Comparing Results of the NAEP Long-Term Trend Assessment: ELLs, Former ELLs, and English-Proficient Students

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Since 1969, NAEP assessments have been conducted periodically in reading, mathematics, science, writing, U.S. history, civics, geography, and other subjects. NAEP collects and reports information on student performance at the national, state, and local levels, making the assessment an integral part of our nation's evaluation of the condition and progress of education. Only academic achievement data and related background information are collected. The privacy of individual students and their families is protected.

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Background

NAEP has assessed 9-, 13-, and 17-year-olds in various content areas since 1969. While there have been periodic changes in the assessment, they generally have not invalidated comparisons across administrations. The only exception to this was the 2004 addition of accommodations for English language learners (ELLs) and students with disabilities who could not otherwise be assessed in a meaningful manner. Those accommodations make it difficult to compare the results from 2004 forward with those from earlier years.

The NAEP long-term trend assessment (LTTA) was developed to identify and report upon students' progress in content areas. It has been used to monitor trend lines in mathematics and

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[1] "*What is The Nation's Report Card?", NAEP 2008: Trends in Academic Progress* (April, 2009). Washington, DC: National Center for Education Statistics, U.S. Department of Education. Accessed on May 5, 2009 from www.nces.ed.gov/nationsreportcard. All data used for these analyses come from this source.

reading first established in 1974 for students at ages 9, 13, and 17.[2] As a general rule, the LTTA assessments do not change in order to assure the comparability of scores across time. However, a number of modifications were implemented in 2004 to revitalize the LTTA. The changes implemented in 2004 were intended to reflect changes in NAEP policy, maintain the integrity of the LTTAs, and increase the validity of the results obtained; a bridge study was conducted to evaluate how these changes would affect assessment results.

The results from the 2008 NAEP LTTA, administered to over 26,000 students in each content area, were released by IES in April 2009. These results have been described in various newspaper and magazine articles. These articles have focused on:

- the improvements seen in reading and mathematics scores for the two younger groups of students;
- the higher reading and mathematics scores of African-American, Hispanic, and White students when compared to NAEP results of the 1970s;
- the narrowing of the achievement gap since the 1970s between White and African-American students and between White and some Hispanic age groups; and
- the increasing numbers of students enrolling in more advanced mathematics classes.

These same newspaper and magazine articles have rarely mentioned ELL students.

Purpose

The focus of this paper is the achievement of ELL students in two content areas, mathematics and reading, as measured by the NAEP long-term trend assessment. At this point, there have been two administrations of the revised LTTA, 2004 and 2008. These data were analyzed with two sets of questions in mind.

1. It has been readily acknowledged that ELL students' achievement scores are lower than those of nonELL students.[3] However, there are now a growing number of formerly ELL students.[4] As of 2004, NAEP is reporting on these students as a separate group; as of 2008, their scores on the LTTA are reported. This leads to the second overarching question: Are there differences in mathematics and reading achievement, using scale scores from the 2008 NAEP LTTAs, between ELL, previously ELL, and nonELL students (i.e., between [a] currently ELL students, [b] MFLEP students, and [c] students who are monolingual English-speakers combined with students who may have been designated as MFLEP more than 2 years ago)?

[2] Items related to science were eliminated in 1999 and a writing assessment was eliminated in 2004. *How was the NAEP long-term trend assessment developed?* (November 10, 2009). Washington, DC: National Center for Education Statistics, U.S. Department of Education. Accessed on March 18, 2009 from http://www.nces.ed.gov/nationsreportcard/ltt/howdevelop.asp .

[3] See, as but two examples over time, Abedi (2002) and Fry (2008); in addition, the Consolidated State PerformanceReports (CSPRs) submitted annually by state education agency (2006-07 and 2007-08) are available through the NCELA website at www.ncela.gwu.edu/t3sis), and the NAEP data from each test administration demonstrate the gap between ELL and nonELL students (c.f., Fry, 2007).

[4] The students described by NAEP as "formerly ELL" are those that Title III of ESEA, as reauthorized, refers to as "monitored former limited English proficient" (MFLEP) students. States must evaluate programs serving ELL and MFLEP students to provide, among other things, "a description of the progress made by children in meeting challenging State academic content and student academic achievement standards for each of the 2 years after such children are no longer receiving services ..." (§3121(a)(4)). Thus the students reported by NAEP as "formerly ELL" are those who are in the 2-year monitoring period; after that 2-year period, NAEP places these students in the nonELL category (private correspondence with NAEP staff, April 5, 2010).

2. It also has been readily acknowledged that ELL students frequently live in poverty[5] and, while the effects of limited English proficiency and poverty have been studied, they are less frequently studied together (i.e., the interaction of proficiency and poverty). This leads to the first overarching question: Are there differences in mathematics and reading achievement, using scale scores from the NAEP LTTAs, between ELL and nonELL students (i.e., between [a] students currently designated as ELL or MFLEP and [b] monolingual English speakers or were designated as MFLEP more than 2 years previously) who were and were not eligible for free and reduced price lunches (used as the operational definition of "poverty" for these analyses) in 2004 and/or 2008?

Statistical analyses were performed in order to answer the above two questions. All statistical analyses were calculated within the NAEP Data Explorer, with family-wise alpha levels of .05, controlling for the number of analyses performed. For subquestions, such as the patterns of math course-taking for ELL and nonELL students, only descriptive statistics are provided.

NAEP math test

The NAEP LTTA mathematics assessment asked students to respond to age appropriate multiple-choice and constructed-response questions. The assessment was designed to measure students' knowledge of basic mathematical facts, ability to carry out computations using paper-and-pencil, knowledge of basic formulas such as those applied in geometric settings, and ability to apply math to daily-living skills. Each student took part of the entire assessment in three 15-minute sections. Table 1 provides information on the identification and assessment of the ELL students.

Table 1: Numbers of students tested for NAEP LTTA-math, 2004 and 2008

Age group	Year	Total students tested[6]	% ELLs identified	% ELLs tested	% ELLs tested with accommodations
9 years	2004	About 11,000	9%	88%	15%
	2008	About 8,600	10%	92%	37%
13 years	2004	About 11,000	5%	85%	18%
	2008	About 8,500	6%	93%	32%
17 years	2004	About 11,000	4%	83%	17%
	2008	About 9,600	5%	84%	33%

[5] For instance, the 1995 *Congressionally Mandated Study of Educational Growth and Opportunity* describes ELL students as "particularly disadvantaged – coming from very poor families and typically living in communities (mostly urban) with high concentrations of poverty" (p 1). Crawford states that ELL children are "50% more likely to live in poverty" and that a study of Chapter 1 (now Title I) of ESEA programs found that "54% of LEP children in grades 2 and 3 came from families [living in poverty] – twice the rate for all public school students" (1997, p 6). As recently as 2008, Ballantyne, Sanderman, and Levy noted that "almost 6 in 10 adolescent ELLs qualify for free or reduced price lunch" (pg 7) and that many ELL students "are faced with the hardships of poverty and language barriers" (pg 16). Further, Congress made clear in the 1994 reauthorization of Chapter 1/Title I that ELL students are eligible for those funds; this was repeated in the 2001 reauthorization of Title I (§1001(2)).

[6] Total number of students tested for 2004 taken from Perie, Moran, & Lutkus, 2005, p 4. Total number of students tested for 2008 taken from Rampey, Dion, & Donahue, 2009, p 7. All other data in table are from U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *National Assessment of Educational Progress (NAEP), 2004 and 2008 Long-Term Trend Mathematics Assessments* and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *National Assessment of Educational Progress (NAEP), 2004 and 2008 Long-Term Trend Reading Assessments*. Both were accessed on April 2, 2010 from http://nces.ed.gov/nationsreportcard/ltt/interpreting_results.asp.

Table 1 shows, for example, that in 2004, about 11,000 9-year-old students took the NAEP LTTA-math. About 990 students (9%) were identified as ELL, 871 of whom (88%) were actually tested, 131 (15%) receiving accommodations in order to provide them with an opportunity to respond to the test items in a meaningful manner.

National math scale scores, which have a possible range from 0 to 500, are available for groups of 9-, 13-, and 17-year-old students, roughly students in grades 4, 8, and 12, who were tested in 2004 and 2008. In order to understand students' scores more clearly, NAEP has provided some descriptors for specific scale score groupings:

- **Level 200** students, scoring about 200 scale score points, understand the addition of 2-digit numbers, and know some basic multiplication and division facts, but still need help with subtraction;
- **Level 250** students, scoring about 250 scale score points, have an initial understanding of the four basic operations, are able to apply whole number skills to one-step word problems, and can compare information from graphs and charts; and
- **Level 300** students, scoring about 300 scale score points, are developing an understanding of number systems and can compute with decimals, simple fractions, and commonly encountered percents; they can identify geometric figures, measure lengths and angles, and calculate areas of rectangles; they are developing the skills to operate with signed numbers, exponents, and square roots.

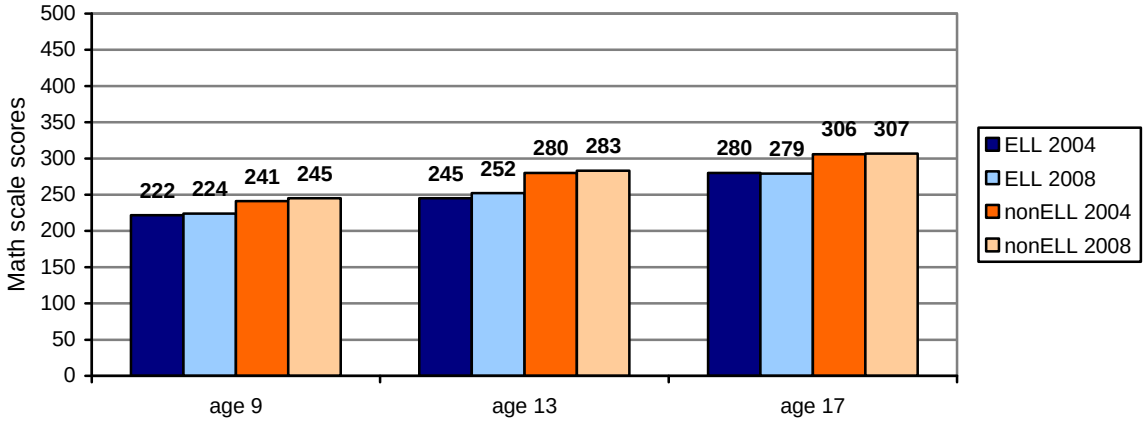
ELL and nonELL students. For purposes of this paper, the scale scores from the 2004 and 2008 LTTA were analyzed for ELL and nonELL[7] students. Tests administered before 2004 are not equivalent to those administered in 2004 and 2008, thus they were not included in the analysis. Figure 1 provides three pieces of information:

(1) ELL student groups' average scale scores are somewhat lower than nonELL students' average scale scores in both 2004 and 2008, but
(2) ELL and nonELL student groups in both 2004 and 2008 are making progress across grades in math, and
(3) From 2004 to 2008, ELL student groups gained slightly more than nonELL student groups at age 13 (an average of 7 scale score points *vs* an average of 3 scale score points).

Even though ELL students at age 9 minimally increased their average scores from 2004 to 2008, they did more than maintain their math skills while students at age 17, both ELL and nonELL, had scores that were about the same in both 2004 and 2008. As a general statement, ELL students at age 9 demonstrated Level 200 math skills; at age 13, ELL students had increased their math skills to Level 250; and the 17-year-old group was closer to Level 300 with their math skills. The nonELL students tended to be one level ahead of the ELL students.

[7] In this analysis, the "ELL" group includes both ELL and MFLEP students; the "nonELL" group may include formerly MFLEP students as well as monolingual English-speaking students.

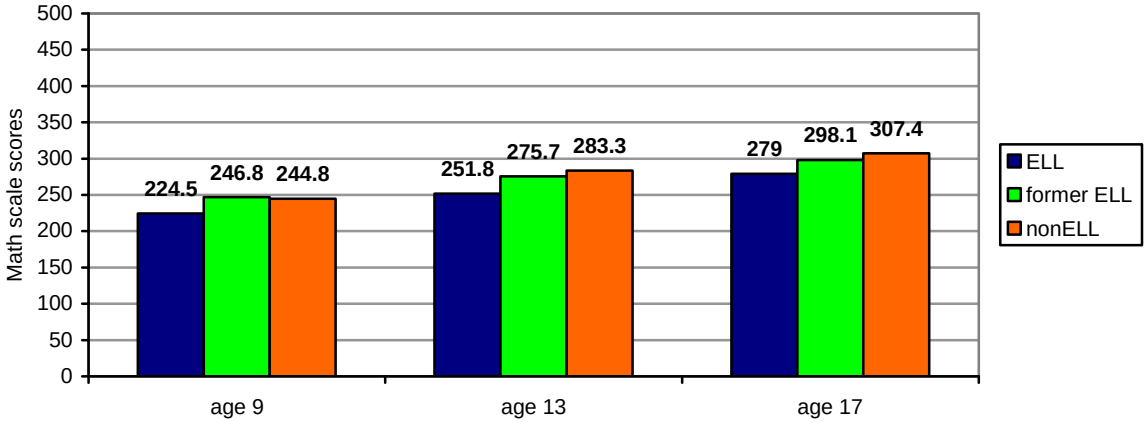
Figure 1: Average NAEP LTTA math scale scores for ELL and nonELL students, by age, 2004 and 2008



In 2008, for the first time, the students were divided further into ELL, former ELL, and nonELL students. While we cannot look at progress for this particular subgroup, we can provide a snapshot of how the students were performing in 2008. Figure 2 shows that,

- for all three age groups, the former ELL students have much higher scores than their ELL peers and score nearer to, or above, their nonELL peers;
- for age 9, the former ELL students scored an average of 23 scale score points above their ELL peers and 2 scale score points above their nonELL peers;
- at age 13, the former ELL students again scored 24 points higher than their ELL peers and only 7 points below their nonELL peers; and
- finally, at age 17, the former ELL students scored 19 points above their ELL peers and only 9 points below their nonELL peers.

Figure 2: Average NAEP LTTA math scale scores for ELL, former ELL, and nonELL students, by age, 2008



Statistical analyses indicate the following:

- At age 9, the former ELL students and the nonELL students scored significantly higher than the ELL students ($p < .001$ for both analyses);
- At age 13, the former ELL students and the nonELL students scored significantly higher than the ELL students ($p < .01$ and $p < .001$, respectively);
- At age 17, the former ELL students and the nonELL students scored significantly higher than the ELL students ($p < .01$ and $p < .001$, respectively); and
- At no age group was there a significant difference between the former ELL and nonELL students ($p > .6$, $p > .2$, and $p > .1$ for the three age groups).

Thus for NAEP LTTA math in 2008, the average scores for the former ELL and nonELL students were statistically indistinguishable, while both groups scored higher than their ELL age peers.

ELLs and students living in poverty. ELL students often are concentrated in schools that serve students living in poverty (as defined by eligibility for free or reduced price lunches [FRPL]). This has led to hypotheses about the effect of poverty on education and its increased effect on ELL students. In Figure 3, the 2004 and 2008 average NAEP scale scores for ELL students and nonELL students[8], who are and are not eligible for FRPL, are provided. First, the average scores of most groups of students increased from 2004 to 2008, and all increased from one age grouping to the next age grouping. However, it might be hypothesized that the scale scores would follow a pattern: nonELL students not living in poverty scoring the highest, followed by nonELL students living in poverty, ELL students not living in poverty, and the ELL students living in poverty – in each case, students not living in poverty "should" outscore their age peers who do live in poverty. As demonstrated in Figure 3, this pattern does hold for two groups: nonELL students not living in poverty clearly have the highest average scale scores in math, and ELL students living in poverty have the lowest average scale scores in math – in both 2004 and 2008. However, for the nonELLs living in poverty and the ELLs not living in poverty, the pattern is more difficult to discern.

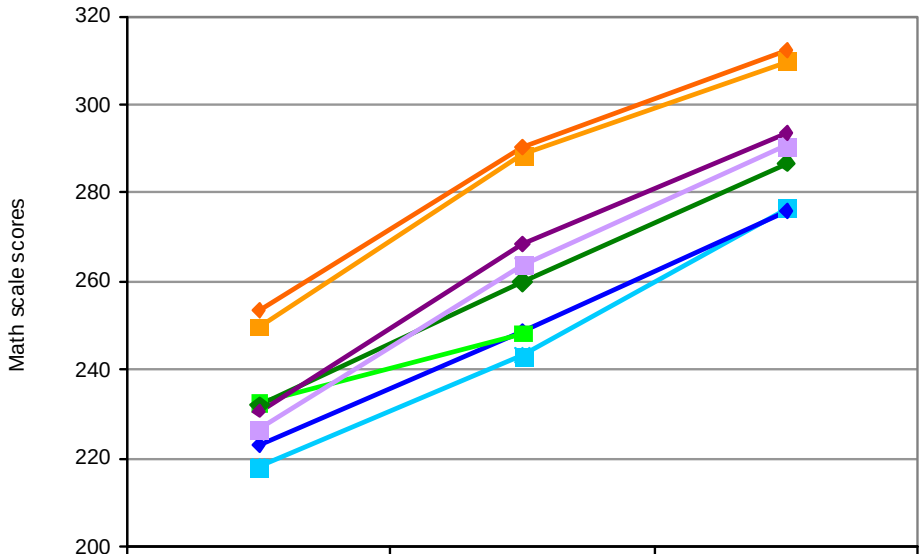
In both 2004 and 2008, the scores of the nonELL students living in poverty increased with the age of the student group, and scores were higher in 2008 than in 2004. These scores also were somewhat lower than the nonELL students not living in poverty, but generally were mixed with the ELL student groups. In 2004, the 9-year-old ELL students *not* living in poverty scored higher than the nonELL students who *were* living in poverty and in 2008, the two 9-year-old groups' average scores were only 1 scale score point apart.

The scores of ELL students *not* living in poverty cannot be clearly interpreted, especially in relation to their age-peers. In both 2004 and 2008, the 9-year-old groups of ELL students *not* living in poverty and, in 2008, the 9-year-old nonELL students *living* in poverty have virtually the same average scale scores (233, 232, and 231, respectively). In 2008, for 13-year-old students, the ELL students *not* living in poverty and, in both 2004 and 2008, the groups of nonELL

[8] In this analysis, the "ELL" group includes both currently ELL and currently MFLEP students; the "nonELL" group may include formerly MFLEP students as well as monolingual English-speaking students.

students *living* in poverty, received fairly similar scores (ranging from 260 to 268 average scale score points). For the 17-year-old groups, the pattern does match what would be hypothesized.

Figure 3: Average NAEP LTTA math scores for ELL and nonELL students, living in poverty and not living in poverty, by age, 2004 and 2008



	age 9	age 13	age 17
ELL-poverty 2004	218	243.2	276.5
ELL- poverty 2008	223.1	248.7	275.9
ELL-not poverty 2004	232.5	248.3	*
ELL-not poverty 2008	231.8	259.8	286.9
nonELL-poverty 2004	226.5	263.7	290.6
nonELL-poverty 2008	230.7	268.4	293.4
nonELL-not poverty 2004	249.8	288.6	309.7
nonELL-not poverty 2008	253.6	290.5	312.1

Note: "Living in poverty" was defined as eligibility for FRPL.
* There were too few 17-year-old ELL students not living in poverty in 2004 for analyses to be completed.

Results of the significance tests are shown in Table 2. Analyses were calculated separately for each year and each age group. The most interesting cells in Table 2 are those that report on the comparison of ELL students who were not living in poverty (i.e, those not eligible for FRPL) and nonELL students who were living in poverty (i.e., those eligible for FRPL); these cells are highlighted in the table. Of the six comparisons, 4 were not significant – indicating that the scores were too similar to differentiate the students, 1 was significant, and there were too few 17-year-old ELL students not living in poverty to allow analyses. The findings support the hypothesis that language skills interact with poverty status, resulting in scores that are similar for ELL students not living in poverty and nonELL students living in poverty, and that the double

effect of poverty and ELL status result in these students scoring consistently lower than other student groups.

Table 2: Results of statistical analyses for NAEP LTTA math based on language proficiency (ELL, nonELL), poverty status (eligible for FRPL, not eligible for FRPL) for each age group (9, 13, 17) and each year (2004, 2008)

		2004				2008			
Age	Student group	Eligible, ELL	Eligible, Not ELL	Not eligible, ELL	Not eligible, Not ELL	Eligible, ELL	Eligible, Not ELL	Not eligible, ELL	Not eligible, Not ELL
9 years	Eligible, ELL	218.0	$p < .001$	$p < .001$	$p < .0001$	223.1	$p < .01$	***p* > .05**	$p < .0001$
	Eligible, Not ELL	8	226.5	***p* > .05**	$p < .0001$	8	230.7	***p* > .80**	$p < .0001$
	Not eligible, ELL	14	**6**	232.5	$p < .0001$	**9**	**1**	231.8	$p < .001$
	Not eligible, Not ELL	32	23	17	249.8	30	23	22	253.6
13 years	Eligible, ELL	243.2	$p < .0001$	***p* > .20**	$p < .0001$	248.7	$p < .0001$	***p* > .05**	$p < .0001$
	Eligible, Not ELL	20	263.7	$p < .01$	$p < .0001$	20	268.4	***p* > .10**	$p < .0001$
	Not eligible, ELL	**5**	15	248.3	$p < .0001$	**11**	**9**	259.8	$p < .0001$
	Not eligible, Not ELL	45	25	40	288.6	42	22	31	290.5
17 years	Eligible, ELL	276.5	$p < .0001$		$p < .0001$	275.9	$p < .0001$	$p < .02$	$p < .0001$
	Eligible, Not ELL	14	290.6		$p < .0001$	18	293.4	***p* > .10**	$p < .0001$
	Not eligible, ELL	Too few Ss				11	7	286.9	$p < .0001$
	Not eligible, Not ELL	33	19		309.7	36	19	25	312.1

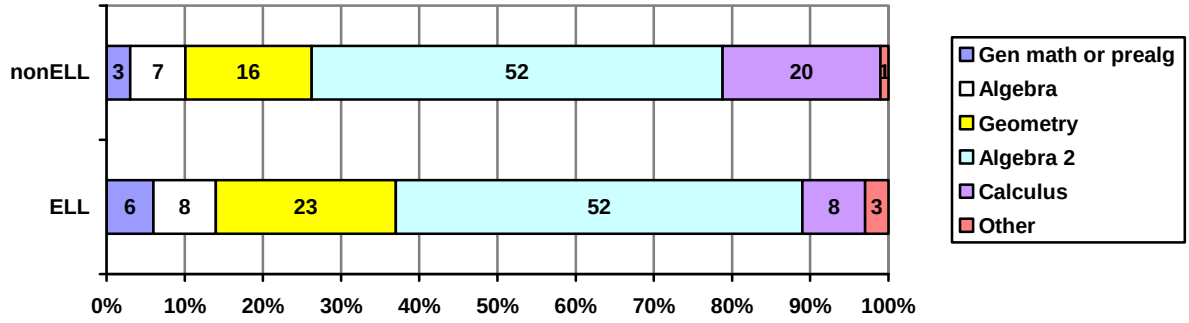
Note: Probability levels are displayed above the diagonals, average scores in the diagonals, and differences between scores below the diagonals. The area of greatest interest, the comparison of students who are living in poverty but are not ELL with students who are not living in poverty but are ELL, is highlighted.

Mathematics course-taking. For the 2008 LTTA, the 17-year-old students were asked to identify all the math courses they had taken, including any course(s) currently being taken. Their choices were

- general, business, or consumer math;
- pre-algebra or introduction to algebra;
- first-year algebra;
- geometry;
- second-year algebra;
- trigonometry; and
- pre-calculus or calculus.

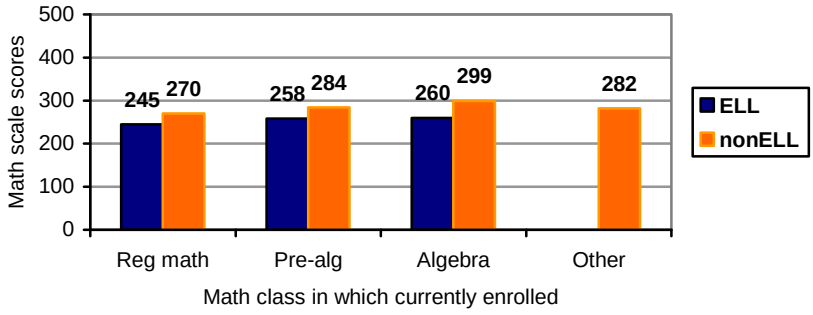
The general trend in course-taking for age 17 students shows that higher percentages of students were taking higher-level mathematics courses in 2008 as compared to previous years. Figure 4 provides a comparison in course-taking for ELL and nonELL students in 2008. When 17-year-old nonELL and ELL students are compared, more of the ELL students report that algebra is the highest math course they have taken, and fewer report that they have taken a class higher than algebra; equal percentages of ELL and nonELL 17-year-old students report that Algebra 2 is the highest level math course they have taken. There were too few former ELL students identified to include them in the analysis.

Figure 4: Highest level math course taken, for 17-year-old ELL and nonELL students, in 2008 (reported as percentage of students)



The 13-year-old students were asked to identify any math course they were currently taking. Their options were none, regular math, pre-algebra, algebra, or other. Scale scores on the math NAEP LTTA were analyzed and grouped by the math course currently being taken.

Figure 5: Average NAEP LTTA math scale scores for ELL and nonELL 13-year-old students, by class currently taken, 2008



Findings indicate that the average LTTA math scale scores for ELL and nonELL students increase based on the level of math course that they report taking in 2008 (the data are not available for 2004); former ELL students could not be included in the analysis. As demon-

strated in Figure 5, this trend is clear for nonELL students, but somewhat less so for ELL students because there are too few ELL student taking higher level courses. For nonELL students, those enrolled in algebra had higher scores than those enrolled in pre-algebra, who in turn had higher scores than those enrolled in general math. For ELL students, those enrolled in both pre-algebra and algebra had higher scores than those enrolled in general math, but there was little difference between pre-algebra and algebra.

NAEP reading test

National LTTA reading scale scores also are available for groups of 9-, 13-, and 17-year-old students, roughly students in grades 4, 8, and 12, who were tested in 2004 and 2008. As with the NAEP math LTTA, in 2008 the ELL subgroup was divided further into ELL, nonELL, and former ELL for the first time. Table 3 provides information on the identification and assessment of the ELL students. When compared to the NAEP LTTA-math, lower percentages of ELL students were tested, and were tested with accommodations, for the NAEP LTTA-reading for both 2004 and 2008.

Table 3: Numbers of students tested for NAEP LTTA-reading, 2004 and 2008

Age group	Year	Total students tested[9]	% ELLs identified	% ELLs tested	% ELLs tested with accommodations
9 years	2004	About 11,000	9%	78%	8%
	2008	About 8,600	10%	85%	23%
13 years	2004	About 11,000	4%	79%	9%
	2008	About 8,400	6%	84%	25%
17 years	2004	About 11,000	5%	76%	10%
	2008	About 9,600	5%	83%	29%

Table 3 shows that, as an example, about 11,000 9-year-old students took the NAEP LTTA-reading in 2004. Of these students, about 990 were identified as ELL and about 722 of them were actually tested; 62 of these tested ELL students were provided with accommodations.

NAEP has developed a useful way of characterizing the scores that students receive on the reading LTTA: Students, regardless of their background, who score at

- **Level 200**, scoring about 200 scale-score points, can locate and identify facts in fairly simple reading material;
- **Level 250** use intermediate skills and strategies to search for, locate, and organize information they find in relatively lengthy passages; and
- **Level 300** can understand complicated literary and informational passages, including material about topics they study at school.

[9] Total number of students tested for 2004 taken from Perie, Moran, & Lutkus, 2005, p 4. Total number of students tested for 2008 taken from Rampey, Dion, & Donahue, 2009, p 7. All other data in table from U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *National Assessment of Educational Progress (NAEP), 2004 and 2008 Long-Term Trend Mathematics Assessments* and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, *National Assessment of Educational Progress (NAEP), 2004 and 2008 Long-Term Trend Reading Assessments*. Both were accessed on April 2, 2010 from http://nces.ed.gov/nationsreportcard/ltt/interpreting_results.asp.

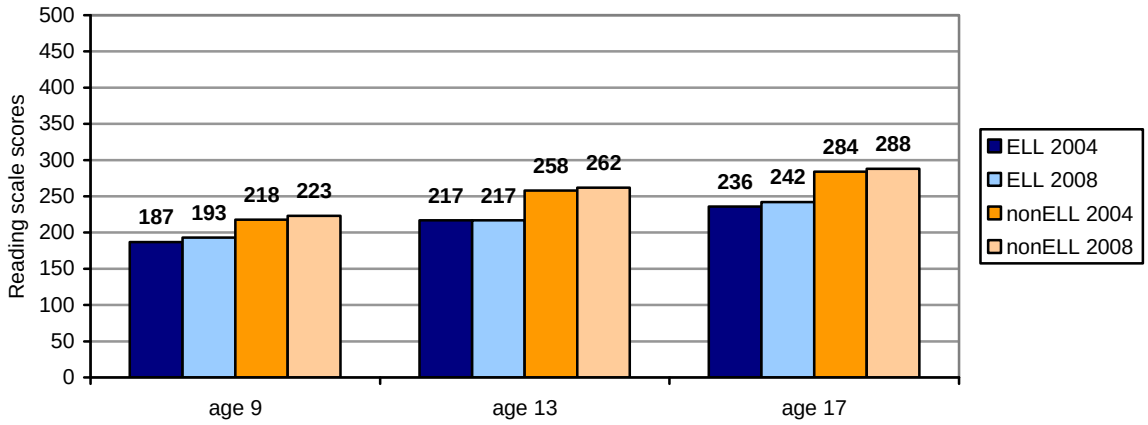
ELL and nonELL students. The first analysis compared ELL and nonELL students' scores on NAEP LTTA reading in both 2004 and 2008. As presented in Figure 6, three pieces of information are evident:

(1) ELL student groups' average reading LTTA scores are somewhat lower than nonELL students,[10] but

(2) ELL student groups and nonELL student groups generally are making progress in reading, and

(3) ELL student groups gained slightly more than nonELL student groups at age nine (6 scale score points *vs* 5) and at age 17 (6 scale score points *vs* 4).

Figure 6: Average NAEP LTTA reading scores for ELL and nonELL students, by age, 2004 and 2008



Even though students at age 13 did not increase their scores from 2004 to 2008, they did maintain their reading skills. As a general statement, all students at age 9 were Level 200 readers. At age 13, ELL students had increased their scores, but were still Level 200 readers while nonELL students had advanced to being Level 250 readers. By age 17, ELL students can generally be defined as nearly Level 250 readers while nonELL students are nearly Level 300 readers.

A more interesting comparison is the snapshot of ELL, nonELL, and former ELL students[11] from the 2008 NAEP LTTA. Figure 7 shows that,

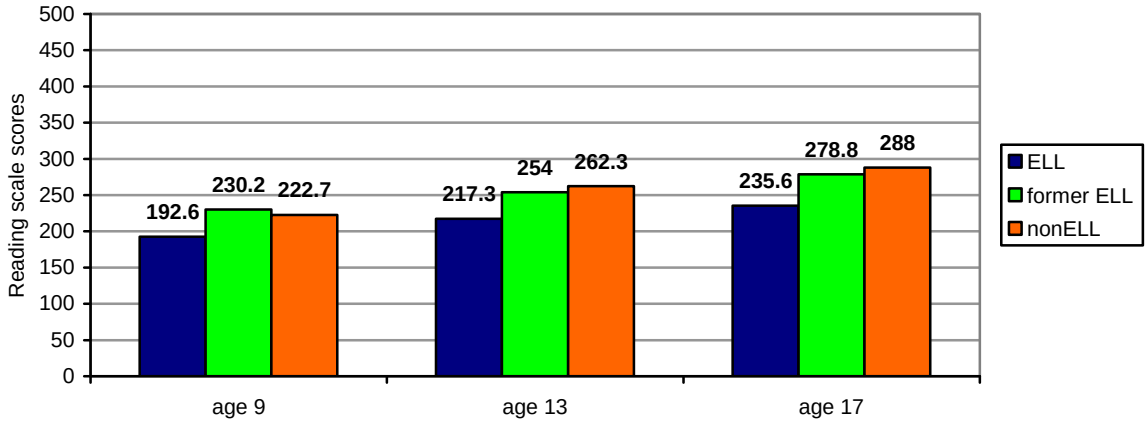
- for all three age groups, the former ELL students have much higher scores than their ELL peers and score nearer to, or above, their nonELL peers;
- for age 9, the former ELL students scored an average of 37 scale score points above their ELL peers and 7 scale score points above their nonELL peers;

[10] For this analysis, the ELL group includes both currently ELL and currently MFLEP students; the nonELL group may include formerly MFLEP students as well as monolingual English-speaking students.

[11] For this analysis, the ELL group is only currently ELL students, the "formerly ELL" group is MFLEP students, and the "nonELL" group may include formerly MFLEP students as well as monolingual English-speaking students.

- for age 13, the former ELL students again scored 37 points higher than their ELL peers and only 8 points below their nonELL peers; and
- finally, at age 17, the former ELL students scored an average of 43 scale score points above their ELL peers and only 9 points below their nonELL peers.

Figure 7: Average NAEP LTTA reading scores for ELL, former ELL, and nonELL students, by age, 2008



Statistical analyses on these data indicate that:

- At age 9, age 13, and age 17, the former ELL students and the nonELL students scored significantly higher than the ELL students ($p < .001$ for all analyses);
- At age 9, the former ELL students scored significantly higher than the nonELL students ($p < .02$); and
- At neither age 13 nor age 17 were there significant differences between the former ELL and nonELL students ($p > .2$ and $p > .06$, respectively.

Thus there were differences between all groups at age 9, with former ELL students scoring higher, on average, than any of their age peers. At the older two ages, average scores for the former ELL students and the nonELL students were higher than those for the ELL students, but the two groups of English-literate students could not be distinguished statistically.

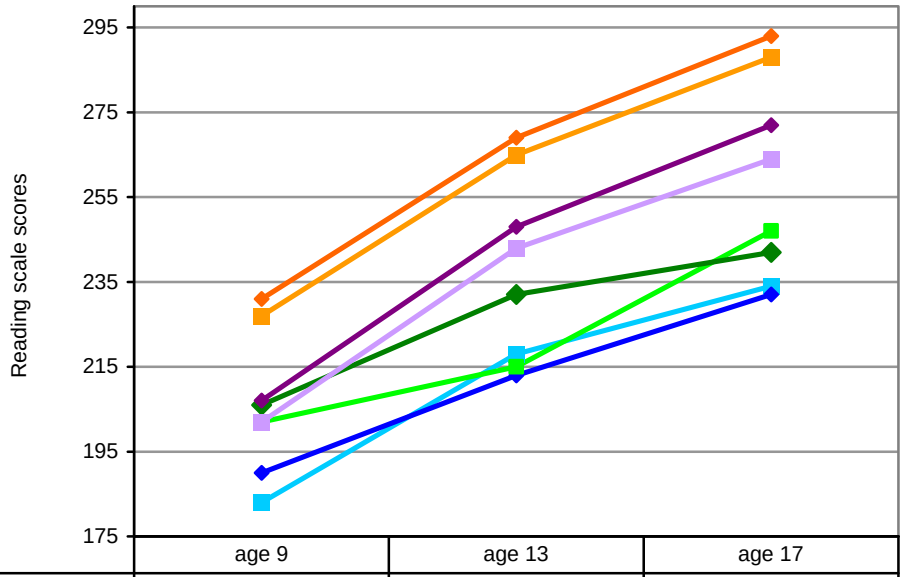
ELLs and students living in poverty. As noted previously, hypotheses were developed about the effect of poverty on education and its increased effect on ELL students. In Figure 8, the 2004 and 2008 NAEP LTTA scale scores for ELL students and nonELL students[12], who are and are not living in poverty, as measured by eligibility for FRPL, are provided. There are some patterns that are fairly unmistakable.

- The average reading LTTA scale scores of nonELL students who are not living in poverty (i.e., are not eligible for FRPL), 2004 and 2008, clearly indicate that these two student

[12] For this analysis, the nonELL group may include formerly MFLEP students as well as monolingual English -speaking students.

groups scored above any others, the scores increased with the age of the student group, and the scores of students tested in 2008 were higher than those in 2004.

Figure 8: Average NAEP LTTA reading scores for ELL and nonELL students, living in poverty and not living in poverty, by age, 2004 and 2008



	age 9	age 13	age 17
ELL-poverty 2004	183	218	234
ELL-poverty 2008	190	213	232
ELL-not poverty 2004	202	215	247
ELL-not poverty 2008	206	232	242
nonELL-poverty 2004	202	243	264
nonELL-poverty 2008	207	248	272
nonELL-not poverty 2004	227	265	288
nonELL-not poverty 2008	231	269	293

Note: "Living in poverty" was defined as eligibility for FRPL.

- The average reading LTTA scores of ELL students who are living in poverty, for 2004 and 2008, indicate that these two student groups scored below others and while the scores increased with the age of the student group, the scores for the 13- and 17-year old students were lower in 2008 than in 2004.
- The average reading LTTA scores of nonELL students who are living in poverty, for 2004 and 2008, show that at ages 13 and 17, these students were continuing to improve and were above any of their ELL student peer groups. However, their English reading skills when tested at age 9 were approximately equal to those of the ELL students who were not living in poverty.
- The average reading LTTA scores of ELL students who are not living in poverty, for 2004 and 2008, demonstrate that these students' scores cannot be clearly interpreted, espe-

cially in relation to their age-peers. As 9-year-olds, they score similarly to the nonELL students who do live in poverty. As 13 year-olds, they scored similarly to their ELL age peers (2004 testing) and somewhat below their nonELL age peers who live in poverty (2008 testing). Finally, at age 17, the scores are about the same for both testing years.

Of note in Figure 8 is the age 9 ELL students who do not live in poverty and the nonELL students who do live in poverty. Their average reading LTTA scores are virtually inseparable each year (2004: average scores of 202 for both groups, 2008: average scores of 206 for ELLs not living in poverty and 207 for nonELLs living in poverty). While the nonELL living in poverty student groups' average scores indicate that their reading skills increase with age, this is not the pattern for ELL students who do not live in poverty. Why this occurs cannot be explained merely by looking at the data, but would necessitate further study of these students.

Results of the significance tests are shown in Table 4. Analyses were calculated separately for each year and each age group.

Table 4: Results of statistical analyses for NAEP LTTA reading based on language proficiency (ELL, nonELL), poverty status (eligible for FRPL, not eligible for FRPL) for each age group (9, 13, 17) and each year (2004, 2008)

		2004				2008			
Age	Student group	Eligible, ELL	Eligible, Not ELL	Not eligible, ELL	Not eligible, Not ELL	Eligible, ELL	Eligible, Not ELL	Not eligible, ELL	Not eligible, Not ELL
9 years	Eligible, ELL	183.1	$p < .0001$	$p < .005$	$p < .0001$	189.6	$p < .0001$	$p < .0001$	$p < .0001$
	Eligible, Not ELL	19	202.2	***p* > .90**	$p < .0001$	18	207.4	***p* > .80**	$p < .0001$
	Not eligible, ELL	18	**1**	201.6	$p < .001$	**17**	**1**	206.4	$p < .0001$
	Not eligible, Not ELL	44	25	26	227.4	41	24	25	231.0
13 years	Eligible, ELL	218.0	$p < .0001$	***p* > .80**	$p < .0001$	212.9	$p < .0001$	$p < .01$	$p < .0001$
	Eligible, Not ELL	25	242.8	$p < .001$	$p < .0001$	35	247.8	$p < .01$	$p < .0001$
	Not eligible, ELL	**3**	28	215.2	$p < .0001$	**19**	16	232.3	$p < .0001$
	Not eligible, Not ELL	47	22	50	264.9	56	21	37	268.8
17 years	Eligible, ELL	234.0	$p < .0001$	$p > .10$	$p < .0001$	231.7	$p < .0001$	$p < .05$	$p < .0001$
	Eligible, Not ELL	30	264.3	$p < .05$	$p < .0001$	40	271.7	$p < .0001$	$p < .0001$
	Not eligible, ELL	13	17	247.1	$p < .0001$	11	29	242.5	$p < .0001$
	Not eligible, Not ELL	54	24	41	288.5	62	22	51	293.4

Note: Probability levels are displayed above the diagonals, average scores in the diagonals, and differences between scores below the diagonals. The area of greatest interest, the comparison of students who are living in poverty but are not ELL with students who are not living in poverty but are ELL, is highlighted.

The most interesting cells in Table 4 are those that report on the comparison of ELL students who were not living in poverty (i.e, those not eligible for FRPL) and nonELL students who were living in poverty (i.e., those eligible for FRPL); these cells are highlighted in the table. Of the six comparisons, the 2 for 9-year-old ELL students not living in poverty and nonELL students living in poverty were not significant – indicating that the scores were too similar to differentiate the students, the rest were significant. The findings support the hypothesis that language skills interact with poverty status, resulting in scores that are similar – but for 9-year-old students only. For older students (ages 13 and 17), there were significant differences, with ELL students not living in poverty scoring lower than nonELL students living in poverty.

Summary and conclusions

As a subgroup of students who participate in NAEP testing, often with accommodation to allow their participation in a more meaningful manner, the ELL students' composite math scale scores and reading test scores demonstrate that:

- The average scores of ELL student groups on NAEP LTTAs generally increase with age group;
- The average scores of ELL student groups on NAEP LTTAs generally were higher in 2008 than in 2004;
- The average scores of former ELL students are close to, or above, their nonELL age peers on the NAEP LTTAs;
- The average scores of former ELL students and nonELL students are above their ELL age peers on the NAEP LTTAs;
- NonELL students who do not live in poverty outscore all other student groups at each age level on the NAEP LTTAs; and
- ELL students who live in poverty score more poorly in math skills and reading achievement than either group of nonELL students and, in some cases, score more poorly than ELL students who do not live in poverty.

Two hypotheses were posited for this study. The statistical analyses show mixed results.

1. Are there differences in mathematics and reading achievement, using scale scores from the 2008 NAEP LTTAs, between ELL, formerly ELL (currently MFLEP) students, and nonELL (monolingual English-speakers and formerly MFLEP) students?
   - Results of these analyses for math indicate that both formerly ELL and nonELL students at all three age levels scored higher than their ELL age peers; there were no significant differences between nonELL and formerly ELL students' scores.
   - Results of these analyses for reading were somewhat different. On the reading LTTA, both formerly ELL and nonELL students at all three age levels scored higher than their ELL age peers and, at ages 13 and 17, there were no significant differences between formerly ELL and nonELL students. However, at age 9, the formerly ELL students significantly outscored the nonELL students.
   - This hypothesis can be rejected for the comparisons between ELL students and those students who are English literate (i.e., nonELL and formerly ELL students) and

generally cannot be rejected for comparisons between nonELL and formerly ELL students as only one analysis in six showed significance.

2. Are there differences in math and reading achievement, using scale scores from the NAEP LTTA, between ELL (currently ELL and currently MFLEP) and nonELL (formerly MFLEP and monolingual English-speaking) students who were and were not eligible for free and reduced price lunches (FRPL, used as the operational definition of "poverty") in 2004 and/or 2008?
   - Results for the math analyses indicate that (1) ELL students living in poverty scored significantly lower than their nonELL age peers (both those living in poverty and not living in poverty), (2) the two ELL student groups scored similarly at age 13 in both 2004 and 2008, and at age 9 in 2008, and (3) the two groups of possibly most interest, ELLs not living in poverty and nonELLs living in poverty, scored similarly in 2008 for all age groups and in 2004 for 13-year-old students (there were too few 17-year-old ELL students not living in poverty to analyze).
   - Results for the reading analyses indicate that (1) ELL students living in poverty scored significantly lower than their nonELL age peers in 2008, and scored lower than their 9-year-old peers in 2004, (2) the two ELL student groups scored similarly only a ages 13 and 17 in 2004; and (3) the two groups of interest, ELLs not living in poverty and nonELLs living in poverty, scored similarly only at age 9.
   - This hypothesis can be rejected for math – of 33 analyses across two years, 26 were significant; the hypothesis also can be rejected for reading – of 36 analyses across two years, 31 were significant.
   - The analyses comparing ELL students not living in poverty and nonELL students living in poverty, were somewhat problematic: 4 of 5 analyses in math were not significant while 4 of 6 analyses in reading were significant.

Based on hypothesis 1, it would appear that we can state that formerly ELL students perform well in both math and reading achievement, as measured by the NAEP LTTAs of 2008. This is an especially positive finding given that this is a relatively new group of students. It tends to confirm what many jurisdictions have been saying: the ELL student group performs poorly, in part, due to the influx of newly identified students as successful students are moved out of the ELL designation. It also is an indication that those who are moved out of the ELL designation have learned the necessary skills to maintain and increase their achievement levels in English-based classrooms without supports.

Based on hypothesis 2, we also can state that language status and poverty interact to have a negative effect on the educational attainment of students, as measured by the NAEP LTTAs of 2004 and 2008. However, explaining that interaction is still difficult. Students who are neither ELL nor living in poverty have the highest average scale scores on both the math and reading NAEP LTTAs in 2004 and 2008; students who are both ELL and living in poverty have the lowest average scores on these same assessments. The effects of English literacy and poverty status cannot be clearly parsed from one another within these data. Comparing scores of nonELL students living in poverty and ELL students not living in poverty resulted in mixed findings.

NAEP describes the math LTTA as measuring basic math facts, paper-and-pencil computations, basic formulas, and ability to apply math to daily life. When looking at the ELL students not living in poverty, it might be assumed that their parents have a higher education level and are able to help their students with math. Couple this with the possibility that the math assessment has less language demand so that, with accommodations, those with less English proficiency may be able to perform better in math than their ELL age peers who do live in poverty as long as they understand math facts and computations. On the other hand, the NAEP reading LTTA is more language-bound so that students with less English proficiency have greater difficulty. Even though this group of students is not living in poverty, in all likelihood, they live in a household in which another language is dominant – making it difficult for parents to help students with reading in English. It also is interesting to note the pattern of differences between ELL students not living in poverty and nonELL students living in poverty: their reading skills do not differ at age 9, but do differ at both ages 13 and 17, in both 2004 and 2008. This may indicate that (1) many of the older students are the so-called "lifers," students who are not increasing their English language proficiency and/or (2) there are increasing numbers of ELL students entering school systems at older ages, and with less educational background.

As noted by Fry, ELLs "tend to go to public schools that have low standardized test scores. … These same schools … have a set of characteristics … such as high student-teacher ratios, high student enrollments and high levels of students living in or near poverty. When ELL students are not isolated in these low-achieving schools, their gap in test score results is considerably narrower" (2008, p i). This could explain the scores of students who are struggling both with language and with poverty (i.e., the ELL students living in poverty) and the scores of students who are not ELL and not living in poverty who, presumably are benefiting from higher-achieving schools with lower student-teacher ratios, lower enrollments, and lower levels of students living in or near poverty. These analyses may help to clarify the double effect on students of being both ELL and living in poverty. Care must be taken with these results because, as noted by Ballantyne, Sanderman, and McLaughlin, "There are a number of studies which report that the deleterious effects of low socio-economic status on academic achievement hold true for ELL populations. … The research base is however extremely small compared to research into the effect of SES on native English speaking students, and because a great deal of the literature on ELLs in general looks at students from low-income families, it is difficult to assess the cumulative effects of low SES and linguistic barriers to access faced by low-income non-English speaking communities" (2008, p 15). It also is important to note that although the NAEP students are randomly selected based on a number of variables, the sample of ELL students is small.

The results described herein are based on a national sample of ELL, nonELL, and former ELL students. However, individual jurisdictions have had some control over the selection of who participates in the NAEP testing and how they participate. Amidst charges that ELL students often are excluded from NAEP testing and that accommodations are provided to ELL students differently across jurisdictions, the National Assessment Governing Board, the independent body that sets policy for NAEP, recently approved a new policy that will "limit school officials' ability to exclude students with disabilities and English-language learners from the national

exams" (Sawchuck, 2010, p 1). This may well lead to changes in both the numbers of ELL students and the achievement levels of ELL students who participate in NAEP – which may result in quite different findings the next time that NAEP is administered as part of the long term trend assessment (2012). We look forward to that time and a continuing review of how well ELL, former ELL, and nonELL students are progressing in their math and reading skills.

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