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REPORT

Who Is Ahead and Who Is Behind?

Gaps in School Readiness and Student Achievement in the Early Grades for California's Children

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Summary

As indicated in the 2002 federal No Child Left Behind (NCLB) Act, raising student achievement in elementary and secondary schools and closing achievement gaps between groups of students are national goals. In California, Governor Schwarzenegger has placed a priority on education reform designed to improve student performance, establishing the Governor's Committee on Education Excellence in 2005. The committee is charged with identifying "bold and creative ideas" to transform California schools, reforms that will be the focus of the Governor's "Year of Education" in 2008. Likewise, State Superintendent of Public Instruction Jack O'Connell has emphasized the need for reforms not only to raise student performance overall, but also to improve achievement for *all* groups of students.

With the goal of raising student achievement at the top of the education policy agenda, policymakers and the public are exploring potential strategies to address achievement shortfalls. One possibility is to expand public funding for preschool education. To evaluate the potential of this approach, the RAND Corporation has undertaken the California Preschool Study, an effort to improve understanding of achievement gaps in the early elementary grades, the adequacy of preschool education currently given, and what efficiencies or additional resources might be brought to bear in early care and education. This volume reports on the first component of this larger study effort, which addresses the following questions:

- What is the number and percentage of students in grades K–3 who do not meet state education standards?
- How does the fraction that fails to meet standards vary across groups defined by gender, race-ethnicity, English-language ability, parent education attainment, and family economic status?
- Do high-quality preschool programs have the potential to close the observed achievement gaps?

To address the first two questions, our analysis draws on state- and local-level school readiness and achievement data for California. Specifically, we use data from the 2007 California Standards Tests (CSTs) to look at the number and proportion of second and third graders who are not reaching state standards for

performance in English-language arts and mathematics. We also use the CST data to examine achievement gaps in these grades between groups of students defined by personal characteristics or family background measures.

In addition, to understand student differences before the CST assessments begin, we turn to other data sources for information on kindergarten and first grade. These sources include reading performance assessments conducted in kindergarten and first grade in a subset of California school districts as part of the Reading First program instituted under NCLB. They also include the California sample of the Early Childhood Longitudinal Study–Kindergarten Class of 1998–99, for behavioral measures of school readiness made after kindergarten entry, based on ratings given by the children's teachers. Those data are complemented by two other studies that examine statewide or county-specific school readiness measures. None of these data sources provide measures of achievement that are representative or truly comparable with CST data on second and third graders. However, they do provide some useful information on group differences in performance and on school readiness at the time of kindergarten entry.

Finally, to address our third question, we evaluate the evidence from rigorous evaluations of preschool programs to assess the potential for well-designed programs to improve school readiness and subsequent school performance. In the remainder of this summary, we highlight our key findings with respect to each of the study questions.

Many Students Are Performing Below State Standards

The CST data demonstrate that, despite rising achievement levels in recent years, California still has a long way to go before second and third graders reach proficiency in English-language arts and mathematics as defined in California's education content standards.

- In the most recent test year, 52 percent of second-grade students and 63 percent of third-grade students did not achieve grade-level proficiency in English-language arts. The equivalent percentages for math performance in the same grades were somewhat better but still quite high at 41 and 42 percent.
- These percentages translate into approximately 240,000 second-grade students and 290,000 third-grade students statewide who do not have the recommended skills in terms of English-language arts. Of the students

performing below proficiency in math, 187,000 are second graders and 198,000 are third graders.

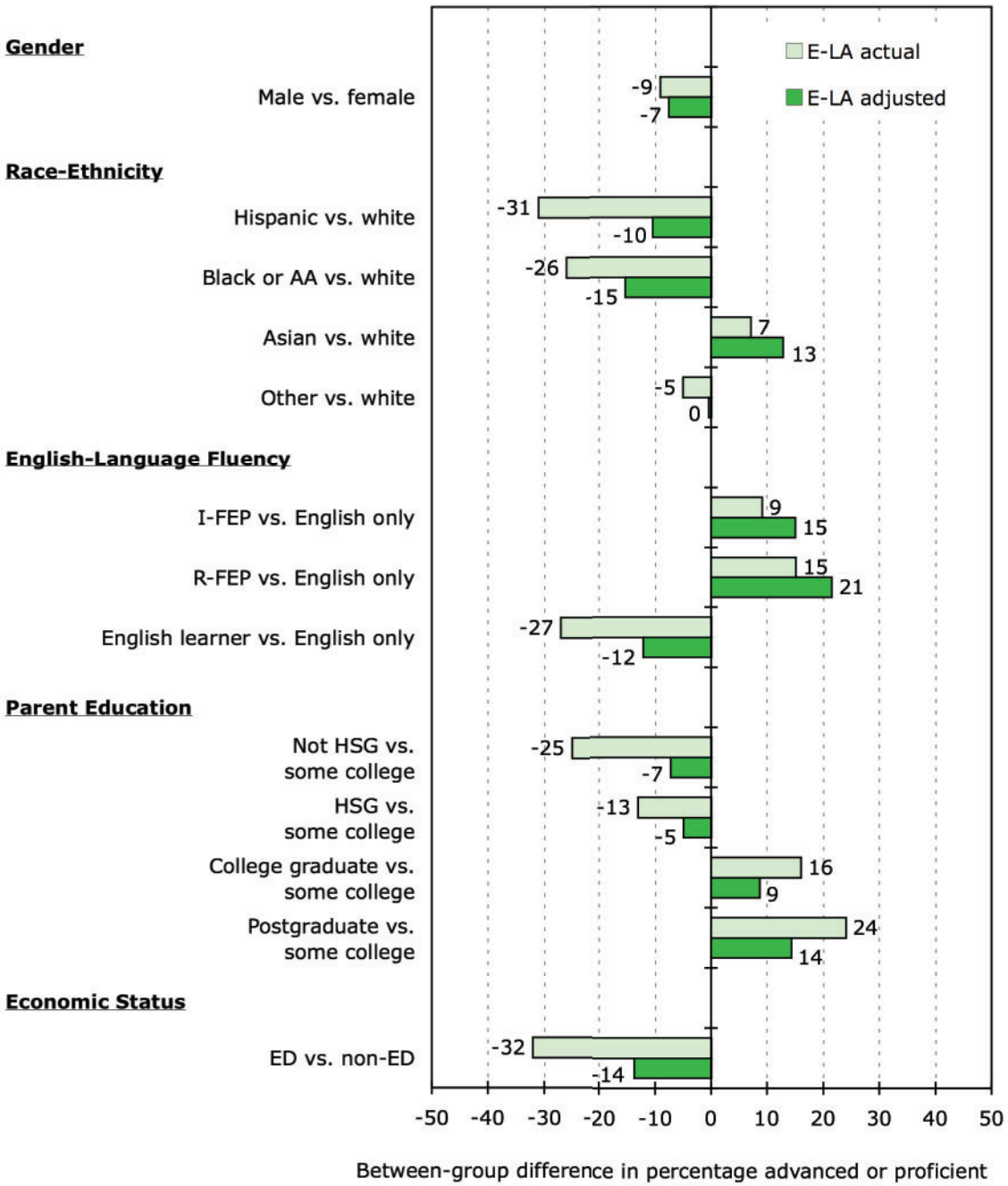
- Of the children in kindergarten and first grade taking a reading skills assessment in 17 school districts that provided us with data, 45 to 49 percent of first graders and 33 to 57 percent of kindergartners did not, at the end of the year, meet the reading benchmark standards, which we take to approximate a proficiency level for these ages. The children assessed in these districts were mostly English learners and four-fifths were Hispanic students. Though an imperfect match for the CST data, these kindergarten and first-grade numbers do suggest that shortfalls in achievement may have early roots.

There Are Large Differences Between Groups

Although the data for all children indicate substantial percentages falling short of proficiency or readiness criteria, some groups of students are falling short by even larger margins.

- English learners and students whose parents did not graduate from high school have the highest proportion who fall short of proficiency. Nearly 70 percent of these students do not meet second-grade proficiency standards in English-language arts, and about 85 percent do not meet third-grade standards. Between 53 and 58 percent do not meet math proficiency standards in those grades. Students whose parents did graduate from high school but who did not attend any college also had lower performance than average.
- Percentages of black and Hispanic students falling short of proficiency in second and third grades are also high, as are those of economically disadvantaged students. These percentages run in the 60s for second-grade English-language arts and in the 70s for third grade. For blacks, the percentages for mathematics are about the same as those for English learners and children with poorly educated parents; for Hispanic students and the economically disadvantaged, they are only slightly better.
- Though proficiency gaps based on race-ethnic, economic, and linguistic differences are substantial, we should not lose sight of the fact that, even among more advantaged groups of students, a sizeable percentage does not meet state education standards. For example, in third grade, 44 percent of students from noneconomically disadvantaged backgrounds

Figure S.1—Actual and Adjusted Between-Group Differences in Percentage Advanced or Proficient in Second Grade: English-Language Arts CST for 2007



SOURCE: Authors' calculations using 2007 California STAR data.
NOTES: AA = African American; ED = economically disadvantaged; E-LA = English-language arts; HSG = high school graduate.

and 30 percent of those whose parents have postgraduate education do not achieve proficiency in English-language arts.

These achievement shortfalls translate into sizeable differences between groups of students. This point is illustrated in Figure S.1 for English-language arts proficiency in the second grade. (Similar results follow if we look at achievement in second-grade mathematics or at either subject for third grade.) The gap between groups in proficiency is plotted, where a negative gap indicates lower performance for the first group relative to the second group, and a positive gap indicates the opposite. For race-ethnicity, we use (non-Hispanic) whites as the comparison group. The comparison group for English-language fluency is English-only students, and we use parents with some college education as the reference for parent education comparisons. We show two calculations for achievement gaps in Figure S.1: actual and adjusted.

Consider first the actual or observed gaps. The percentage of proficient Hispanic students in English-language arts in second grade is 31 percentage points below the percentage for whites. The gap is equally as large for economically disadvantaged students compared with their economically advantaged peers. Other large gaps in English-language arts proficiency are evident between blacks and whites (26 percentage points), English learners and English only (27 points), and those whose parents' education is less than high school versus those whose parents completed some college (25 points). The largest between-group gap is the 49 percentage points that separate the fraction who are proficient in English-language arts when parent education is less than high school versus when parent education exceeds a college degree. In contrast, the gap is smaller between boys and girls, with girls having higher proficiency in English-language arts than boys. (The reverse holds for mathematics, but the gender gap is even smaller.) To a large extent, these results mirror what has been confirmed in other research for California and for the nation.

Some of these differences in student performance are the result of compositional variation between the groups in terms of other characteristics related to achievement. For example, Hispanics have a higher share of English learners compared with whites, which would account for some of the gap between the two groups. To assess the importance of compositional variation, Figure S.1 also shows the adjusted gap for each pairwise comparison. We would expect to see this size gap if there were no compositional differences between the groups of students we compare (based on the characteristics we can observe). In other words, when comparing Hispanics and whites, we adjust for differences in those

two groups in terms of English-language fluency, parent education, economic status, and gender. We make similar adjustments for comparisons within groups of students defined by other characteristics. As seen in Figure S.1, when we account for these compositional differences, the between-group achievement gaps are generally smaller, but they are not eliminated. Although these adjusted gaps would be expected to change if we could account for a richer set of child, family, and school characteristics, our results suggest that there are meaningful, independent differences in student achievement across students defined by race-ethnicity, English-language fluency, parent education, and economic status.

These patterns of differences between groups of students do not suddenly appear in second grade. Reading tests taken by students in some districts participating in the Reading First program show that children in kindergarten and first grade exhibit some of the same patterns: English learners perform less well than English-only students, blacks and Hispanics perform less well than whites, and boys perform less well than girls. (Data are not available on parent education or economic status.) The same patterns are evident across the various data sources we consulted for measures of school readiness early in kindergarten. Groups that perform less well against the CST standards in second and third grades also trail on both cognitive and socioemotional readiness measures early in their kindergarten year.

Table S.1 summarizes these proficiency gap patterns and some others applying to different groups of children. The data sources are in columns, beginning on the left with school readiness measures and ending with the right-hand columns presenting CST results for second- and third-grade English-language arts and mathematics. Each row reports a set of different between-group comparisons. In the table cells, the letter indicates which of the two groups in that row is trailing in proficiency or readiness according to the measure in the column head. Where the difference is not statistically significant, the cell is colored light gray. Where it is significant, the colors represent consistency with the majority of results for that row (black) or exception to those results (green). In the cells in the CST columns, where we are able to measure the direction and magnitude of the gaps, the number of daggers indicates the size of the gap between groups: one dagger corresponds to gaps of 5 percentage points or less, two daggers corresponds to gaps between 6 and 20 points, and three daggers corresponds to gaps of more than 20 points.

Because the CST data are based on all students in the grade, we have more confidence in those results than in the other data sources. We have the least

Table S.1—Summary of Who Is Behind: Proficiency Findings Across Data Sources and Groups

	Group Trailing in Performance in Data from Source, Grade, and Measure Named									
	Early Childhood Longitudinal Study–Kindergarten Cohort				Other K Readiness Sources	Reading Lions Center Skills Assessments			California Standards Tests	
	Fall Kindergarten (K)					Fall K	EOY 1	EOY 2	EOY 2 and 3	
Group	EBP	AL	SC	IP		Rdg	Rdg	Rdg	E-LA	Math
Gender										
Male vs. **F**emale	M	M	M	M		M	M	M	M ††	F †
Race-Ethnicity										
Hispanic vs. **W**hite	W	H	H	H	H	H	H	H	H †††	H †††
Black or AA vs. **W**hite	B	B	B	B		W	B	B	B †††	B †††
Asian vs. **W**hite	W	W	A	A		W	W	W	W †	W ††
Other vs. **W**hite	W	O	W	O	O	W	W	W	O †	O †
English-Language Fluency										
English **P**roficient vs. English **O**nly	O	O	O	P		O	O	O	O ††	O ††
English **L**earner vs. English **O**nly	O	L	L	L	L	L	L	L	L †††	L †††
Parent Education										
Not HSG vs. **S**ome College	N	N	N	N	N				N †††	N ††
HSG vs. **S**ome College	H	H	H	H	H				H ††	H ††
College Grad. vs. **S**ome College	C	S	S	S					S ††	S ††
Postgraduate vs. **S**ome College	S	S	S	S					S †††	S †††
Economic Status										
Disadvantaged vs. **N**ot Disadv.	N	D	D	D	D				D †††	D †††

Legend:	
	Group designated in cell trailed other group in performance by statistically significant amount or (for CST) by any amount. Black indicates trailing group in that cell trailed in most cells; green indicates exceptions.
	Group designated in cell trailed other group in performance, but not by a statistically significant amount.
	No data from this source comparing the groups in this row.
†	Group trailed by small magnitude (5 or fewer percentage points).
††	Group trailed by moderate magnitude (6–20 percentage points).
†††	Group trailed by large magnitude (more than 20 percentage points).

SOURCE: See Table 5.1.

NOTES: AA = African American; AL = approaches to learning; CST = California Standards Test; EBP = external behavior problems; E-LA = English-language arts; EOY = end of year; HSG = high school graduate; IP = interpersonal skills; Rdg = reading; SC = self-control.

confidence in the school readiness measures because of the details of sampling and measurement methods. In fact, the lack of consistent data down through the earliest grades prevents a clear understanding of when and how children perform differently. However, we do find consistent patterns for between-group gaps across these different data sources at earlier grades, which suggests that we are likely picking up genuine gaps at earlier ages. The direction of the gaps, with only a few exceptions, are consistent across sources, although we are unable to determine the magnitude of gaps in kindergarten and first grade.

Preschool Programs Appear To Be Promising, but We Need to Verify Scope for Expansion

To answer our third research question regarding the promise of preschool programs to address achievement gaps, we broke it into three parts:

- Which students are failing to meet the state's education goals? This study has demonstrated that the students who start behind and stay behind include English learners, students from economically disadvantaged backgrounds, Hispanics, and blacks. Although these groups show the largest shortfalls in achievement relative to state standards, all groups we considered include a subset of students who do not succeed against the state standards.
- To what extent does participation in high-quality preschool programs produce gains in school readiness and subsequent education performance? To answer this question, we reviewed the available scientific evidence in that regard.

  Scientifically rigorous studies show that well-designed preschool programs serving children one or two years before kindergarten entry can improve measures of school readiness and raise performance on academic achievement tests in the early elementary grades. They can also generate sustained effects on academic achievement into the middle-school years, and produce other education gains such as reduced special-education use and grade repetition and higher rates of high school graduation. The early-grade effects have been demonstrated not only for smaller-scale model programs, but also for larger-scale publicly funded programs currently operating in a number of states, namely Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. For the most part, these findings pertain to programs that serve more disadvantaged students.

However, a universal preschool program in Oklahoma, evaluated as implemented in Tulsa, demonstrates that high-quality preschool programs can benefit children from a range of racial or ethnic and economic backgrounds, at least in terms of readiness measures at the start of kindergarten. At the same time, on the basis of several of the studies we reviewed, it appears that larger effects are found for more disadvantaged students. It remains to be seen whether longer-term effects will be as strong.

This research evidence suggests that several groups of California students who perform at lower levels in the early elementary grades can benefit from well-designed preschool programs. We know less about the potential benefits for English learners. Though several studies show that Hispanic children receive significant benefits from preschool participation, English learners have not been studied as closely.

- Is there scope for expanding the participation of less-proficient groups of children in high-quality preschool programs? Participation in high-quality preschool programs can be expanded only to the extent that children do not already participate in such programs. In a companion analysis that is part of the California Preschool Study, we will be examining newly collected data to determine the extent to which California's children overall, and those who face the largest achievement gaps in particular, participate in high-quality early learning programs. If we find that participation in such programs is lower for students at risk of poor academic performance, it will suggest that there is scope to expand preschool enrollments as a strategy for narrowing early achievement gaps.

A confident answer to our third research question will thus have to await subsequent phases of the California Preschool Study. While awaiting those findings, it will be important to remember that the favorable effects from preschool programs may not be big enough to greatly reduce the large achievement differences highlighted in this study. The magnitudes of the effects of preschool programs on school readiness and other education outcomes reported in the scientific literature, while statistically significant and large in terms of other education interventions, would not be big enough in most cases to bring all students up to proficiency in terms of California's education standards. Nevertheless, the size of the achievement gaps that currently exist and the strength of the evidence of favorable education benefits that derive from well-designed preschool programs together make a solid case for considering

preschool as a component of a multipronged strategy to close achievement gaps in California.