



What's Happening

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# Initial Spanish proficiency and English language development among Spanish-speaking English learner students in New Mexico

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American Institutes for Research

## Key findings

This study of the 2010 and 2011 kindergarten cohorts of Spanish-speaking English learner students in four school districts in New Mexico examined the connection between initial Spanish proficiency and English language development, as well as grade-level readiness by grade 4 or 5 in English language arts and math. Key findings include:

- More than 80 percent of English learner students in the 2010 cohort started kindergarten at the lowest English proficiency level, as did half of those in the 2011 cohort.
- A majority of students in both cohorts attained English proficiency by grade 4, but students with high initial Spanish proficiency were more likely to do so.
- Among English learner students with low or medium initial Spanish proficiency, roughly a quarter of the 2010 cohort were not reclassified as fluent English proficient by grade 5, and roughly half the 2011 cohort were not reclassified by grade 4.
- Of English learner students who were reclassified as fluent English proficient by grade 4 or 5, fewer than a quarter also demonstrated grade-level readiness in grade 4 or 5 English language arts or math on standardized academic assessments.

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## Summary

To what extent do Spanish-speaking English learner students develop English proficiency and grade-level readiness in English language arts and math from early elementary school to upper elementary school? Is there a relationship between proficiency in a student's primary home language, Spanish, and the amount of time needed to attain fluency in the student's second language, English? And are there differences in these relationships across English learner student subgroups? These topics are of high priority to members of the New Mexico Achievement Gap Research Alliance. New Mexico has a long history of working to support the maintenance and development of students' biliteracy skills. Many members of the alliance provide districts with technical assistance related to English learner students, so answers to these questions may inform this technical assistance.

This study, conducted by the Regional Educational Laboratory Southwest, sought to inform the New Mexico Achievement Gap Research Alliance about the path toward English proficiency and academic outcomes for Spanish-speaking English learner students who entered kindergarten with varying levels of Spanish proficiency. The study followed two cohorts of Spanish-speaking English learner students in four districts in New Mexico from kindergarten through grade 4 or 5. The 2010 cohort included students enrolled in kindergarten in 2009/10 who were followed through grade 5, and the 2011 cohort included students enrolled in kindergarten in 2010/11 who were followed through grade 4. The study examined cumulative rates of English learner students' progress toward reclassification as fluent English proficient. The study also examined students' demonstration of grade-level readiness on the New Mexico Partnership for Assessment of Readiness for College and Careers (NMPARCC) standardized academic assessments in English language arts and math in grades 4 and 5. All of the results were also observed through the lens of initial Spanish proficiency in kindergarten to understand differences among groups of English learner students.

The main findings were:

- More than 80 percent of English learner students in the 2010 cohort started kindergarten at the lowest English proficiency level, as did half of those in the 2011 cohort.
- Nearly 83 percent of students in the 2010 cohort attained English proficiency by grade 5, and 59 percent of students in the 2011 cohort did so by grade 4.
- Among English learner students with high initial Spanish proficiency, nearly all those in the 2010 cohort were reclassified as fluent English proficient by grade 5, and nearly three-quarters of those in the 2011 cohort were reclassified by grade 4.
- Among English learner students with low or medium initial Spanish proficiency, roughly a quarter of the 2010 cohort were not reclassified as fluent English proficient by grade 5, and almost half the 2011 cohort were not reclassified by grade 4.
- Of English learner students who were reclassified as fluent English proficient by grade 4 or 5, fewer than a quarter also demonstrated grade-level readiness in grade 4 or grade 5 English language arts or math on the NMPARCC assessment.
- Regardless of initial Spanish proficiency, the rates of grade-level readiness were generally low on NMPARCC English language arts and math outcomes in grades 4 and 5. However, students with high initial Spanish proficiency were more likely to demonstrate grade-level readiness than were students in the other Spanish proficiency groups.

- Grade-level readiness in English language arts and math among students in the two cohorts who were reclassified as fluent English proficient in grades 4 and 5 was generally lower than statewide averages for all students in the same grades in New Mexico.

Most students who were identified as English learner students in kindergarten required a minimum of three to four years of instruction after kindergarten to attain English proficiency. A large percentage of students were not reclassified as fluent English proficient before leaving elementary school. Even when students were reclassified, this milestone did not always translate into grade-level readiness in English language arts and math. Among English learner students who were reclassified as fluent English proficient by grade 4 or 5, only a small percentage demonstrated grade-level readiness in grade 4 or grade 5 English language arts and math. The findings suggest that English learner students with low and medium initial Spanish proficiency will not fare as well in English language arts and math as students with high initial Spanish proficiency. A Spanish proficiency measure could be used as an early indicator to target students with low and medium Spanish proficiency in kindergarten for language and literacy interventions in early grades.

## **Contents**

<b>Summary</b>	<b>i</b>
<b>Why this study?</b>	<b>1</b>
<b>What the study examined</b>	<b>2</b>
<b>What the study found</b>	<b>6</b>
Most English learner students entered kindergarten with medium or high Spanish proficiency	6
Most English learner students in the 2010 cohort entered kindergarten with low English proficiency, but students in the 2011 cohort were about evenly divided between low and medium proficiency	6
Students with higher initial Spanish proficiency in kindergarten also had higher initial English proficiency	8
A majority of English learner students were reclassified as fluent English proficient four years after kindergarten	9
Students with high initial Spanish proficiency in kindergarten were more likely to be reclassified as fluent English proficient than were students with low or medium initial Spanish proficiency	9
Only a small percentage of English learner students who were reclassified as fluent English proficient by grade 4 or 5 also demonstrated grade-level readiness in English language arts and math in grade 4 or 5	11
Although fewer than a quarter of English learner students reclassified as fluent English proficient were grade-level ready, in both cohorts students with high initial Spanish proficiency had a slight advantage	11
Supplemental correlation analysis supports the finding that grade-level readiness in math is more strongly linked to higher initial Spanish proficiency than grade-level readiness in English language arts	13
<b>Implications of the study findings</b>	<b>13</b>
<b>Limitations of the study</b>	<b>16</b>
<b>Appendix A. Research literature overview</b>	<b>A-1</b>
<b>Appendix B. Data and methodology</b>	<b>B-1</b>
<b>Notes</b>	<b>Notes-1</b>
<b>References</b>	<b>Ref-1</b>
<b>Boxes</b>	
1 Key terms	2
2 Data, sample, and methods	4
<b>Figures</b>	
1 About three-quarters of Spanish-speaking English learner students in the 2010 and 2011 sample cohorts in New Mexico entered kindergarten with medium or high Spanish proficiency	7

2	Most Spanish-speaking English learner students in the 2010 sample cohort in New Mexico entered kindergarten with low English proficiency, whereas those in the 2011 cohort were evenly divided between low and medium English proficiency	7
3	Spanish-speaking English learner students entering kindergarten in the 2010 and 2011 sample cohorts in New Mexico with higher Spanish proficiency also had higher English proficiency	8
4	More than 80 percent of Spanish-speaking English learner students in the 2010 sample cohort in New Mexico were reclassified as fluent English proficient five years after kindergarten, and 59 percent in the 2011 sample cohort were reclassified four years after kindergarten	9
5	In both the 2010 and 2011 sample cohorts in New Mexico, students who entered kindergarten with high Spanish proficiency were more likely to be reclassified as fluent English proficient in years 4 and 5 after kindergarten than were students who entered with low or medium Spanish proficiency	10
6	Among Spanish-speaking English learner students reclassified as fluent English proficient by grade 4 or 5, less than a quarter in both New Mexico sample cohorts also demonstrated grade-level readiness in English language arts or math	12
B1	Identifying English learner students in New Mexico for inclusion in the study sample	B-3

## Tables

1	Percentages of Spanish-speaking English learner students reclassified as fluent English proficient who demonstrated grade-level readiness in English language arts and math in grade 4 or 5, by initial Spanish proficiency, and percentages of all students statewide who demonstrated grade-level readiness, by 2010 and 2011 cohorts	12
B1	Information on Spanish language proficiency assessments and domains used in New Mexico, 2009/10–2010/11	B-2
B2	On-time grade-level progression and assessments for 2010 and 2011 kindergarten cohorts in four districts in New Mexico through 2014/15	B-3
B3	Number and percentage of English learner students in kindergarten in New Mexico, 2009/10 and 2010/11	B-4
B4	Number and percentage of initial Spanish-speaking English learner students in kindergarten and receiving bilingual multicultural education program services, statewide and in four sample districts, 2009/10 and 2010/11	B-5
B5	Number and percentage of initial Spanish-speaking English learner students in kindergarten with valid standardized assessment data in grade 4 or 5 in 2014/15 in four sample districts in New Mexico	B-5
B6	Number and percentage of initial Spanish-speaking English learner students in kindergarten reclassified as fluent English proficient and with valid standardized assessment data in grade 4 or 5 in 2014/15 in four sample districts in New Mexico	B-6
B7	Comparison of demographic characteristics of initial Spanish-speaking English learner students in kindergarten in four sample school districts and statewide in New Mexico, 2009/10 and 2010/11 (percent)	B-6

## **Why this study?**

In the 2014/15 school year 42,310 English learner students were enrolled in New Mexico public schools, constituting 14 percent of the state's student population, one of the highest proportions in the United States (New Mexico Public Education Department, 2016a).<sup>1</sup> English learner students in New Mexico lag behind the New Mexico Public Education Department's 2022 goals under the Every Student Succeeds Act of 2015. The goals for 2022 for English learner students on New Mexico Partnership for the Assessment of Readiness of College and Careers (NMPARCC) outcomes are 51 percent proficient in English language arts and 50 percent proficient in math (New Mexico Public Education Department, 2016b, 2017). In 2016, however, only 7 percent of English learner students in grade 5 were proficient on the NMPARCC English language arts assessment and 7 percent on the math assessment. In contrast, 25 percent of all grade 5 students in the state demonstrated proficiency in English language arts on NMPARCC outcomes, and 26 percent of all grade 5 students demonstrated proficiency in math.

Because of these lagging assessment results, the performance of English learner students is a priority of the New Mexico Achievement Gap Research Alliance, a group of stakeholders and policymakers that partnered with the Regional Educational Laboratory Southwest to investigate achievement gaps of Hispanic and American Indian students in New Mexico.<sup>2</sup> Alliance members also wanted a deeper look at the performance of English learner students in bilingual programs. Anecdotal evidence suggests that these students outperform other English learner students in the long term, and alliance members suspect that these students' performance was being masked in aggregated reports about English learner students. The alliance also wanted to know whether early elementary school proficiency in students' first language, Spanish, and second language, English, was related to upper elementary school academic achievement.

Many alliance members provide direct technical assistance to districts to support English learner students. This study can inform alliance members' work related to identifying and tracking this student population's achievement. School staff, using Spanish proficiency data to identify students at the lowest language and literacy levels early in elementary school, may direct resources to students most in need to increase the number of English learner students who attain proficiency by grade 5.

Research on English learner students has shown a relation between a student's skill in the native language and the student's growth in the second language (Genesee, Geva, Dressler, & Kamil, 2006; Proctor, August, Carlo, & Snow, 2006; Roessingh & Elgie, 2009; see appendix A for a review of the literature). Growth in a student's second language should be studied as the student progresses through elementary school because the language proficiency skills needed for academic success change, and the pattern of growth is often uneven (Coppola, 2005; Kieffer, 2011; Mancilla-Martinez & Lesaux, 2010; Marian, Shook, & Schroeder, 2013; Nakamoto, Lindsey, & Manis, 2007). Many researchers have referenced Cummins's (1979, 1991) cross-linguistic transfer theory as a framework for understanding bilingual learner students' competence in their second language. That theory postulates that the competence attained in the student's second language is related to the student's competence in the first language. A body of research supports this theoretical framework (August & Shanahan, 2006; Genesee et al., 2006; Goldenberg, 2008; Proctor, August, Snow, & Barr, 2010; Proctor, Carlo, August, & Snow, 2005).

***Anecdotal evidence suggests that English learner students in bilingual programs outperform other English learner students in the long term, but these students' performance is being masked in aggregated reports about English learner students***

Despite the state’s strong support for bilingual instruction, few longitudinal data are available on New Mexico students obtaining biliteracy skills, or even on English learner students’ demographics. Most New Mexico state reports give cross-sectional snapshots of English and Spanish proficiency of both English learner and non-English learner students in state-supported bilingual and multicultural programs. And English learner students’ performance on state assessments<sup>3</sup> is reported only for the first two years after a student’s reclassification as fluent English proficient, hampering the tracking of student progress across a longer period.

Many districts use English proficiency data to track student progress, but they collect Spanish proficiency data beyond kindergarten inconsistently and use them irregularly for early identification of students who would benefit from additional help to achieve English proficiency and academic success. School districts identifying connections between Spanish proficiency and English proficiency development and academic achievement in upper elementary school may increasingly use both Spanish and English assessment data to set progress-monitoring measures and identify students in early grades who may need additional language support.

*Despite strong support for bilingual instruction, few longitudinal data are available on New Mexico students obtaining biliteracy skills, or even on English learner students’ demographics*

### **What the study examined**

This study used data from four New Mexico districts to examine the development of English proficiency and academic achievement among Spanish-speaking English learner students in bilingual multicultural education programs during elementary school (see box 1 for definitions of key terms). Because 79 percent of English learner students in the state are Hispanic (New Mexico Public Education Department, 2016b), and Spanish is the only

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#### **Box 1. Key terms**

***Bilingual multicultural education programs.*** Bilingual multicultural education programs in New Mexico consist of five state-funded program models that provide study and instruction in English and in the home language of students: Dual Language Immersion, Maintenance, Enrichment, Heritage, and Transitional (New Mexico Public Education Department, 2014). Bilingual multicultural education programs are required to assess language proficiency in a student’s home language as well as in English, whereas English as a second language services are not required to assess students’ proficiency in their home language. Thus data on students’ Spanish proficiency are available only for students in bilingual multicultural education programs. On average, 70 percent of Spanish-speaking English learner students statewide who started kindergarten in 2009/10 and 2010/11 participated in a bilingual multicultural education program.

***English learner student.*** A New Mexico student whose primary home language is identified, through a parent survey or through the school, as other than English is considered to be a possible English learner student. The student is administered the World-class Instructional Design and Assessment Assessing Comprehension and Communication in English State-to-State Placement Test (W-APT), a language screening assessment. Students who score 27 or higher are classified as initial fluent English proficient. Students who score lower than 27 are classified as English learner students. In this study, English learner student refers to students whose home language is Spanish.

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**Box 1. Key terms (continued)**

**Initial English proficiency in kindergarten.** For this study, English learner students were classified into three initial English proficiency groups (low, medium, or high) according to their scores in kindergarten on the Assessing Comprehension and Communication in English State-to-State for English language learners (ACCESS for ELLs®) assessment: low = entering (level 1); medium = beginning, developing, expanding (levels 2–4); and high = bridging and reaching (levels 5 and 6).

**Grade-level ready.** Students performing at level 4 (met expectations) or level 5 (exceeded expectations) on the New Mexico Partnership for the Assessment of Readiness of College and Careers (NMPARCC) are considered to demonstrate readiness for the next grade level and ultimately to be on track for college and careers (Partnership for Assessment of Readiness for College and Careers, 2014). NMPARCC scores are reported at five performance levels: 1–did not yet meet expectations; 2–partially met expectations; 3–approached expectations; 4–met expectations; and 5–exceeded expectations.

**Initial Spanish proficiency in kindergarten.** For this study, Spanish-speaking English learner students were classified into three initial Spanish proficiency groups according to their scores in kindergarten on the standardized assessments used in the students' districts. For students who took the Woodcock-Muñoz Language Survey–Revised (WMLS-R), the three groups correspond to the following proficiency levels: low Spanish = negligible, or beginning proficiency (level 1); medium Spanish = very limited and limited, or intermediate proficiency (levels 2 and 3); and high Spanish = fluent, advanced, very advanced or proficient (levels 4–6). For students assessed on the Pre-Language Assessment Scales (preLAS), the Spanish groups are categorized as follows: low Spanish = beginning, or non-Spanish speaker (level 1); medium Spanish = early intermediate to intermediate, or limited Spanish speaker (levels 2 and 3); and high Spanish = proficient to above proficient, or fluent Spanish speaker (levels 4 and 5).<sup>1</sup>

**Reclassification as fluent English proficient.** Students were classified as fluent English proficient in this study if they scored a level 5 or 6 on the ACCESS for ELLs assessment (see “Initial English proficiency in kindergarten,” above) at any point from kindergarten through grade 5 for the 2010 cohort and kindergarten through grade 4 for the 2011 cohort. This classification is in line with the state’s exit criterion for English learner students (New Mexico Public Education Department, 2017).

**Note**

1. WMLS-R proficiency levels and classifications were derived from agreed-on practice between the districts and the New Mexico Public Education Department. Pre-LAS proficiency levels and classifications were based on CTB/McGraw-Hill 2006.

*The study examined relationships between students' initial Spanish proficiency in kindergarten and their English and academic proficiency in grade 4 or 5 to understand whether differences in initial Spanish proficiency were linked to differences in English proficiency and academic achievement*

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language besides English to have standardized assessments in New Mexico, only English learner students whose primary home language was Spanish were included in the study sample. The study examined relationships between students' initial Spanish proficiency in kindergarten and their English and academic proficiency in grade 4 or 5 to understand whether differences in initial Spanish proficiency were linked to differences in English proficiency and academic achievement.

The study focused on English language proficiency and progress for two cohorts of Spanish-speaking English learner students. The 2010 cohort, which started kindergarten in 2009/10, and the 2011 cohort, which started in 2010/11, were followed through 2014/15. On-time students in the 2010 cohort would have completed grade 5 by the end of the

study period, and on-time students in the 2011 cohort would have completed grade 4. The study also focused on identifying connections between initial Spanish proficiency and subsequent academic performance in English language arts and math among students who were reclassified as fluent English proficient by grade 4 or 5 (depending on the cohort).

The study included two cohorts so that patterns related to English proficiency outcomes or academic outcomes could not be attributable solely to factors affecting a single cohort, such as adjustment to the new assessment. The 2010 cohort was the first cohort in New Mexico to take the English proficiency assessment used in this study, Assessing Comprehension and Communication in English State-to-State for English language learners (ACCESS for ELLs®).

The study addressed three research questions:

1. What were the initial Spanish and English proficiencies of English learner students in kindergarten?
2. What percentage of English learner students were reclassified as fluent English proficient four or five years after kindergarten?
  - Do the results vary by initial Spanish proficiency in kindergarten?
3. What percentage of English learner students who were reclassified as fluent English proficient four or five years after kindergarten also demonstrated grade-level readiness in grade 4 or 5 in English language arts and math?
  - Do the results vary by initial Spanish proficiency in kindergarten?
  - How do the rates of grade-level readiness for these students compare with those for all students statewide in the same grades?

*The study also focused on identifying connections between initial Spanish proficiency and subsequent academic performance in English language arts and math among students who were reclassified as fluent English proficient by grade 4 or 5 (depending on the cohort)*

More details on study methodology are in box 2 and appendix B. Additional information about student and school characteristics of all English learner students and Spanish-speaking English learner students in New Mexico is in tables B3–B5 in appendix B.

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## **Box 2. Data, sample, and methods**

### **Data sources**

Student-level data were obtained from two sources. Four participating school districts provided initial Spanish proficiency assessment data from 2009/10 for the 2010 cohort and from 2010/11 for the 2011 cohort, as well as English proficiency assessment data from the 2009/10 Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs®). The New Mexico Student Teacher Accountability Reporting System, which is managed through the New Mexico Public Education Department, provided ACCESS for ELLs data for 2010/11–2014/15, English language arts and math assessment scores on the New Mexico Partnership for the Assessment of Readiness of College and Careers (NMPARCC) for 2014/15, and student demographic data (see appendix B for more information). The outcome data used in this study include:

- Language proficiency measures:
  - English proficiency (ACCESS for ELLs).
  - Initial Spanish language proficiency (Woodcock-Muñoz Language Survey-Revised or the pre-Language Assessment Scales).
- English language arts and math achievement measures (NMPARCC) in 2014/15 for grades 4 and 5.

*(continued)*

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**Box 2. Data, sample, and methods** *(continued)***Study sample**

The student sample for research questions 1 and 2 (initial Spanish and English proficiency of English learner students, and proportion who were reclassified as fluent English proficient by grade 4 or 5) included any incoming kindergarten student who was classified by a language screening assessment as an English learner student in 2009/10 or 2010/11, spoke Spanish as a home language, and was enrolled in a bilingual multicultural education program. Bilingual multicultural education programs are required to assess language proficiency in a student's home language; students receiving English as a second language services who do not participate in a bilingual multicultural education program are not required to be administered Spanish proficiency assessments, so these students were not included in the sample. On average, 70 percent of Spanish-speaking English learner students in New Mexico who started kindergarten in 2009/10 and 2010/11 participated in a bilingual multicultural education program.

Both cohorts were tracked through 2014/15; only students with valid language proficiency measures and English language arts and math measures on the NMPARCC were included in the sample. The New Mexico Public Education Department did not gain access to ACCESS for ELLS data until 2010/11, a year after the transition to the new assessment. For these reasons the sample was restricted to four participating school districts that provided data for the 2009/10 and 2010/11 school years. The 2010 cohort had 1,393 students, and the 2011 cohort had 1,583 students.

Students in the 2010 and 2011 cohorts for research questions 1 and 2 constituted 52 percent of Spanish-speaking English learner students statewide in kindergarten bilingual multicultural education programs. The 2010 cohort included 25 percent of all English learner students in the state, and the 2011 cohort included 35 percent (see table B4 in appendix B). Analyses of background characteristics of these students confirmed that the students in the four districts were similar to students statewide (see appendix B). The sample used in research question 3 (students reclassified as fluent English proficient and as grade-level ready) was further narrowed from the sample for research questions 1 and 2 to students who were reclassified as fluent English proficient during the study period.

The sample for research question 3 had 836 students with valid grade 5 English language arts assessment data (73 percent), 913 students with valid grade 5 math assessment data (79 percent), 947 students with valid grade 4 English language arts assessment data (68 percent), and 1,197 students with valid grade 4 math assessment data (76 percent; see table B5 in appendix B). (For more details about the study samples, see tables B3–B6 and figure B1 in appendix B.)

**Methodology**

Research question 1 used descriptive analysis to determine students' initial English and Spanish proficiency in kindergarten. The analysis evaluated English proficiency in kindergarten as assessed on ACCESS for ELLs and Spanish proficiency assessments in kindergarten among English learner students across the two cohorts. For all English and Spanish proficiency assessments, proficiency was reported as low, medium, or high (see box 1 for additional details). Significance testing using a two-tailed z-score test at the .05 significance level was conducted to understand whether the differences in English proficiency among initial Spanish proficiency groups were statistically different from zero.

Research question 2 used descriptive analysis to examine how many years after kindergarten it took English learner students to become reclassified as fluent English proficient (that is level 5 or level 6 on ACCESS for ELLs), if ever, and to test whether the results varied by initial Spanish proficiency in kindergarten. The results are reported by number of years after kindergarten and not by grade level because about 13 percent of students in the 2010 and 2011 cohorts were retained during the study period, so not all students were in their expected grade each year.<sup>1</sup>

Research question 3 used descriptive analysis to find the proportions of English learner students who were reclassified as fluent English proficient during the study period and who demonstrated readiness for the next grade level by receiving a score of met expectations (level 4) or exceeded expectations (level 5) on NMPARCC English

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**Box 2. Data, sample, and methods** *(continued)*

language arts and math assessments in grade 4 or 5. The analysis evaluated whether English learner students who were reclassified as fluent English proficient were just as ready for the next grade level as other students by comparing NMPARCC outcomes of the study sample students with publicly available NMPARCC outcomes for all students statewide in the same grades (New Mexico Public Education Department, 2015). The results were also disaggregated by the three initial Spanish proficiency groups. The study evaluated the strength of the relationship between initial Spanish proficiency and grade-level readiness using a Pearson product-moment correlation coefficient, which assessed whether the relationship was positive or negative and rated the strength of the relationship on a scale of -1 to 1; values close to -1 or 1 indicate a strong negative or positive relationship, and values close to 0 indicate a weak relationship. (See appendix B for a full description of the data, sample, and methodology.)

**Note**

1. In the 2010 cohort of 1,393 students, 59 students were retained from kindergarten from the previous year, 2008/09. The 2011 cohort did not have any kindergarten repeaters from the previous year (2009/10) as any retained students from the 2010 cohort remained part of their original cohort. Therefore, retained kindergarten students from 2008/09 may account for a very small part of the discrepancy between the 2010 and 2011 cohorts on English proficiency outcomes in kindergarten.

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### **What the study found**

The findings reported here focus on understanding the proficiency outcomes of two cohorts of English learner students on their initial Spanish and English proficiency, their subsequent path toward reclassification as fluent English proficient four or five years after kindergarten, and student performance on standardized measures of English language arts and math in grade 4 or 5. Overall, the study found that differences in English proficiency and later in demonstrating grade-level readiness in English language arts and math emerged by English learner students' initial Spanish proficiency, with students with high initial proficiency more likely to have better outcomes. In addition, among students who were eventually reclassified as fluent English proficient four or five years after kindergarten, students across all incoming Spanish proficiency groups struggled to demonstrate grade-level readiness in English language arts and math. The following discussion provides a more detailed breakdown of the descriptive study results.

***About three-quarters of English learner students entering kindergarten had medium or high Spanish proficiency in both the 2010 and 2011 cohorts, and about one-third had high Spanish proficiency in both the 2010 and 2011 cohorts***

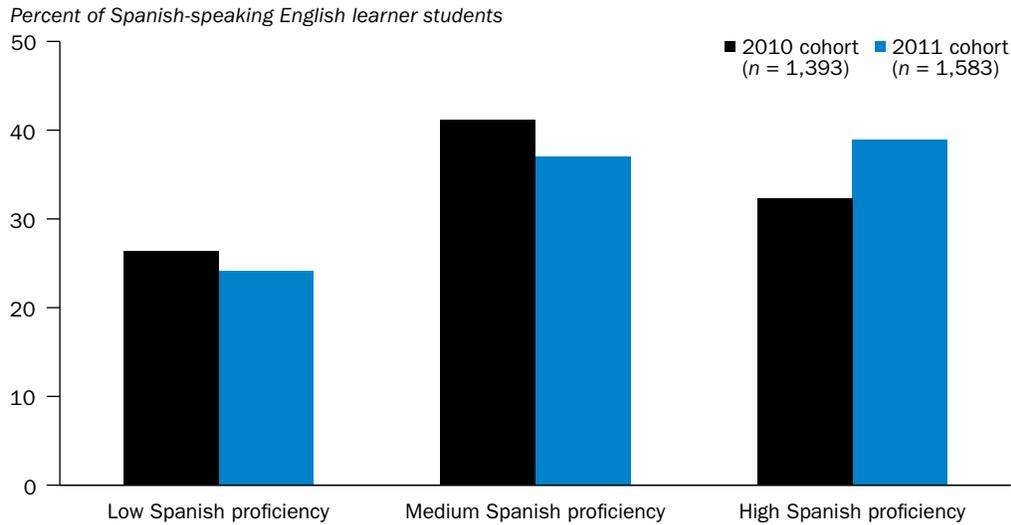
#### **Most English learner students entered kindergarten with medium or high Spanish proficiency**

About three-quarters of English learner students entering kindergarten had medium or high Spanish proficiency in both the 2010 cohort (74 percent) and the 2011 cohort (76 percent), and about one-third had high Spanish proficiency in both the 2010 cohort (32 percent) and the 2011 cohort (39 percent; figure 1).

#### **Most English learner students in the 2010 cohort entered kindergarten with low English proficiency, but students in the 2011 cohort were about evenly divided between low and medium proficiency**

Of English learner students entering kindergarten in the 2010 cohort, 83 percent had low English proficiency, and about 17 percent had medium proficiency (figure 2). In contrast, about 51 percent of English learner students entering kindergarten in the 2011 cohort had low English proficiency, and 48 percent had medium proficiency.

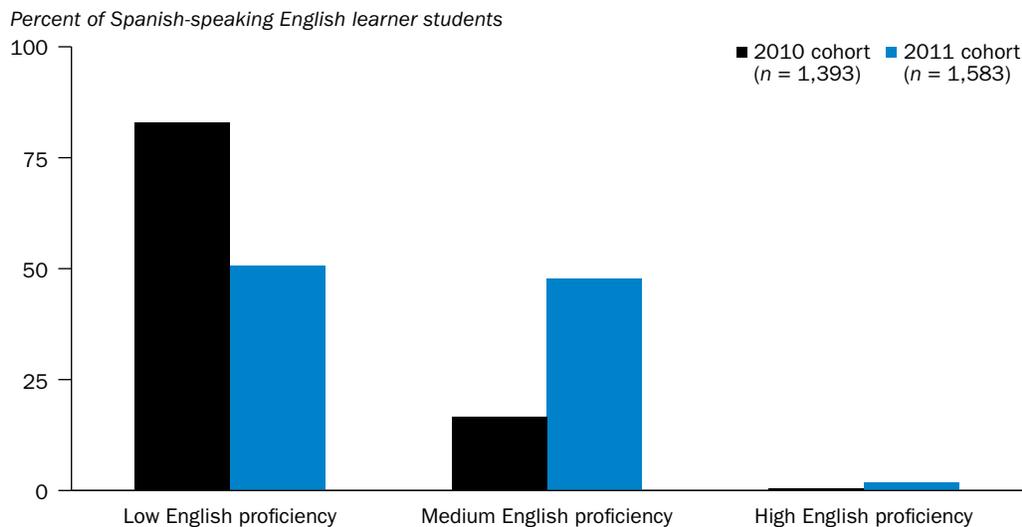
**Figure 1. About three-quarters of Spanish-speaking English learner students in the 2010 and 2011 sample cohorts in New Mexico entered kindergarten with medium or high Spanish proficiency**



**Note:** See box 1 for explanations of Spanish proficiency levels.

**Source:** Authors' analysis of Spanish proficiency data from the Woodcock-Muñoz Language Survey-Revised or the Pre-Language Assessment Scales for 2009/10 and 2010/11 from four New Mexico school districts.

**Figure 2. Most Spanish-speaking English learner students in the 2010 sample cohort in New Mexico entered kindergarten with low English proficiency, whereas those in the 2011 cohort were evenly divided between low and medium English proficiency**



**Note:** See box 1 for explanations of English proficiency levels.

**Source:** Authors' analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) data for 2009/10 from four New Mexico school districts and ACCESS for ELLs data for 2010/11–2014/15 from the New Mexico Public Education Department.

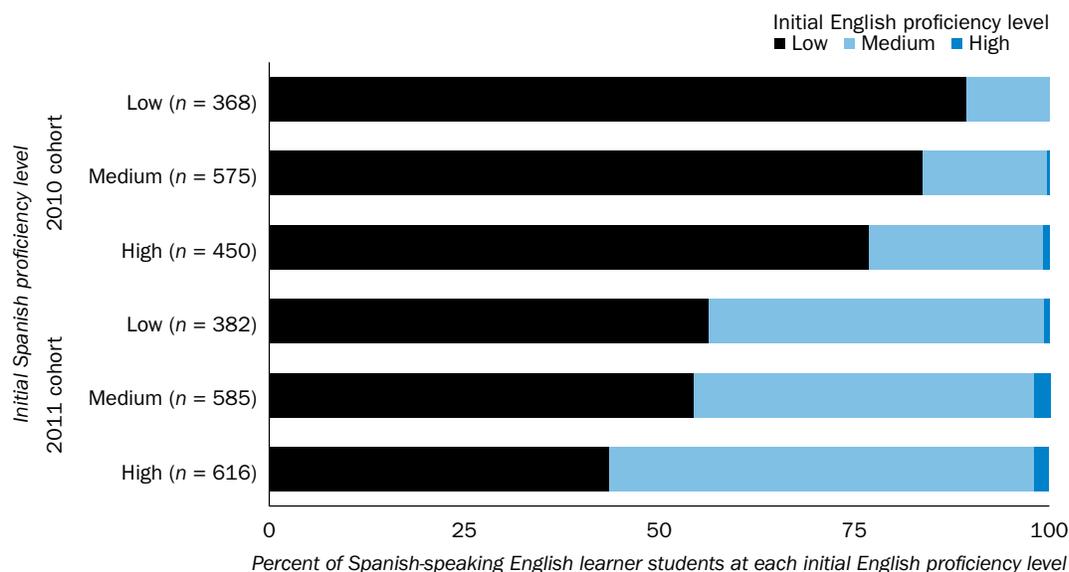
**Students with higher initial Spanish proficiency in kindergarten also had higher initial English proficiency**

Students across both cohorts who entered kindergarten with high initial Spanish proficiency were less likely to have low initial English proficiency than were students with medium or high initial Spanish proficiency (figure 3). Over three-quarters of students in the 2010 cohort with high initial Spanish proficiency had low initial English proficiency, while 44 percent of students in the 2011 cohort with high initial Spanish proficiency had low initial English proficiency. Across both cohorts, students with high initial Spanish proficiency were more likely than students with low or medium initial Spanish proficiency to have medium initial English proficiency. The difference in the proportion of students with medium initial English proficiency between students with high initial Spanish proficiency and students with low and medium initial Spanish proficiency was 6–12 percentage points for the 2010 cohort and 11–12 percentage points for the 2011 cohort.

The percentage of students at each initial English proficiency level in kindergarten was similar for students with low Spanish proficiency and students with medium Spanish proficiency. The difference in the percentages of students with low and medium initial English proficiency between students with low initial Spanish proficiency and students with medium initial Spanish proficiency was 5–6 percentage points in the 2010 cohort and virtually zero in the 2011 cohort. However, across all three initial Spanish proficiency groups, low English proficiency was more prevalent among the 2010 cohort than the 2011 cohort.

*The difference in the proportion of students with medium initial English proficiency between students with high initial Spanish proficiency and students with low and medium initial Spanish proficiency was 6–12 percentage points for the 2010 cohort and 11–12 percentage points for the 2011 cohort*

**Figure 3. Spanish-speaking English learner students entering kindergarten in the 2010 and 2011 sample cohorts in New Mexico with higher Spanish proficiency also had higher English proficiency**



**Note:** See box 1 for explanations of English and Spanish proficiency levels.

**Source:** Authors' analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) data for 2009/10 and Spanish proficiency data from the Woodcock-Muñoz Language Survey–Revised or the Pre-Language Assessment Scales for 2009/10 and 2010/11 from four New Mexico school districts and ACCESS for ELLs data for 2010/11–2014/15 from the New Mexico Public Education Department.

## A majority of English learner students were reclassified as fluent English proficient four years after kindergarten

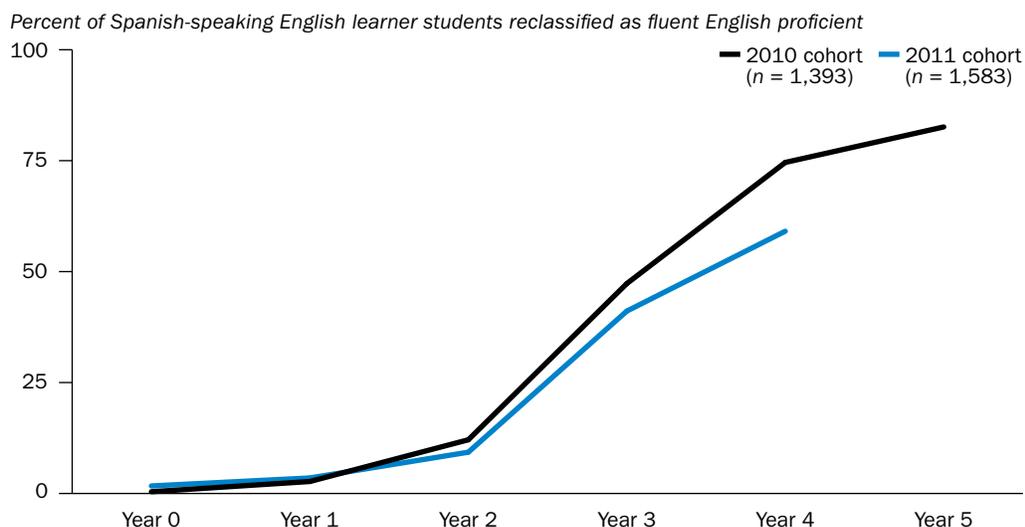
A majority of students who were reclassified as fluent English proficient were reclassified two to four years after kindergarten. By year 4 (grade 4 for students who were not retained), about 75 percent of students in the 2010 cohort were reclassified (and about 83 percent by year 5) and about 59 percent of students in the 2011 cohort (figure 4).

## Students with high initial Spanish proficiency in kindergarten were more likely to be reclassified as fluent English proficient than were students with low or medium initial Spanish proficiency

By year 4 or 5 after kindergarten, the gaps in the percentage of students reclassified as fluent English proficient between students with low initial Spanish proficiency and students with high initial Spanish proficiency were statistically significant: 31 percentage points in year 5 after kindergarten for the 2010 cohort and 28 percentage points in year 4 for the 2011 cohort (figure 5). The gaps in the percentage of students reclassified as fluent English proficient between students with medium initial Spanish proficiency and students with high initial Spanish proficiency were smaller but also statistically significant: 22 percentage points in year 5 after kindergarten for the 2010 cohort and 17 percentage points in year 4 for the 2011 cohort.

*A majority of students who were reclassified as fluent English proficient were reclassified two to four years after kindergarten*

**Figure 4. More than 80 percent of Spanish-speaking English learner students in the 2010 sample cohort in New Mexico were reclassified as fluent English proficient five years after kindergarten, and 59 percent in the 2011 sample cohort were reclassified four years after kindergarten**



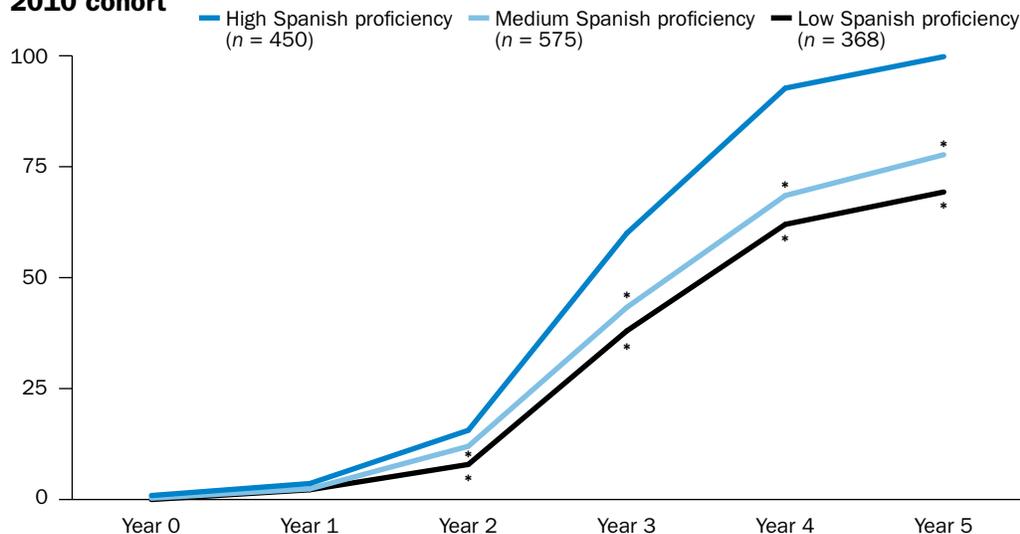
**Note:** See box 1 for explanations of English and Spanish proficiency levels. Year 0 is the year students entered kindergarten. Years 1–5 reflect the number of years after kindergarten, rather than grades, because about 13 percent of students in the 2010 and 2011 cohorts were retained during the study period and were not in their expected grades every year. There are no data for the 2011 cohort in year 5 because the study ended with that cohort’s year 4 (2014/15).

**Source:** Authors’ analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) data for 2009/10 and Spanish proficiency data from the Woodcock-Muñoz Language Survey–Revised or the Pre-Language Assessment Scales for 2009/10 and 2010/11 from four New Mexico school districts and ACCESS for ELLs data for 2010/11–2014/15 from the New Mexico Public Education Department.

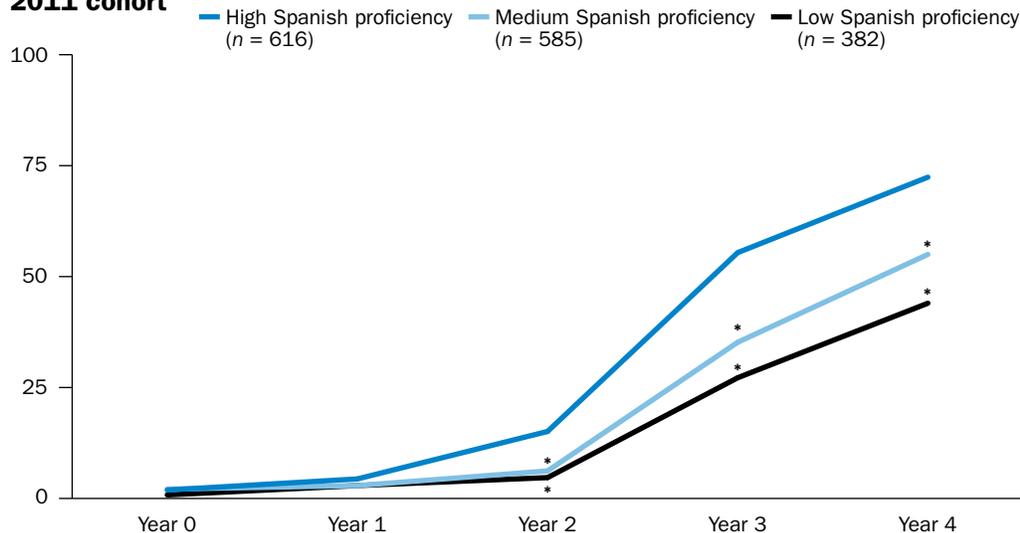
**Figure 5. In both the 2010 and 2011 sample cohorts in New Mexico, students who entered kindergarten with high Spanish proficiency were more likely to be reclassified as fluent English proficient in years 4 and 5 after kindergarten than were students who entered with low or medium Spanish proficiency**

Percent of Spanish-speaking English learner students reclassified as fluent English proficient

**2010 cohort**



**2011 cohort**



\* The differences between low and high Spanish proficiency groups and between medium and high Spanish proficient groups are significant at  $p < .05$ .

**Note:** Year 0 is the year students entered kindergarten. Years 1–5 reflect the number of years after kindergarten, rather than grades, because about 13 percent of students in the 2010 and 2011 cohorts were retained during the study period and were not in their expected grades every year. There are no data for the 2011 cohort in year 5 because the study ended with that cohort's year 4 (2014/15).

**Source:** Authors' analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) data for 2009/10 and Spanish proficiency data from the Woodcock-Muñoz Language Survey–Revised or the Pre-Language Assessment Scales for 2009/10 and 2010/11 from four New Mexico school districts and ACCESS for ELLs data for 2010/11–2014/15 from the New Mexico Public Education Department.

In both cohorts a majority of students with high initial Spanish proficiency were reclassified as fluent English proficient by year 3 after kindergarten, and a majority of students with medium initial Spanish proficiency were reclassified by year 4. In the 2010 cohort a majority of students with low initial Spanish proficiency were reclassified by year 4, but in the 2011 cohort a majority were not reclassified by year 4, the end of the study period.

For all three initial Spanish proficiency groups the percentage of students reclassified as fluent English proficient by year 1 after kindergarten was similar: roughly 2–4 percent (see figure 5). By year 2, differences began to emerge: the difference between the low and high initial Spanish proficiency groups was about 8 percentage points for the 2010 cohort and about 10 percentage points for the 2011 cohort. The difference between the low and high initial Spanish proficiency groups for the 2010 cohort grew to 22 percentage points in year 3 and then to more than 30 percentage points in years 4 and 5. The difference between the low and high initial Spanish proficiency groups also widened in the 2011 cohort, to 28 percentage points in years 3 and 4 after kindergarten. Differences between the medium and high Spanish proficiency groups, although smaller, also grew.

**Only a small percentage of English learner students who were reclassified as fluent English proficient by grade 4 or 5 also demonstrated grade-level readiness in English language arts and math in grade 4 or 5**

In both cohorts only a small percentage of English learner students who were reclassified as fluent English proficient by the time they reached grade 4 (2011 cohort) or grade 5 (2010 cohort) also demonstrated readiness for the next grade level by meeting or exceeding expectations in English language arts and math on the 2014/15 NMPARCC. Fewer than 15 percent of reclassified students in both cohorts demonstrated grade-level readiness in English language arts (figure 6). Similarly, slightly more than 15 percent of reclassified students in the 2010 cohort demonstrated grade-level readiness in grade 5 math, and almost 17 percent of reclassified students in the 2011 cohort demonstrated readiness in grade 4 math. The rates of grade-level readiness were 2–10 percentage points lower for the two cohorts of English learner students than for all students statewide in the same subject and expected grades as the cohorts.

**Although fewer than a quarter of English learner students reclassified as fluent English proficient were grade-level ready, in both cohorts students with high initial Spanish proficiency had a slight advantage**

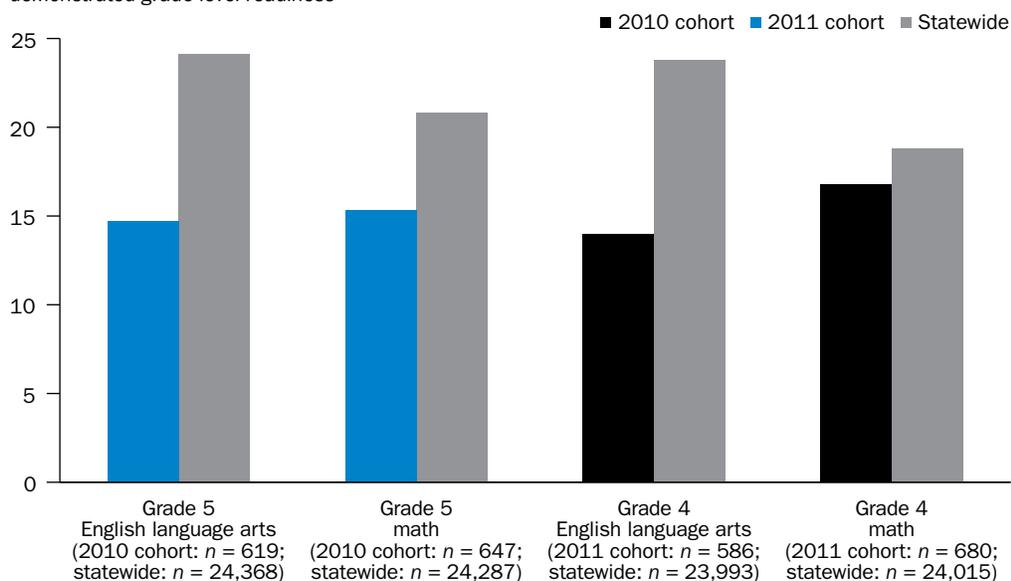
Only about a quarter of all students statewide in grades 4 and 5 demonstrated grade-level readiness on the NMPARCC English language arts, and only about a fifth of all students statewide in grades 4 and 5 demonstrated grade-level readiness in math (table 1). The percentage of students who demonstrated grade-level readiness was generally lower among English learner students than among all students statewide, except for English learner students with high initial Spanish proficiency in math.

The percentage of students who demonstrated grade-level readiness in both English language arts and math was higher among students with high initial Spanish proficiency who were reclassified as fluent English proficient in grades 4 and 5 than among students with low or medium initial Spanish proficiency who were reclassified as fluent English proficient (see table 1). Among students who were reclassified as fluent English proficient by grade 4

*The percentage of students who demonstrated grade-level readiness was generally lower among English learner students than among all students statewide, except for English learner students with high initial Spanish proficiency in math*

**Figure 6. Among Spanish-speaking English learner students reclassified as fluent English proficient by grade 4 or 5, less than a quarter in both New Mexico sample cohorts also demonstrated grade-level readiness in English language arts or math**

Percent of Spanish-speaking English learner students reclassified as fluent English proficient by grade 4 or 5 who demonstrated grade-level readiness



**Note:** Students are considered grade-level ready if they scored at the met or exceeded expectations levels on the New Mexico Partnership for Assessment of Readiness for College and Careers in 2014/15. See table B6 in appendix B for more details.

**Source:** Authors' analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) for 2009/10 from four New Mexico school districts and ACCESS for ELLs data and New Mexico Partnership for Assessment of Readiness for College and Careers (NMPARCC) data for 2014/15 from the New Mexico Public Education Department.

**Table 1. Percentages of Spanish-speaking English learner students reclassified as fluent English proficient who demonstrated grade-level readiness in English language arts and math in grade 4 or 5, by initial Spanish proficiency, and percentages of all students statewide who demonstrated grade-level readiness, by 2010 and 2011 cohorts**

Student group	2010 cohort		2011 cohort	
	Grade 5 English language arts grade-level ready	Grade 5 math grade-level ready	Grade 4 English language arts grade-level ready	Grade 4 math grade-level ready
<i>Initial Spanish proficiency of English learner students in sample cohorts</i>				
Low	13.0	9.8	11.7	7.7
Medium	12.6	15.0	13.1	15.5
High	15.5	24.2	17.8	18.9
All students statewide	24.1	20.8	23.8	18.8

**Note:** Students are considered grade-level ready if they scored met or exceeded expectations on the New Mexico Partnership for Assessment of Readiness for College and Careers in 2014/15. The number of grade-level ready students in the 2010 cohort was  $n = 619$  in English language arts and  $n = 647$  in math; in the 2011 cohort  $n = 586$  in English language arts and  $n = 680$  in math; statewide  $n = 24,368$  in grade 4 English language arts,  $n = 24,287$  in grade 4 math,  $n = 23,993$  in grade 5 English language arts,  $n = 24,015$  in grade 5 math. See table B6 in appendix B for more details.

**Source:** Authors' analysis of Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs) for 2009/10 from four New Mexico school districts and ACCESS for ELLs data and New Mexico Partnership for Assessment of Readiness for College and Careers (NMPARCC) data for 2014/15 from the New Mexico Public Education Department.

(2011 cohort), the rate of grade-level readiness was 5–6 percentage points higher among students with high initial Spanish proficiency than among students with low or medium initial Spanish proficiency in grade 4 English language arts, but only about 3 percentage points higher in grade 5 English language arts.

In math the differences were more pronounced between students with high initial Spanish proficiency and students with low or medium initial Spanish proficiency. In grade 4 math, rates of grade-level readiness were 5–6 percentage points higher among students with high initial Spanish proficiency than among students with low or medium initial Spanish proficiency. In grade 5 math, rates of grade-level readiness were 9–14 percentage points higher among students with high initial Spanish proficiency. The high initial Spanish proficiency group even surpassed the statewide rate of grade-level readiness in grade 5 math for all students by 3 percentage points. The high initial Spanish proficiency group was the only Spanish proficiency group in the sample to exceed the statewide average in either subject in either grade.

The rate of grade-level readiness for students with low initial Spanish proficiency was similar to that for students with medium initial Spanish proficiency for English language arts but lower for math. About 12–13 percent of students with low or medium initial Spanish proficiency demonstrated grade-level readiness in grade 4 and 5 English language arts (statewide averages for all students who tested in grades 4 and 5 were fairly low as well, at 24 percent). Students with low initial Spanish proficiency had a lower rate of grade-level readiness in math than in English language arts. Only 8 percent of students with low initial Spanish proficiency demonstrated grade 4 math readiness—8 percentage points lower than students with medium initial Spanish proficiency. And only about 10 percent of students with low initial Spanish proficiency demonstrated grade 5 math readiness—5 percentage points lower than students with medium initial Spanish proficiency and about 11 percentage points lower than the statewide average for students in the same grade who were tested on the NMPARCC.

**Among English learner students reclassified as fluent English proficient the largest statistically significant relationship was between initial Spanish proficiency in kindergarten and grade 4 math readiness**

**Supplemental correlation analysis supports the finding that grade-level readiness in math is more strongly linked to higher initial Spanish proficiency than is grade-level readiness in English language arts**

A supporting descriptive analysis found that among English learner students reclassified as fluent English proficient the largest statistically significant relationship was between initial Spanish proficiency in kindergarten and grade 4 math readiness (.32). There were also smaller statistically significant positive relationships between initial Spanish proficiency and grade 5 math readiness (.24) and between initial Spanish proficiency and English language arts grade readiness for both grades (.17).

**Implications of the study findings**

This study focused on understanding the path toward English proficiency and academic outcomes in elementary school for students who entered kindergarten with varying levels of English proficiency and Spanish proficiency. The study also followed students who were reclassified as fluent English proficient to explore the connection between Spanish proficiency in kindergarten and grade-level readiness in grade 4 or 5 English language arts and math.

One key finding of this study is that English proficiency outcomes differed when examined across initial Spanish proficiency groups. Students with low and medium initial Spanish proficiency were reclassified as fluent English proficient at lower rates than were students with high initial Spanish proficiency, even by year 4 or 5 after kindergarten. English learner students with high initial Spanish proficiency who were reclassified by year 4 or 5 also had higher rates of grade-level readiness in English language arts and math in grades 4 and 5 than did students with low or medium initial Spanish proficiency. Although the strength of the relationship between initial Spanish proficiency and academic achievement in grade 4 and 5 English language arts was relatively small, the positive relationship lends additional credence to the idea that achieving high proficiency in a student's home language supports the development of the student's second language (see August & Shanahan, 2006; Cummins, 1979, 1991; Genesee et al., 2006; Goldenberg, 2008).

An additional noteworthy finding is that students with medium initial Spanish proficiency had similar challenges to students with low initial Spanish proficiency in being reclassified as fluent English proficient by year 4 or 5. About a quarter of students with low and medium initial Spanish proficiency did not attain English proficiency five years after kindergarten and were at risk of remaining in the English learner status at entry to middle school, where the academic content and demands become progressively more challenging. Students with low and medium initial Spanish proficiency had similar low rates of grade-level readiness in grade 4 and 5 English language arts, and students with low initial Spanish proficiency had a particularly low rate of grade-level readiness in math in grades 4 and 5.

These findings suggest that the initial Spanish proficiency assessment could serve as an important flag for practitioners to identify students who are at higher risk of struggling to gain English and academic proficiency in elementary school. The Spanish assessments that districts use for incoming students could identify students with low or medium Spanish proficiency to provide them with more intensive support services in early elementary school.

The findings from this study may be relevant to meeting the English language proficiency goals outlined in New Mexico's Every Student Succeeds Act (ESSA) plan (New Mexico Public Education Department, 2017). The plan's goal for students entering school with the lowest English language proficiency is for them to be reclassified as fluent English proficient by year 5 after kindergarten. The plan's annual proficiency goals are based on a student's grade and English proficiency at entry. This study showed that proficiency in the student's home language at entry matters as well. Perhaps differentiating annual growth targets for being reclassified as English language proficient by Spanish proficiency in kindergarten could produce more accurate annual growth targets for English learner students.

New Mexico's annual proficiency goals are intended to flag whether students are on target to be reclassified as fluent English proficient within five years after kindergarten (New Mexico Public Education Department, 2017). This study found that most incoming English learner kindergarten students, regardless of their initial Spanish proficiency, needed at least three to four years of instruction before they were reclassified as fluent English proficient. About 69 percent of students with low initial Spanish proficiency and 78 percent of students with medium initial Spanish proficiency in the 2010 cohort were reclassified by grade 5, while 44 percent of students with low initial Spanish proficiency and 55 percent of students with medium initial Spanish proficiency in the 2011 cohort were reclassified

***The findings suggest that the initial Spanish proficiency assessment could serve as an important flag for practitioners to identify students who are at higher risk of struggling to gain English and academic proficiency in elementary school***

by grade 4. In comparison, nearly all students with high initial Spanish proficiency were reclassified five years after kindergarten in the 2010 cohort and 72 percent of those in the 2011 cohort were reclassified four years after kindergarten. About 18 percent of the 2010 cohort were not reclassified as fluent English proficient five years after kindergarten, and 40 percent of the 2011 cohort did not reach English proficiency four years after kindergarten. A uniform standard for time to English proficiency may not be appropriate for English learner students with varying initial Spanish proficiency in kindergarten.

The state's ESSA plan also sets long-term academic goals of increasing rates of grade-level readiness for English learner students from 8 percent in 2016 to 51 percent in 2022 in English language arts and from 7 percent to 50 percent in math on the NMPARCC (New Mexico Public Education Department, 2017). All New Mexico students statewide in grades 4 and 5 generally had low grade-level readiness in English language arts and math as assessed on the 2014/15 NMPARCC. In this study rates of grade-level readiness were even lower for English learner students in the four study districts—although English learner students with high initial Spanish proficiency had a slight edge over students with low or medium initial Spanish proficiency. To raise student achievement, New Mexico has proposed such supports as a student assistance team, a Systemic Improvement Plan, and technical assistance to engage families and communities, as well as job-embedded professional development for teachers. Schools and districts could flag English learner students who need additional support sooner through assessments of Spanish proficiency in kindergarten.

The state's ESSA plan mentions continuing to monitor students for accountability purposes by tracking progress toward the ESSA plan goals for two years after a student is reclassified as fluent English proficient by flagging the student in state database. The plan acknowledges the need to track the long-term performance of students reclassified as fluent English proficient, but beyond the two-year designation, state-level data do not easily identify reclassified students. This study found that some students who were reclassified as fluent English proficient still struggled academically, as evidenced by NMPARCC English language arts and math outcomes. To understand long-term progress of former English learner students, it seems necessary to track those students for more than two years after reclassification in order to monitor their middle school and high school academic progress. Having a formal method built into the New Mexico Student Teacher Accountability Reporting System could facilitate these efforts, even if the data are no longer being tracked for accountability.

Future research could explore whether socioeconomic status contributes to the group differences found in this study. It may be that differences in academic outcomes by initial Spanish proficiency group are explained by the socioeconomic status of students in each group, which this study did not examine. Other studies have shown that language proficiency is related to socioeconomic status. For example, Kieffer (2011) found that the reading achievement of language-minority students (English learner students) was moderated by individual and contextual socioeconomic factors and that language-minority students with limited English proficiency at the beginning of elementary school achieved reading levels comparable to those of their peers from similar socioeconomic backgrounds by the end of middle school. Other studies have found connections among language proficiency, academic outcomes, and socioeconomic status (Krashen & Brown, 2005; Parker, O'Dwyer, & Irwin, 2014; Roberts, Mohammed, & Vaughn, 2010). Future research on English learner

*To understand long-term progress of former English learner students, it seems necessary to track those students for more than two years after reclassification in order to monitor their middle school and high school academic progress*

students in New Mexico could explore the connection between socioeconomic status and initial Spanish proficiency, as well the long-term connection between socioeconomic status and academic outcomes as students progress through middle school.

### **Limitations of the study**

The study design had several limitations. First, it did not include all English learner students in the state. Only bilingual multicultural education programs (supported by the Bilingual Multicultural Education Bureau) require language proficiency assessment in a student's primary and secondary language. English learner students receiving solely federal Title III English as a second language services do not face this requirement, so there was no measure of Spanish proficiency in kindergarten for these students. The study required standardized assessments in a student's primary language, so it did not include English as a second language students, who account for about 51 percent of English learner students in the four participating districts.

Second, the study included only students in the four districts that agreed to provide the necessary Spanish proficiency assessment data (collected and stored at the district, not the state, level). The four districts covered a broad geographic range of districts and of English learner students across the state. For the 2010 cohort the study sample represented 52 percent of the state's students in bilingual multicultural education programs and 25 percent of kindergarten English learner students. For the 2011 cohort they represented 53 percent of students in bilingual multicultural education programs and 35 percent of kindergarten English learner students. Nevertheless, these students may not adequately represent all elementary school English learner students in New Mexico. Future research using a larger sample of districts could examine whether initial Spanish proficiency data are, in fact, better predictors of future English and academic proficiency than are other kinds of data already collected, including initial English proficiency and academic outcome data.

Third, because the study focused on English learner students whose home language was Spanish, the results may not apply to English learner students whose home language was other than Spanish. More than 72 percent of New Mexico's English learner students in the 2010 and 2011 kindergarten cohorts spoke Spanish at home, however.

Fourth, both the English proficiency assessment (ACCESS for ELLs) and the English language arts and math assessments (NMPARCC) were administered in New Mexico for the first time during the study period, and as school districts and students adjust to a new assessment, the challenges associated with administering and scoring can lead to outcomes during the first test administration that may differ from outcomes in subsequent academic years. The state administered ACCESS for ELLs for the first time in 2009/10 and NMPARCC for the first time in 2014/15. For NMPARCC, in particular, having data for additional cohorts could provide more clarity on the reliability of the 2014/15 results. In addition, the cohort sizes were reduced for research question 3, which required NMPARCC assessment scores (which were not available for all students): the 2010 cohort was reduced 42 percent for the English language arts analysis and 37 percent for the math analysis, and the 2011 cohort was reduced 42 percent for the English language arts analysis and 27 percent for the math analysis.

***Because the study focused on English learner students whose home language was Spanish, the results may not apply to English learner students whose home language was other than Spanish***

Fifth, the study used results from two standardized assessments of Spanish proficiency employed by the four study school districts—the Woodcock-Muñoz Language Survey–Revised and the pre-Language Assessment Scales. (The New Mexico Public Education Department allows districts to choose from among three assessments of Spanish proficiency.) The study team divided students into three groups by Spanish proficiency in kindergarten (high, medium, and low) on the basis of the two assessments, and some misalignment of levels across assessments was possible.<sup>4</sup> Confirmation of the categorization levels for the Woodcock-Muñoz Language Survey–Revised was available for only one of the three study districts that used that assessment.

Sixth, some districts collected multiple years of Spanish proficiency data, whereas others assessed students in Spanish only in kindergarten or until students attained Spanish proficiency. Because of these differences, the study used kindergarten data only, which were the only data collected consistently in all four districts. Access to Spanish proficiency data beyond kindergarten could provide an opportunity to explore the relationship between English and Spanish proficiency over time.

Finally, the study tried to understand, through a descriptive analysis, the connections between initial Spanish proficiency in kindergarten and English proficiency development and subsequent academic outcomes in English language arts and math as students progressed into upper elementary school. The study did not investigate the effectiveness of language instructional approaches. Finally, the study’s nonexperimental design means that inferences cannot be drawn about English proficiency outcomes or grade level preparedness linked to any particular educational approach (such as bilingual education or structured English immersion for English learner students) being more effective in achieving higher student outcomes in English language arts and math.

***Access to Spanish proficiency data beyond kindergarten could provide an opportunity to explore the relationship between English and Spanish proficiency over time***

## **Appendix A. Research literature overview**

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This appendix reviews research on second-language learners.

### **Cross-linguistic transfer and language development in elementary school**

The concept of cross-linguistic transfer has been used by many researchers to explain how students develop linguistic and oral proficiency in a second language (August & Shanahan, 2006; Goldenberg, 2008). Many of these researchers referred to Cummins's (1979, 1991) pivotal work related to linguistic interdependence as a framework for understanding the cross-language relationship between a student's language and literacy skills in the first language and the student's second language. Cummins's (1979) developmental interdependence hypothesis postulated that the level of competence attained by a bilingual learner in the second language is related to the learner's exposure in the first language at the time that intensive exposure to the second language begins. In particular, strong encouragement of language and vocabulary development in the first language appears to facilitate higher language development in the second language.

Researchers have sought to use Cummins's line of inquiry on linguistic interdependence to understand the individual contributions of various domains of language and literacy development in school. Other researchers have expanded the inquiry to further develop theoretical models on the linguistic relationship between a student's first and second languages. Genesee et al.'s (2006) meta-analysis focused on linguistic interdependence between the first and second languages. The authors concluded that the meta-analysis provided strong evidence that competency in the first language influences language and literacy development in the second language, and they called for more complex research designs to better understand the precise nature of these relationships, their causes, and their long-term developmental impacts.

A group of researchers, highly influenced by Cummins (1979, 1991), followed 135 Spanish–English bilingual students in Illinois, Massachusetts, and Texas who were participating in English-only, bilingual, and Spanish instruction programs in grades 2–4 (August et al., 2006; Proctor, August, Carlo, & Barr, 2010; Proctor, August, Carlo, & Snow, 2006; Proctor, August, Snow, & Barr, 2010; Proctor, Carlo, August, & Snow, 2005). They found that Spanish-reading comprehension modestly predicted English-reading comprehension and positively influenced English-reading comprehension indirectly through the relationship between Spanish-reading comprehension and Spanish oral language. The researchers concluded that the association of Spanish–English alphabetic knowledge with both Spanish- and English-reading comprehension supports the idea of a cross-linguistic relationship between the two languages.

### **Language proficiency skills are needed to achieve academic success over time**

As students' cognitive development progresses through various stages from early to middle childhood, the academic demands and language/literacy skills needed to achieve English proficiency also change (Heo, Han, Koch, & Aydin, 2011). Coppola (2005), Cummins (1979), and Roessingh and Elgie (2009) found that the language proficiency skills needed for academic success in elementary school change as students progressed from grade to grade. For example, many skills related to oral language, such as syntax and comprehension,

matter more in grades 3 and above for explaining variation in English-reading comprehension than they do in previous grades (Proctor, August, Carlo, & Snow, 2006; Proctor, Carlo, August, & Snow, 2005).

Marian et al. (2013) indicate that the cognitive benefits of bilingual language instruction are fully realized only over the entire length of elementary school. The authors found that English learner students do not gain cognitive benefits from instruction in two languages until they have mastered English-language proficiency at an academic level, a threshold they are unlikely to reach until later elementary school grades. The authors also found that students from both a majority-language background (native English) and a minority-language background (Spanish) participating in a two-way immersion program and students in a transitional program of instruction/English as a second language exhibited advantages in reading and math. However, those advantages manifested at different times across the two groups. The majority-language students in the two-way immersion students had advantages in reading and math scores in earlier grades (grades 3 and under), whereas the advantages favored minority-language two-way immersion students by grade 5. The outcomes of both majority-language and minority-language students participating in a two-way immersion program suggested an advantage in both math and reading over peers not participating in two-way immersion programs.

#### Language proficiency growth and patterns over time

Longitudinal studies can demonstrate patterns along a student's language proficiency growth. Three studies found interesting pattern changes over time for English learner students acquiring new language and literacy skills (Kieffer, 2011; Mancilla-Martinez & Lesaux, 2010; Nakamoto et al., 2007). Two of these studies found quadratic growth patterns for English learner students in grades from prekindergarten through grade 6 on components of language and literacy skills and reading comprehension, suggesting relatively large growth in the early grades that slowed considerably in later grades (Mancilla-Martinez & Lesaux, 2010; Nakamoto et al., 2007). An examination of a truncated time period would have given the impression that growth was linear.

For English learner students, many individual factors such as poverty and parent education, often grouped under socioeconomic status, predict first-language development (Kieffer, 2011; Slavin, Madden, Calderón, Chamberlain, & Hennessy, 2011). Socioeconomic status is a powerful predictor of English learner students' English proficiency and academic achievement (Hakuta, Butler, & Witt, 2000; Kieffer, 2011; Kim, Curby, & Winsler, 2014). Kieffer (2011) compared language-minority students and their native English-speaking peers from similar socioeconomic backgrounds attending schools with similar poverty concentrations and found that their trajectories in English reading achievement became increasingly similar by the end of grade 8. Contextual factors in neighborhood or school composition, including peer academic performance, socioeconomic status, second-language development, and linguistic integration or isolation within schools, have been shown to matter as well (Kieffer, 2011; Proctor, August, Carlo, & Snow, 2006; Slavin et al., 2011). Although most of the studies reviewed did not specifically study the role of socioeconomic status, students in many of the study samples were from low-income households and attended high-poverty schools (Mancilla-Martinez & Lesaux, 2010; Nakamoto et al., 2007).

## **Appendix B. Data and methodology**

This appendix describes the data sources, analytic samples, and research methods used for this study.

### **Data**

Data for this study were obtained from two main sources: the New Mexico Student Teacher Accountability Reporting System, which is managed through the New Mexico Public Education Department (NMPED), and four New Mexico school districts that agreed to participate in the study.

***New Mexico Student Teacher Accountability Reporting System data.*** These data are managed through the NMPED. Four types of student data were collected from the NMPED for this study:

- *Incoming language screening assessment.* The results from the English language screening assessment World-class Instructional Design and Assessment (WIDA) Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS for ELLs®) Placement Test (W-APT) were used for 2009/10 (2010 cohort) and 2010/11 (2011 cohort).
- *English proficiency assessment.* Composite scores on the ACCESS for ELLs assessment for 2010/11–2014/15. (Kindergarten ACCESS for ELLs data for the 2010 cohort were gathered from participating districts; see below.) This assessment is administered annually at the beginning of the calendar year.
- *English language arts and math achievement.* New Mexico is a Partnership for the Assessment of Readiness of College and Careers consortium member, and the state adopted the New Mexico Partnership for the Assessment of Readiness of College and Careers (NMPARCC) in 2014/15. NMPARCC English language arts and math scores were used to answer research question 3.
- *Student-level characteristics.* The study team obtained the following student-level demographic information from the NMPED:<sup>5</sup>
  - Home language.
  - English learner status (current or reclassified) as indicated by district records provided to the NMPED.
  - Participation in a bilingual multicultural education program or standalone English as a second language services.
  - Grade retention.
  - Gender.
  - Participation in special education.
  - Eligibility for the federal school lunch program.

***District language proficiency data.*** Language proficiency data were collected from four school districts in the state:

- *English proficiency.* During the transition to ACCESS for ELLs in 2009/10, an outside vendor was responsible for the data management of the assessment. The NMPED took over the data management of ACCESS for ELLs in 2010/11 and could provide data for the study from 2010/11 onward. Most districts could not access scale scores, so they provided proficiency-level data instead.

**Table B1. Information on Spanish language proficiency assessments and domains used in New Mexico, 2009/10–2010/11**

Assessment name	Oral language	Reading/writing	Vocabulary	Grades or age group
Woodcock-Muñoz Language Survey–Revised	✓	✓	✓	Age 2 to adult
Pre-Language Assessment Scales	✓	na	✓	K–1

na is not applicable.

**Source:** Adapted from Sugarman et al. (2007).

- Incoming Spanish proficiency.* New Mexico schools assessed English learner students’ Spanish language proficiency using one of three standardized Spanish assessments. Three of the four participating districts used Woodcock-Muñoz Language Survey–Revised (WMLS-R), and the remaining district used the pre-Language Assessment Scales (preLAS) in kindergarten and the Language Assessment Scales (LAS) in grades above kindergarten (see table B1 for more detail on these assessments). The districts had access only to proficiency-level data and did not have scale scores. These exams are not administered at a set time of year, but schools generally try to administer them at least one academic year apart, according to conversations with New Mexico Achievement Gap Alliance members. Whether the administration of the initial Spanish proficiency tests was aligned with ACCESS for ELLs in the same testing window across districts was unconfirmed.

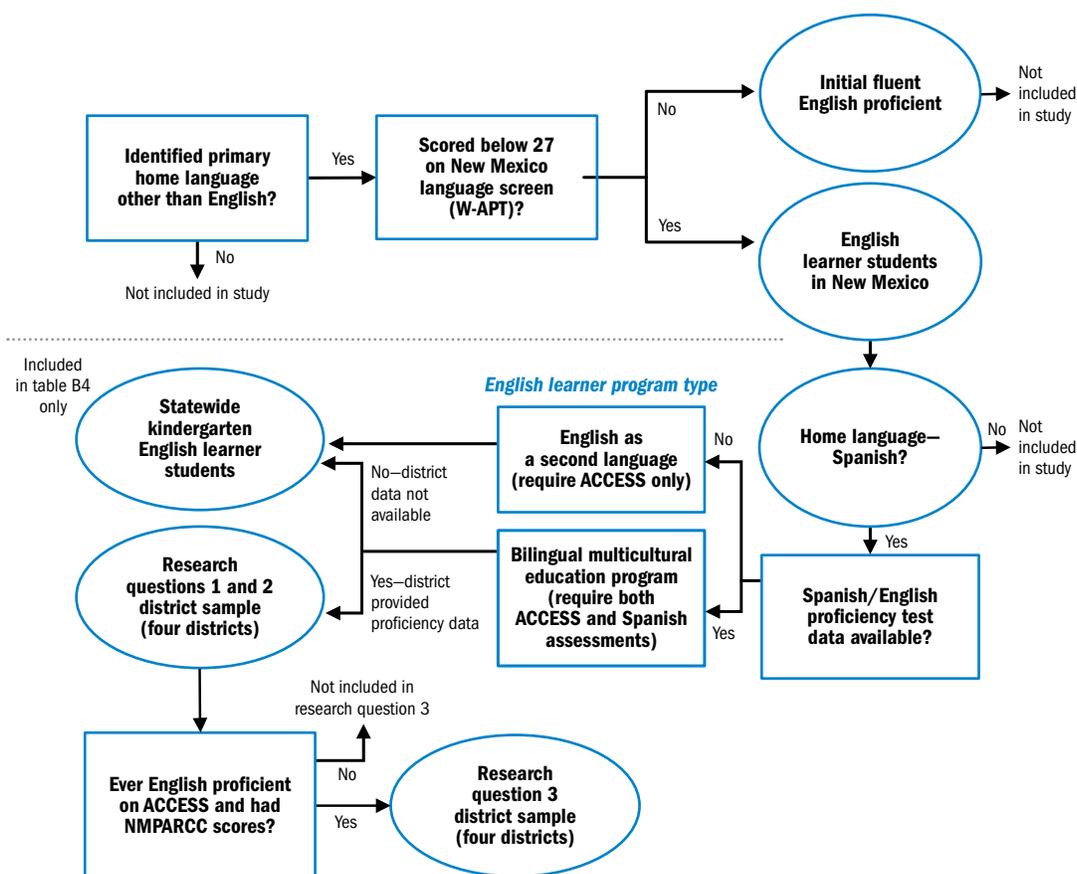
### Sample

The study sample for analysis was selected through a multistep process (figure B1). The first step was to select all incoming New Mexico kindergarteners who were classified as an English learner student in 2009/10 or 2010/11 and whose home language was Spanish. The inclusion of two cohorts provides assurance that any patterns related to English proficiency outcomes through grades 4 and 5 were not attributable to a single cohort of students (table B2).

The second step was related to availability of assessment data. English learner students who met the criteria above also had to have English proficiency data (measured by ACCESS for ELLs) either for all years between kindergarten and 2014/15 or until students were categorized as fluent English proficient and were no longer tested. Students also had to have initial Spanish proficiency in kindergarten.

The NMPED did not have access to Spanish assessment outcome data for individual students, so the study team recruited nine school districts in the state that collectively enrolled the vast majority of New Mexico’s English learner students that participated in a state-funded bilingual multicultural education program, and whose student demographic characteristics were similar to those of English learner students statewide. Four districts signed a memorandum of understanding with the Regional Educational Laboratory Southwest and provided Spanish assessment data. These districts are in different geographic regions in the state—northwest, central, southeast, and south. One of the participating school districts is categorized as a city, another district is categorized as a town, and the two remaining districts are rural. Only students enrolled in a bilingual multicultural education

**Figure B1. Identifying English learner students in New Mexico for inclusion in the study sample**



ACCESS for ELLs is Assessing Comprehension and Communication in English State-to-State for English Language Learners. W-APT is World-Class Instructional Design and Assessment Assessing Comprehension and Communication in English State-to-State Placement Test.

**Source:** Authors' compilation.

**Table B2. On-time grade-level progression and assessments for 2010 and 2011 kindergarten cohorts in four districts in New Mexico through 2014/15**

Grade level progression and timing of assessments	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
On-time grade-level progression						
2010 cohort	K	1	2	3	4	5
2011 cohort	na	K	1	2	3	4
ACCESS for ELLs	Yes	Yes	Yes	Yes	Yes	Yes
Spanish language proficiency tests	Yes	Yes	Yes	Yes	Yes	Yes
Achievement outcomes (English language arts, math)	na	na	na	na	na	NMPARCC

na is not applicable. ACCESS for ELLs is Assessing Comprehension and Communication in English State-to-State for English Language Learners. NMPARCC is New Mexico Partnership for Assessment of Readiness for College and Careers.

**Note:** The NMPARCC was first administered in New Mexico in 2014/15. The New Mexico Standards-Based Assessments administered prior to 2014/15 were not used in this study.

**Source:** Authors' compilation.

program in the four districts were included in the study sample, because only those programs required the Spanish proficiency tests called for in the study design.<sup>6</sup>

An additional set of criteria was required for students included in the sample for research question 3 (on what proportion of English learner students who achieved fluent English proficiency by four or five years after kindergarten also demonstrated grade-level readiness in grade 4 or 5 in English language arts and math). To be included, a student must have been reclassified as fluent English proficient between kindergarten and the 2014/15 school year. In addition, students must have valid NMPARCC assessment data in either English language arts or math for the 2014/15 school year. Of the 2010 cohort of students reclassified as fluent English proficient, 60 percent had assessment scores in grade 5 English language arts, and 66 percent had assessment scores in grade 5 math. Of the 2011 cohort students reclassified, 60 percent had assessment scores in grade 4 English language arts, and 76 percent had assessment scores in grade 4 math.

Overall, the 2010 cohort included 1,393 students, and the 2011 cohort included 1,583 students after duplicates were removed from the district data. Together, the four school districts accounted for 52 percent of Spanish-speaking English learner students entering kindergarten in a bilingual multicultural education program in New Mexico in 2009/10 and 2010/11. They accounted for 25 percent of Spanish-speaking English learner students entering kindergarten in New Mexico in 2009/10 and 35 percent of those entering kindergarten in 2010/11 (tables B3–B6).

Student demographic characteristics were compared for all Spanish-speaking English learner students across the four school districts, for initial Spanish-speaking English learner students in a bilingual multicultural education program in the four districts, and for all Spanish-speaking English learner students in kindergarten statewide (table B7). The comparisons revealed little differences across the populations by gender, special education status, or eligibility for the federal school lunch program.

## Analysis methods

**Research question 1: What were the initial Spanish and English proficiencies of English learner students in kindergarten?** Proficiency level outcomes on the ACCESS for ELLs test in kindergarten were condensed and reported descriptively for the 2010 and 2011 cohorts of Spanish-speaking English learner students. There are six proficiency levels

**Table B3. Number and percentage of English learner students in kindergarten in New Mexico, 2009/10 and 2010/11**

Category	Cohort	Number	Percent
All kindergarten students	2010	27,885	100.0
	2011	27,491	100.0
Kindergarten English learner students	2010	7,692	27.6
	2011	6,220	22.6
Kindergarten Spanish-speaking English learner students	2010	5,500	19.7
	2011	4,554	16.6

**Source:** Authors' analysis of statewide kindergarten student enrollment data from the New Mexico Public Education Department for 2009/10 and 2010/11.

**Table B4. Number and percentage of initial Spanish-speaking English learner students in kindergarten and receiving bilingual multicultural education program services, statewide and in four sample districts, 2009/10 and 2010/11**

Category and services	Cohort	Number	Percent
Statewide kindergarten Spanish-speaking English learner students	2010	5,500	100.0
	2011	4,554	100.0
Statewide kindergarten Spanish-speaking English learner students in a bilingual multicultural education program	2010	3,919	71.2
	2011	3,077	67.6
Sample kindergarten Spanish-speaking English learner students in four districts	2010	2,843	52.0
	2011	2,355	51.7
Sample kindergarten Spanish-speaking English learner students in a bilingual multicultural education program in four districts	2010	1,393	25.3
	2011	1,583	34.8

**Note:** Bilingual multicultural education programs require districts to assess students in both English and Spanish.

**Source:** Authors' analysis of kindergarten student enrollment data from the New Mexico Public Education Department for 2009/10 and 2010/11 statewide and narrowed down to the four districts used in the study.

**Table B5. Number and percentage of initial Spanish-speaking English learner students in kindergarten with valid standardized assessment data in grade 4 or 5 in 2014/15 in four sample districts in New Mexico**

Category	Cohort	Assessment	Number	Percent
Kindergarten Spanish-speaking English learner students in a bilingual multicultural education program	2010	na	1,393	100.0
	2011	na	1,583	100.0
Kindergarten English learner students in a bilingual multicultural education program with valid standardized assessment data	2010	English language arts grade 5	836	72.9
		Math grade 5	913	79.3
	2011	English language arts grade 4	947	68.0
		Math grade 4	1,197	75.5

na is not applicable.

**Note:** Bilingual multicultural education programs require districts to assess students in both English and Spanish.

**Source:** Authors' analysis of kindergarten student enrollment data from the New Mexico Public Education Department for 2009/10 and 2010/11 statewide and narrowed down to the four districts used in the study.

**Table B6. Number and percentage of initial Spanish-speaking English learner students in kindergarten reclassified as fluent English proficient and with valid standardized assessment data in grade 4 or 5 in 2014/15 in four sample districts in New Mexico**

Category	Cohort	Assessment	Number	Percent
Kindergarten Spanish-speaking English learner students reclassified as fluent English proficient by grade 4 or 5	2010	na	1,151	100.0
	2011	na	947	100.0
Kindergarten English learner students in a bilingual multicultural education program reclassified as fluent English proficient with standardized assessment data in grade 4 or 5	2010	English language arts grade 5	619	53.8
		Math grade 5	647	56.2
	2011	English language arts grade 4	586	61.9
		Math grade 4	680	71.8

na is not applicable.

**Note:** Bilingual multicultural education programs require districts to assess students in both English and Spanish.

**Source:** Authors' analysis of kindergarten student enrollment data from the New Mexico Public Education Department for 2009/10 and 2010/11 statewide and narrowed down to the four districts used in the study.

**Table B7. Comparison of demographic characteristics of initial Spanish-speaking English learner students in kindergarten in four sample school districts and statewide in New Mexico, 2009/10 and 2010/11 (percent)**

Cohort	Student variable	Four school districts		Statewide <sup>c</sup>
		Spanish speaking English learner students <sup>a</sup>	Students in a bilingual multicultural education program <sup>b</sup>	
2010	Female	49	49	48
	In special education	9	8	10
	Eligible for federal school lunch program	97	98	96
2011	Female	46	47	46
	In special education	11	8	11
	Eligible for federal school lunch program	98	99	94

**Note:** The descriptive statistics were analyzed only for students who received support services for English language development and who had English proficiency assessment data.

a.  $n = 2,843$  in 2010;  $n = 2,355$  in 2011.

b.  $n = 1,393$  in 2010;  $n = 1,583$  in 2011.

c.  $n = 5,500$  in 2010,  $n = 4,554$  in 2011.

**Source:** Authors' analysis of kindergarten student enrollment data from the New Mexico Public Education Department for 2009/10 and 2010/11 for the state and for the four districts in the study.

on ACCESS for ELLs, but for simplicity the results for this report were condensed to three proficiency levels. The English proficiency levels were grouped as follows: low = entering (level 1 on ACCESS for ELLs); medium = beginning, developing, expanding (levels 2–4 on ACCESS for ELLs), and fluent English proficient = bridging and reaching (levels 5 and 6 on ACCESS for ELLs).

Spanish proficiency results at entry to kindergarten for the 2010 and 2011 cohorts were descriptively reported in three categories: low, medium, and high. Across the four districts, three districts used WMLS-R and one district used the preLAS for initial Spanish proficiency testing at kindergarten entry. The WMLS-R has six proficiency levels: level 1 = negligible, level 2 = very limited, level 3 = limited, level 4 = fluent, level 5 = advanced, and level 6 = very advanced (Barrueco, López, Ong, & Lozano, 2012). According to conversations with a school district and the district's agreement with the NMPED, the district categorizes level 1 as beginning proficient, levels 2 and 3 as intermediate proficient, and levels 4–6 as proficient. Therefore, this study used similar reporting categories for WMLS-R: level 1 = low Spanish proficiency, levels 2 and 3 = medium Spanish proficiency, and levels 4–6 = high Spanish proficiency. For consistency with district practices, rounding was not used for proficiency assessments, so a student who scored 3.5 would be categorized under medium proficiency, not high proficiency.

The preLAS has five proficiency levels: 1–prefunctional = nonspeaker category; 2–beginning = limited speaker category; 3–intermediate = limited speaker category; 4–advanced = fluent speaker category; and 5–proficient/trial mainstream = fluent speaker category (Barrueco et al., 2012). As for the six WMLS-R categories, these five categories were condensed into three: low Spanish proficiency = nonspeaker (level 1); medium Spanish proficiency = limited speaker (levels 2 and 3); and high Spanish proficiency = fluent speaker (levels 4 and 5). PreLAS proficiency levels and classifications were based on the *LAS Links Technical Manual* (CTB/McGraw-Hill, 2006).

In addition to descriptively reporting initial Spanish and English proficiency, the study descriptively reported three English proficiency outcomes on ACCESS for ELLs in kindergarten by the three initial kindergarten Spanish proficiency groups.

**Research question 2: What percentage of English learner students were reclassified as fluent English proficient four or five years after kindergarten, and do the results vary by initial Spanish proficiency in kindergarten?** The focus of this analysis was on how many English learner students in each cohort ever attained fluent English proficiency by the 2014/15 school year. A flag was created in the data to track students who ever attained fluent English proficiency (defined as reaching level 5 or 6 on ACCESS for ELLs) between kindergarten and 2014/15. The numbers were summed to produce a numerator of all students who reached fluent English proficiency by 2014/15. The denominators used to calculate the rates of fluent English proficiency were the total sample for the 2010 or 2011 cohort. Next, the analysis disaggregated the cumulative English proficiency rates by the three initial Spanish proficiency groups.

**Research question 3: What percentage of English learner students who were reclassified as fluent English proficient four or five years after kindergarten also demonstrated grade-level readiness in grade 4 and 5 English language arts and math, and do the results vary by initial Spanish proficiency? How do the rates of grade-level readiness**

*for these students compare with those for all students statewide in the same grades?*

Research question 3 used descriptive analyses to report the percentages of Spanish-speaking English learner students reclassified as fluent English proficient who exhibited grade-level readiness on the NMPARCC in 2014/15. NMPARCC scale scores were converted into five performance levels: level 1—did not yet meet expectations, level 2—partially met expectations, level 3—approached expectations, level 4—met expectations, and level 5—exceeded expectations; this conversion followed guidance and reporting standards from the NMPARCC Score Report Interpretation Guide (Partnership for Assessment of Readiness for College and Careers, 2014). Students who scored at 4 or 5 were categorized as exhibiting grade-level readiness. Next, the results were disaggregated by the three initial Spanish proficiency groups and were compared with statewide NMPARCC results for all students in grades 4 and 5 English language arts and math publicly reported by the NMPED (New Mexico Public Education Department, 2015).

An additional analysis examined the correlations between initial Spanish proficiency in kindergarten and NMPARCC English language arts and math outcomes in grades 4 and 5. Pearson product-moment correlation coefficients ( $r$ ) were calculated to assess the associations between performance level on the initial Spanish proficiency test in kindergarten and grade 4 and 5 grade-level readiness in English language arts and math on the NMPARCC. The relationships were evaluated as a positive or negative linear relationship on a scale of  $-1$  to  $1$  (although there are no universal thresholds that constitute a “strong” relationship using this method, values close to  $-1$  or  $1$  generally indicate a strong relationship, and values closer to  $0$  indicate a weak relationship). Pearson product-moment correlation coefficients were calculated separately for each cohort and subject.

## Notes

1. NMPED (2016a) showed that the number of English learner students in New Mexico decreased by 19 percent between 2010/11 and 2014/15 but offers no explanations for this trend.
2. Research alliance members are represented by the following organizations: New Mexico Public Education Department, Dual Language Education of New Mexico, New Mexico Association for Bilingual Education, Center for the Education and Study of Diverse Populations at New Mexico Highlands University, New Mexico Regional Education Cooperatives, New Mexico State University, Santa Fe Indian School, Northern New Mexico College, University of New Mexico Center for Education Policy Research, several school districts and schools in the state, New Mexico Coalition of School Administrators, IDRA South Central Collaborative for Equity, and New Mexico Bureau of Indian Education.
3. Formerly State Based Assessments, then after 2014/15, the New Mexico Partnership for Assessment of Readiness for College and Careers (NMPARCC).
4. These conversions were based on recommendations from Language Assessment Scales and Woodcock-Muñoz Language Survey–Revised technical manuals and reports, as well as on district agreements with the NMPED on proficiency levels.
5. Gender, participation in special education, and eligibility for the federal school lunch program were used to compare the sample with all Spanish-speaking English learner students in New Mexico.
6. Students enrolled in four of the five bilingual multicultural education programs (dual language, maintenance, heritage, and transitional) were included in this study. The fifth bilingual multicultural education program, the enrichment model, is geared toward fluent English-proficient students and native English speakers.

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