what if the gap was lower simply because the higher performing group decreased its performance?* Certainly, it becomes important to examine achievement gaps in context of performance.

Figure 1 highlights instances in which a measured achievement gap may narrow.[1] As displayed by the figure, not all methods to narrowing the gap are desirable. Similarly, it is possible that all student groups experience equally great growth in a given year; in such a case, while it would be true that the achievement gaps did not diminish, we likely would want to view that achievement growth in a positive light. Therefore, it becomes evident that it is important to examine achievement gaps in context of the performance of each of the focal student subgroups. In this report, achievement gaps between Arkansas' subgroups will be examined alongside the performance of each group over time.

Figure 1: Examining different ways that achievement gaps can narrow



[1] http://nces.ed.gov/nationsreportcard/pdf/studies/2009455.pdf

Results

To thoroughly analyze achievement gaps in Arkansas, we present Arkansas' achievement gaps while examining the performance and growth of subgroups over time on the National Assessment of Educational Progress (NAEP) assessment and state grade 3-8 Benchmark assessments. The analysis reveals nuanced results, depending on the measure (proficiency levels, scale scores, or percentile rankings) and subject and grade levels; however, the overall analysis confirms the following patterns:

- While all subgroups experience positive growth over time, black and Hispanic students performed less well than white students on math and literacy national and state assessments.
    - The gap between black and white students is greater than the gap between Hispanic and white students over time.
- The gap between black and white students slightly decreased in respect to average scale score points on math and literacy national and state assessments; however, with respect to the percentage of students reaching proficiency cutoffs, the gap slightly increased on three national assessments (grade 4 math, grade 8 math, and grade 8 literacy).
- While both the low-income and non-low-income subgroups experience positive growth over time on math and literacy national and state assessments, the gap between low-income and non-low-income students widened over time.

Furthermore, when Arkansas is compared to the nation and to surrounding states on the National Assessment of Educational Progress (NAEP), often referred to as the best measure to compare the performance of states across the nation, the following results emerge:

Compared to the nation

- Arkansas' gaps between black and white students and Hispanic and white students were moderately smaller than the average gaps of the nation on grade 4 and 8 math and literacy in respect to performance as measured by average scale scores and proficiency levels.
- Arkansas' gap between low-income and non-low-income students was smaller than the average gap of the nation on grade 4 and 8 math and literacy, as measured by average scale scores and proficiency levels.

Compared to surrounding states

- Arkansas' gaps between black and white students and Hispanic and white students were moderately smaller than the gaps of the surrounding states on grade 4 math and literacy; however, on grade 8 math and literacy, Arkansas' racial gaps were equal or slightly larger than the racial gaps of the surrounding states.
- Arkansas' gap between low-income and non-low-income students was moderately smaller than the gaps of the surrounding states on grade 4 math and literacy; however, on grade 8 math and literacy, Arkansas' racial gaps were equal or slightly larger than the racial gaps of the surrounding states.

Finally, the report concludes by examining the relationship between district performance and growth and district student composition. This analysis allows us to see the impact of student demographics on school district performance by comparing districts based on the percentage of minority students and the percentage of low-income students. The final analysis confirms that districts with higher percentages of minority students and/or low-income students perform less well over time. However, districts with higher percentages of minority students and/or low-income students experienced higher growth with more students moving into the proficient or advanced levels; therefore, the gap between the districts slightly decreased over time. However, it is important to recognize that these differences in growth may be attributed to a ceiling effect, in which scores reach high levels and thus growth from that point on becomes difficult and close to impossible.

In Arkansas and across the country, students in poverty and in racial minority groups have historically had relatively low student achievement on average. In this report, we find that students in these subgroups have experienced positive growth over time; however, performance gaps between subgroups of students continue to exist in Arkansas and across the nation. While Arkansas' achievement gaps were generally smaller than the nation's average achievement gaps on the most recent administration of the NAEP, substantial issues remain, particularly when considering gaps between low-income and non-low-income students. While the purpose of this report is not to offer a picture of how or why achievement has changed over time, we hope that this report will provide evidence regarding performance and growth of Arkansas' students, so that we can continue to work together to move all of Arkansas' students forward.

I. INTRODUCTION

The 2013-14 school year marks ten years since the Arkansas General Assembly passed legislation to construct a new K-12 funding system in response to a 2002 Arkansas Supreme Court ruling in the decades-long court case, *Lake View School District No. 25 v. Huckabee*. The General Assembly established a foundation formula to provide adequate funding to districts across the state and created categorical funding to provide additional equity funding to districts based on need. In doing so, the state provides additional funding to districts based on the number of students that are English Language Learners, in alternative learning environments, or from low-income households (National School Lunch Act funding). With the post-*Lake View* funding structure, the state seeks to equalize educational opportunities for all students.

In prior work, we have found that the new funding formula has had the effect of targeting additional funds to districts serving our state's most disadvantaged students. The fact that racial minority students and economically disadvantaged students, on average, attend schools with greater levels of financial resources should certainly be viewed as a victory by equity advocates. However, while it is important to ensure that equal resources be provided, it is even more important to assess the quality of the education being provided to all of our state's students, including disadvantaged students.

The purpose of this report is to measure the performance of Arkansas' students and the subsequent achievement gaps between students of different subgroups over the past ten years. While this report does not attempt to make connections between achievement and spending or other education reforms, it is important to recognize the reforms that have occurred in the past ten years that may attribute to changes in performance. Additionally, the purpose of this report is not to offer a picture of how or why achievement has changed over time. Instead, the report will provide evidence regarding performance and growth with the hopes of continuing the discussion and work of moving Arkansas' students forward.

A. Defining the Achievement Gap

An achievement gap is defined as the difference between the average score of one subgroup as compared to another. The 2001 update of the Elementary and Secondary Education Act (ESEA) stated that it sought "to close the achievement gap […] so that no child is left behind."[2] Since the passing of the original ESEA in the 1960s, it has become well-documented that achievement gaps exist between subgroups of students in the United States. In fact, the term "achievement gap" yields over 7 million hits in Google. Achievement gaps can be detected between various subgroups of students, including by race, income, gender, language status, or location.

For the purposes of this report, we focus on the disparities in achievement between black and white students, Hispanic and white students, and low-income and non-low-income students. The relationship between the race and household income of a student and a student's performance is a matter of concern for educators and policymakers—particularly when considering the ideas of

[2] http://www2.ed.gov/policy/elsec/leg/esea02/beginning.html

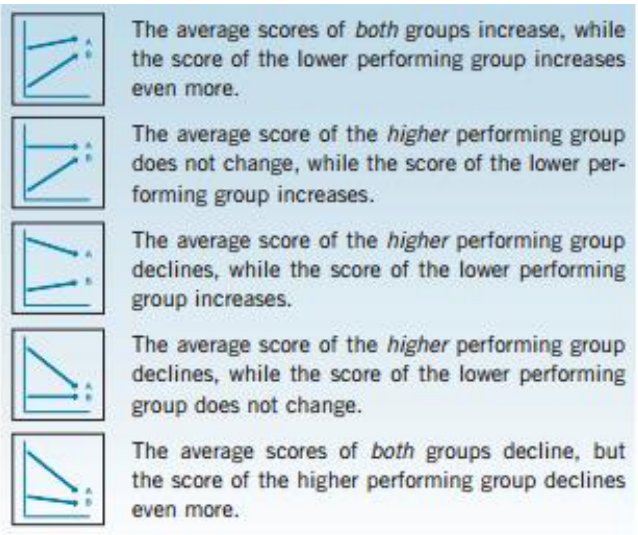
adequacy and equality in education. In Arkansas and across the country, students in poverty and in racial minority groups have historically had relatively low student achievement on average. Of course, one of the primary goals of public education is to provide each child an equal opportunity for a quality education regardless of background. While decreasing these achievement gaps is not the sole goal of public education, it is an important indicator of how effective our schools are at leveling the playing field. As we analyze the achievement gaps between students of different incomes and races, it is important to remember that these student subgroups compose a significant proportion of our student population.[3]

B. Considering Achievement Gaps and Performance

The focus of this paper is to examine the overall performance and gaps in performance between subgroups of students. Often, achievement gaps are reported as a solitary measure. For instance, a media outlet might report that a school decreased an achievement gap between two subgroups of students by 3 percentage points. Without additional data, it may be assumed that the school is doing a better job with its students, as the gap between two subgroups of students has decreased. However, what if the gap was lower simply because the higher performing group decreased its performance? Certainly, it becomes important to examine achievement gaps in context of performance.

Figure 1, produced by the National Center for Education Statistics within the US Department of Education, highlights various ways in which a measured achievement gap may narrow.[4] As displayed by the figure, not all methods to narrowing the gap are desirable. Therefore, it becomes evident that it is important to examine achievement gaps in context of performance. In this report, achievement gaps between Arkansas' subgroups will be examined alongside subgroup performance over time.

Figure 1: Examining different ways that achievement gaps can narrow



C. Arkansas Demographics

In this report, we examine the performance of Arkansas students over time and compare subgroups of students. The Arkansas Department of Education (ADE) provides data on Arkansas students and identifies the following racial subgroups: Asian, black, Hispanic, Native

[3] In the 2012-13 school year, 36% of Arkansas' K-12 students were classified as minority students and 61% received free-and-reduced lunches (a measure of the percentage of low-income students).
[4] http://nces.ed.gov/nationsreportcard/pdf/studies/2009455.pdf

American/Native Alaskan, Native Hawaiian/Pacific Islander, white, and two or more races. Furthermore, the ADE releases data on income by reporting the number of students who receive free-and-reduced lunch (FRL).

In the 2012-13 school year, 36% of Arkansas' K-12 students were classified as minority students and 61% received free-and-reduced lunches (a measure of the percentage of low-income students). Figure 1 below highlights Arkansas' K-12 enrollment by race in 2012-13: 64% of the state's students are white, 21% are black, and 10% are Hispanic. Then, Table 1 highlights Arkansas' K-12 enrollment by race and income over time. Over the eight-year time span, the percentage of Hispanic students in Arkansas increased, and the percentage of FRL students increased. In this report, we focus on three racial subgroups of students (black, Hispanic, and white), as the other racial subgroups are small (<2% respectively).

Figure 1: Arkansas' K-12 enrollment, by race, 2012-13

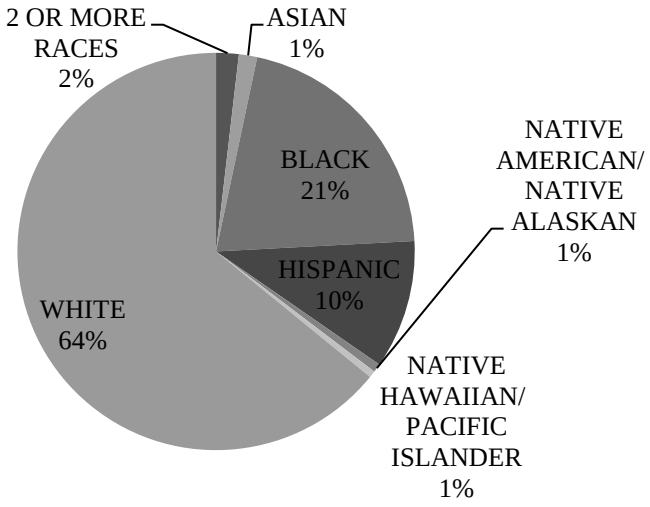


Table 1: Arkansas K-12 enrollment, by race and income, over time, 2005-06 to 2012-13

	Two Or More Races *	Asian	Black	Hispanic	Native American/ Native Alaskan	Native Hawaiian / Pacific Islander*	White	% FRL	Total Enroll-ment
2005-06	-	1%	23%	7%	1%	-	68%	54%	463,890
2006-07	-	2%	23%	7%	1%	-	68%	54%	465,613
2007-08	-	2%	22%	8%	1%	-	67%	55%	466,391
2008-09	-	2%	22%	8%	1%	-	67%	56%	465,801
2009-10	1%	1%	22%	9%	1%	0%	66%	58%	467,061
2010-11	1%	1%	21%	10%	1%	0%	65%	59%	468,066
2011-12	2%	1%	21%	10%	1%	0%	65%	60%	468,656
2012-13	2%	1%	21%	10%	1%	1%	64%	61%	471,867
Change over time	-	**0 % pts.**	**-1.9 % pts.**	**+3.8 % pts.**	**0 % pts.**	-	**-4.4 % pts.**	**+7 % pts.**	**+7,977**

**Subgroup unidentified prior to the 2009-10 school year*

D. Report Outline

In the following sections, the performance of Arkansas' students and the existing achievement gaps will be examined over time based on national and state assessments. The subsequent section uses national achievement data from the National Assessment of Education Progress (NAEP) to compare Arkansas' performance and achievement gaps to that of the nation and Arkansas' surrounding states. The following section analyzes Arkansas' achievement over time on the state's criterion-referenced test, the Benchmark. Finally, in the last section, performance and achievement gaps are analyzed in context of school districts. In doing so, the aim of this report is to provide information so that policy makers, administrators, teachers, and other stakeholders can continue to work on elevating the performance of all students in Arkansas.

II. ACHIEVEMENT GAP ANALYSIS: BETWEEN STATES

In the following section, the performance of Arkansas' students is examined in a national context through the National Assessment of Educational Progress (NAEP). The performance of Arkansas' 4th and 8th grade students and the subsequent achievement gaps between racial and socioeconomic subgroups is analyzed over time in math and reading, as compared to the nation and to Arkansas' surrounding states.

A. National Assessment of Educational Progress (NAEP)

The National Assessment of Educational Progress (NAEP) is a set of national assessments administered to students across the United States by the National Center for Education Statistics (NCES). NCES has administered a host of assessments to students since the 1970s, including the long-term trend assessments that are given every four years to a representative sample of US students. Additionally, since 1990, NCES has administered an assessment to a representative sample of students in public and nonpublic schools from each state. This NAEP assessment, known as "the Nation's Report Card," serves as "a common metric for all states."[5] It is administered to students in grades 4, 8, and 12 in reading and mathematics; however, results are only available for all 50 states in grades 4 and 8 (results are only available to 13 states at the 12th grade level). The assessments are administered uniformly, as students use the same sets of test booklets. The state-level NAEP is widely recognized as a rigorous assessment of student performance in math and literacy. The reading and math assessments are based on frameworks created by the National Assessment Governing Board; subsequently, the assessments have remained relatively unchanged since 1990. The assessments are administered at the state-level every two years and are "essentially the same from year to year, with only carefully documented changes." The reading and math assessments consist of multiple-choice and constructed-response questions. Additionally, students, teachers, and schools complete a questionnaire that collects demographic and other data; and in doing so, the NCES is able to report subgroup performance for the state-level NAEP assessment.

In the following sections, state-level NAEP data is used to examine the performance of subgroups of students over time in grade four and eight math and reading. By analyzing NAEP data, we are able to examine Arkansas' performance and achievement gaps as compared to the nation and to Arkansas' surrounding states. The first section analyzes the performance of students by race over time, and the second section analyzes the performance of students based on socioeconomic status over time.

B. Racial Disparities: NAEP Performance by Race Over Time[6]

In this section, NAEP performance is examined by race in grade four and eight reading and math. To do so, four graphs are presented for each grade-level by subject. Two graphs examine performance and achievement gaps based on the percent of students at or above the proficient

[5] http://nces.ed.gov/nationsreportcard/about/
[6] NAEP scale scores for Hispanic students in Arkansas were not available prior to 2005.

level and two graphs examine performance and achievement gaps based on average scale scores. It is important to consider both the proficiency levels and the scale scores, as they provide different pieces of information at times. Although most policymakers and casual observers can easily understand the concept of "passing" rates, it is also important to report group performance in terms of average scale scores. By reporting this metric, we can observe growth and score changes across the full distribution of student ability, rather than solely in those instances of when student scores move above or below the proficiency cut scores.

1. Math

a. Grade 4

On the NAEP grade 4 math assessment, 39% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (42%), it was higher than that of Arkansas' surrounding states (35%). Since the 2000 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+25 percentage points) than did that of the nation (+18 percentage points) or that of the surrounding states (+17 percentage points) (Figure 2).

Black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; additionally, since the 2000 NAEP administration, the proficiency percentage for white students grew more (+29 percentage points) than did the percentages for black and Hispanic students (+15 percentage points and +25 percentage points, respectively) (Figure 2). As a result, the white-black gap and the white-Hispanic gap, in terms of proficiency percentages, grew from 2000 to 2013 (Figure 3).

However, as we alluded to above, viewing the group performance based on the proficiency percentage may well overlook a great deal of student growth either above or below the proficiency cut score. Thus, although most policymakers and casual observers can easily understand the concept of "passing" rates, it is also important to report group performance in terms of average scale scores. By reporting this metric, we can observe growth and score changes across the distribution of students, rather than solely in those instances of when student scores move above or below the cut scores.

In terms of average scale scores, black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; however, since the 2000 NAEP administration, the average scale score for white students grew less (+21 scale score points) than did the average scale scores for black students (+29 scale score points) (Figure 4). Thus, based on these scale scores, the gap between white and black students decreased between 2000 and 2013 (Figure 5). The apparent difference between the proficiency gap and scale score gap can be explained by the fact that while black and Hispanic students were increasing their raw scores more rapidly, the number of students reaching the proficiency cutoff was not increasing as rapidly.

b. Grade 8

On the NAEP grade 8 math assessment, 28% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (35%), it was on par with Arkansas' surrounding states. Since the 2000 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+15 percentage points) than did that of the nation (+9 percentage points) or that of the surrounding states (+11 percentage points) (Figure 6).

Black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; additionally, since the 2000 NAEP administration, the proficiency percentage for white students grew more (+15 percentage points) than did the percentage for black students (7 percentages points) (Figure 6). As a result, the white-black gap, in terms of proficiency percentages, grew from 2000 to 2013 (Figure 7). However, since the 2000 NAEP administration, the proficiency percentage for Hispanic students grew slightly more (+16 percentage points) than did the percentage for white students (+15 percentage points) (Figure 6); therefore, as a result, the white-Hispanic gap slightly decreased from 2000 to 2013 (Figure 7).

In terms of average scale scores, black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; however, since the 2000 NAEP administration, the average scale score for black students grew more (+28 scale score points) than did the average scale scores for white students (+18 scale score points) (Figure 8). Thus, based on these scale scores, the gap between white and black students decreased between 2000 and 2013 (Figure 9). The apparent difference between the proficiency gap and scale score gap can be explained by the fact that while black students were increasing their raw scores more rapidly, the number of students reaching the proficiency cutoff was not increasing as rapidly.

c. Summary points

In 4th and 8th grade, Arkansas' subgroups experienced positive growth in performance between 2000 and 2013 on proficiency levels and scale score points.

- The achievement gap between black and white students grew over time in respect to the percentage of students scoring proficient or higher (+14 percentage points in 4th grade and +8 percentage points in 8th grade), as the percentage of white students reaching proficiency increased more rapidly over time. However, in respect to scale score points, the gap between black and white students slightly decreased (-8 scale score points in 4th grade and -10 in 8th grade) as the average scale score of black students increased more rapidly during this time period.

- The achievement gap between Hispanic and white students slightly grew in 4th grade between 2000 and 2013, as the percentage of white students reaching proficiency increased over time. However, in 8th grade, the gap between Hispanic and white students slightly decreased (-1 percentage points), as the percentage of Hispanic students reaching proficiency increased slightly more rapidly over time.

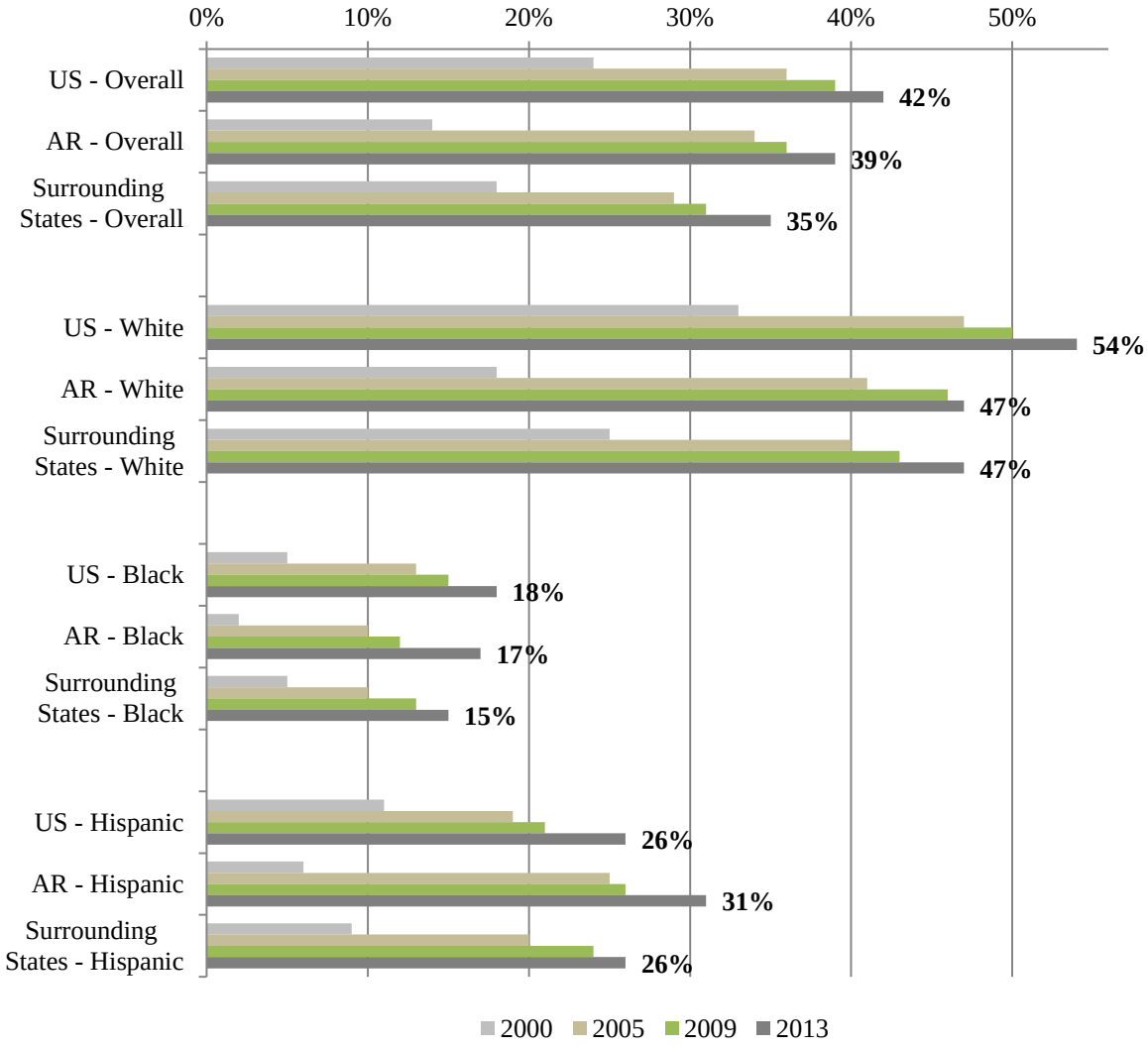
Compared to the nation

- Arkansas' gap between black and white students and Hispanic and white students were moderately smaller than the average gaps of the nation on grade 4 and 8 math in respect to performance as measured by average scale scores and proficiency levels.

Compared to surrounding states

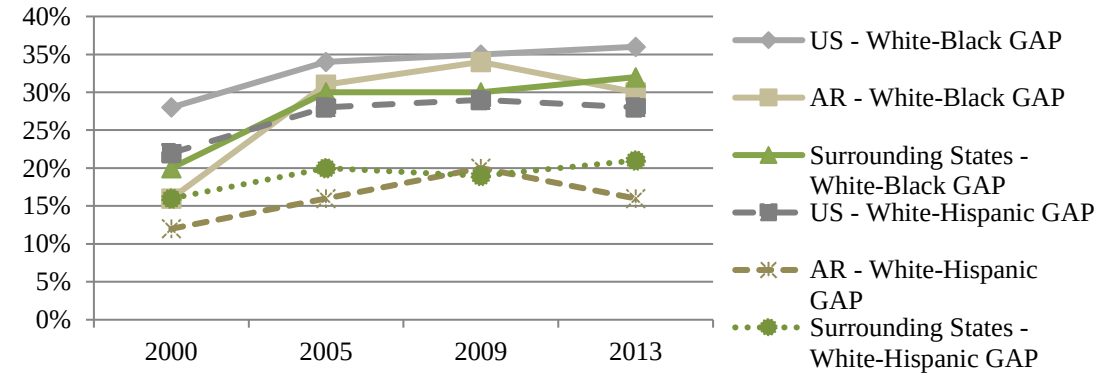
- Arkansas' gaps between black and white students and Hispanic and white students were moderately smaller than the gaps of the surrounding states on grade 4 math; however, on grade 8 math, Arkansas' racial gaps were equal to or slightly larger than the racial gaps of the surrounding states.

Figure 2: NAEP math, grade 4, % of students at or above proficient level, 2000 to 2013



Growth
+18 % pts.
+25 % pts.
+17 % pts.
+21 % pts.
+29 % pts.
+22 % pts.
+13 % pts.
+15 % pts.
+10 % pts.
+15 % pts.
+25 % pts.
+17 % pts.

Figure 3: NAEP math, grade 4, achievement gaps in % of students of students proficient or advanced, 2000 to 2013



Change in gap
+8 % pts.
+14 % pts.
+12 % pts.
+6 % pts.
+4 % pts.
+5% pts.

Figure 4: NAEP math, grade 4, scale scores, 2000 to 2013

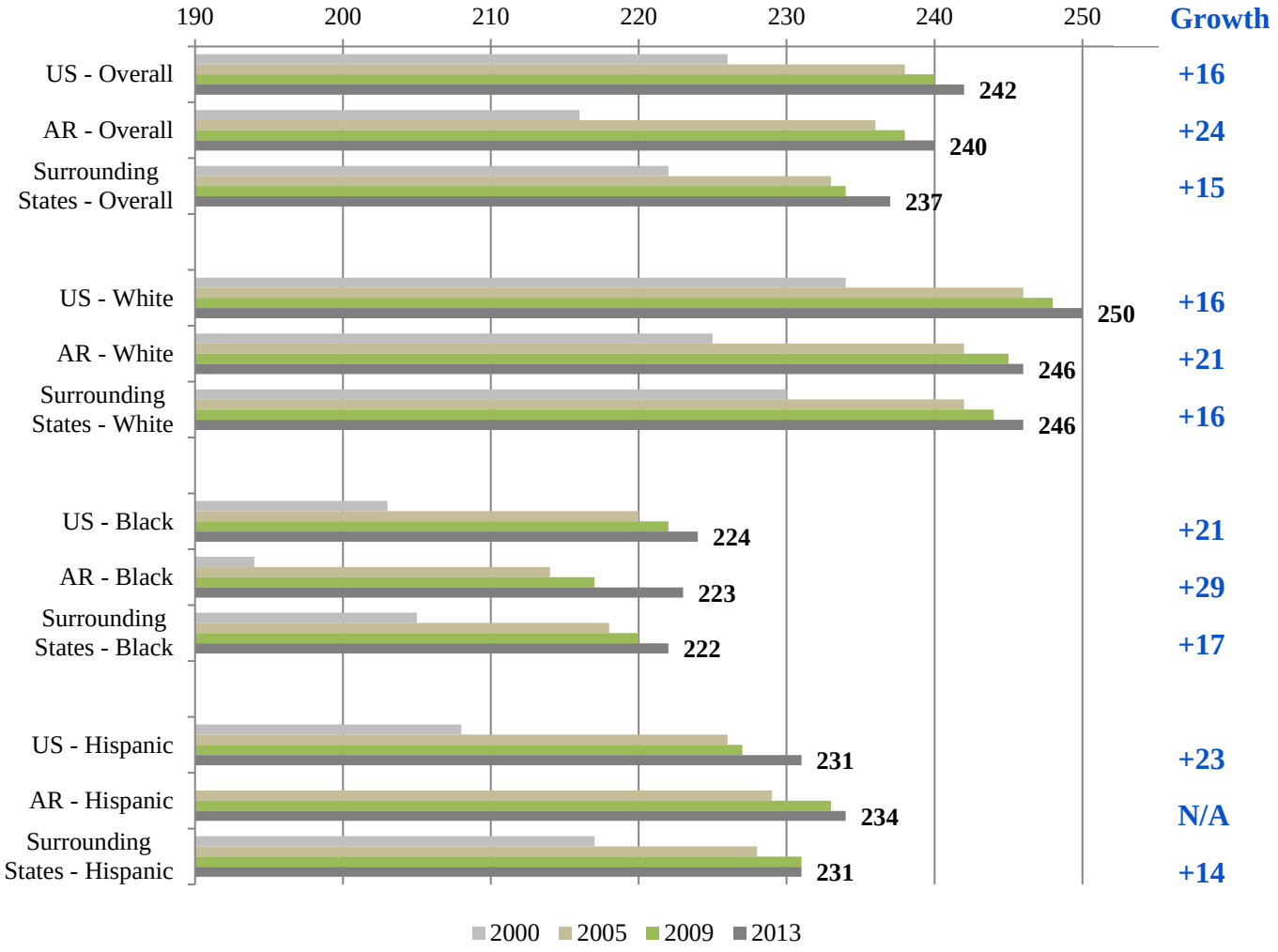


Figure 5: NAEP math, grade 4, achievement gaps in scale scores, over time, 2000 to 2013

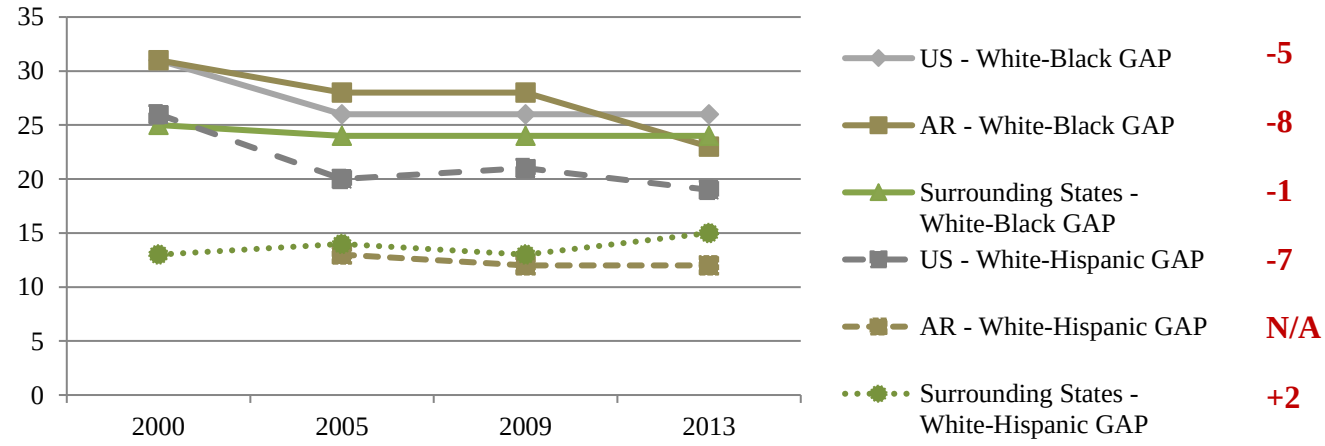


Figure 6: NAEP math, grade 8, % of students at or above proficient level, 2000 to 2013

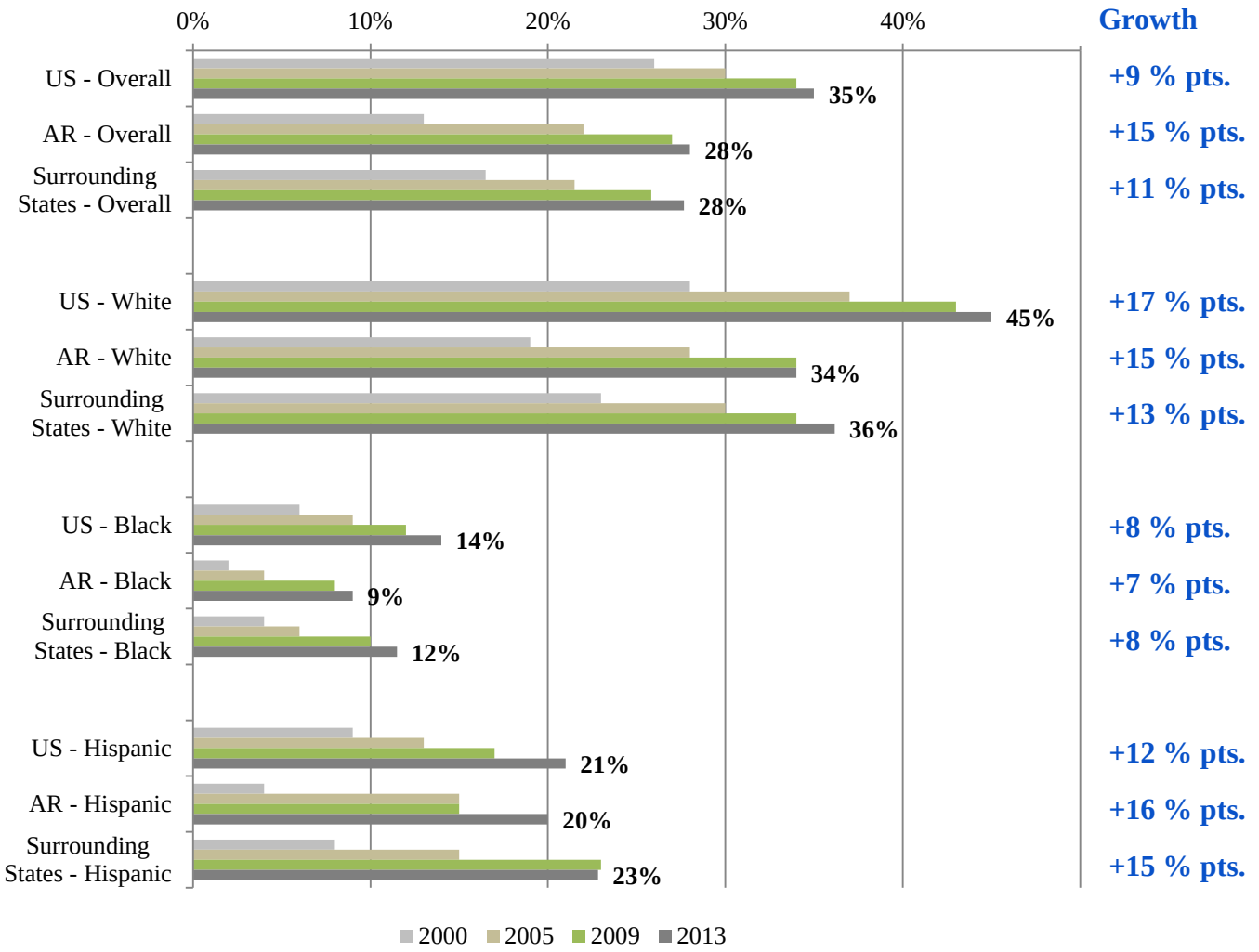


Figure 7: NAEP math, grade 8, achievement gaps in % of students of students proficient or advanced, 2000 to 2013

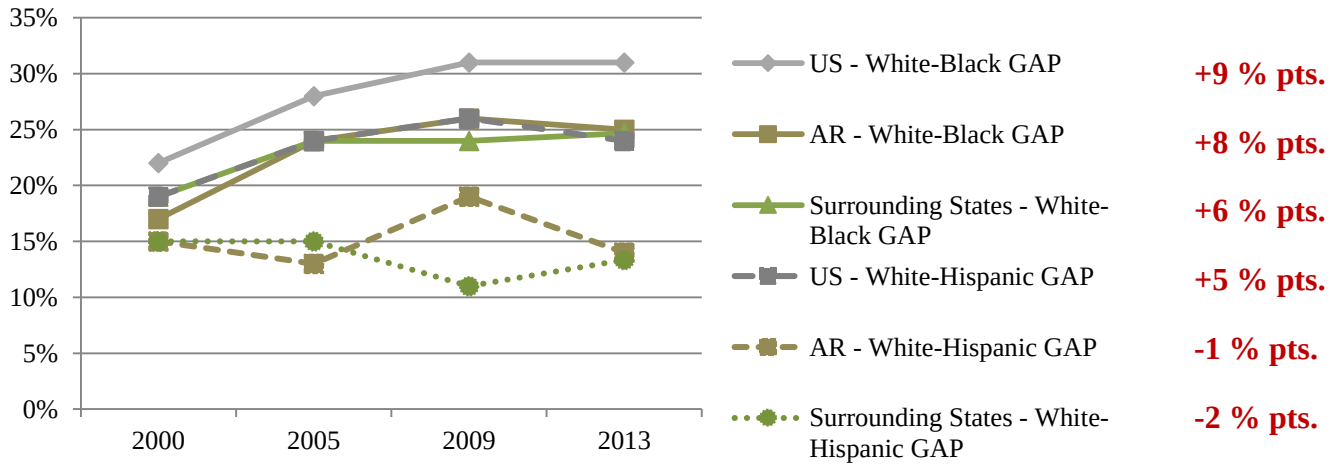


Figure 8: NAEP math, grade 8, scale scores, 2000 to 2013

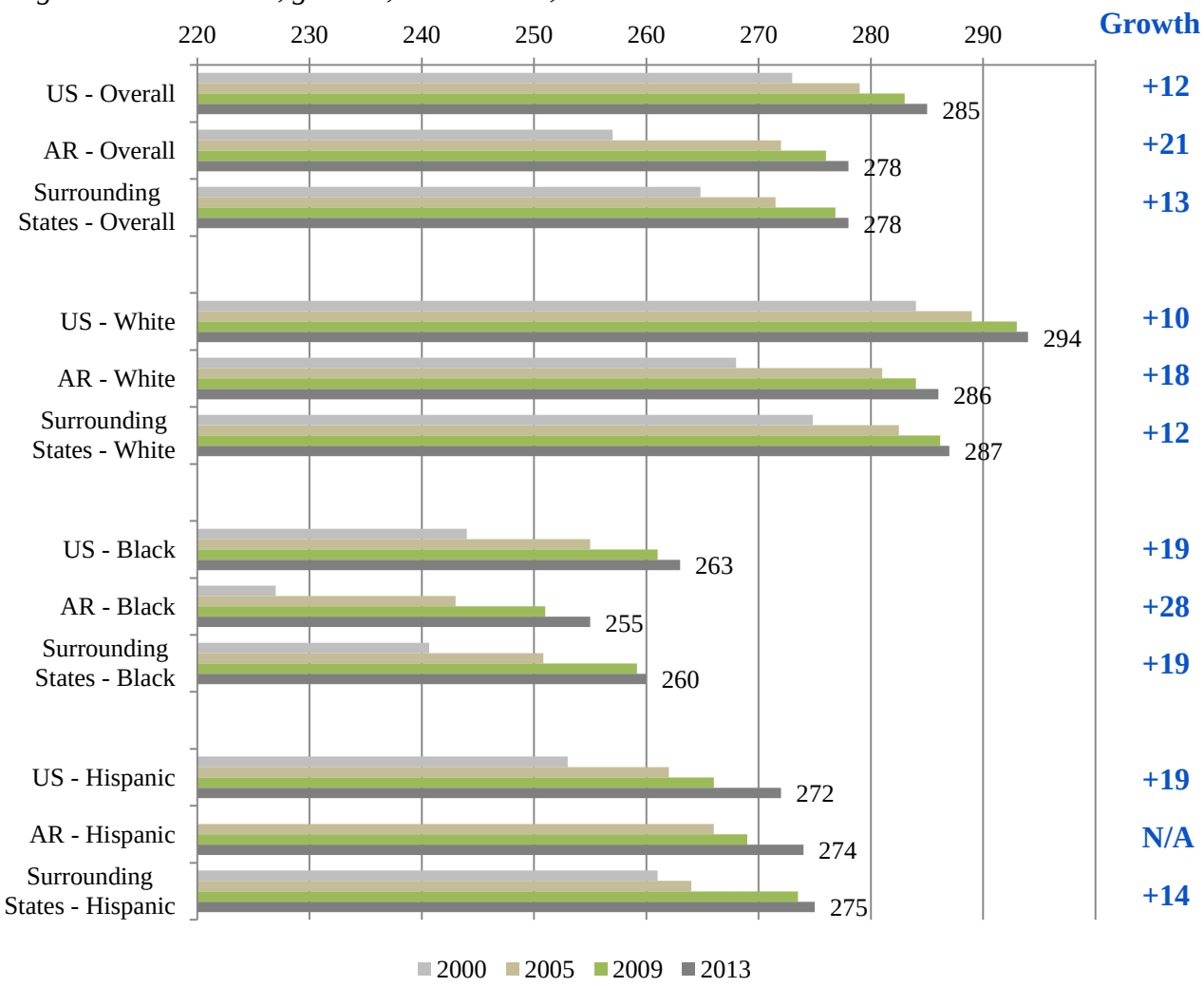
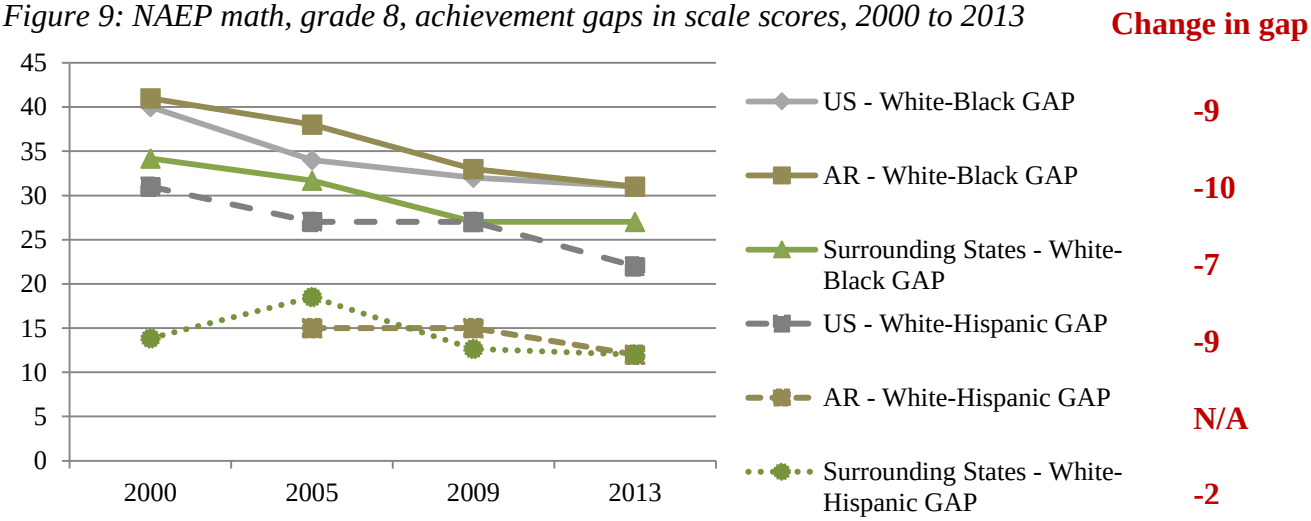


Figure 9: NAEP math, grade 8, achievement gaps in scale scores, 2000 to 2013



2. Literacy

a. Grade 4

On the NAEP grade 4 literacy assessment, 32% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (35%), it was higher than that of Arkansas' surrounding states (29%). Since the 2002 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+6 percentage points) than did that of the nation (+3 percentage points) or that of the surrounding states (+4 percentage points) (Figure 10).

Black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied. However, since the 2002 NAEP administration, the proficiency percentage for black and Hispanic students grew more (+7 and +8 percentage points, respectively) than did the percentages for white students (+5 points) (Figure 10). As a result, Arkansas' the white-black gap and the white-Hispanic gap, in terms of proficiency percentages, slightly decreased from 2002 to 2013 (Figure 11). Furthermore, since the 2002 NAEP administration, the average scale score for black and Hispanic students grew more (+8 and +7 scale score points, respectively) than did the average scale scores for white students (+4 scale score points) (Figure 12). Thus, based on these scale scores, the gap between white and black students and white and Hispanic students decreased between 2002 and 2013 (Figure 13).

b. Grade 8

On the NAEP grade 8 literacy assessment, 30% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (36%), it was slightly higher than that of Arkansas' surrounding states (29%). Since the 2002 NAEP administration, the nation's proficiency percentage increased by 6 percentage points, while Arkansas increased by 2 percentage points and the surrounding states increased by 3 percentage points (Figure 14).

Black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; however, since the 2002 NAEP administration, the proficiency percentage for black students grew more (+6 percentage points) than did the percentages for white students (+3 percentage points) (Figure 14). As a result, Arkansas' white-black gap, in terms of proficiency percentages, slightly decreased from 2002 to 2013 (Figure 15). Moreover, in terms of average scale scores, black and Hispanic students in Arkansas performed less well than did their white peers in each of the time periods studied; however, since the 2002 NAEP administration, the average scale score for black students grew more (+6 scale score points) than did the average scale scores for white students (+2 scale score points) (Figure 16). Thus, based on these scale scores, the gap between white and black students decreased between 2002 and 2013 (Figure 17).

c. Summary points

In 4th and 8th grade, Arkansas' subgroups experienced positive growth in performance between 2002 and 2013 on proficiency levels and scale score points.

- In 4th grade, the achievement gaps between black and white students and Hispanic and white students slightly decreased over time, as the proficiency percentage for black and Hispanic students grew more (+7 and +8 percentage points, respectively) than did the percentages for white students (+5 points). Moreover, black and Hispanic students experienced more growth on scale scores as well.

- In 8th grade, the achievement gaps between black and white students slightly decreased over time, as the proficiency percentage for black students grew more (+6 percentage points) than did the percentages for white students (+3 points). Moreover, black students experience more growth on scale scores as well. Additionally, the achievement gaps between Hispanic and white students slightly decreased from 2005 to 2013 in respect to proficiency percentages and scale score points.

Compared to the nation

- Arkansas' gap between black and white students and Hispanic and white students were moderately smaller than the average gaps of the nation on grade 4 and 8 literacy in respect to performance as measured by average scale scores and proficiency levels

Compared to surrounding states

- Arkansas' gaps between black and white students and Hispanic and white students were moderately smaller than the gaps of the surrounding states on grade 4 literacy; however, on grade 8 literacy, Arkansas' racial gaps were equal to or slightly larger than the racial gaps of the surrounding states

Figure 10: NAEP literacy, grade 4, % of students at or above proficient level, 2002 to 2013

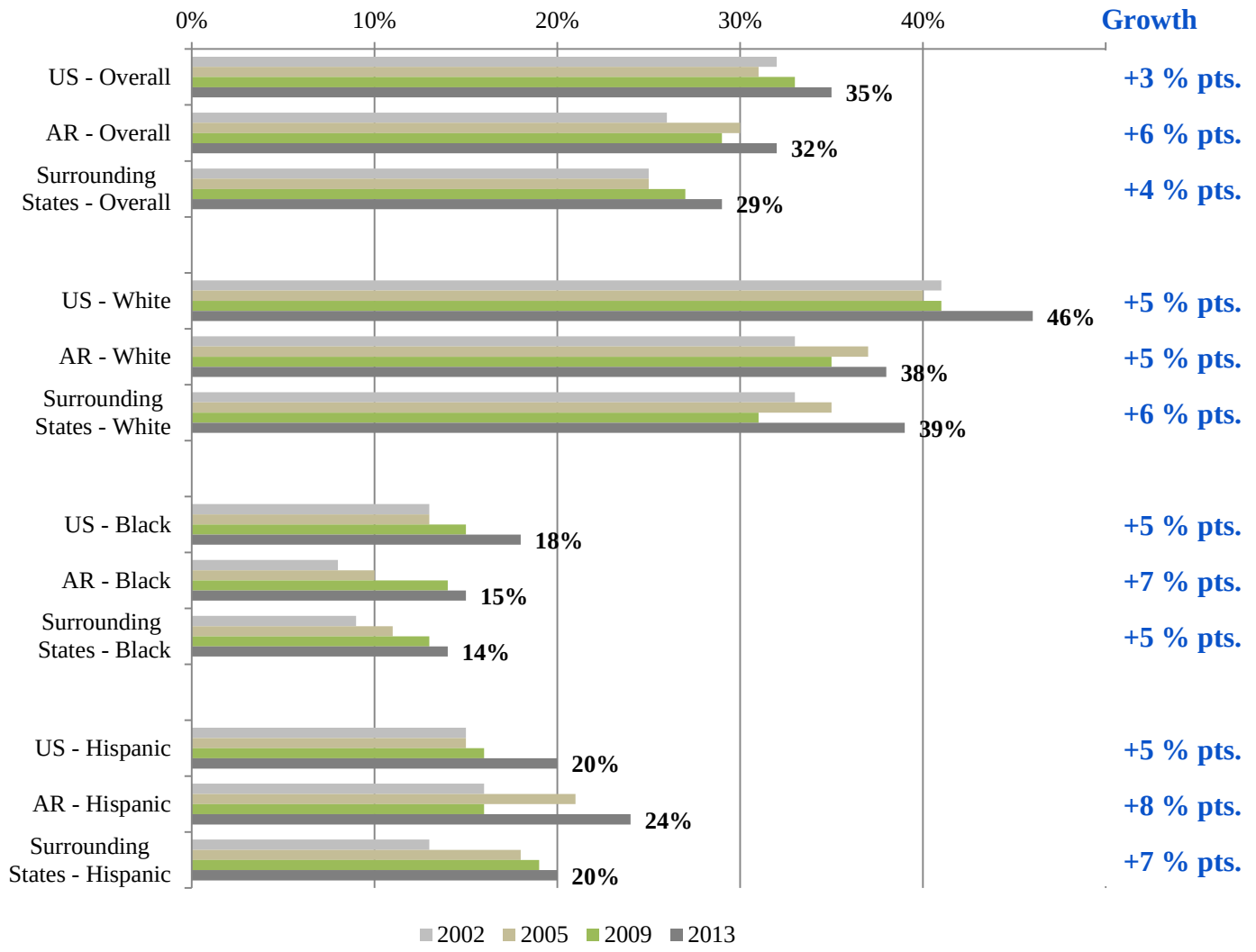


Figure 11: NAEP literacy, grade 4, achievement gaps in % of students of students proficient or advanced, 2002 to 2013

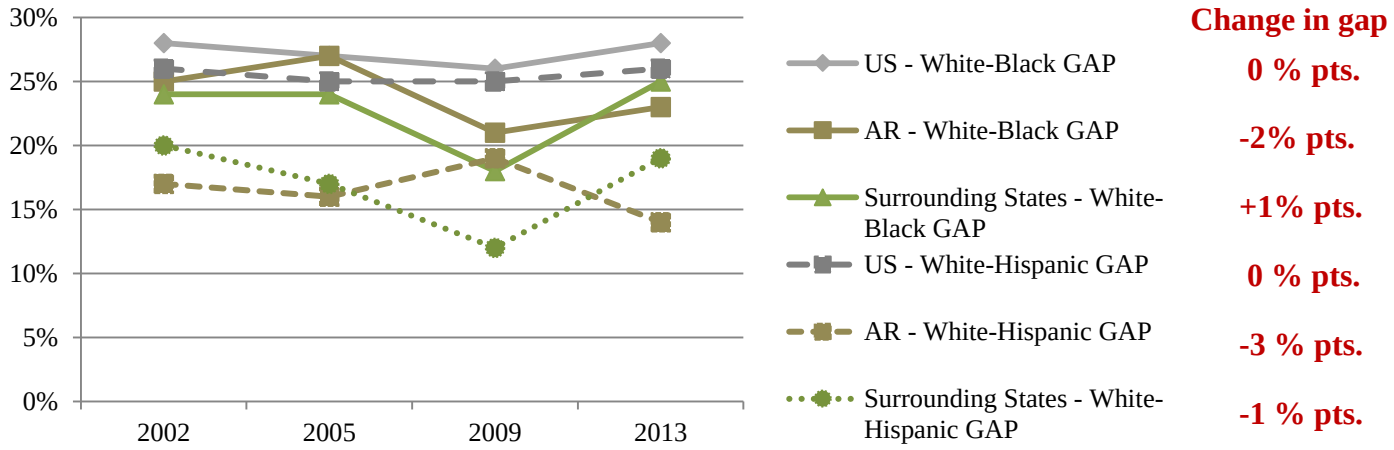


Figure 12: NAEP literacy, grade 4, scale scores, 2002 to 2013

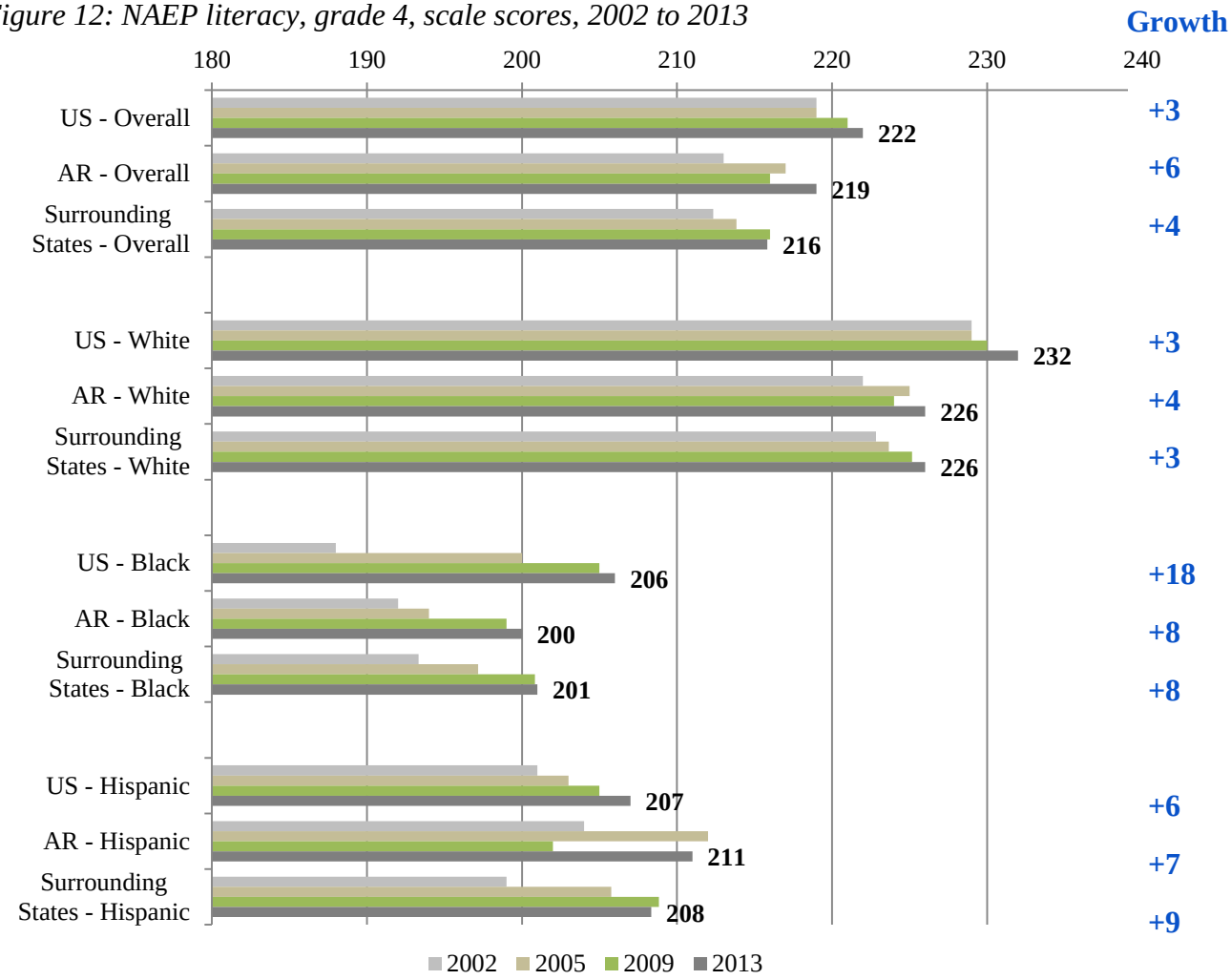


Figure 13: NAEP literacy, grade 4, achievement gaps in scale scores, 2002 to 2013

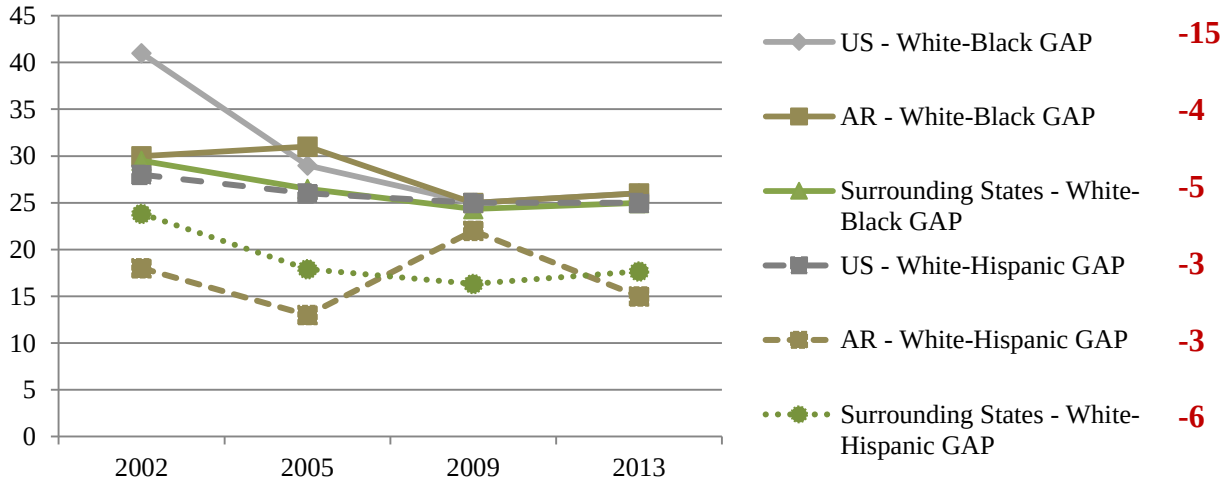


Figure 14: NAEP literacy, grade 8, % of students at or above proficient level, 2002 to 2013

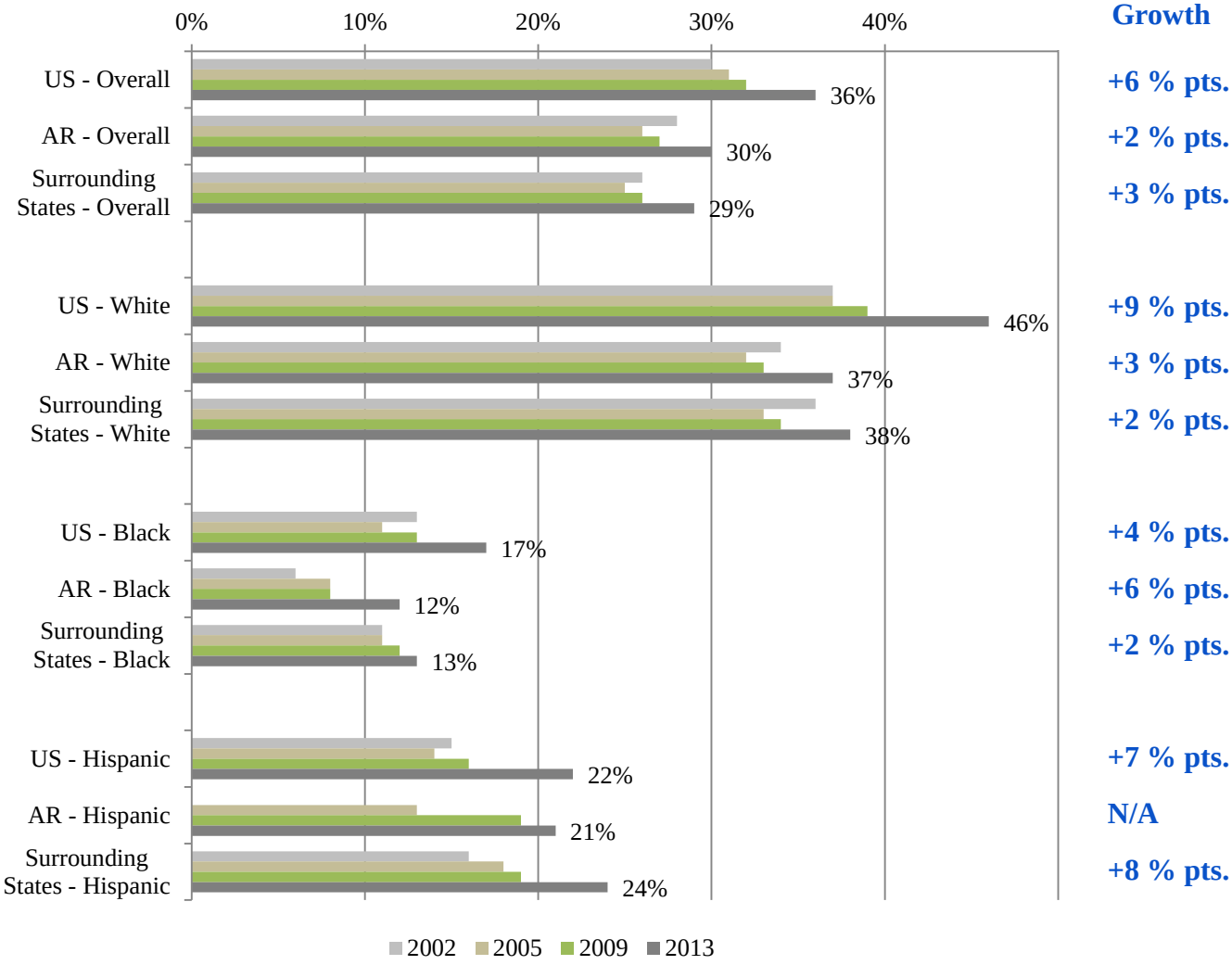


Figure 15: NAEP literacy, grade 8, achievement gaps % of students of students proficient or advanced, 2002 to 2013

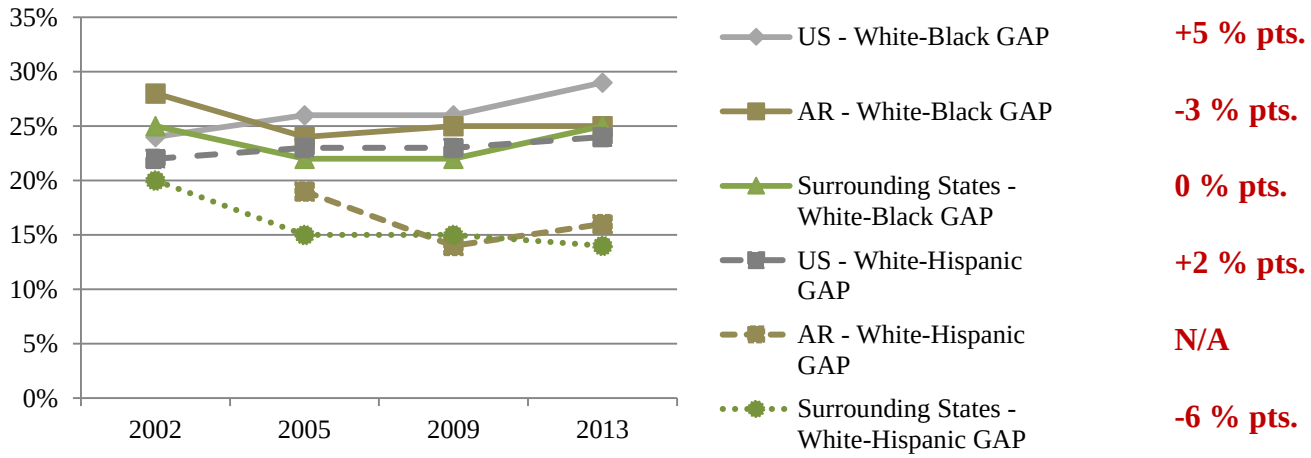


Figure 16: NAEP literacy, grade 8, scale scores, 2002 to 2013

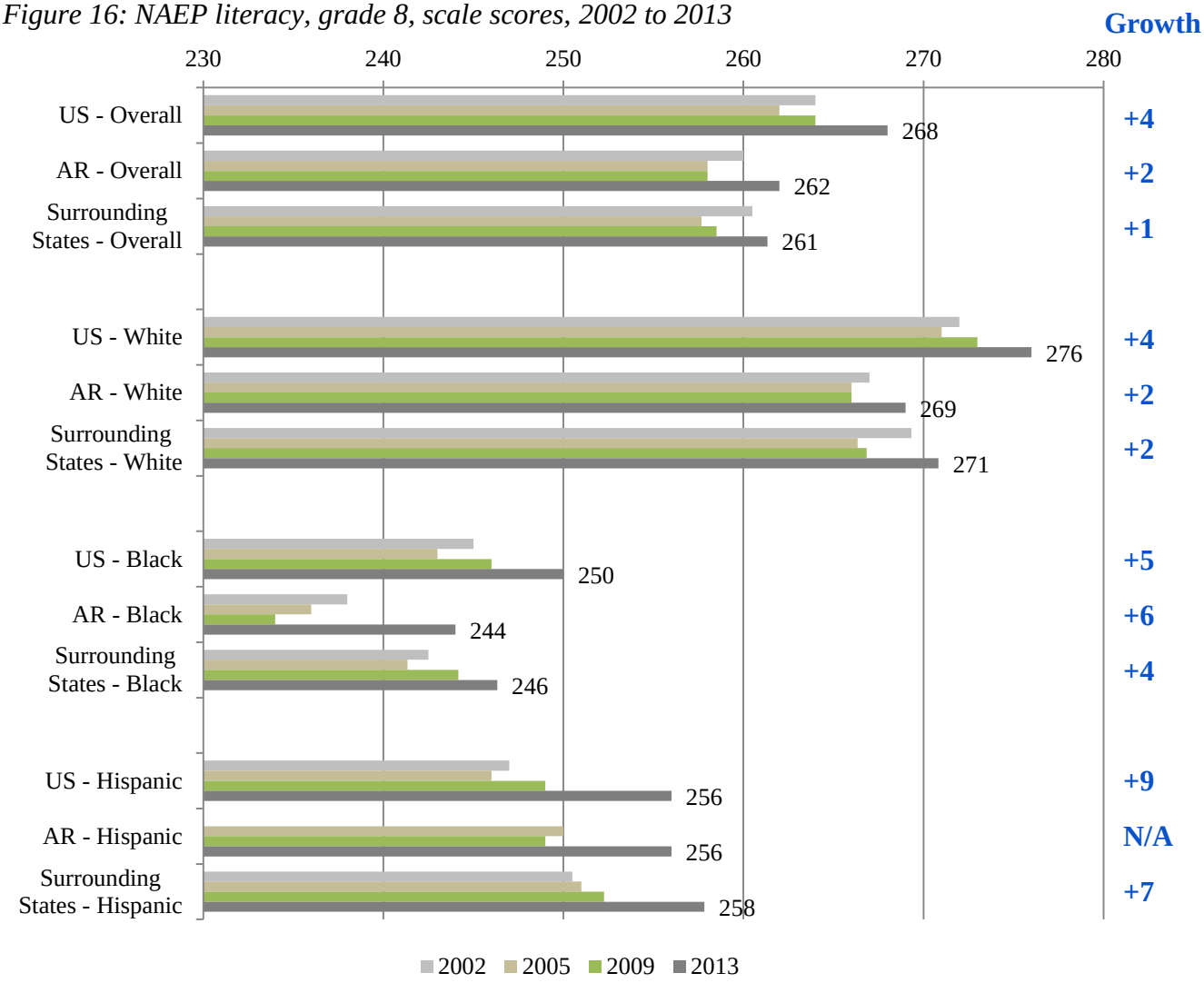
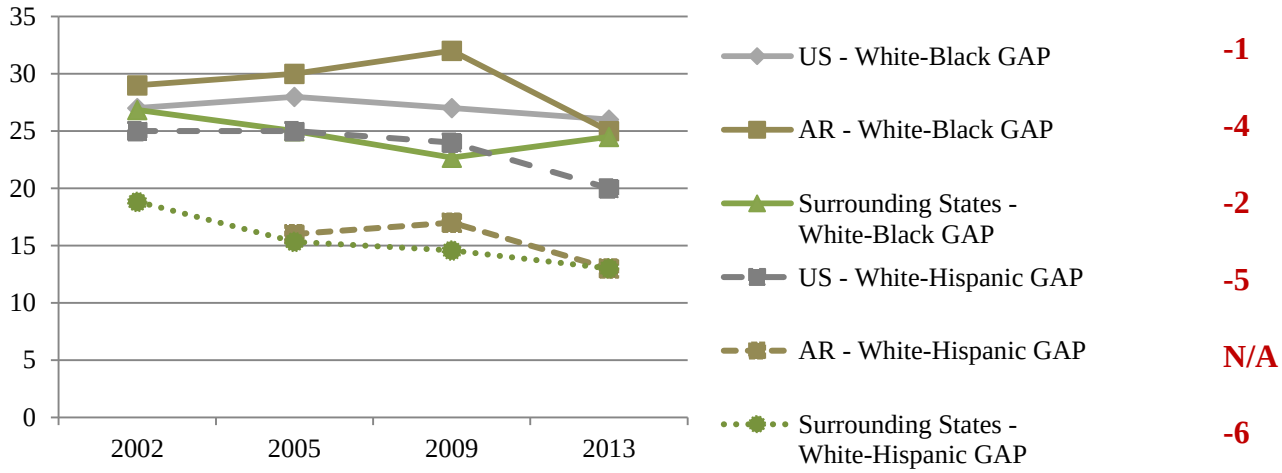


Figure 17: NAEP literacy, grade 8, achievement gaps in scale scores, 2002 to 2013



C. Income Disparities: NAEP Performance by Income Over Time

1. Math

a. Grade 4

On the NAEP grade 4 math assessment, 39% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (42%), it was higher than that of Arkansas' surrounding states (35%). Since the 2000 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+25 percentage points) than did that of the nation (+18 percentage points) or that of the surrounding states (+17 percentage points) (Figure 18).

Non-low-income students performed better than did their low-income peers in each of the time periods studied; additionally, since the 2000 NAEP administration, the proficiency percentage for non-low-income students in Arkansas grew more (+35 percentage points) than did the percentages for low-income students (+23 percentage points) (Figure 18). As a result, the gap between non-low-income and low-income students, in terms of proficiency percentages, increased from 2000 to 2013 (Figure 19).

In terms of average scale scores (see prior discussion on why analyses based on scale scores may provide a different perspective than those based on proficiency percentages), low-income students in Arkansas performed less well than did their non-low-income peers in each of the time periods studied; however, since the 2000 NAEP administration, the average scale score for low-income students increased more (+27 scale score points) than did the average scale scores for non-low-income students (+23 scale score points) (Figure 20). Thus, based on these scale scores, the gap between low-income and non-low-income students decreased between 2000 and 2013 (Figure 21). The apparent difference between the proficiency gap and scale score gap can be explained by the fact that while low-income students were increasing their raw scores, the number of students reaching the proficiency cutoff was not increasing as rapidly.

b. Grade 8

On the NAEP grade 8 math assessment, 28% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (35%), it was on par with Arkansas' surrounding states. Since the 2000 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+15 percentage points) than did that of the nation (+9 percentage points) or that of the surrounding states (+11 percentage points) (Figure 22).

Non-low-income students performed better than did their low-income peers in each of the time periods studied; additionally, since the 2000 NAEP administration, the proficiency percentage for non-low-income students grew more (+25 percentage points) than did the percentages for low-income students (+9 percentage points) (Figure 22). As a result, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened a great deal from 2000 to 2013 (Figure 23). Additionally, since the 2000 NAEP administration, the average scale score for non-low-income students (+23 scale score points) increased more than did the average

scale scores for low-income students (+18 scale score points) (Figure 24). Thus, based on these scale scores, the gap between low-income and non-low-income students widened between 2000 and 2013, while nationally this gap slightly decreased (-3 scale score points) (Figure 25). Overall, therefore, in grade 8 math, on all metrics considered, Arkansas' low-income students made lesser gains than did their more affluent peers.

c. Summary points

In 4th and 8th grade, Arkansas' subgroups experienced positive growth in performance between 2000 and 2013 on proficiency levels and scale score points.

- In 4th grade, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2000 to 2013, as the proficiency percentage for non-low-income students grew more (+35 percentage points) than did the percentages for low-income students (+23 percentage points). However, during this time period, the average scale score for low-income students (+27 scale score points) increased more than did the average scale scores for non-low-income students (+23 scale score points).

- In 8th grade, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2000 to 2013, as the proficiency percentage for non-low-income students grew more (+25 percentage points) than did the percentages for low-income students (+9 percentage points). Additionally, during this time period, the average scale score for non-low-income students (+23 scale score points) increased more than did the average scale scores for low-income students (+18 scale score points).

Compared to the nation

- Arkansas' gap between low-income and non-low-income students were smaller than the average gap of the nation on grade 4 and 8 math in respect to performance as measured by average scale scores and proficiency levels

Compared to surrounding states

- Arkansas' gap between low-income and non-low-income students was moderately smaller than the gaps of the surrounding states on grade 4 math; however, on grade 8 math, Arkansas' racial gaps were slightly larger than the racial gaps of the surrounding states

Figure 18: NAEP math, grade 4, % of students at or above proficient level, 2000 to 2013

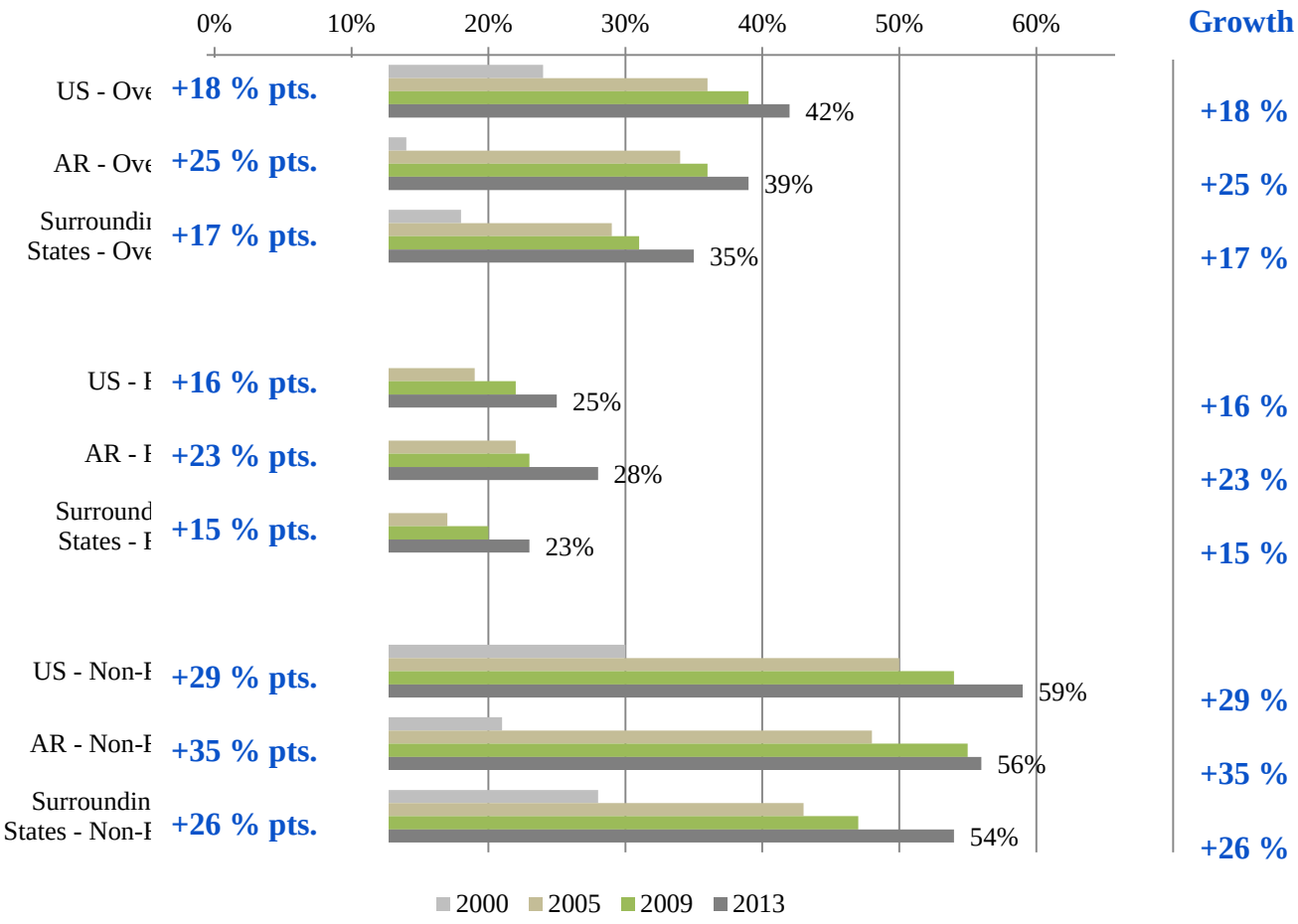


Figure 19: NAEP math, grade 4, achievement gaps in % of students at or above proficient level, 2000 to 2013

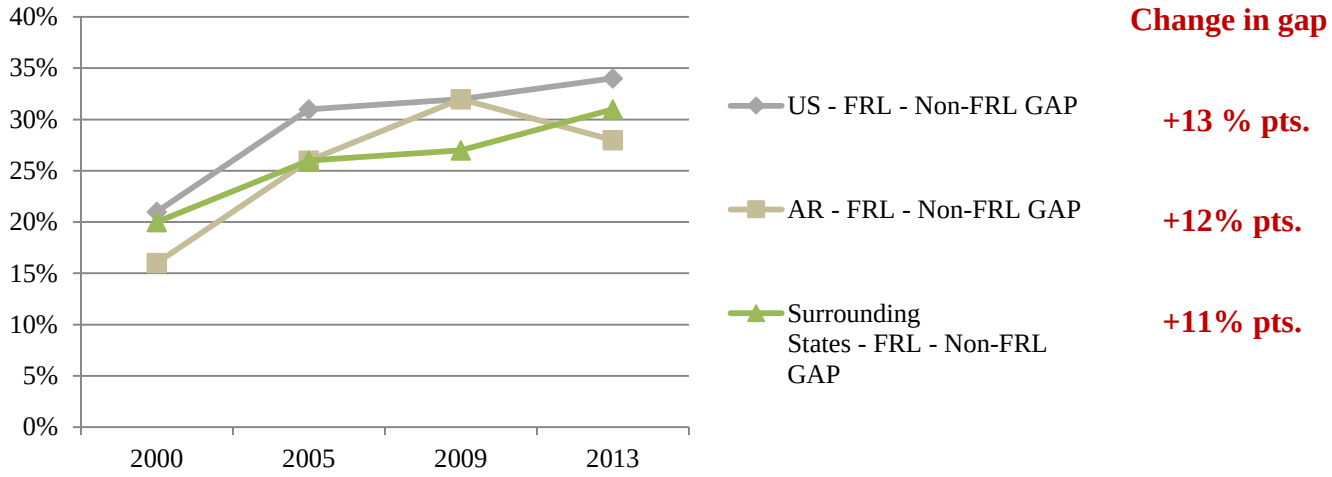


Figure 20: NAEP math, grade 4, scale scores, 2000 to 2013

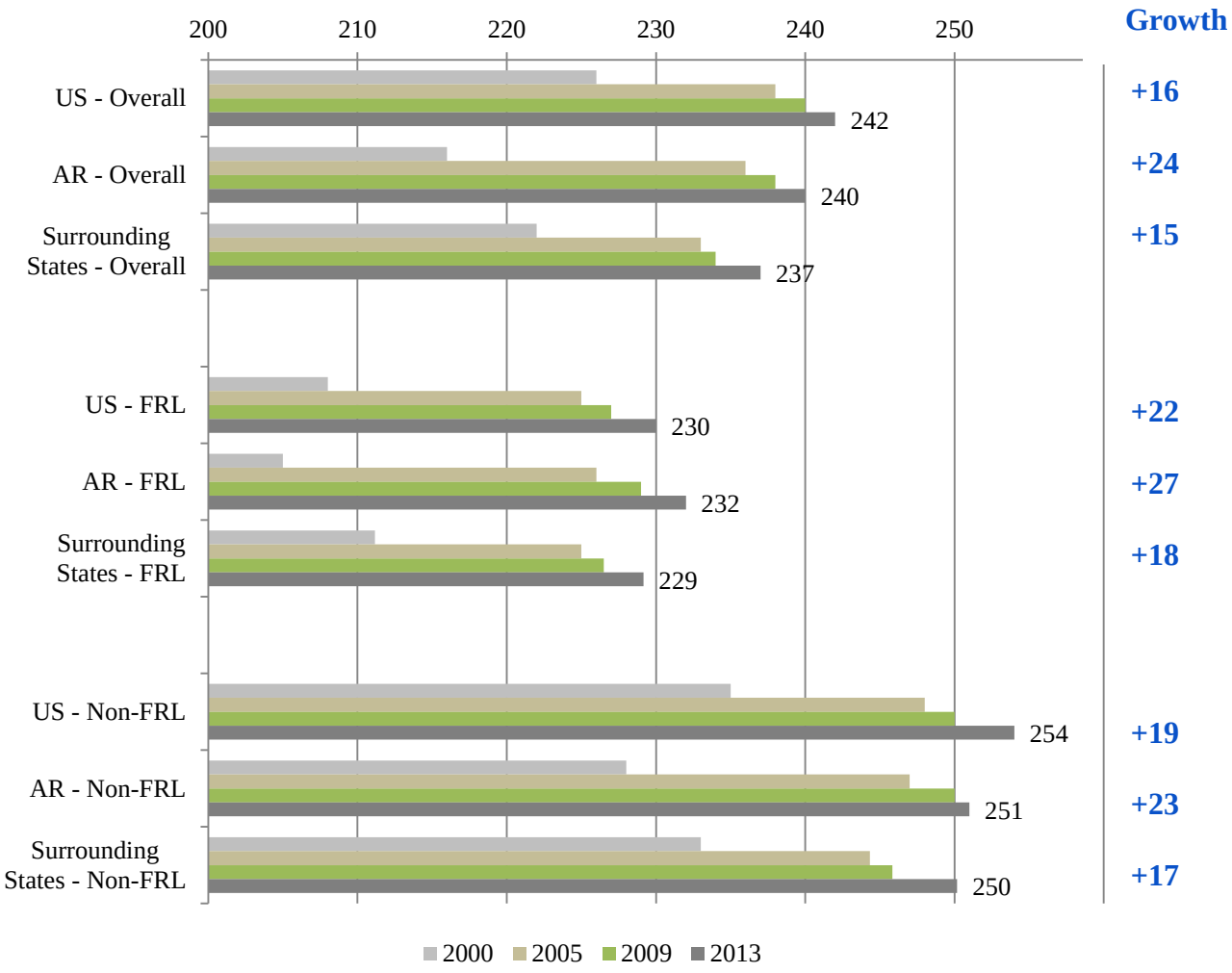


Figure 21: NAEP math, grade 4, achievement gaps in scale scores, 2000 to 2013

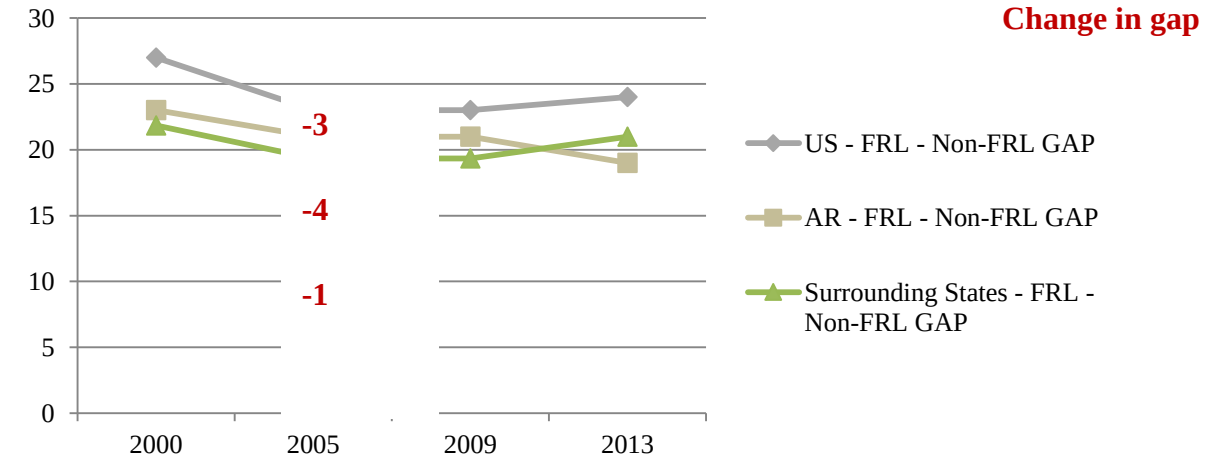


Figure 22: NAEP math, grade 8, % of students at or above proficient level, 2000 to 2013

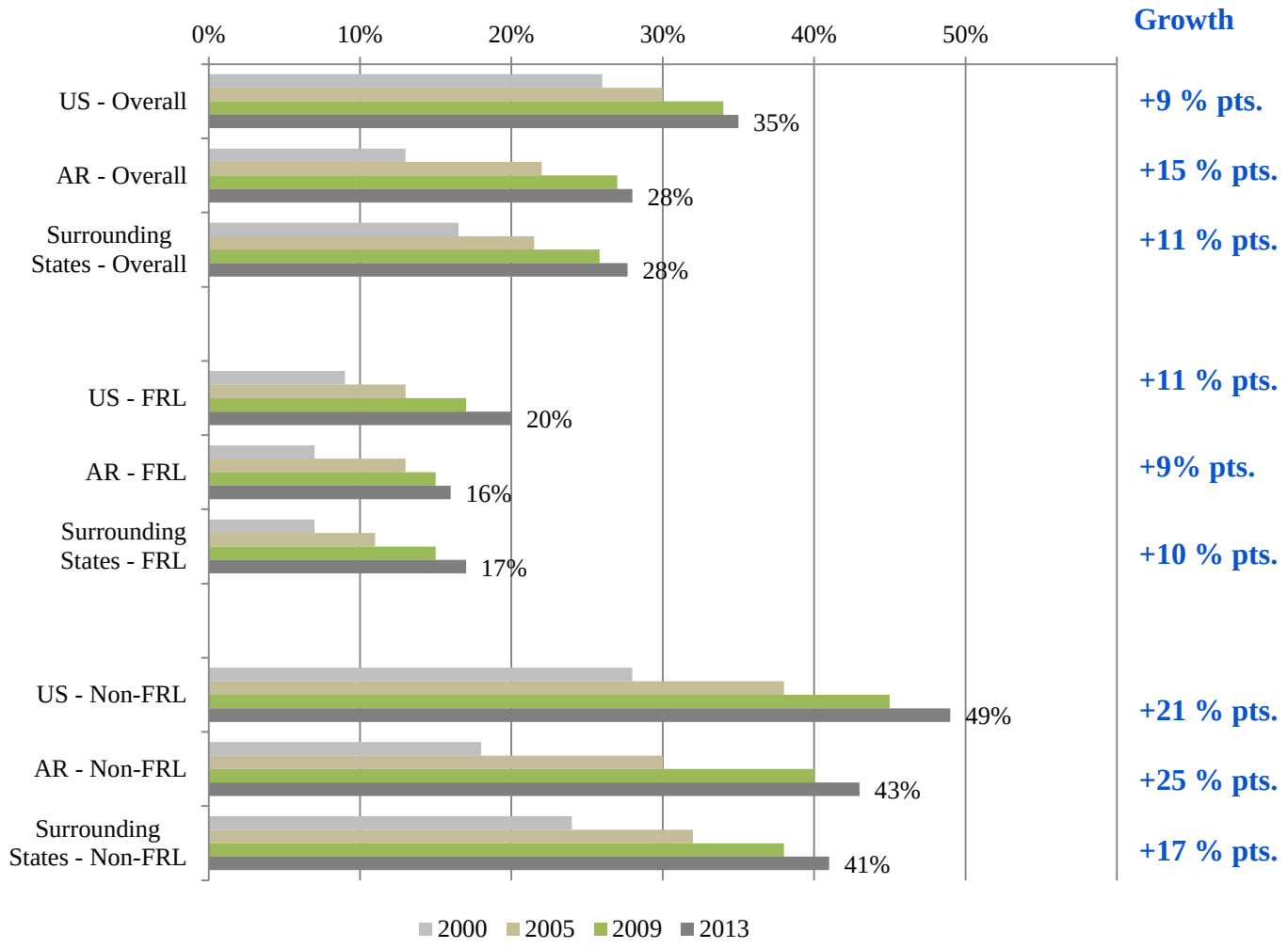


Figure 23: NAEP math, grade 8, achievement gaps in % of students at or above proficient level, 2000 to 2013

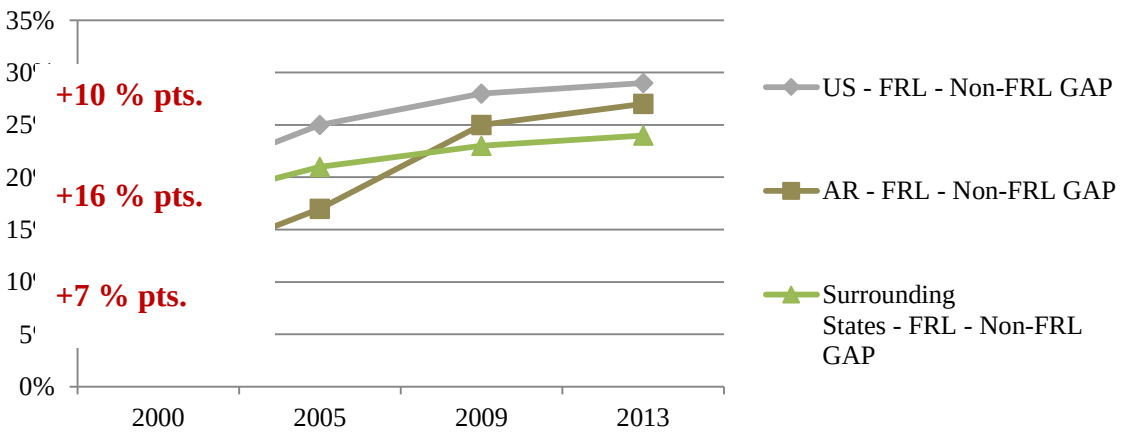


Figure 24: NAEP math, grade 8, scale scores, 2000 to 2013

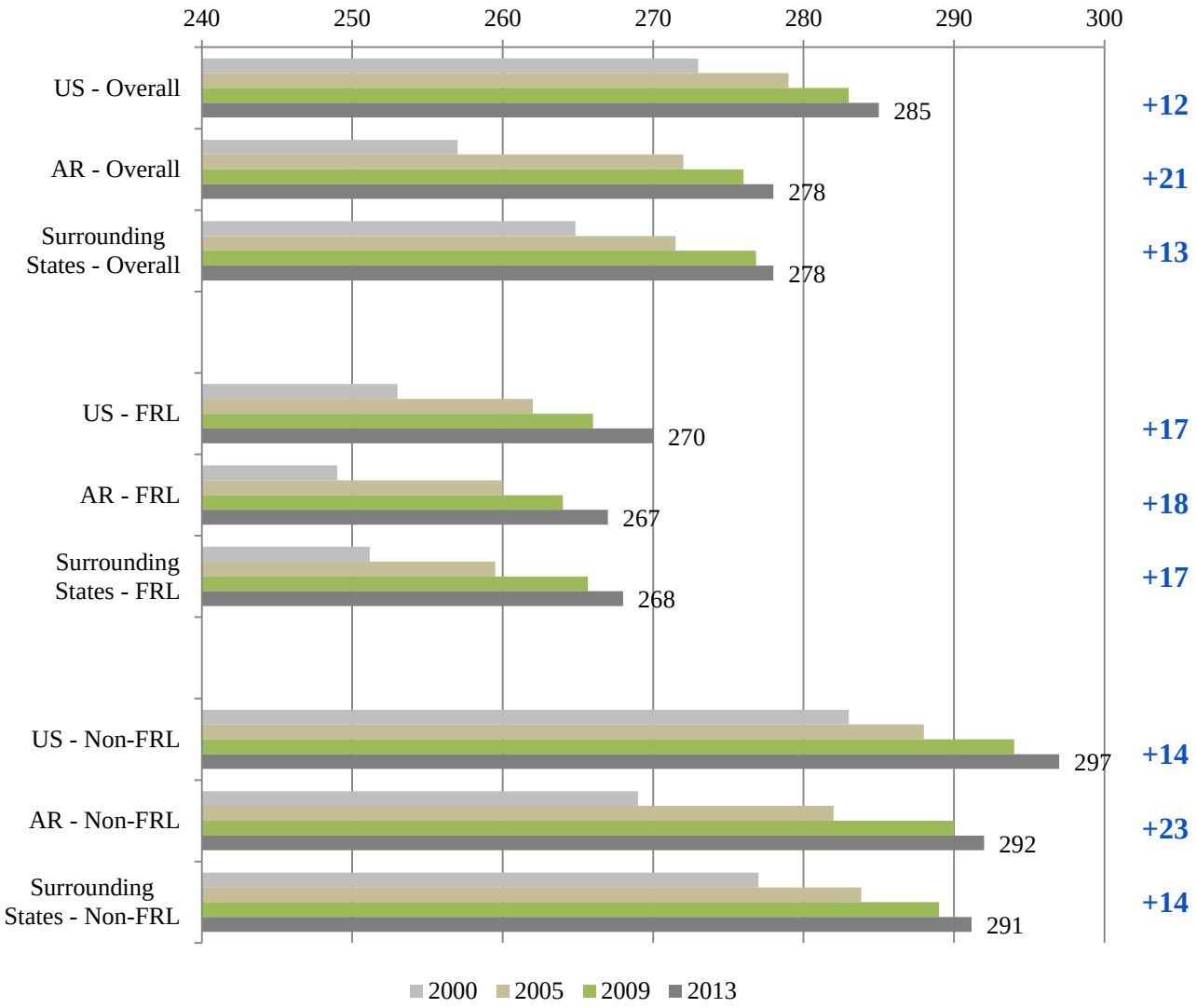
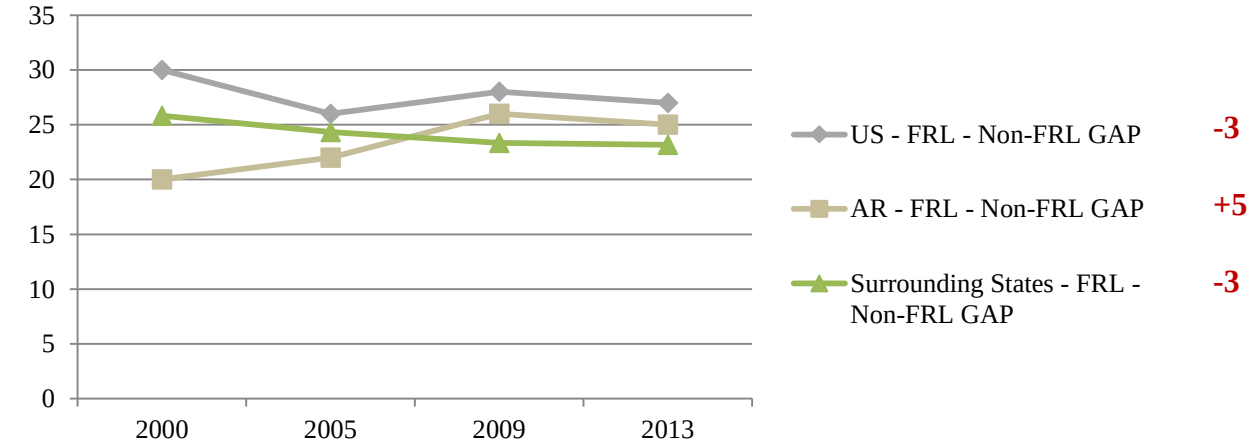


Figure 25: NAEP math, grade 8, achievement gaps in scale scores, 2000 to 2013



2. Literacy

a. Grade 4

On the NAEP grade 4 literacy assessment, 32% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (35%), it was higher than that of Arkansas' surrounding states (29%). Since the 2002 NAEP administration, the Arkansas proficiency percentage increased more rapidly (+6 percentage points) than did that of the nation (+3 percentage points) or that of the surrounding states (+4 percentage points) (Figure 26).

Non-low-income students performed better than did their low-income peers in each of the time periods studied; additionally, since the 2002 NAEP administration, the proficiency percentage for non-low-income students grew more (+25 percentage points) than did the percentages for low-income students (+9 percentage points) (Figure 26). As a result, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2002 to 2013 (Figure 27).

In terms of average scale scores, low-income students in Arkansas performed less well than did their non-low-income peers in each of the time periods studied; however, since the 2002 NAEP administration, the average scale score for low-income students increased by 7 scale score points, while the average scale score for non-low-income students increased by 6 scale score points (Figure 28). Thus, based on these scale scores, the gap between low-income and non-low-income students slightly decreased between 2002 and 2013 (Figure 29). The apparent difference between the proficiency gap and scale score gap can be explained by the fact that while low-income students were increasing their raw scores more rapidly, the number of students reaching the proficiency cutoff was not increasing as rapidly.

b. Grade 8

On the NAEP grade 8 literacy assessment, 30% of Arkansas' students reached the proficient level or better in 2013. While Arkansas' average was lower than the nation's average (36%), it was slightly higher than that of Arkansas' surrounding states (29%). Since the 2002 NAEP administration, the nation's proficiency percentage increased by 6 percentage points, while Arkansas increased by 2 percentage points and the surrounding states increased by 3 percentage points (Figure 30).

Non-low-income students performed better than did their low-income peers in each of the time periods studied; additionally, since the 2002 NAEP administration, the proficiency percentage for non-low-income students grew more (+9 percentage points) than did the percentages for low-income students (+2 percentage points) (Figure 30). As a result, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2002 to 2013 (Figure 31).

In terms of average scale scores, since the 2002 NAEP administration, the average scale score for non-low-income students (+7 scale score points) increased more than did the average scale scores for low-income students (+3 scale score points) (Figure 32). Thus, based on these scale scores, the gap between low-income and non-low-income students widened between 2002 and

2013 (Figure 33). Overall, therefore, in grade 8 math, on all metrics considered, Arkansas' low-income students made lesser gains than did their more affluent peers.

c. Summary points

In 4th and 8th grade, Arkansas' subgroups experienced positive growth in performance between 2002 and 2013 on proficiency levels and scale score points.

- In 4th grade, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2002 to 2013, as the proficiency percentage for non-low-income students grew more (+25 percentage points) than did the percentages for low-income students (+9 percentage points). However, during this time period, the average scale score for low-income students increased by 7 scale score points, while the average scale score for non-low-income students increased by 6 scale score points.

- In 8th grade, the gap between non-low-income and low-income students, in terms of proficiency percentages, widened from 2002 to 2013, as the proficiency percentage for non-low-income students grew more (+9 percentage points) than did the percentages for low-income students (+2 percentage points). Additionally, during this time period, the average scale score for non-low-income students (+7 scale score points) increased more than did the average scale scores for low-income students (+3 scale score points).

Compared to the nation

- Arkansas' gap between low-income and non-low-income students were smaller than the average gap of the nation on grade 4 and 8 literacy in respect to performance as measured by average scale scores and proficiency levels

Compared to surrounding states

- Arkansas' gap between low-income and non-low-income students was moderately smaller than the gaps of the surrounding states on grade 4 literacy; however, on grade 8 literacy, Arkansas' racial gaps were slightly larger than the racial gaps of the surrounding states

Figure 26: NAEP literacy, grade 4, % of students at or above proficient level, 2002 to 2013

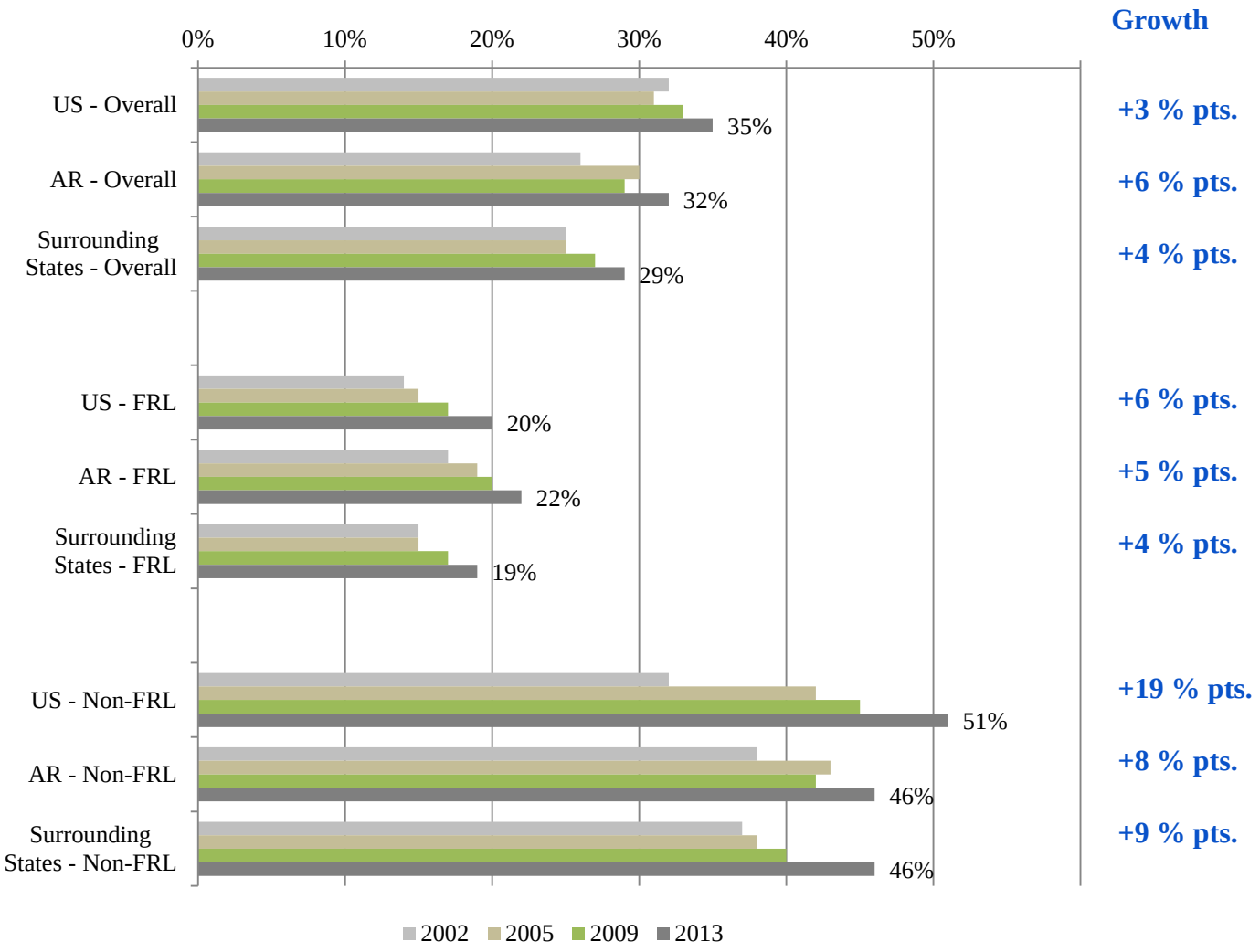


Figure 27: NAEP literacy, grade 4, achievement gaps in % of students at or above proficient level, 2002 to 2013

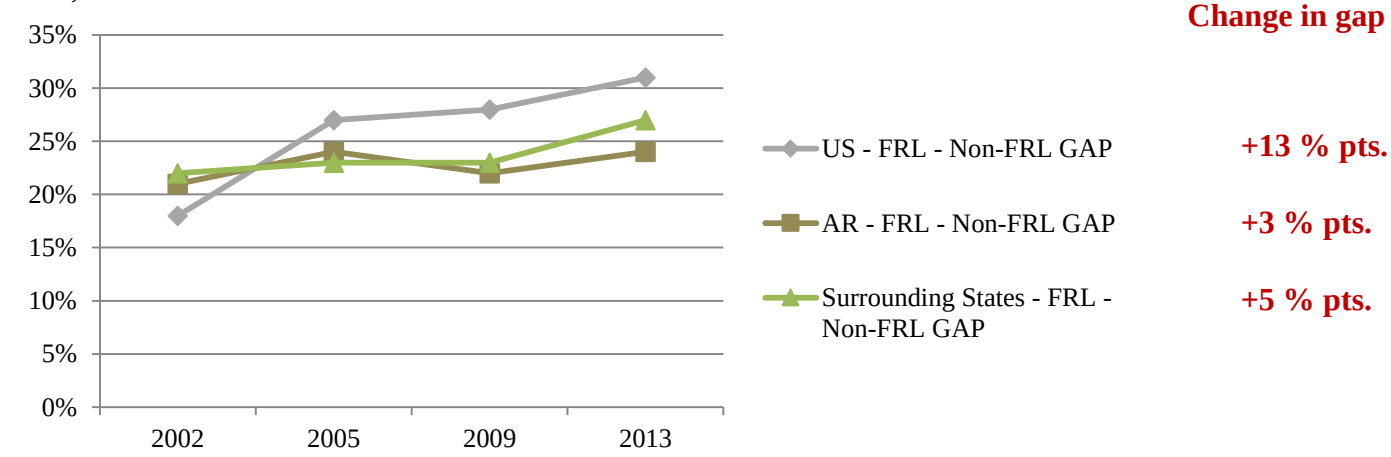


Figure 28: NAEP literacy, grade 4, scale scores, 2002 to 2013

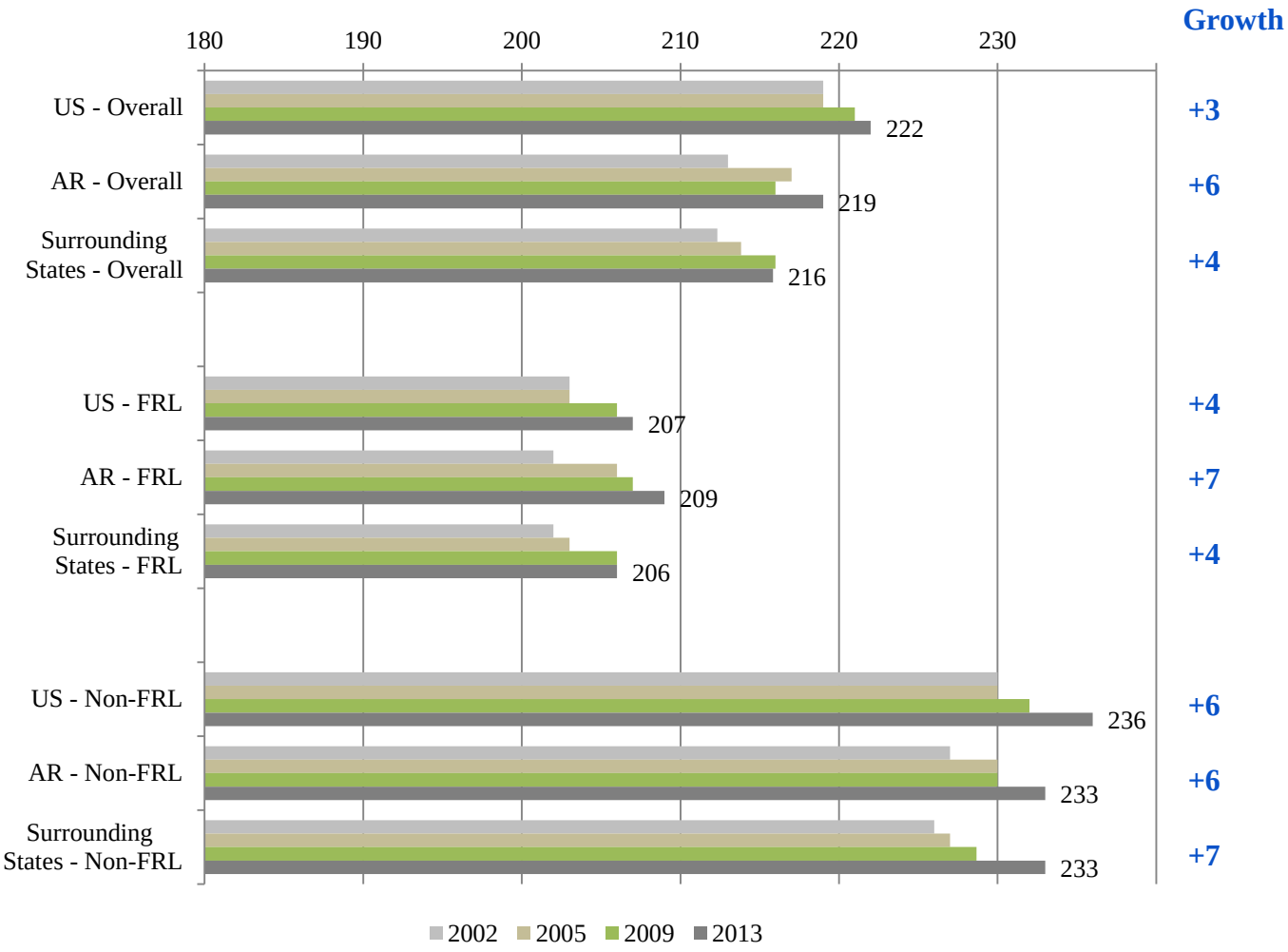


Figure 29: NAEP literacy, grade 4, achievement gaps in scale scores, 2002 to 2013

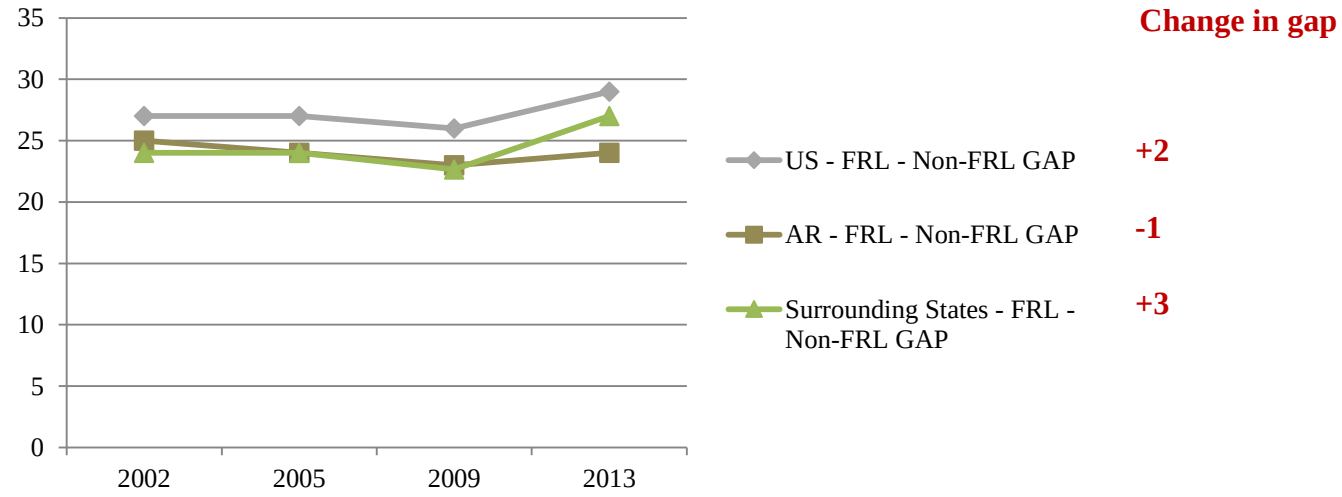


Figure 30: NAEP literacy, grade 8, % of students at or above proficient level, 2002 to 2013

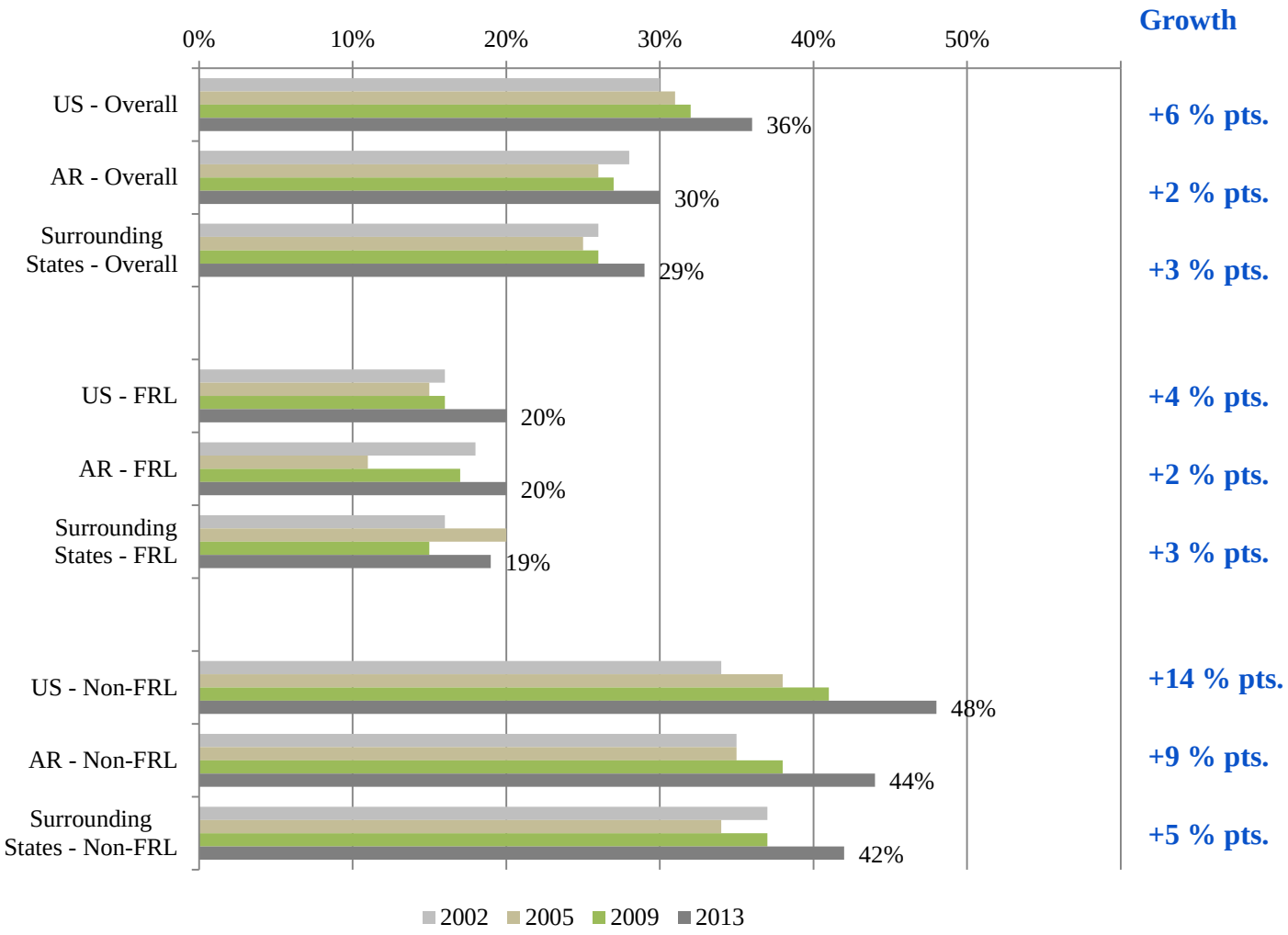


Figure 31: NAEP literacy, grade 8, achievement gaps in % of students at or above proficient level, 2002 to 2013

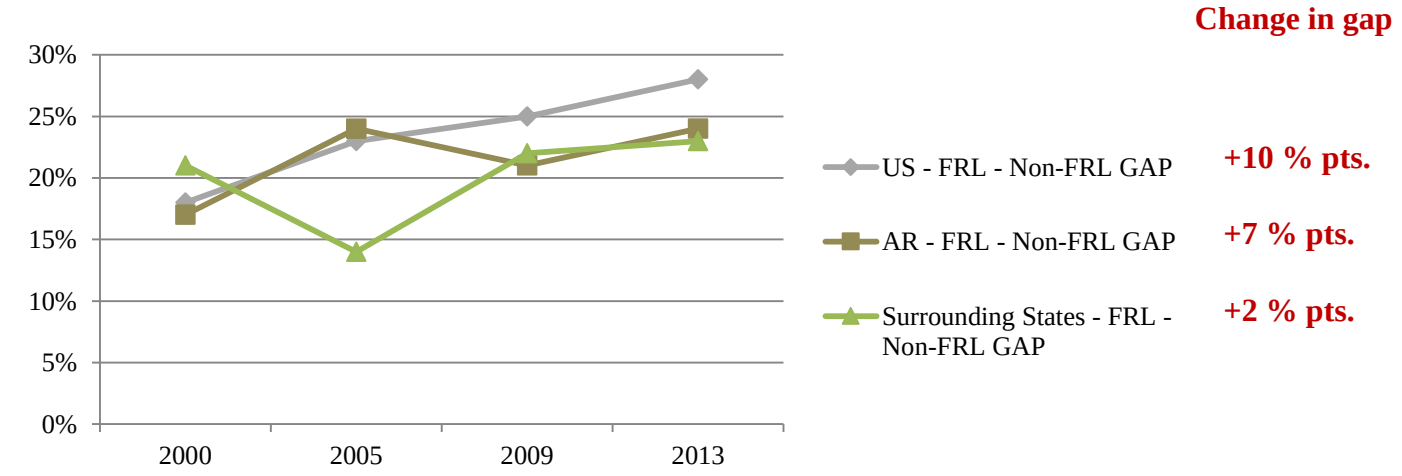


Figure 32: NAEP literacy, grade 8, scale scores, 2002 to 2013

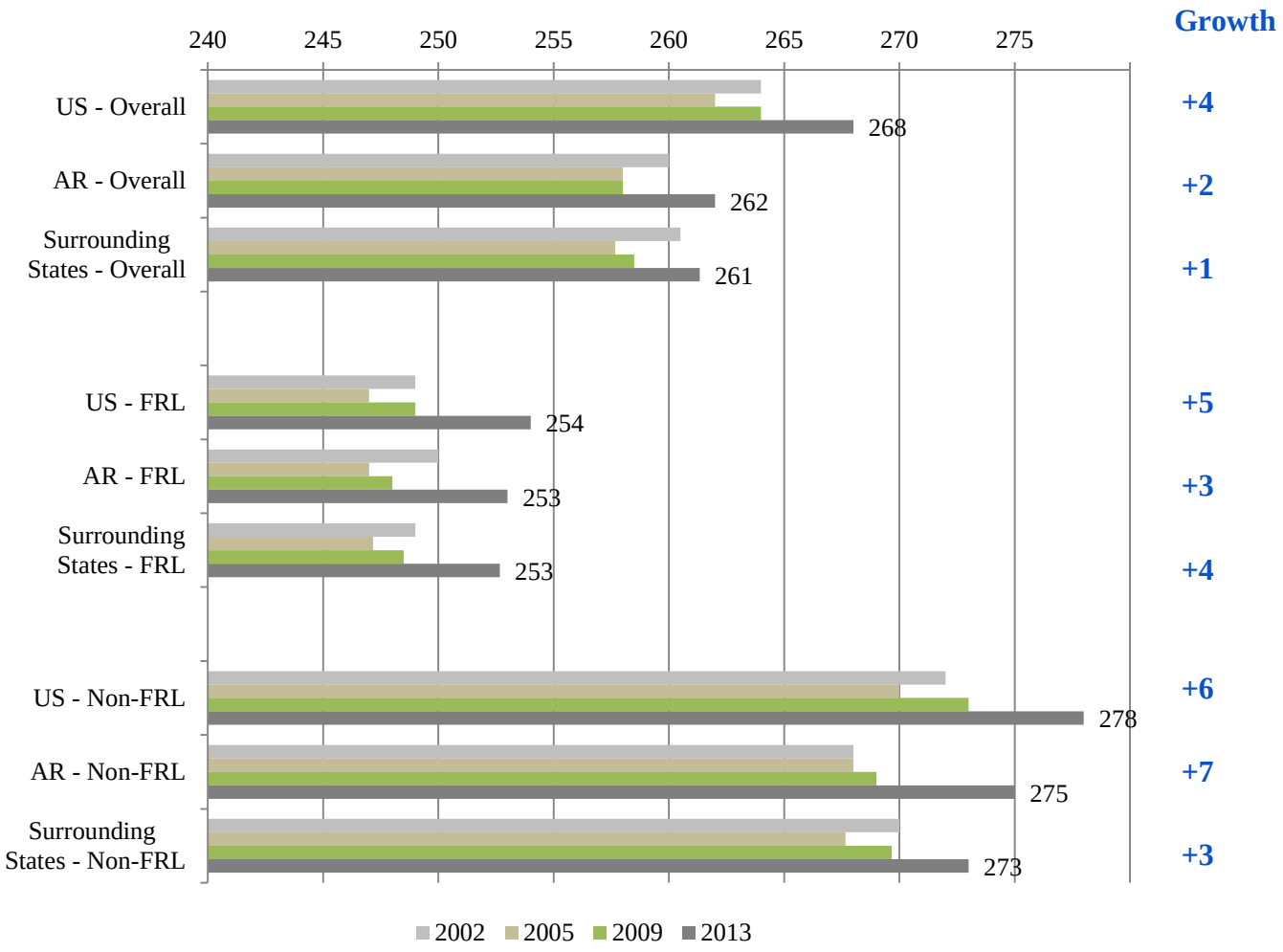
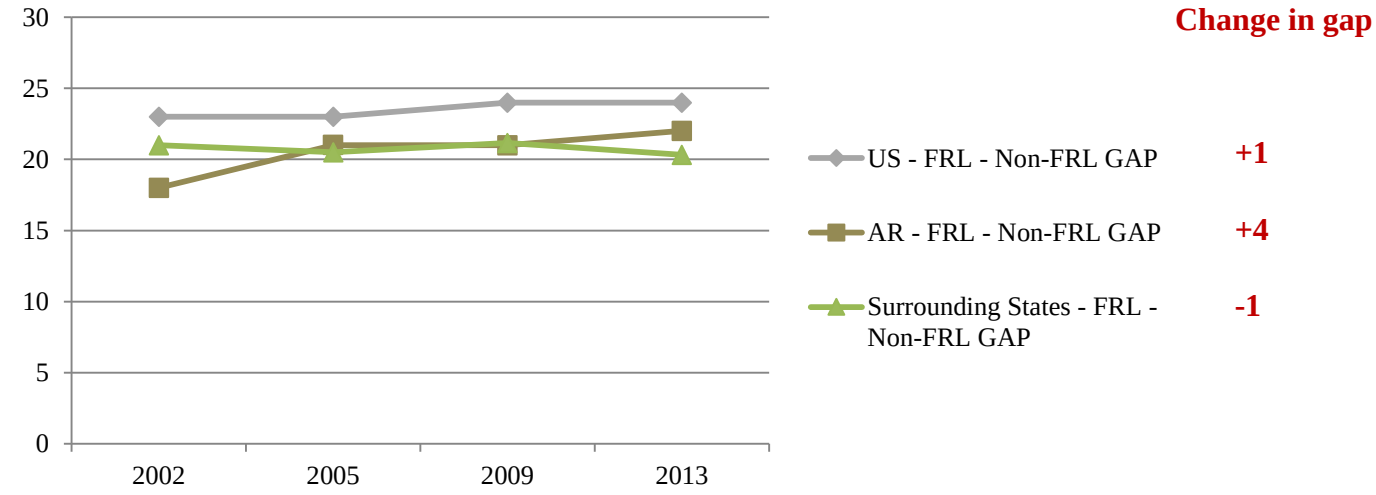


Figure 33: NAEP literacy, grade 8, achievement gaps in scale scores, 2002 to 2013



III. ACHIEVEMENT GAP ANALYSIS: WITHIN ARKANSAS

In the following section, the performance of Arkansas' students is examined in relation to Arkansas' criterion-referenced test, the Arkansas Benchmark.

A. Arkansas Benchmark Assessment

The Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) includes the Benchmark Examination, which is a criterion-referenced test administered in reading and mathematics to grades 3 – 8 each April. The Benchmark Exam also includes a science assessment for students in grades 5 and 7. The ACTAAP also includes End-of-Couse Examinations for students in Algebra I, Geometry, Biology, and Grade 11 Literacy. The Benchmark and End-of-Course exams are criterion-referenced tests that are based on the Arkansas Curriculum Frameworks. Questions include multiple-choice questions and open-response items. The exam results are represented by scale scores, which are categorized in four levels: Below Basic, Basic, Proficient, and Advanced. Accountability measures are often based upon students reaching proficient or advanced; therefore, school and district performance is often measured by proficiency percentages.

In the following section, we examine the performance of subgroups of students to analyze achievement gaps in Arkansas over time. We first do so by examining performance based on the proficiency cutoffs and scale scores over time. It is important to consider both measures, as the proficiency cutoffs may omit student growth that occurs above or below the cut score. Thus, although most policymakers and casual observers can easily understand the concept of "passing" rates, it is also important to report group performance in terms of average scale scores. In the final analysis, we standardized the scale scores against the population of all Arkansas students by converting them to a z-score with a mean of 0 and a standard deviation of 1. As such, we can report student performance in terms of how distant an individual score is from the mean (0), the average Arkansas student. For example, a student with Benchmark math performance z-score of +0.75 scored three-quarters of a standard deviation above the mean of all students in Arkansas. Likewise, a Benchmark literacy z-score of -0.33 is one third standard deviation below the mean of all students in Arkansas.

B. Racial Disparities: Benchmark Performance by Race Over Time

1. Math

On the Benchmark math assessment, 75% of Arkansas' students reached the proficient or advanced in 2012-13 (Table 2). Black and Hispanic students performed less well (56% and 74%, respectively) than white students (81%). However, since the 2005-06, the gaps between black and white students and Hispanic and white students decreased, as the proficiency percentage for black and Hispanic students increased more than it did for their white peers during this time. Furthermore, in respect to scale scores, scores for black and Hispanic students grew slightly more over time (+62 and +56 scale score points, respectively) than scores for white students (+55 scale score points) (Table 3).

Table 2: Benchmark math performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13

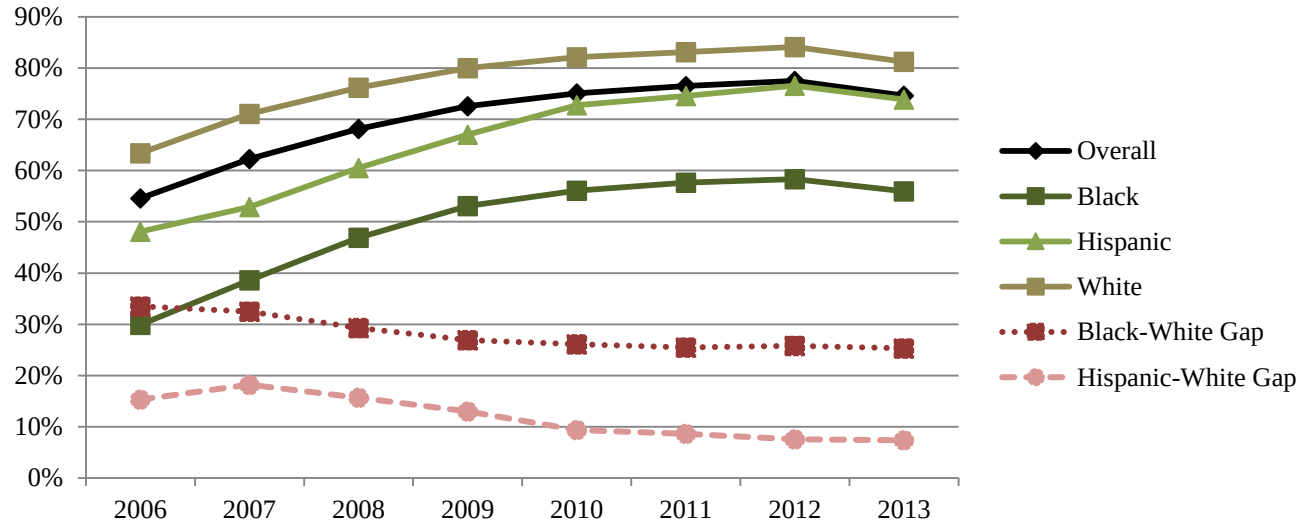
	Overall	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	55%	30%	48%	63%	34%	15%
2006-07	62%	39%	53%	71%	33%	18%
2007-08	68%	47%	61%	76%	29%	16%
2008-09	73%	53%	67%	80%	27%	13%
2009-10	75%	56%	73%	82%	26%	9%
2011-12	78%	58%	77%	84%	26%	8%
2012-13	75%	56%	74%	81%	25%	7%
Change over time	**+20%**	**+26%**	**+26%**	**+18%**	**-8%**	**-8%**

Table 3: Benchmark math performance and achievement gaps over time, scale scores, 2005-06 to 2012-13[7]

	Overall	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	619	563	606	638	76	32
2006-07	641	584	611	662	78	50
2007-08	656	602	630	677	75	47
2008-09	668	615	644	687	72	43
2009-10	676	627	662	696	70	34
2010-11	681	630	665	702	72	37
2011-12	685	634	669	704	69	35
2012-13	675	625	662	693	69	31
Change over time	**+57**	**+62**	**+56**	**+55**	**-7**	**-1**

[7] The average scale score represents an average of all grade-level scale scores. As the scale scores and proficiency cutoffs vary by grade-level, the actual number by itself is relatively meaningless; however, the average scale scores can be used as points of comparison across years.

Figure 34: Benchmark math performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13



As Arkansas' Benchmark assessments are criterion-referenced tests, there is the possibility that students are experiencing a ceiling effect. A ceiling effect occurs when scores reach high levels, and growth from that point on becomes difficult and close to impossible. Therefore, it is difficult to compare all students along the continuum based on growth, as some students might have maxed out on performance.

Therefore, in the final analysis, we standardized the scale scores against the population of all Arkansas students by converting them to a z-score with a mean of zero and a standard deviation of one. As such, we can report student performance in terms of how distant an individual score is from the mean (0), the average Arkansas student. For example, a student with Benchmark math performance z-score of +0.75 scored three-quarters of a standard deviation above the mean of all students in Arkansas. Likewise, a Benchmark literacy z-score of -0.33 is one third standard deviation below the mean of all students in Arkansas.

Table 4 below highlights Benchmark mark performance from 2005-06 to 2012-13. Over time, the performance gap between black and white students slightly decreased; however, with a 27 percentile point difference in 2012-13, the performance gap is wide. Moreover, the gap between Hispanic and white students slightly decreased over time, with an 11 percentile point difference in 2012-13.

*Table 4: Benchmark **math** performance and achievement gaps over time, Percentile, 2005-06 to 2012-13*

	Average	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	50th	29th	44th	58th	29	14
2008-09	50th	30th	42nd	58th	28	16
2012-13	50th	30th	46th	57th	27	11

2. Literacy

On the Benchmark literacy assessment, 79% of Arkansas' students reached the proficient or advanced in 2012-13 (Table 5). Black and Hispanic students performed less well (65% and 77%, respectively) than white students (84%). However, since the 2005-06, the gaps between black and white students and Hispanic and white students decreased, as the proficiency percentage for black and Hispanic students increased more than their white peers during this time. Furthermore, in respect to scale scores, black and Hispanic students grew slightly more over time (+124 and +116 scale score points, respectively) than white students (+101 scale score points) (Table 6)

Table 5: Benchmark literacy performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13

	Overall	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	59%	36%	51%	67%	30%	16%
2006-07	59%	39%	45%	67%	28%	22%
2007-08	64%	42%	51%	72%	30%	22%
2008-09	68%	47%	57%	76%	29%	19%
2009-10	73%	55%	67%	79%	24%	13%
2010-11	75%	59%	71%	80%	22%	9%
2011-12	81%	68%	79%	86%	18%	7%
2012-13	79%	65%	77%	84%	19%	6%
Change over time	**+20%**	**+28%**	**+26%**	**+17%**	**-11%**	**-9%**

Table 6: Benchmark literacy performance and achievement gaps over time, scale scores, 2005-06 to 2012-13

	Overall	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	634	542	603	668	126	65
2006-07	639	556	567	674	118	107
2007-08	658	564	588	697	133	110
2008-09	672	584	622	707	122	85
2009-10	698	622	660	732	110	72
2010-11	712	638	686	741	103	55
2011-12	752	679	727	778	99	52
2012-13	742	667	719	769	102	50
Change over time	**+108**	**+124**	**+116**	**+101**	**-23**	**-15**

*Figure 35: Benchmark **literacy** performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13*

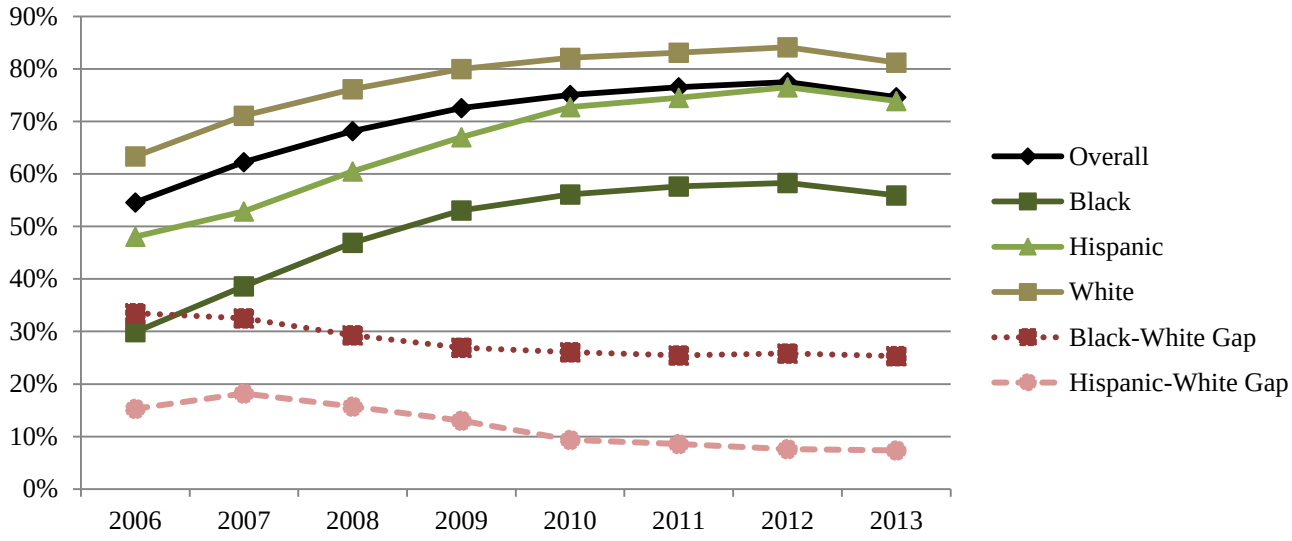


Table 7 below highlights Benchmark mark performance from 2005-06 to 2012-13. Over time, the performance gap between black and white students decreased; however, with a 23 percentile point difference in 2012-13, the performance gap remains wide. Moreover, the gap between Hispanic and white students slightly decreased over time, with an 11 percentile point difference in 2012-13.

*Table 7: Benchmark **literacy** performance and achievement gaps over time, Percentile, 2005-06 to 2012-13*

	Average	Black	Hispanic	White	Black-White Gap	Hispanic-White Gap
2005-06	50th	30th	43rd	57th	27	14
2008-09	50th	31st	40th	58th	27	18
2012-13	50th	33rd	45th	56th	23	11

C. Income Disparities: Benchmark Performance by Income Over Time

1. Math

On the Benchmark math assessment, non-low-income students outperformed low-income students during the 2005-06 to 2012-13 time period. However, since the 2005-06, the gap

between low-income and non-low-income students decreased, as the proficiency percentage for low-income students increased more than their non-low-income peers during this time (Table 8).

*Table 8: Benchmark **math** performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13*

	Overall	Non-FRL	FRL	Non-FRL - FRL Gap
2005-06	55%	68%	43%	25%
2006-07	62%	75%	52%	24%
2007-08	68%	81%	59%	22%
2008-09	73%	84%	65%	19%
2009-10	75%	88%	68%	19%
2010-11	77%	89%	70%	19%
2011-12	78%	89%	71%	18%
2012-13	75%	87%	68%	19%
Change over time	**+20%**	**+19%**	**+25%**	**-6%**

*Figure 36: Benchmark **math** performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13*

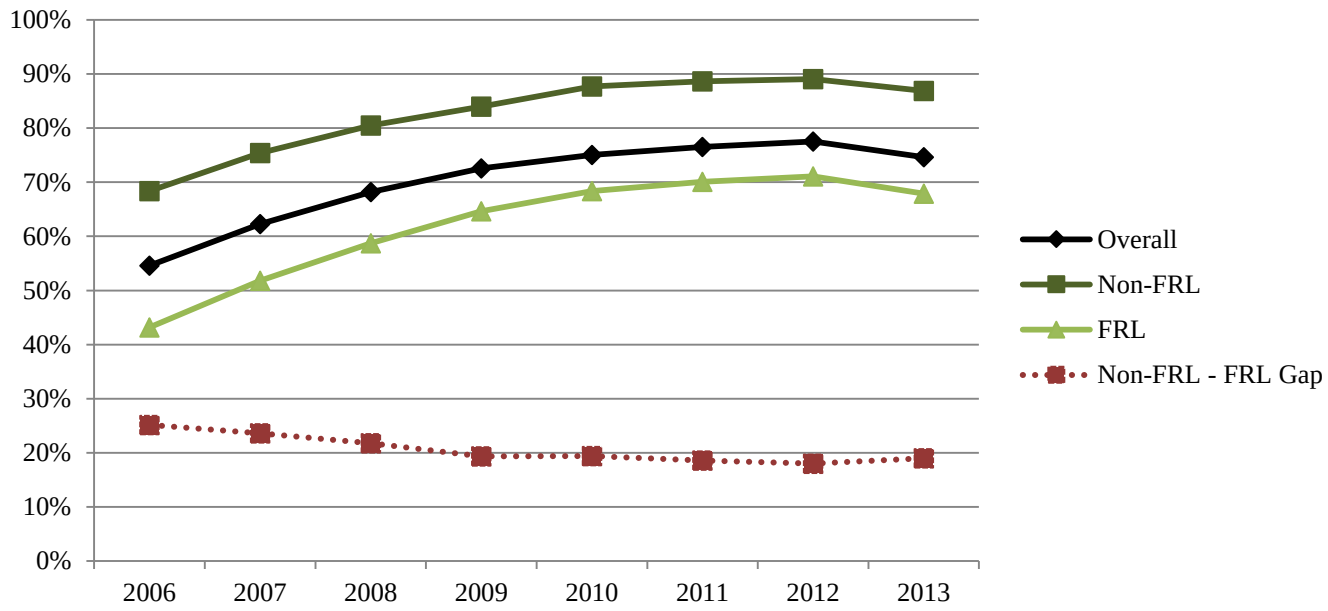


Table 9 below highlights Benchmark mark performance and growth in percentiles from 2005-06 to 2012-13. Over time, the performance gap between non-low-income and low-income slightly increased. While both non-low-income and low-income students experience growth, non-low-income students experience more growth over time.

*Table 9: Benchmark **math** performance and achievement gaps over time, Percentile, 2005-06 to 2012-13*

	2005-06	2011-12	2012-13	Percentile Point Growth
Non-FRL students	62nd	66th	66th	+4
FRL students	40th	40th	41st	+1
Gap	**22**	**26**	**25**	

2. Literacy

On the Benchmark literacy assessment, non-low-income students outperformed low-income students during the 2005-06 to 2012-13 time period. However, since the 2005-06, the gap between low-income and non-low-income students decreased, as the proficiency percentage for low-income students increased more than their non-low-income peers during this time (Table 10).

*Table 10: Benchmark **literacy** performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13*

	Overall	Non-FRL	FRL	Non-FRL - FRL Gap
2005-06	59%	73%	47%	27%
2006-07	59%	74%	48%	26%
2007-08	64%	78%	52%	25%
2008-09	68%	81%	57%	23%
2009-10	73%	87%	65%	22%
2010-11	75%	88%	68%	20%
2011-12	81%	91%	75%	16%
2012-13	79%	90%	73%	17%
Change over time	**+20%**	**+17%**	**+27%**	**-10%**

*Figure 37: Benchmark **literacy** performance and achievement gaps over time, % proficient or advanced, 2005-06 to 2012-13*

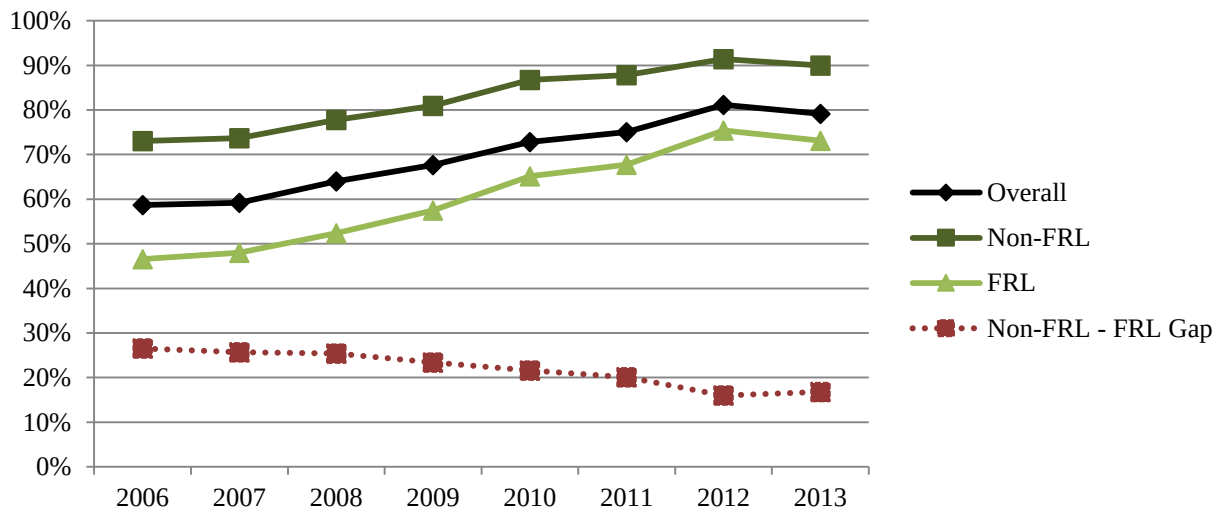


Table 11 below highlights Benchmark mark performance and growth in percentiles from 2005-06 to 2012-13 as a percentile. Over time, the performance gap between non-low-income and low-income remained relatively unchanged, as both groups experienced similar slight growth over time.

*Table 11: Benchmark **literacy** performance and achievement gaps over time, percentile, 2005-06 to 2012-13*

	2005-06	2011-12	2012-13	Percentile Point Growth
Non-FRL students	63rd	66th	65th	+2
FRL students	39th	43rd	41st	+2
Gap	**24**	**23**	**24**	

D. Summary

The Arkansas criterion-referenced assessments allow comparisons of Arkansas' students and subgroups over time.

On the Benchmark, in grades 3 – 8 math and reading, black and Hispanic students performed less well than white students in 2012-13 and over time. However, since the 2005-06, the gaps between black and white students and Hispanic and white students slightly decreased, as the proficiency percentage and average scale scores for black and Hispanic students increased more than their white peers during this time. The widest gap in 2012-2013 remains between black and white students (27 percentile points in math and 23 percentile points in literacy).

The gap between low-income and non-low-income students slightly widened in math with respect to percentile points, as while both subgroups experienced slight growth, non-low-income students experience more growth over time. The gap between low-income and non-low-income students slightly decreased with respect to the percentage of students scoring proficient or higher; however, the gap remained relatively unchanged in literacy with respect to percentile growth over time.

IV. ACHIEVEMENT GAPS ACROSS ARKANSAS' SCHOOL DISTRICTS

In the following section, Arkansas' school districts will be compared based on the student compositions of the districts. This analysis places the preceding statewide achievement data into the context of school district performance. While it is not a fine-tuned analysis, as the unit of analysis is the district level instead of the school level, the analysis allows us to see the impact of student demographics on school district performance. In considering the results, it is important to keep in mind that there are many factors that impact student performance. The purpose of this analysis is not to critique the school system; instead, it is to report the performance of school districts across the state, so that Arkansas can continue to move all students forward.

A. Racial Disparities: Performance of Districts Over Time by % Minority

1. Introduction

In this section, the relationship between the percentage of minority students in districts and student performance and growth is examined. As detailed in Section I, in 2012-13, 36% of Arkansas' public school students identified as minority students, a slight increase from 32% in 2006-07. This increase can be attributed to a growth in population and an increase in the Hispanic population in Arkansas. In 2012-13, the average percent of minority students in a district was 27%.

For this analysis, districts are split into quintiles (five equal groups) based on the percentage of minority students in the district in 2006-07 (with new districts were added to appropriate quintiles). Data is examined beginning in 2006-07 (three years after the start of the ACTAAP) for Benchmark and End-of-Course Exams (EOC) through 2012-13 (the most recently available data).

Table 12 highlights the five quintiles of school districts: lowest (≤ 2%), moderate low (3% to 6%), middle (7% to 19%), moderate high (20% to 39%), and highest (≥ 40%). Districts with higher percentages of minority students are larger on average and have higher percentages of FRL students.

Table 12: Quintiles by district % minority, descriptive data over time

	Avg. % FRL	Avg. % Minority	Avg. District Size	Avg. % FRL	Avg. % Minority	Avg. District Size
	2006-07			2012-13		
State Average	54%	32%	1853	61%	36%	1859
Lowest (≤ 2%)	55%	2%	955	61%	4%	906
Moderate Low (3% to 6%)	52%	5%	1412	59%	7%	1467
Middle (7% to 19%)	49%	11%	1531	59%	14%	1709
Moderate High (20% to 39%)	56%	30%	1879	65%	34%	1930
Highest (≥ 40%)	72%	65%	3513	76%	69%	3143

2. Benchmark Performance

Benchmark data over time reveal that districts with the highest percentages of minority students score less well than districts with lower percentages of minority students in math and literacy, but these districts experienced higher growth on average over time. Districts in the bottom three quintiles with lower percentages of minority students perform similarly over time in math and literacy (Tables 13 and 14).

*Table 13: Benchmark **math** achievement over time, quintiles by district % minority*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	62%	73%	77%	75%	+13%
Lowest (≤ 2%)	67%	75%	81%	78%	+11%
Moderate Low (3% to 6%)	67%	75%	80%	77%	+10%
Middle (7% to 19%)	66%	76%	79%	78%	+12%
Moderate High (20% to 39%)	62%	73%	76%	74%	+12%
Highest (≥ 40%)	48%	60%	64%	63%	+15%

*Table 14: **Literacy** benchmark achievement over time, quintiles by district % minority*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	59%	68%	75%	79%	+20%
Lowest (≤ 2%)	64%	72%	79%	82%	+18%
Moderate Low (3% to 6%)	64%	70%	77%	82%	+18%
Middle (7% to 19%)	63%	72%	76%	81%	+18%
Moderate High (20% to 39%)	59%	68%	73%	79%	+20%
Highest (≥ 40%)	47%	54%	63%	71%	+24%

3. End-of-Course Exam Performance

To analyze End-of-Course exam performance, we use an academic performance indicator: the "GPA" rating system. The GPA measure takes into account the four levels of performance (below basic, basic, proficient, and advanced) by assigning a number to each level (similar to a high school GPA, where 1 is assigned to below basic, 2 to basic, 3 to proficient, and 4 to advanced). We believe this measure provides a better measure of student achievement as it differentiates between the four groups. Furthermore, this measure allows the four EOC subject tests (Algebra, Geometry, Grade 11 Literacy, and Biology) to be combined into one measure.

End-of-Course exam data over time reveals that districts with higher minority percentages perform less well over time. Districts in the first three quintiles (with lower percentages of minority students) perform similarly over time. Over time, the GPA measure indicates that districts grew similarly over time, with the middle quintile (7% to 19%) experiencing the highest growth (Table 15).

*Table 15: **EOC** achievement over time by GPA, quintiles by district % FRL*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	2.63	2.63	2.77	2.82	+0.19
Lowest (≤ 2%)	2.74	2.69	2.84	2.87	+0.13
Moderate Low (3% to 6%)	2.73	2.70	2.83	2.84	+0.11
Middle (7% to 19%)	2.70	2.72	2.87	2.86	+0.16
Moderate High (20% to 39%)	2.61	2.62	2.76	2.75	+0.14
Highest (≥ 40%)	2.33	2.32	2.43	2.48	+0.15

B. Income Disparities: Performance of Districts Over Time by % Low-income

1. Introduction

In this section, the relationship between the percentage of low-income students and student performance and growth is examined. This relationship is a matter of concern for educators and policymakers for many reasons, including the fact that additional funding is distributed to districts based on the percentage of FRL students in a district.

In 2012-13, 61% of students in Arkansas received free-or-reduced lunch (FRL), an increase from 2006-07, in which 54% of students in Arkansas were classified as FRL (Table 16). This increase in the percentage of FRL students can be attributed to a population increase in the state and to economic changes over time.

In order to examine district performance, districts are split into quintiles based on the percentage of free-and-reduced lunch (FRL) students in 2006-07. Table 16 describes the five quintiles. The quintile with the highest poverty level has the highest percentage of minority students. Districts with lower levels of poverty have fewer percentages of minority students and larger on average. The next sections compare the quintiles based on Benchmark and EOC data.

Table 16: Quintiles by district % FRL, descriptive data over time

	Avg. % FRL	Avg. % Minority	Avg. District Size	Avg. % FRL	Avg. % Minority	Avg. District Size
	2006-07			2012-13		
State Average	54%	32%	1853	61%	36%	1859
Lowest (≤ 45%)	35%	10%	2349	45%	15%	2477
Moderate Low (46% to 52%)	49%	15%	2495	58%	19%	2628
Middle (53% to 60%)	56%	14%	1550	66%	17%	1503
Moderate High (61% to 70%)	65%	23%	1800	71%	29%	1787
Highest (≥ 71%)	77%	48%	1233	81%	52%	1072

2. Benchmark Performance

Over time in math and literacy, districts with lower percentages of low-income students have consistently higher student achievement on the Benchmark assessment than those districts with higher poverty levels (Tables 17 and 18). Districts with mid-range poverty levels (quintiles between 46%-52% and 53%-60%) perform similarly over time. However, it is also important to consider growth in test scores over time. Districts with higher poverty levels have experienced more growth than districts with lower poverty levels. This can be attributed to a number of ideas: a ceiling effect on higher performing districts (students are already performing about as well as possible) and the idea that districts that previously performed lower had more room to grow.

*Table 17: **Math** Benchmark achievement over time, quintiles by district % FRL*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	62%	73%	77%	75%	+13%
Lowest (≤ 45%)	71%	80%	83%	82%	+11%
Moderate Low (46% to 52%)	65%	76%	79%	76%	+11%
Middle (53% to 60%)	64%	73%	77%	75%	+11%
Moderate High (61% to 70%)	60%	71%	75%	72%	+12%
Highest (≥ 71%)	50%	60%	66%	64%	+14%

*Table 18: **Literacy** Benchmark achievement over time, quintiles by district % FRL*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	59%	68%	75%	79%	+20%
Lowest (≤ 45%)	68%	76%	81%	85%	+17%
Moderate Low (46% to 52%)	63%	72%	76%	80%	+17%
Middle (53% to 60%)	61%	68%	75%	80%	+19%
Moderate High (61% to 70%)	57%	66%	72%	77%	+20%
Highest (≥ 71%)	48%	55%	64%	71%	+23%

3. End-of-Course Exam Performance

End-of-Course exam data reveals similar patterns that many educators and policymakers already regard as common: districts with lower poverty levels perform higher than those districts with higher poverty levels over time (Table 19). Moreover, during this time period, districts with lower poverty levels experienced more growth than those with higher levels of poverty.

*Table 19: **EOC** achievement over time by GPA, quintiles by district % FRL*

	2006-07	2008-09	2010-11	2012-13	Growth
State Average	2.63	2.63	2.77	2.82	+0.19
Lowest (≤ 45%)	2.81	2.83	2.95	3.00	+0.19
Moderate Low (46% to 52%)	2.67	2.67	2.81	2.82	+0.15
Middle (53% to 60%)	2.68	2.67	2.78	2.77	+0.09
Moderate High (61% to 70%)	2.59	2.54	2.68	2.69	+0.10
Highest (≥ 71%)	2.39	2.36	2.49	2.51	+0.12

V. CONCLUSION

The purpose of this report is to measure the performance of Arkansas' students and the subsequent achievement gaps between students of different subgroups over the past ten years. In 2012-13, 36% of Arkansas' K-12 students were identified under minority statuses, while 61% of students were identified as low-income. Thus, as we analyze the achievement gaps between students of different incomes and races, it is important to remember that these student subgroups compose a significant proportion of our student population.

National research over time reveals that minority and low-income students perform less well than non-minority and non-low-income students. However, in the discussion regarding performance of subgroups of students, achievement gaps are often presented without the context of actual performance and growth over time. Therefore, to thoroughly analyze achievement gaps in Arkansas, we present Arkansas' achievement gaps while examining the performance and growth of subgroups over time on national and state assessments. The analysis reveals nuanced results, depending on the measure that is examined (proficiency levels, scale scores, or percentile rankings); however, on whole the analysis confirms the following patterns:

- While all subgroups experience positive growth over time, black and Hispanic students performed less well than white students on math and literacy national and state assessments.
    - The gap between black and white students is more severe than the gap between Hispanic and white students over time.
- The gap between black and white students slightly decreased in respect to average scale score points on math and literacy national and state assessments; however, with respect to the percentage of students reaching proficiency cutoffs, the gap slightly increased on three national assessments (grade 4 math, grade 8 math, and grade 8 literacy).
- While low-income and non-low-income subgroups experience positive growth over time on math and literacy national and state assessments, the gap between low-income and non-low-income students widened over time.

When Arkansas' students are compared to the nation and to surrounding states on the NAEP, the best measure to compare the performance of states across the nation, the following results emerge:

Compared to the nation

- Arkansas' gap between black and white students and Hispanic and white students were moderately smaller than the average gaps of the nation on grade 4 and 8 math and literacy in respect to performance as measured by average scale scores and proficiency levels.
- Arkansas' gap between low-income and non-low-income students was smaller than the average gap of the nation on grade 4 and 8 math and literacy in respect to performance as measured by average scale scores and proficiency levels.

Compared to surrounding states

- Arkansas' gaps between black and white students and Hispanic and white students were moderately smaller than the gaps of the surrounding states on grade 4 math and literacy; however, on grade 8 math and literacy, Arkansas' racial gaps were slightly larger than the racial gaps of the surrounding states.
- Arkansas' gap between low-income and non-low-income students was moderately smaller than the gaps of the surrounding states on grade 4 math and literacy; however, on grade 8 math and literacy, Arkansas' racial gaps were slightly larger than the racial gaps of the surrounding states.

Finally, the report concludes by examining the relationship between district performance and growth and district student composition. This analysis allows us to see the impact of student demographics on school district performance over time by comparing districts based on the percentage of minority students and the percentage of low-income students. The final analysis confirms that districts with higher percentages of minority students and/or low-income students perform less well over time.

In Arkansas and across the country, students in poverty and in racial minority groups have historically had relatively low student achievement on average. In this report, we find that students in these subgroups have experienced positive growth over time; however, performance gaps between subgroups of students continue to exist. While the purpose of this report is not to offer a picture of how or why achievement has changed over time, we hope that this report will provide evidence regarding performance and growth of Arkansas' students, so that we can continue to work together to move all of Arkansas' students forward.