

RESEARCH BRIEF

MAY 2017

A Research Brief
from the *Study of
California's Transitional
Kindergarten Program*

Transitional Kindergarten in California

The Impact of Transitional Kindergarten on English Learner Students

Introduction

California's Kindergarten Readiness Act of 2010 revised the cutoff date by which children must turn five for kindergarten entry in that year. The act established September 1 as the new kindergarten eligibility date—changed from the previous date of December 2—and phased in the new age requirement by moving the birthdate cutoff back one month per year for three years beginning in fall 2012. The Kindergarten Readiness Act also established transitional kindergarten (TK), defined as the first year of a two-year kindergarten program for all students affected by the birthdate eligibility change. Instead of enrolling in regular kindergarten, students who reach age five between September 2 and December 2 now receive an “age and developmentally appropriate” experience in TK prior to entering kindergarten the following year (California Department of Education, 2016; Governor's State Advisory Council on Early Learning and Care, 2013). Since it has been implemented across the state, TK has been shown to significantly improve kindergarten readiness for California's students (Manship et al, 2015).

But what benefits do students who might need a little extra support—such as English learner (EL) students—experience? EL students—those who do not speak, read, write or understand English well as a result of English not being their home language¹—make up 33 percent of the kindergarten population in California,² and represent a wide range of language groups, including Spanish, Vietnamese, Mandarin, Filipino, and Arabic.³ Understanding the impact of TK on this group is critical to evaluating the success of the program.

Key Findings

This brief describes the impact of transitional kindergarten (TK) on English learner students in California. Key findings include:

- TK improves mathematics knowledge and problem-solving skills for EL students, giving them almost a six-month advantage in problem-solving skills over EL students who did not attend TK.
- TK also improves literacy skills for EL students, putting them ahead of their peers who did not attend TK by more than seven months at kindergarten entry.
- Participating in TK gives EL students a substantial boost in their English language development, including in speaking skills, listening skills, and overall language proficiency. This benefit holds true for EL students from all language groups.

¹ <http://www.cde.ca.gov/sp/el/>

² <http://dq.cde.ca.gov/dataquest/longtermel/ELAS.aspx?cds=00&agglevel=State&year=2016-17>

³ <http://www.cde.ca.gov/ds/sd/cb/cefelfacts.asp>

This brief, the fifth in a series highlighting findings from the *Study of California's Transitional Kindergarten Program*, summarizes what we have learned about the impact of TK on EL students' school readiness skills, including mathematics skills, language and literacy skills, and English proficiency.⁴ The findings are based on analyses of two sources of data: 1) direct assessments of a sample of EL students in 20 school districts across California in the fall of 2014 and 2015 (2,647 students), and 2) statewide English proficiency data on all EL students who took the California English Language Development Test (CELDT) in school years 2013–14 and 2014–15 (54,854 students).

Using a regression discontinuity framework (see Study Methodology box), we compare outcomes for students who were born between October 1 and December 2 (and were therefore eligible for TK) to those who were born between December 2 and February 2—those who missed the cutoff for TK but who entered kindergarten at the same time as the TK students. Controlling for the slight age difference between these two groups, the primary factor that distinguishes them is eligibility for TK. The regression discontinuity model therefore identifies differences in outcomes which can be attributed to participation in TK.

Prior Research Suggests that Transitional Kindergarten Should be Particularly Beneficial for EL Students

Many children from homes in which English is not the primary language arrive at school with limited English language and literacy skills (Moats, 2001; Slavin & Cheung, 2005). And for Latino students in particular, we know that English proficiency is linked to academic performance, educational attainment, and future economic opportunity (August & Shanahan, 2006). Formal education prior to kindergarten may help support these students' academic and language skills. For example, Magnuson, Lahaie, & Waldfogel (2006) found that attending preschool raised the English language proficiency of children of immigrants. Research also suggests that attending pre-kindergarten programs may give EL students an advantage over students who do not attend these programs in terms of their literacy, mathematics, social skills, and executive function—skills that support a solid foundation for school achievement (Mokrova, Broekhuizen, & Burchinal, 2015; Schmitt, Pratt, & McClelland, 2014). Research also demonstrates that English learners—and Hispanic students, who comprise the largest group of English learners in California—benefit from preschool as much or more than children from other backgrounds in terms of cognitive, language, literacy, and mathematics development (Laosa & Ainsworth, 2007; Gormley, 2008). In fact, Yazejian and colleagues (2015) found that the link between dosage of preschool and receptive language skills was stronger for dual language learner (DLL) children than for non-DLLs.

TK is a particular type of prekindergarten experience characterized by several important features, which may further benefit EL students. First, TK teachers are required, at a minimum, to hold a bachelor's degree and a multiple subject teaching credential. Preschool teachers are not held to this requirement in California—in fact, only 25 percent of early care and education teachers in California have a bachelor's degree (Whitebook et al, 2006). Thus, EL students in TK have the benefit of instruction provided by more highly qualified teachers, on average, than what English learners in preschool classrooms receive. Second, TK teachers are required to use a curriculum (a modified version of the kindergarten curriculum) to guide their instruction, a practice considered to be an important element of high-quality prekindergarten classrooms (National Research Council, 2000). Finally, TK almost always is taught on elementary campuses, and often by former kindergarten teachers (AIR, 2016; Quick et al., 2014), creating an environment where kindergarten transitions may be smoother and alignment between TK and grades K–3 may be stronger. This close alignment may further enhance the benefits of TK for students'

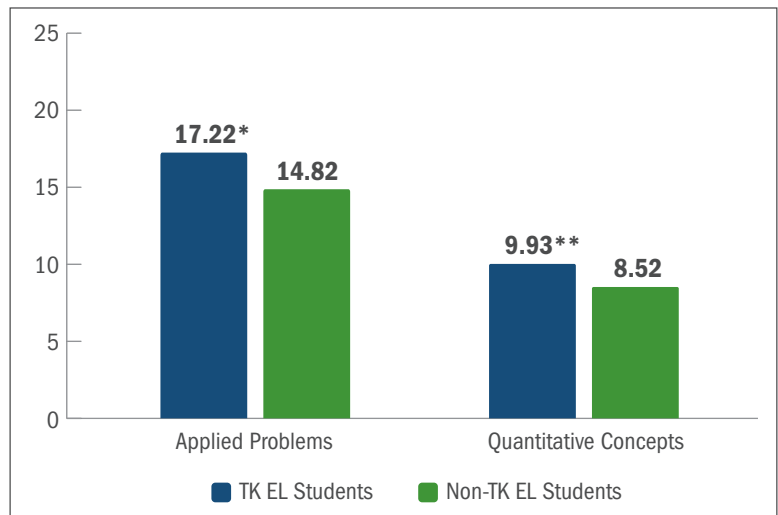
⁴ For the full set of results, see Manship et al. (2017): <http://tkstudy.airprojects.org>.

kindergarten readiness. Thus, we expect that TK, with its features of high quality early learning experiences, will promote better school readiness skills for all students—but especially EL students who often benefit particularly from additional early education.

Transitional Kindergarten Improves Mathematics Knowledge and Problem-Solving Skills for EL Students

Analysis of child assessment data from the current TK study demonstrates that TK improves EL students' mathematics skills at kindergarten entry (Exhibit 1). TK gives EL students an advantage at the beginning of kindergarten on both knowledge of mathematical concepts and symbols (Quantitative Concepts assessment, effect size = 0.385) and on problem-solving skills (Applied Problems assessment, effect size = 0.319) compared to their non-TK peers. This effect translates into an advantage of almost six months of learning in problem-solving skills.

Exhibit 1. Adjusted Mean Scores for TK EL Students and Non-TK EL Students on Mathematics Assessments



* = $p < 0.01$, ** = $p < 0.001$, n for TK EL students = 1,117; n for non-TK EL students = 1,153
Note. Effect sizes: 0.319 for Applied Problems and 0.385 for Quantitative Concepts.
Source. Authors' analysis of student scores on the Woodcock-Johnson Quantitative Concepts and Applied Problems tests.

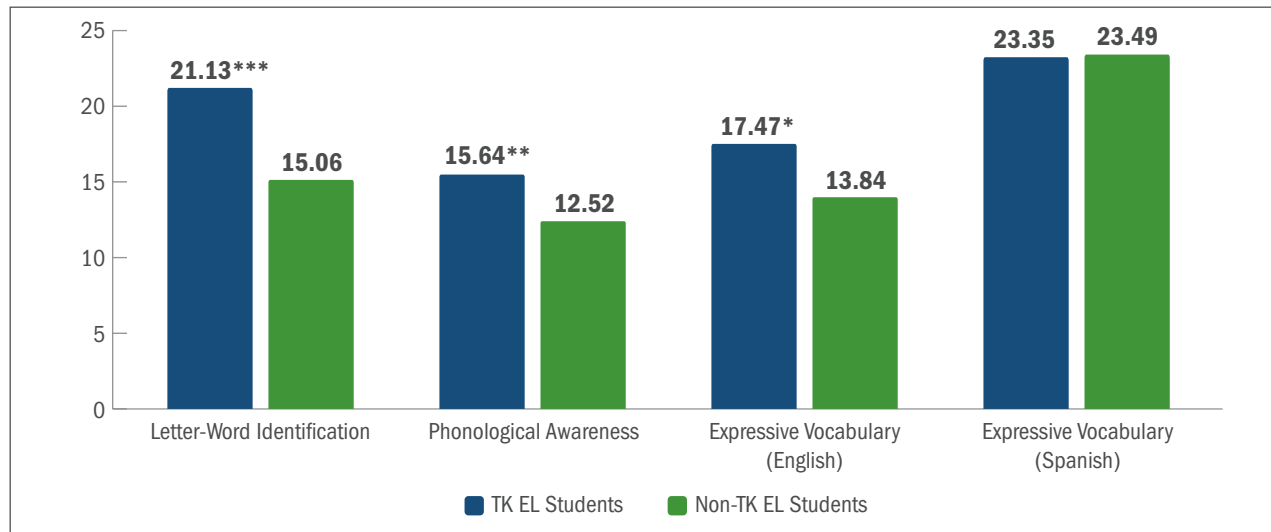
Transitional Kindergarten Improves Language and Literacy Skills for EL Students

TK also improves literacy skills for EL students. When they enter kindergarten, EL students who attended TK perform significantly better than their non-TK peers in several literacy domains (Exhibit 2). First, TK improves EL students' letter and word identification skills (Woodcock-Johnson Letter-Word Identification assessment, effect size = 0.534);⁵ this advantage is equivalent to 7.5 months of learning. Second, TK improves EL students' phonological awareness (effect size = 0.349), an important foundational skill for literacy.⁶ TK also gives EL students an advantage over their non-TK EL peers on expressive vocabulary in English (effect size = 0.224), translating to just over five months of learning. However, we did not find evidence that TK improved Spanish vocabulary for EL students who spoke Spanish at home. This may be because of the limited use of Spanish in the typical classroom in California since the passage of Proposition 227 in 1998 (Garcia & Curry-Rodriguez, 2000). We also see no evidence that TK students lost Spanish vocabulary, relative to non-TK students; expressive vocabulary scores were comparable for TK and non-TK EL students.

⁵ Effect sizes are the standardized mean difference in the outcomes between students who attended TK and students who did not as estimated by the RD model. Means are adjusted for race, gender, special education, free and reduced lunch eligibility, and parent education. Effect sizes are computed by dividing the mean difference in the outcome by the pooled standard deviation. Effect sizes of 0.2 are considered small, 0.5 moderate, and 0.8 high.

⁶ Age-equivalent scores and thus months of learning differences are not available for the Phonological Awareness assessment.

Exhibit 2. Adjusted Mean Scores for TK EL Students and Non-TK EL Students on Language and Literacy Assessments



* = $p < .05$, ** = $p < 0.01$, *** = $p < 0.001$, n for TK students = 1,101; n for non-TK EL students = 1,077

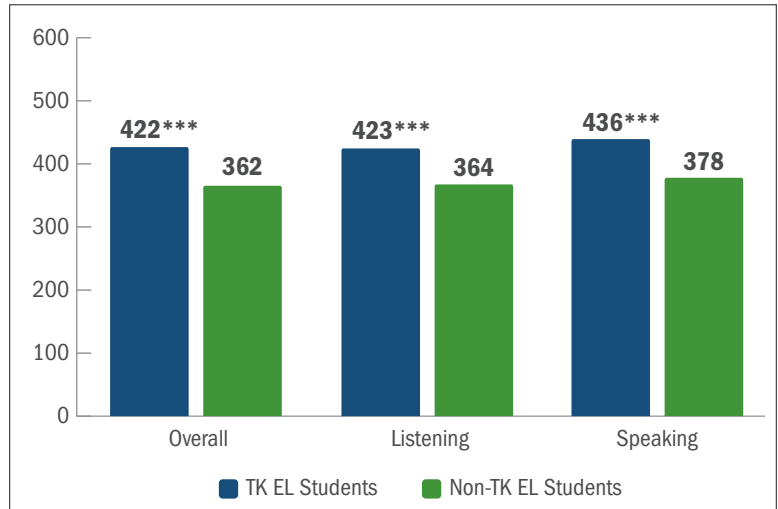
Note. Effect sizes: 0.534 for Letter-Word Identification, 0.349 for Phonological Awareness, and 0.224 for Expressive Vocabulary.

Source. Authors' analysis of student scores on the Woodcock-Johnson Letter-Word Identification test and Expressive Vocabulary and the Clinical Evaluation of Language Fundamentals Phonological Awareness test.

Transitional Kindergarten Improves English Proficiency for EL Students

Analysis of statewide CELDT data also shows that TK has a strong impact on EL students' English proficiency (Exhibit 3). EL students who attended TK outperform their non-TK peers on listening, speaking, and overall CELDT score by about 60 points. This advantage represents a difference of one full performance level.⁷ On average, TK students perform at an "intermediate" level at kindergarten entry. At this performance level, students are typically able to understand more concrete details and some abstract concepts in regular instruction; respond with increasing ease and with fewer errors; and provide responses in the form of sentences conveying original thoughts and questions.⁸ Meanwhile, non-TK students perform on average at an "early intermediate" level. At this performance level, students respond with increasing ease and reduced number of errors, but typically student responses are limited to phrases and memorized statements or questions, and their errors limit degree of communication overall.⁹

Exhibit 3. Adjusted Mean Scores for TK EL Students and Comparison Students on Overall English Language Skills



*** = $p < 0.001$, n for TK EL students = 15,902; n for non-TK EL students = 38,952

Note. Effect sizes: 0.747 for Overall, 0.685 for Listening, and 0.583 for Speaking.

Source. Authors' analysis of student scores on the CELDT.

⁷ The CELDT results are reported for overall English proficiency attained by students as well as performance in each of four domains (i.e., listening, speaking, reading and writing). Results are reported at five performance levels for accountability purposes based on scale score ranges: beginning (184–345 points), early intermediate (346–396 points), intermediate (397–447 points), early advanced (448–498 points), and advanced (499–598 points).

^{8,9} <http://www.cde.ca.gov/ta/tg/ep/documents/celdt1618guide.pdf>

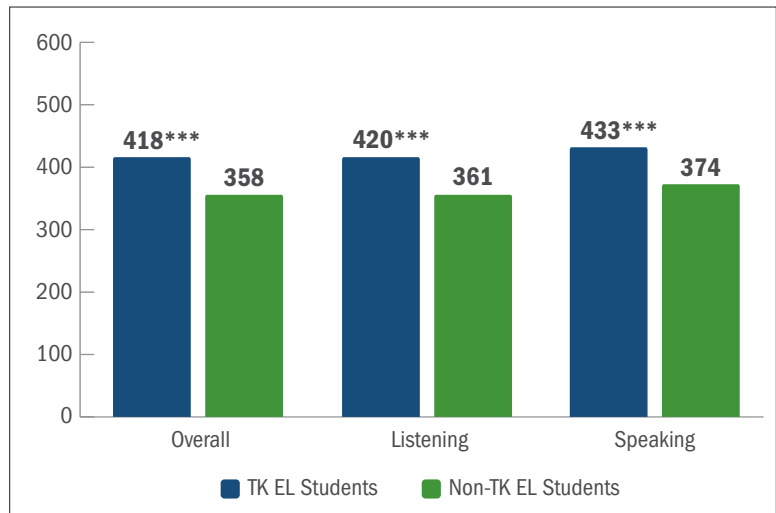
Impact of TK for Specific Language Groups

Spanish-speaking students represent the largest population of EL students in California; according to the California Department of Education (CDE), nearly 84 percent of EL students in California speak Spanish at home.¹⁰ However, the state also has a notable population of Asian language-speaking students. To investigate whether TK has a differential impact for speakers of these different languages, we estimated the effect of TK on English language proficiency for each language group separately.

First, we examined the largest group of EL students—Spanish speakers. Among Spanish-speaking EL students, those who attended TK outperform their non-TK peers on all CELDT assessments examined (Exhibit 4). TK gave this group an advantage of a full performance level—or about 60 points on average—on overall proficiency scores, as well as on listening and speaking scores, consistent with results for the overall EL population.

Next, we examined scores for EL students who speak an Asian language at home. Since Asian language-speaking students are not a homogenous group, we examined the impact of TK for language subgroups organized by region in Asia. Using United Nations classifications, we defined five regions in Asia as shown in Exhibit 5. Given that populations within region share some characteristics such as economic and educational opportunities, we examine the impacts of TK by these region designations.

Exhibit 4. Adjusted Mean Scores for Spanish-Speaking TK EL Students and Non-TK EL Students on English Language Skills (CELDT)

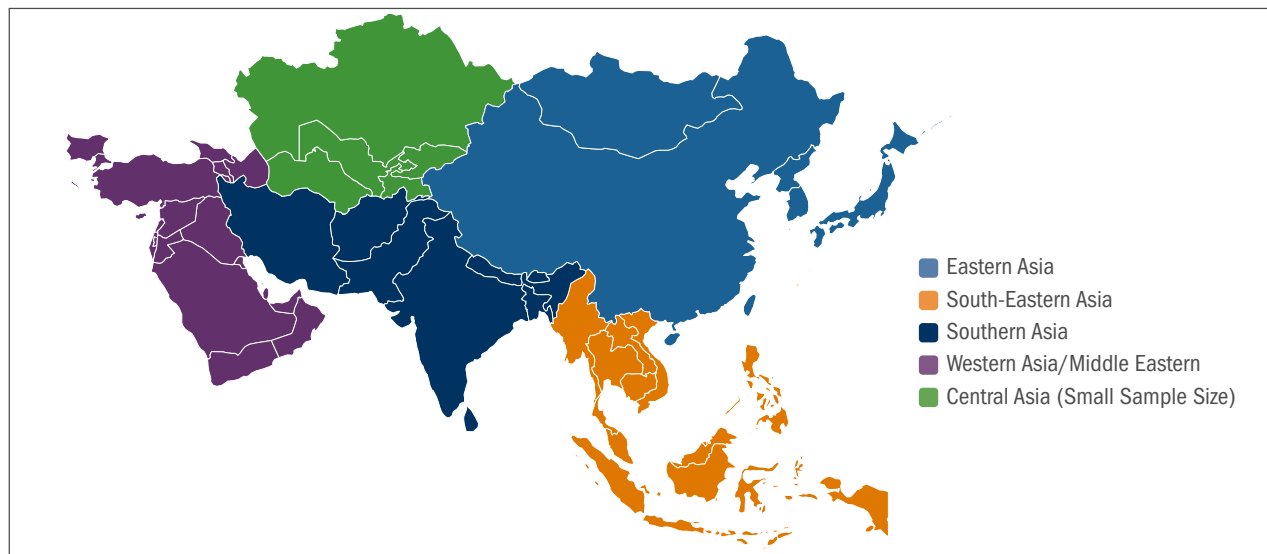


*** = $p < 0.001$, n for TK EL students = 13,373; n for non-TK EL students = 31,637

Note. Effect sizes: 0.746 for Overall, 0.678 for Listening, and 0.589 for Speaking.

Source. Authors' analysis of student scores on the CELDT.

Exhibit 5. Asian Language Regions Examined

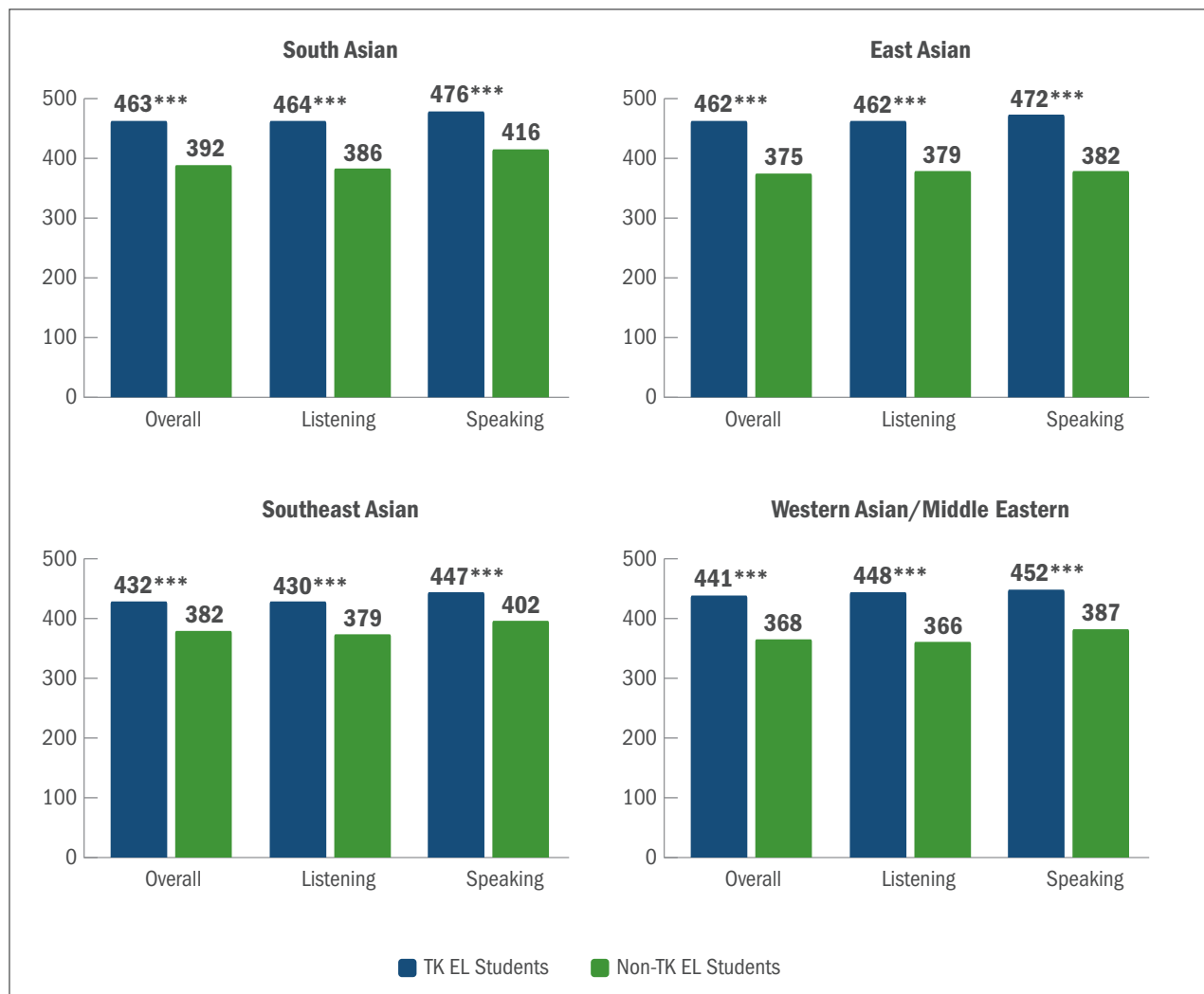


Note. Results for Central Asian language speakers are not presented due to their small sample size.

¹⁰ <http://www.cde.ca.gov/ds/sd/cb/cefelfacts.asp>

TK shows a significant impact on CELDT scores for all Asian language groups. For most Asian-language groups, TK has a robust effect equivalent to a two-performance-level advantage for TK students over their non-TK peers on overall and listening scores (Exhibit 6). Southeast Asian language speakers who attended TK outperform their non-TK peers by one performance level. For example, among East Asian language-speaking EL students, overall CELDT performance in kindergarten was at an “early advanced” level for those who attended TK, which means that these students are typically able to identify and summarize most concrete details and abstract concepts, and oral language is more elaborate. In contrast, their non-TK peers performed at an “early intermediate” level where oral language is typically limited to phrases and memorized statements.¹¹

Exhibit 6. Adjusted Mean Scores for Asian Language-Speaking TK EL Students and Non-TK EL Students on English Language Skills (CELDT)



*** = $p < 0.001$

Notes: Sample sizes: South Asian TK = 471, South Asian Non-TK = 1,047; East Asian TK = 612, East Asian Non-TK = 2,108; Southeast Asian TK = 878, Southeast Asian Non-TK = 2,245; Western Asian/Middle Eastern TK = 288, Western Asian/Middle Eastern Non-TK = 683.

Effect sizes: South Asian Overall - 0.989, South Asian Listening - 1.047, South Asian Speaking - 0.655; East Asian Overall - 1.155, East Asian Listening - 1.023, East Asian Speaking - 0.971; Southeast Asian Overall - 0.597, Southeast Asian Listening - 0.545, Southeast Asian Speaking - 0.445; Western Asian/Middle Eastern Overall - 0.898, Western Asian/Middle Eastern Listening - 0.986, Western Asian/Middle Eastern Speaking - 0.598. Though effects appear larger for some groups than others, no significance testing was conducted between effect sizes; we do not know if the effect of TK on one Asian language group is statistically different from the effect on another language group.

Source. Authors' analysis of student scores on the CELDT.

¹¹ <http://www.cde.ca.gov/ta/tg/ep/documents/celdt1618guide.pdf#search=kindergarten%20early%20intermediate%20CELDT%20level&view=Fith&pagemode=none>

Conclusions and Considerations

In California, TK was created to help support the state's young five-year-olds by providing them with an additional year of early education prior to kindergarten. This brief examines the impact of the TK program specifically on English learner students, who stand to benefit from an extra year of early education and English language development. The results presented here demonstrate that TK has an impact on EL students' mathematics skills, language and literacy skills, and English proficiency. EL students who attend TK enjoy a particularly strong advantage over their non-TK EL peers on English proficiency as measured by the CELDT.

These results indicate that TK may play an important role in improving academic outcomes for English learners, as students who start school with stronger academic skills tend to do better over time (Duncan et al., 2007). Given these findings, districts and the state should ensure that families of EL students know about the advantages of TK and that they have ready access to TK programs.

There is more to be done with regard to supporting English learner students in TK and beyond, however, to ensure long-term positive outcomes. For example, EL students who were eligible for TK did not show an advantage over their peers in terms of social skills or executive function. And while there was a positive impact of TK on academic outcomes at kindergarten entry, by the spring, significant effects for EL students were no longer observed.¹² Students who enter kindergarten with an academic advantage may require more challenging content and greater instructional differentiation to support continued learning gains in kindergarten. Further examination of the potential advantages of TK participation on academic and social-emotional skills as well as English proficiency in later academic years—and the context for supporting continued growth—is needed.

Study Methodology

For this study, we examined two sets of school readiness outcomes: 1) academic outcomes (mathematics and literacy) directly assessed for EL students in the 20 study school districts ($n = 2,647$); and 2) English proficiency outcomes measured by California English Language Development Test (CELDT) scores for all EL kindergartners in the state ($n = 54,854$).

Academic outcomes directly assessed in the fall of 2014 and fall of 2015 included mathematics skills of counting, basic mathematical operations, and problem-solving skills (Woodcock-Johnson Applied Problems assessment), and understanding math symbols and measurement (Woodcock-Johnson Quantitative Concepts). Language and literacy outcomes included phonological awareness [Clinical Evaluation of Language Fundamentals Preschool-2 (CELF-2P Phonological Awareness), expressive vocabulary (CELF-2P Expressive Vocabulary), and letter and word identification (Woodcock-Johnson Letter-Word Identification)]. In addition, districts provided demographic data on study students, including special education status, free or reduced-price lunch eligibility, and gender; we also gathered parent education and early childhood program participation information from parent surveys.

The study team obtained CELDT data from the California Department of Education (CDE) for all EL students in the state in school years 2013-14 and 2014-15 to examine the effect of TK on English language proficiency. Data included overall scale scores as well as subscale scores for listening and speaking skills. The CELDT listening domain assesses a student's skill in following oral directions, understanding teacher talk, extended listening comprehension, and rhyming. The speaking domain assesses a student's skill in oral vocabulary, speech functions, choosing and giving reasons, and narrative explanation of pictures. The overall performance score is computed by combining listening and speaking scores (each contributing 45 percent) and reading and writing scores (each contributing 5 percent) (CDE, 2016). CDE also provided data on students' gender, race, and home language.

In both sets of analyses, we used a regression discontinuity (RD) approach to compare students who were eligible for TK (those born between September 2 and December 2) with students with birth dates just on the other side of the December 2 cutoff date who were not eligible for TK because they were too young. These younger students (the "non-TK" group) entered kindergarten at the same time as the TK students but without the TK experience. The RD method controls for age such that differences detected in outcomes cannot be attributed to the small differences in age between the groups. All models controlled for available student demographic characteristics and clustered standard errors account for clustering of students within schools. This study's design enables researchers to attribute differences in outcomes between TK students and non-TK students to participation in TK, though the generalizability of the results to students outside of the narrow age range around the cutoff date may be limited.

¹² See full study report (Manship et al., 2017) for details on these analyses: <http://tkstudy.airprojects.org>.

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About the Study

In 2010, then-Governor Arnold Schwarzenegger signed the Kindergarten Readiness Act into law, moving up the date by which students must turn 5 to enter kindergarten, aligning California's kindergarten enrollment policy with the policies of most other states in the country and creating the transitional kindergarten (TK) program for young 5-year-olds affected by the change. To determine whether TK is effective in improving school readiness and learning outcomes for students, American Institutes for Research (AIR) is conducting an evaluation of the impact of TK in California. The goal of this study is to assess the impact of TK on California students' readiness for kindergarten across multiple domains of development critical for success in school. Using a regression discontinuity design, this study examines whether TK participation improves kindergarten readiness in the domains of early literacy and language, mathematics, executive function, and social-emotional skills. Funding for this study was provided by the Heising-Simons Foundation, the David and Lucile Packard Foundation, and First 5 California.

More information about the study is available at <http://tkstudy.airprojects.org>.

About AIR

Established in 1946, with headquarters in Washington, D.C., American Institutes for Research (AIR) is an independent, nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance both domestically and internationally. As one of the largest behavioral and social science research organizations in the world, AIR is committed to empowering communities and institutions with innovative solutions to the most critical challenges in education, health, workforce, and international development.

AIR's early childhood development research focuses on evaluating programs and policies, improving professional development, examining accountability and assessment systems, investigating program quality and classroom practices, and translating research to practice to aid young children and their families.



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