



Five Years of Supplemental Educational Services in LAUSD: Participation and Impact on Student Achievement

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Preface

Seven years after adoption of the No Child Left Behind Act (NCLB) in 2001, lawmakers, researchers, and practitioners continue to debate the merits of the legislation. Current discussions take place under the looming decision over whether or not to reauthorize the act. The provision of supplemental educational services (SES) is only one of many components within the accountability system established by NCLB, yet it reflects two substantial controversies regarding education policy: school choice and privatization.

Under NCLB, school districts must offer low-income students in Title I schools that fail to meet Adequate Yearly Progress (AYP) for three consecutive years the option of receiving free tutoring services outside of regular school hours. Districts are required to allocate 20% of their Title I funds to finance school choice options and SES. Students eligible for SES can apply for tutoring services from any provider that has been approved by the state, and the approved list of providers may include for-profit, non-profit, and faith-based organizations.

This is the third year the Beyond the Bell Branch asked the Division of Accountability and System-Wide Performance to examine SES participation and impacts for students in the Los Angeles Unified School District (LAUSD). Two similar studies of SES in 2004-05 and 2006-07 found low overall SES participation and attendance among eligible students and a small overall impact on California Standards Test (CST) results in English language arts (ELA) and math. This study expands upon our earlier work to analyze SES over the entire five year history of its existence in the district and investigate any multiyear effects of SES utilization.

This study is aligned with Superintendent Brewer's five guiding principles, specifically, decision-making based on data, research and analysis, and reflects the mission of the Division of Accountability and System-Wide Performance to provide feedback to program managers for program improvement.

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Introduction

Since 2002-03, Los Angeles Unified School District (LAUSD) low-income students in Program Improvement schools have had the option of receiving free tutoring services under NCLB. These services are referred to as supplemental educational services (SES) and are available from a state-approved list of providers—including for-profit, non-profit, and faith-based organizations. From 2002-03 through 2006-07, LAUSD spent approximately \$75 million of its Title I funds for SES.

A handful of studies looked at the impact of SES in a single year and found low participation rates with small or no statistically significant effects on academic achievement (Chicago Public Schools, 2007; Rickles & White, 2006; Rickles & Barnhart, 2007; Potter et al., 2007). In 2007, the U.S. Department of Education released the first in a series of reports on NCLB, which examined the impact of SES among seven large, urban school districts—including LAUSD. In addition to examining the effects of participating in SES for one year, the Department of Education report explored the effects of SES for more than one year, and concluded there were “statistically significant average effects in both reading and math for participants in supplemental services, with evidence that students participating for multiple years saw accumulating benefits in both subjects” (Zimmer et al., 2007, p. 31). The Department of Education study did not specifically identify the impact for LAUSD students and had some methodological limitations.

To further investigate the impact of SES in LAUSD, including potential cumulative effects, we examined the pattern of SES participation and impacts on student achievement over the history of the policy’s existence in the district (from 2003 to 2007). Our study relied on SES participation data provided by the Beyond the Bell Branch and student CST performance data. We used a value added model to estimate the impact of SES participation on CST scores. Appendix A provides a more detailed description of our research methods.

Overall, our analysis indicates low SES participation rates within years and over time. Among students who applied for SES, attending a SES program had a substantively small effect on student performance in 2007 and we found no consistent evidence of a benefit to receiving SES over multiple years. Our report expands on these general conclusions in three separate sections:

1. analysis of participation rates and exposure to SES within years and over time;
2. analysis of the SES impact on student achievement within years; and
3. analysis of the relationship between within year and across year exposure to SES and student achievement.

Since students are not required to attend SES, it is important to understand who utilizes the services before examining the impact such services may have on test score performance. In this section, we present three different looks at SES utilization. First, we describe SES utilization during the 2006-07 school year to understand current levels of participation. Next, we put the current participation rates in historical perspective through a discussion of the within-year utilization rates during the five-year history of SES. We conclude the section with an across-year description of SES utilization for a sense of SES participation over time.

SES Utilization in 2006-07

In 2006-07, over 300,000 of the district's 723,000 students were eligible for SES, yet a very small proportion of eligible students actually received services. Figure 1 shows how many students enrolled in the district were eligible for, applied to, or attended a SES program. Most eligible students did not even apply for SES (12%).

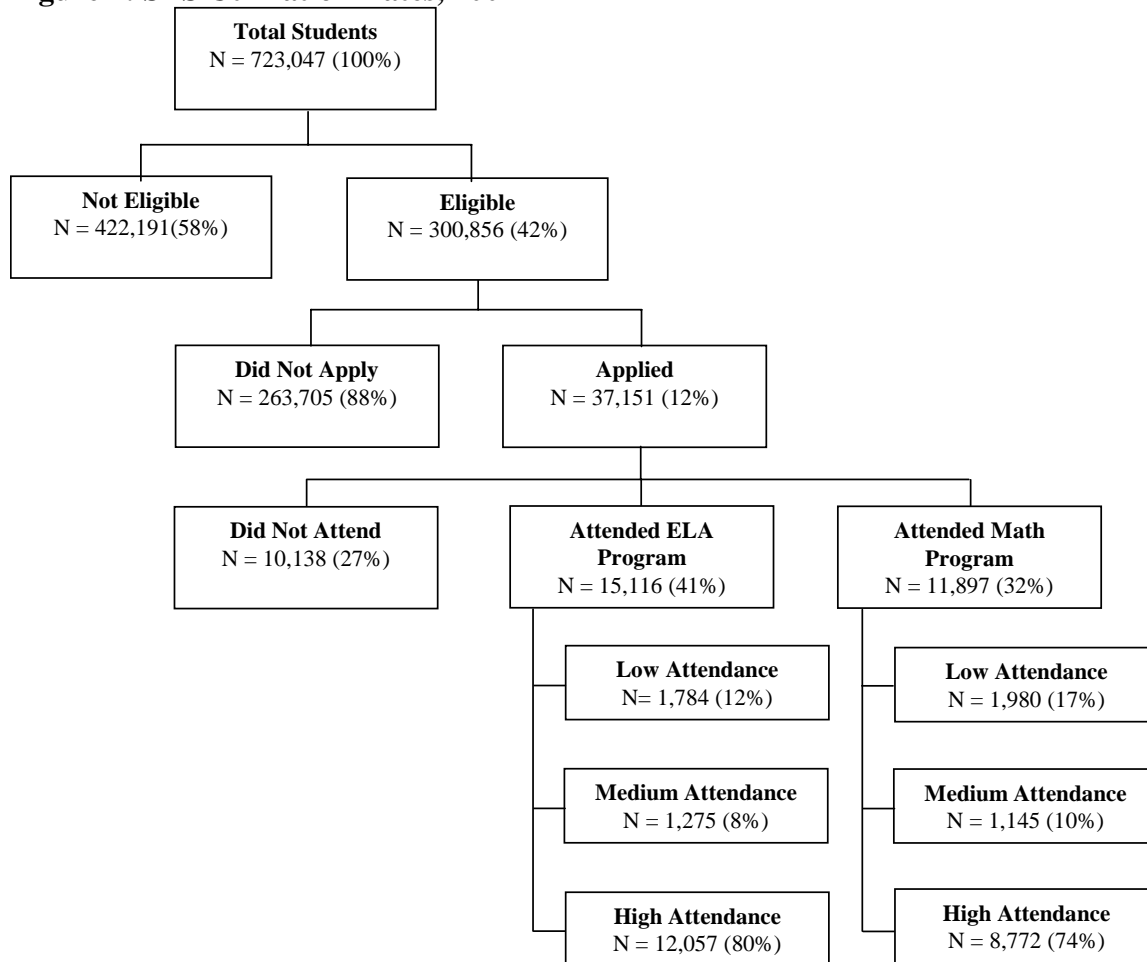
When students applied, most of them did receive services. LAUSD received applications for over 90% of the roughly 40,600 slots available for SES in 2006-07 (based on the amount of Title I funding allocated to SES that year) and about two-thirds of the slots were filled with students who ultimately attended a SES program. Of the 37,151 students who applied, nearly three-quarters attended a SES program: 15,116 (41%) attended an ELA-based program and 11,897 (32%) attended a math-based program.

Participating student did not necessarily receive all the service hours available to them, however. Among the students who attended a SES program, 14% attended less than half of the program's total hours (low attendance), 9% attended at least half but less than nine-tenths of the program's hours (medium attendance), and 77% attended at least nine-tenths of the program's hours (high attendance). The fact that many participating students were not exposed to the full SES program has implications for how one interprets the impact analysis in the following section. (Table B1 in Appendix B provides a similar breakdown of utilization rates for each year from 2003 to 2007.)

Few eligible students, roughly one-in-eight, applied for SES and almost a third of the students who applied did not attend, but we did not find dramatically different characteristics between students who attend and those who did not attend or apply. Table 1 presents the student characteristics by eligibility, application status, attendance status, and program subject. The demographics presented in this table are the same ones we controlled for in the value added model discussed in the next chapter and Appendix A.

Perhaps the most important distinction among the groups is that elementary students (grades K-5) were over-represented in the applied and attended categories, while middle school (grades 6-8) and senior high school (grades 9-12) students were under-represented. Elementary grade students accounted for 28% of all eligible students but 49% of those who attended were elementary grade students. Middle school students who applied to SES were more likely to attend than senior high school students. Additionally, elementary students were over-represented among those who attend ELA programs, while middle and senior high school students were over-represented in math programs.

Figure 1: SES Utilization Rates, 2007



Note: percentages are out of the population in the category directly above.
 Low Attendance = 1% to 49% of program hours
 Medium Attendance = 50% to 89% of program hours
 High Attendance = 90% to 100% of program hours

Table 1: Student Characteristics across SES Utilization Groups, 2007

Student Characteristics	All Eligible Students	Application Status		Attendance Status		Attendance by Subject	
		Did Not Apply	Applied	Did Not Attend	Attended	Attended ELA	Attended Math
Number of Students	300,856	263,705	37,151	10,138	27,013	15,116	11,897
School Level (%)							
Elementary School	28.1%	25.6%	45.9%	38.2%	48.8%	63.8%	29.6%
Middle School	37.6%	38.3%	33.0%	31.8%	33.4%	26.5%	42.2%
Senior High School	34.3%	36.2%	21.1%	30.1%	17.8%	9.6%	28.2%
Gender (%)							
Female	48.9%	49.1%	47.7%	48.0%	47.6%	44.5%	51.6%
Male	51.1%	50.9%	52.3%	52.0%	52.4%	55.5%	48.4%
Ethnicity (%)							
African American	9.3%	9.2%	10.2%	14.5%	8.6%	5.8%	12.2%
Asian/Pacific Islander	1.8%	1.9%	1.5%	2.0%	1.3%	1.4%	1.2%
Hispanic	84.9%	84.9%	85.3%	79.9%	87.4%	90.7%	83.1%
White	2.3%	2.4%	1.6%	1.9%	1.5%	1.2%	2.1%
Other	1.6%	1.7%	1.3%	1.7%	1.2%	1.0%	1.4%
Language Status (%)							
English Only	19.7%	19.7%	19.8%	26.0%	17.4%	13.8%	22.0%
Initially Fluent (IFEP)	7.9%	7.8%	8.7%	8.0%	8.9%	9.2%	8.5%
Redesignated (RFEP)	32.5%	33.4%	25.6%	24.1%	26.2%	20.9%	32.8%
English Learner	39.9%	39.1%	46.0%	41.9%	47.5%	56.0%	36.7%
Students with Disabilities (%)	11.9%	11.5%	14.5%	15.2%	14.3%	14.2%	14.3%
GATE (%)	7.3%	7.5%	6.1%	6.1%	6.1%	6.0%	6.1%
Parental Education (%)							
College Degree	11.5%	11.3%	12.9%	13.6%	12.6%	10.7%	15.1%
High School Degree	14.5%	14.4%	15.7%	14.8%	16.0%	14.9%	17.4%
No HS Degree/ Unk.	74.0%	74.4%	71.4%	71.6%	71.4%	74.4%	67.5%
2006 CST Proficiency* (%)							
ELA	20.5%	20.7%	19.2%	18.6%	19.4%	17.7%	20.9%
Math	21.2%	20.9%	23.7%	20.5%	25.0%	36.2%	14.7%

*Restricted to students with valid CST data in the 2005-06 school year.

In general, historically disadvantaged students were as likely, if not more likely, to utilize SES. Although African American students were slightly over-represented among SES applicants, they were slightly under-represented among SES attendees. Hispanic students were over-represented in ELA attendance and under-represented in math attendance. The opposite was true for African American students, who were more likely to attend a math than an ELA program. Compared to other students, English learners were more likely to apply and attend SES and much more likely to attend ELA programs than math programs. Students with disabilities were slightly more likely to apply and attend SES than students without disabilities.

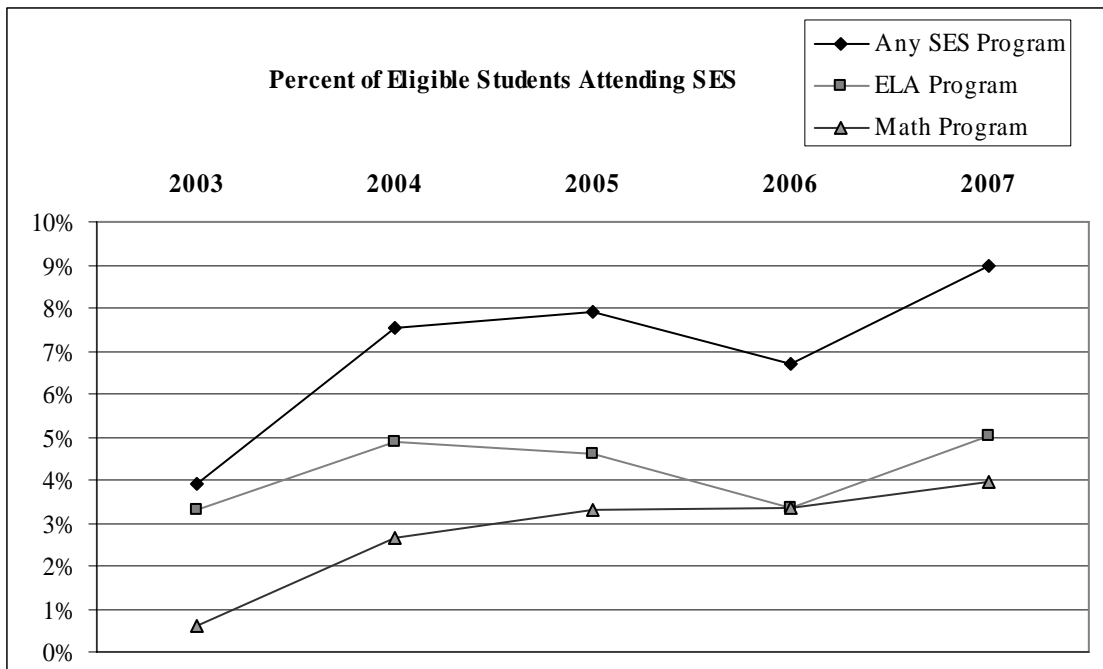
Students who did better on the prior year’s math CST were more likely to attend an ELA program and students who did better on the ELA CST were more likely to attend a math program. This pattern is clear when we look at the percent of students who scored proficient or advanced on the 2006 ELA and math CST. Students who scored proficient or advanced on the math CST were over-represented in ELA programs, while the opposite was true for students in the math programs.

Within-Year SES Utilization

From 2003 to 2007, the number of students eligible for SES in the district increased from 163,706 to over 300,000. The increase in eligible students was driven by the fact that more and more schools failed to make AYP for the third year (i.e., entered their second year of Program Improvement). Overall, the within-year SES utilization rates among the eligible population also increased during this period. Although relatively low, the percentage of eligible students attending SES more than doubled from 4% in 2003 to 9% in 2007 (see Figure 2).¹ Higher SES participation rates were largely through increased participation in SES math programs, which increased from less than 1% in 2003 to 4% in 2007.

One should note that while the participation rates among all eligible students are low, the percent of available SES slots—based on the amount of Title I funding allocated to SES in a given year—filled was much higher. As mentioned earlier, LAUSD received applications for over 90% of the roughly 40,600 slots available for SES in 2007, which was a marked increase from earlier years when applications were received for only about 50% to 60% of the available slots.

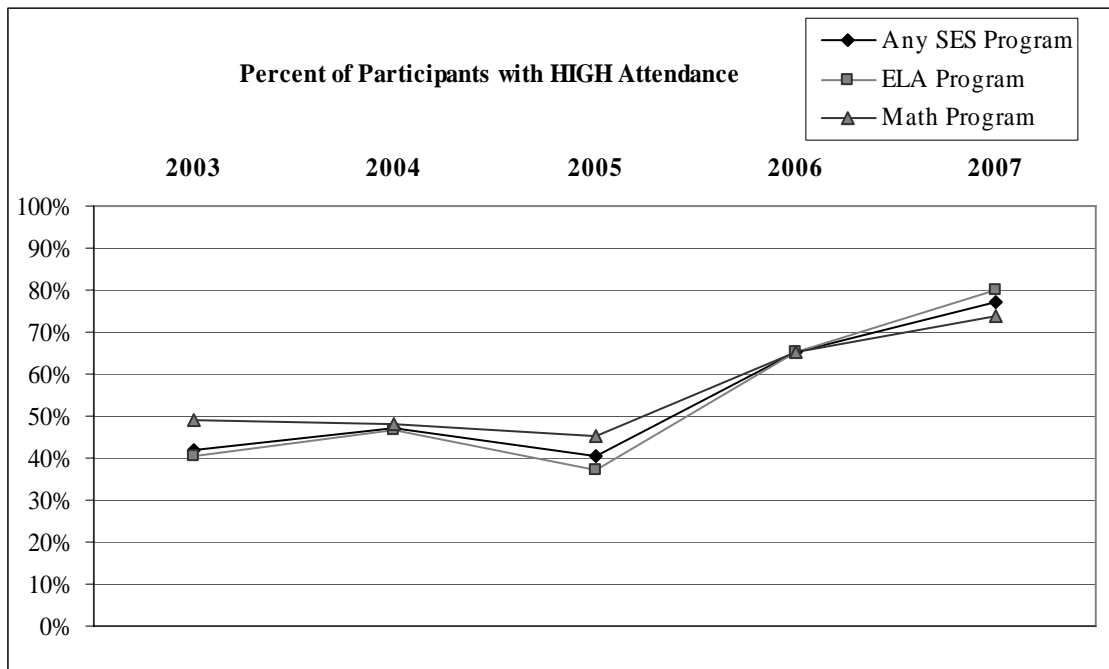
Figure 2: Increase in Percentage of Eligible Students Attending SES, 2003 to 2007



¹ The district was a SES provider from 2003 through 2005. The dip in attendance in 2006 may be the result of the district no longer providing services. If so, the rebound in 2007 suggests that non-district providers were able to accommodate possible gaps in services provision.

The five-year history of SES also included a dramatic increase in the percent of participants with high attendance. The percentage of participants with high attendance (at least 90% of total hours) nearly doubled from 42% in 2005 to 77% in 2007 (see Figure 3).² However, the actual number of service hours received by the average student did not go up as dramatically. The average hours attended by SES participants increased by about seven hours for ELA and eight hours for math from 2003 to 2007. By 2007, the average SES participant received about 30 hours of tutoring services.

Figure 3: Increase in Percentage of Participants with High Attendance, 2003 to 2007



Across-Year SES Utilization

Over 550,000 students were eligible for SES in the district at some point during the district’s five-year history with SES (2003 to 2007). The multiple layers of SES participation within a single year described above are exponentially compounded when looking at SES utilization across years. We focused on different student cohorts for our description of SES utilization over time to exemplify the longitudinal trends.

Most eligible students never applied for SES services and of those exposed to a SES program, very few chose to attend more than one year. Of all the students ever eligible for SES services in the district, a third were only eligible in one of the five years, a third were eligible in just two of the five years, and another third were eligible for three or more years. Only a small handful of students received services in the same subject for more than three years. Among those ever eligible for SES, only 12% attended a SES program in at least one of the five years and less than 1% attended more than three years. Even among students with at least three years of eligibility, only 18% attended at least one year of SES and 1% attended three or more years. Among the cohort of students attending a SES program in 2006-07, almost three-fourths were in at least their second year of eligibility, yet 70% were attending a SES

² The post-2005 increase in high attendance rates may have been influenced by the fact that 2005 marked the last year the district was a SES provider. However, other district forces were also at play during this time period—namely an increased effort to increase attendance rates.

program for the first time. Table B2 in Appendix B presents the eligibility and participation rates across years for five student cohorts: those ever eligible, those eligible for at least three years, those who attended in 2003, those who attended in 2005, and those who attended in 2007.

The lack of SES uptake over time is exemplified by the low percentage of students that attended a SES program beyond one year. The decline in SES participation for the cohorts attending SES in 2003 and 2005 is displayed in Figures 4 and 5, respectively. Less than half of the 2003 cohort, and less than a quarter of the 2005 cohort, attended more than one year of SES. The numbers are even smaller when one looks at repeat participation in the same subject matter. For the 2003 cohort, 23% participated in an ELA program for at least two years and only 7% participated in a math program for at least two years. The multiyear participation rates for the ELA and math programs were only about 8% for the 2005 cohort. Even among students who attended at least one year of SES and were eligible for at least three years, only 30% attended two or more years and 8% attended three or more years (not shown in figure).

A consumer choice policy such as SES can only be effective if the eligible population actually receives the available services. Numerous factors could influence the levels of uptake we observed for SES. For example, families may not have adequate information about the available services, there may be gaps in available services across the district, or the program’s benefits may not outweigh the opportunity costs associated with attendance. This study does not directly address the question of why some students choose to participate and others do not. However, the lack of “repeat customers” documented above highlights the importance of studying the potential breakdown in market forces, as well as the expected benefit of SES participation.

Figure 4: Decline in SES Participation for 2003 SES Attendees

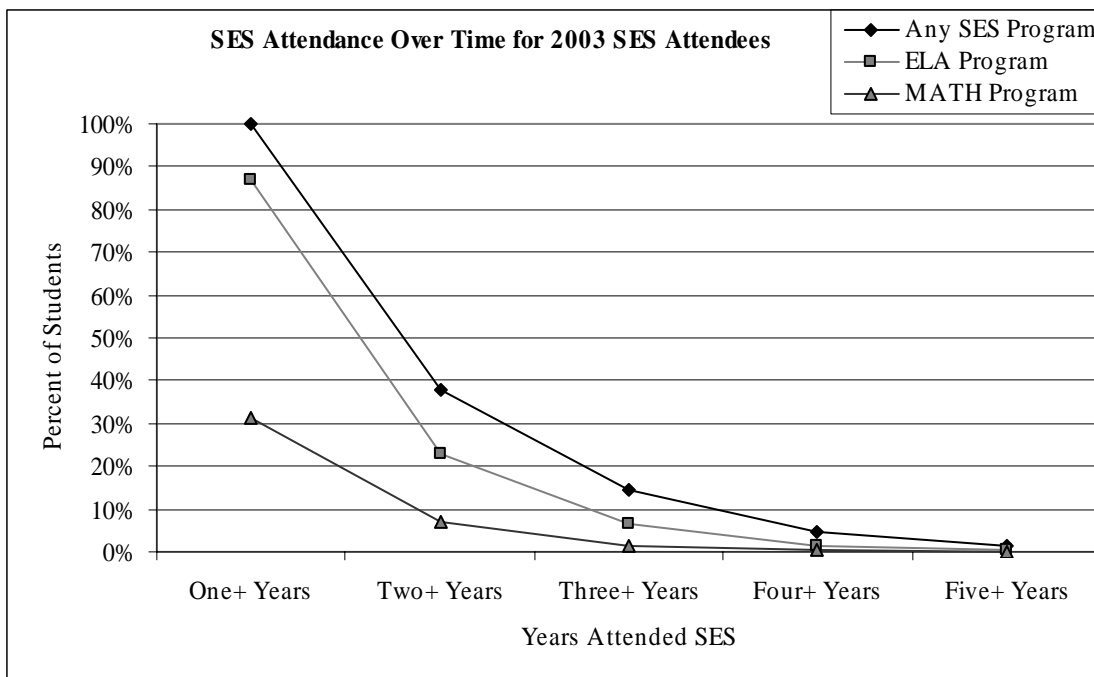
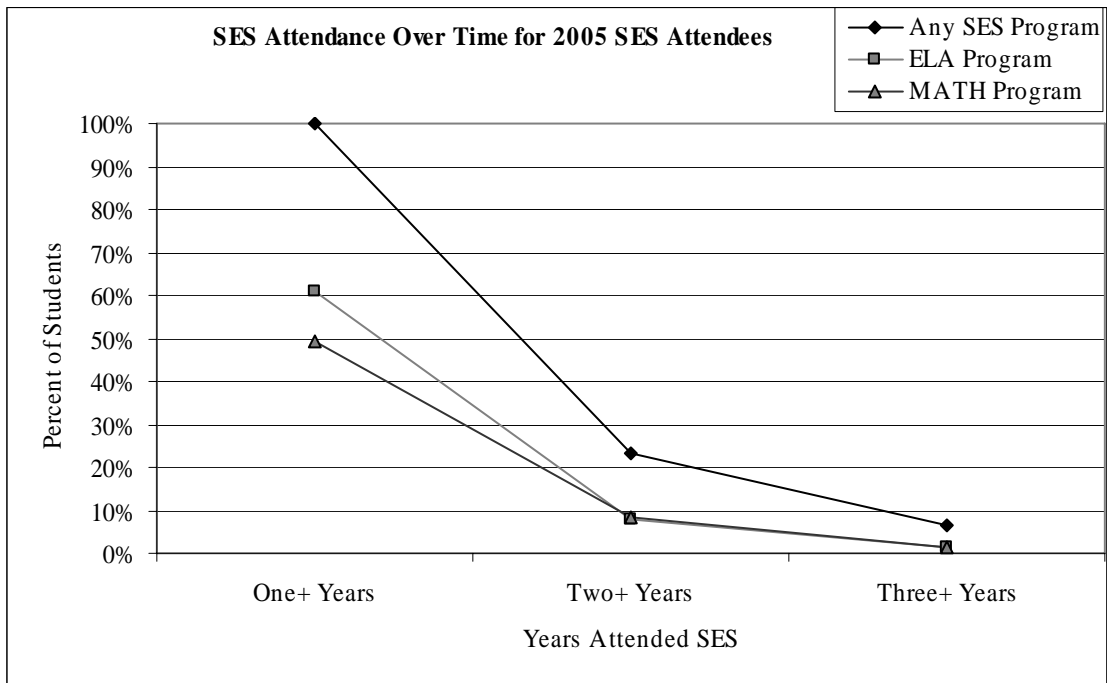


Figure 5: Decline in SES Participation for 2005 SES Attendees



We present our analysis of the SES impact on student performance by first describing the value added results for students eligible for SES and the estimated impact of SES participation during the 2006-07 school year. Next, we put the current levels of performance in historical perspective through a discussion of the year-to-year impacts during the five-year history of SES.

The designed self-selection process of the SES policy allows for a comparison of test performance for those who received the services and those who did not, but makes it difficult to isolate the impact of SES from other factors influencing attendance and performance, such as motivation. The value added approach allows us to measure how much an individual student's test performance differed from the average student in the district with similar previous test performance and other measurable student characteristics. A positive value added means the student did better than expected and a negative value added means the student did worse than expected. We can estimate the impact of SES participation as the difference between average value added for the participating group and the average value added for the non-participating comparison group. See Appendix A for a more detailed discussion of the value added method.

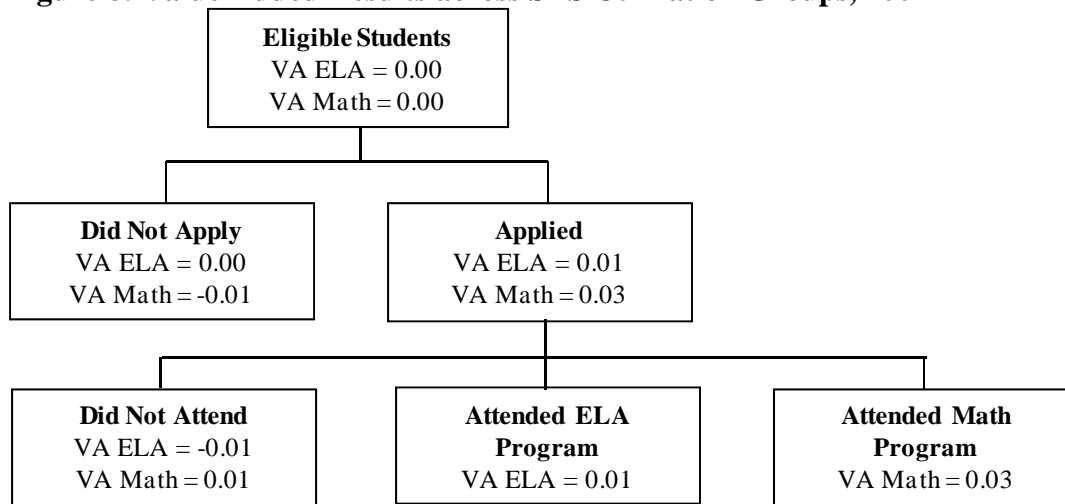
Impact of SES in 2006-07

We calculated value added estimates for each level of SES utilization in 2006-07 (see Figure 6). Eligible students who did not apply for SES services performed as expected, on average, on the ELA and math CST (with a value added of 0.00 and -0.01, respectively). Those who applied but did not attend also did about as well as expected, on average, with a value added of -0.01 and 0.01 on the ELA and math CST, respectively. Since neither of these groups was exposed to a SES program, we would expect their value added to be zero. For the group of students that attended an ELA program, their value added for the ELA CST was also close to zero (0.01). The students who attended a math program had a slightly higher value added score for the math CST (0.03). Throughout the analysis we only examine ELA CST performance for ELA program participants and math CST performance for math program participants.³

Given these value added results, we estimated the average impact of the SES policy to be 0.02 for both ELA and math programs—using the applied but did not attend group as the primary comparison group. The size of this impact represents a statistically significant difference, but is substantively very small—an effect size of about 0.04 to 0.05, or about two scale score points.

³ This may seem like an obvious analytic approach, but other studies on SES effectiveness did not identify which subject participants received tutoring in, and thus examine ELA and math performance for all participants (Zimmer et al, 2007).

Figure 6: Value Added Results across SES Utilization Groups, 2007



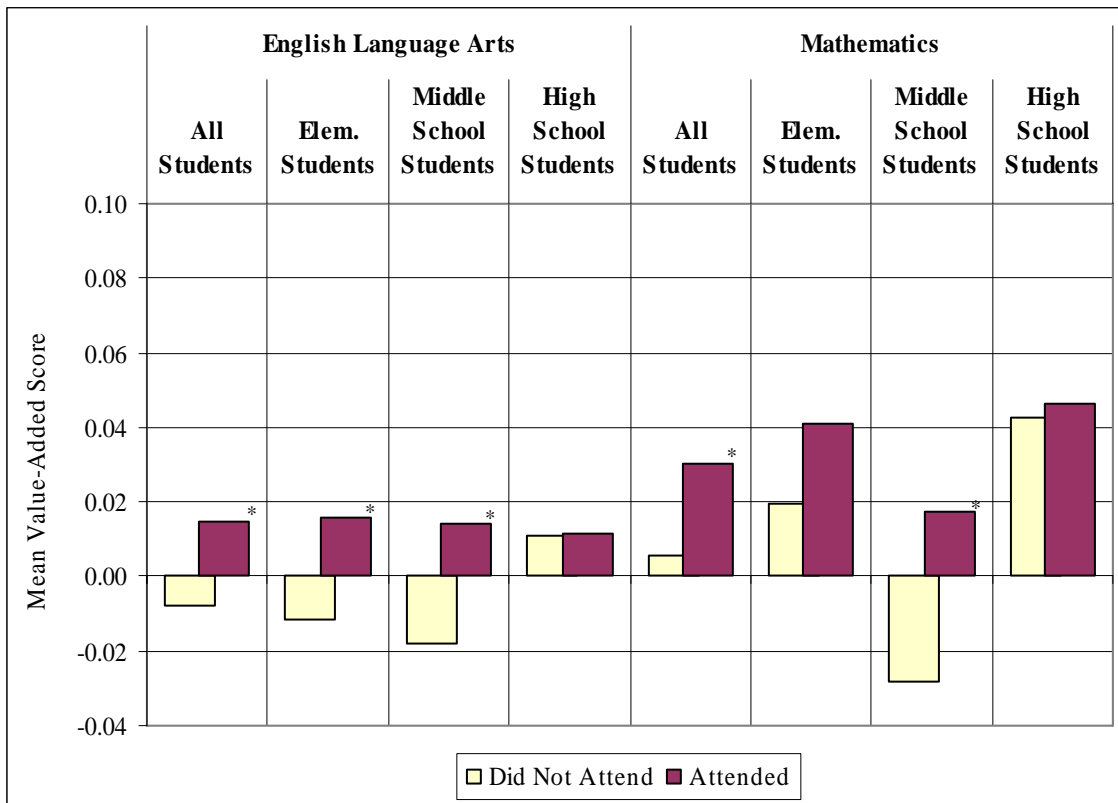
Note: VA=value added.

Given the disproportionate participation patterns across schooling levels described in the previous section, it makes sense to examine the SES effects by grade. Prior studies of SES found a greater impact on student performance for elementary grade students than middle or high school students (Chicago Public Schools, 2007; Rickles & White, 2006; Rickles & Barnhart, 2007). For 2007, we did not find this to be the case.

Figure 7 shows the estimated impact of SES by schooling level. The difference in ELA value added between students who attended an ELA SES program and those who did not attend a program was statistically different among elementary and middle school students, but not high school students. The size of the ELA impact was similar for both elementary and middle school students (a value added difference of about 0.03 points). For math, the only statistically significant impact was among middle school students (a value added difference of about 0.04 points).

While our focus is on the overall SES policy impact and not specific program effects, examining variation in effects across providers creates additional insights into the overall effectiveness of SES. Given variations in SES services across providers, one would expect variations in the impact on student performance across providers. Average student value added scores did, in fact, differ by provider (see Figures B1 and B2 in Appendix B). However, only a few statistically significant differences existed. Additionally, when compared to students who applied to the same provider but did not attend, only three providers had a statistically significant impact on ELA performance and two had a statistically significant impact on math performance. For ELA and math, the largest average, statistically significant, impact for a provider was an effect size of about 0.30, or about 10 scale score points.

Figure 7: Estimated Impact of SES by Schooling Level, 2007



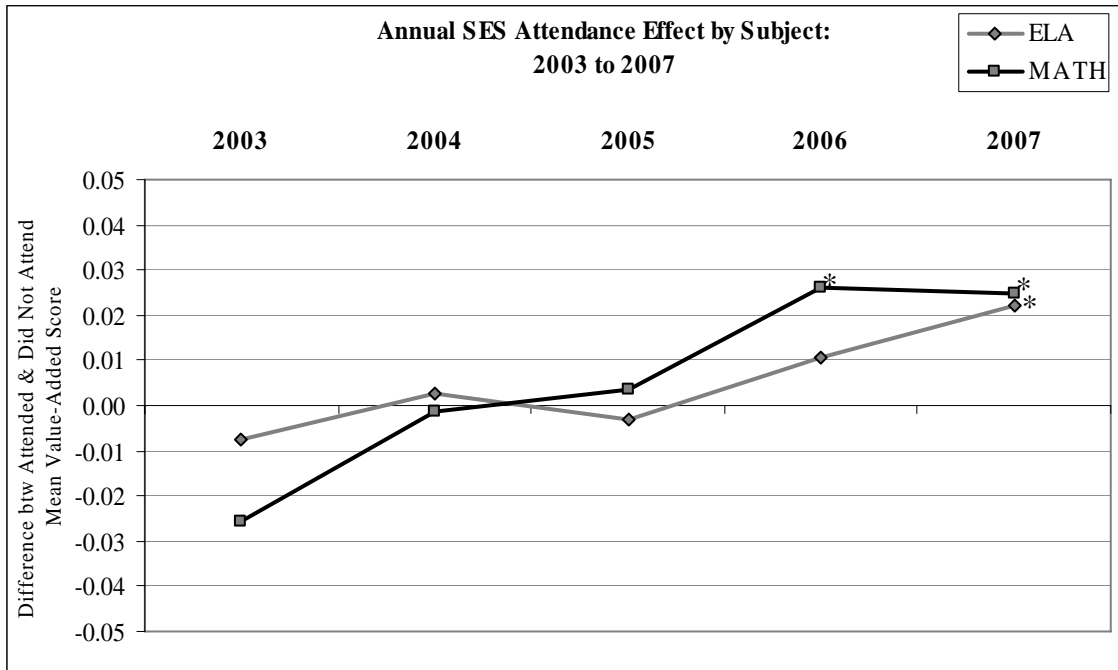
* statistically significant difference compared to “did not attend” group ($p < 0.05$).

Annual Impact of SES from 2003 to 2007

The overall estimated impact of SES for the 2006-07 school year is substantively small, yet it marks an improvement in the annual impact of SES over its five-year history. Figure 8 displays the year-to-year impact of SES from 2003 to 2007. The annual numbers represent the difference in average value added for those attending an ELA or math SES program and those who applied but did not attend in a given year. In the first three years of SES (2003 to 2005), students in an ELA or math program did not exhibit a statistically different value added score than their peers who applied but did not attend. In 2006, the value added for those attending a math SES program increased significantly relative to those who applied but did not attend. As in 2007, however, the impact of attendance is not sizable from a practical standpoint—an effect size of about 0.05 or about two scale score points on the CST. The impact of ELA SES programs also increased from 2005 to 2007, but 2007 marks the only year the difference between participants and non-participants was statistically different. And again, the impact is substantively small.

The upward trend in the SES impact mirrors the trend in the percent of participants with high attendance presented in Figure 3. If SES has any impact on student performance, a relationship between full receipt of the program services (high attendance) and student performance makes sense. We will explore this relationship in more detail in the next section.

Figure 8: Annual Impact of SES Attendance from 2003 to 2007



* statistically significant effect ($p < 0.05$).

In this section we use the value added scores to shed some light on one of the lingering issues related to the impact of SES on student performance: participants received different amounts of tutoring services. In the previous section we focused on the average effect for all SES participants and briefly examined variations across providers. Here we focus on the relationship between exposure to SES and student performance. In the previous chapter the primary question was whether those who attended a SES program experienced higher value added than those who applied but did not attend. To estimate variations in the SES effect based on exposure, we must ask whether a student receiving more services did better than a student receiving fewer services.

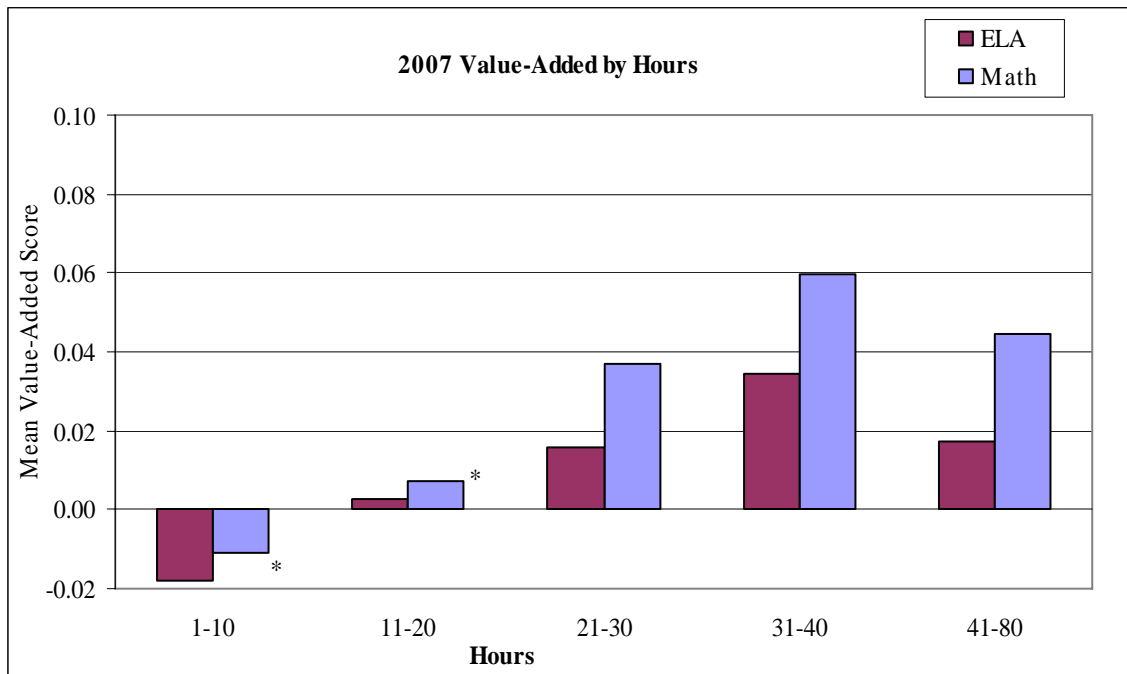
Exposure to SES during 2006-07

In 2007, the range of possible program hours across providers was 20 to 80, with an average of 30 hours. Of the 15,116 students who attended an ELA program and 11,897 students who attended a math program, nearly 50% attended 21 to 30 hours and only 2% attended over 40 hours. Figure 9 shows the relationship between value added scores and the number of hours attended. Value added scores for students with relatively low hours of service were negative, meaning, on average, students who attended 1-10 hours of SES performed worse than expected. On average, students who completed more than 11 hours of service performed better than expected, although there was a decline in average value added between students with 31-40 hours and those with 40-80 hours. However, very few students (2%) are represented in the over 40 hours category and the estimated impact is not statistically different from the other categories. In fact, the only statistically significant differences occur in math participation between the lower participation groups (less than 20 hours) and the 31 to 40 hour group. The greatest difference between groups—the 1 to 10 hours group and 31 to 40 hours group—resulted in a value added difference of 0.07 points. Meaning, on average, students who attended 31 to 40 hours of math SES obtained about four CST scale score points more than students who attended 1 to 10 hours of math SES.

The number of SES hours participants received was not strongly related to performance, but the number of hours might be confounded by the type of tutoring program offered by different providers. Another way to examine exposure to SES is based on whether a student attended all the hours prescribed by whichever program they attended. To explore the relationship between receipt of all, some, or little of a SES provider's services, we compared value added performance among the low attendance (less than 50% of a programs hours), medium attendance (50% to 89% of the hours), and high attendance (90% to 100% of the hours) groups discussed earlier in the report (see Figure 1). If a meaningful SES effect exists, one would expect students who received all a program's services to out-perform students with no, or little, exposure to SES.

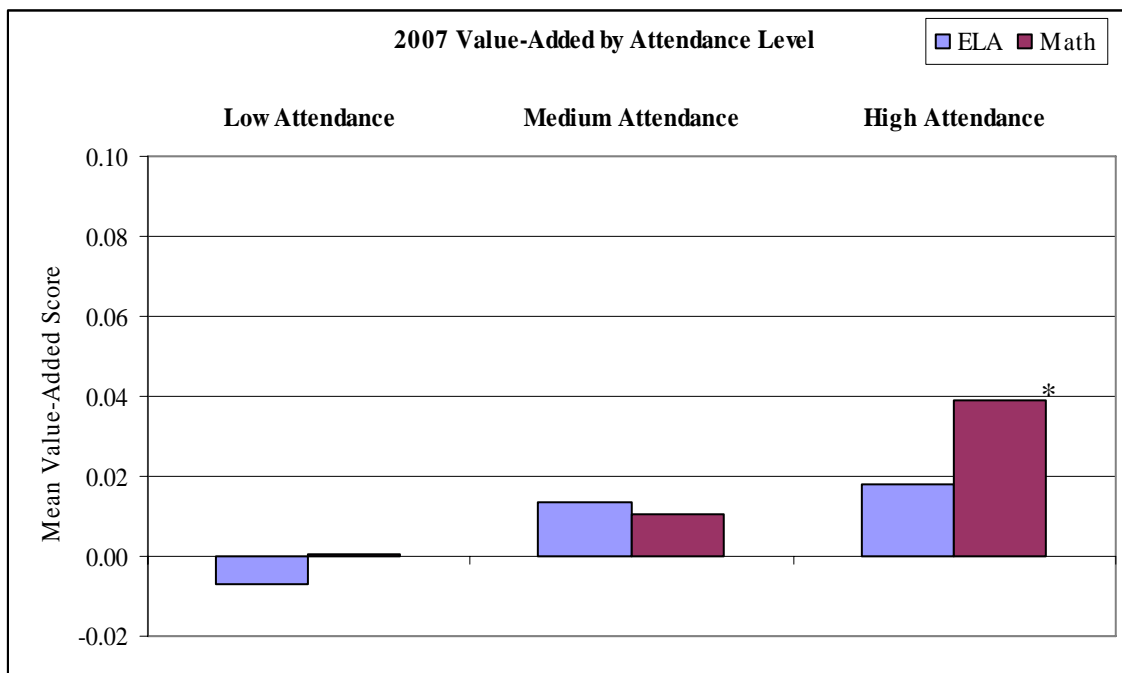
The attendance level data in Figure 10 shows that students with medium attendance rates in ELA and math SES programs preformed, on average, better than those with low attendance rates and students with high attendance rates preformed better than both the low and medium groups. However, the only statistically significant difference in value added occurred between low and high math attendance groups. The difference in math among students attending almost all a provider's hours of service compared to students with very few hours of service was about 0.04 value added points, or about two CST scale score points. Even in the best case scenario, SES does not appear to have a meaningful impact on student performance in a given year.

Figure 9. Relationship between Value Added Scores and Hours Attended, 2007



* statistically significant difference ($p < 0.05$) from 31-40 hours of math SES attendance.

Figure 10: Relationship between Value Added Scores and Attendance Levels, 2007



* statistically significant difference ($p < 0.05$) from low attendance group.

Exposure to SES over Multiple Years

To examine the impact of attending SES over multiple years, our main question was whether a student attending SES for three years experienced higher value added than the student who attends for two, and whether both had higher value added than their peer who only attended one year. For a more concrete example, imagine three students attending an ELA SES program for the first time: Maya, Ian, and Josephine. At the end of the first year only Ian and Josephine decide to attend for a second year, and at the end of the second year only Josephine decides to attend for a third year. Did the second year of attendance result in higher than expected CST scores for Ian and Josephine in the second year relative to Maya? Did the third year of attendance result in higher than expected CST scores for Josephine in the third year relative to Ian and Maya?

Essentially, we sought to assess the marginal effect of SES attendance over time. To estimate this effect, we focused on the cohort of students who first attended a SES program in 2005 and compared their cumulative value added results over three years (2005 to 2007) based on whether they attended one, two, or three years during that period. To improve the comparison, we restricted the analysis to students who were eligible during all three years and excluded students with a non-linear attendance pattern (i.e., attended in year one and three but not year two).

Complicating this approach is the fact that—as we documented in Chapter 1—very few students actually participated in a SES program for more than one year. Of the 3,973 students who met our criteria for ELA, 3,620 (91%) attended one year, 248 (6%) attended two years, and 105 (3%) attended all three years. For math, 3,070 (84%) of the 3,670 students meeting our criteria attended one year, 419 (11%) attended two years, and 181 (5%) attended all three years. The selectivity of multiple year participation must be considered when interpreting the results of our analysis.

Over the three years examined, we found no statistically significant effect of multiple year attendance in ELA or math. The three-year trend for ELA is suggestive of a positive effect in the second year of participation but not the third (see Figure 11). Students who attended two or three years of an ELA program experienced an increase in their value added in the second year, on average, while those only attending in 2005 had a slight decline. In 2007, third year participants had no change in their value added, on average, while those with two years of participation saw their value added decline in 2007. In each of the years, however, the average value added is not statistically different between the three groups.

The three-year trend for math shows no signs of a benefit to multi-year attendance (see Figure 12). By 2007, students attending a math SES program in only the first year actually had a higher cumulative value added, on average, than those with two or three years of math SES participation. The three year participants actually exhibited worse value added over time. The only statistically significant difference in the cumulative value added was between the two-year and three-year students in 2006, when both groups had equal exposure to SES. This finding, along with the downward trend for three-year participants, suggests that these groups of students had different experiences with SES and likely with other, unobserved, factors related to SES participation and student performance. A thorough study aimed at identifying these factors is required to truly measure the cumulative impact of SES.

While our analysis of cumulative effects of SES lacks the straightforward comparison group used for our analysis of the annual impact of SES, the non-significant findings are consistent with the rest of the data presented in this report. Given that we found very small or no statistically significant effects within each year of SES availability, a large effect from multiple years of participation was not expected.

Additionally, low participation rates, particularly beyond one year, are consistent with the finding that attending SES does not significantly impact CST performance.

Figure 11: Effect of Attending an ELA SES Program Over Multiple Years (2005 Cohort)

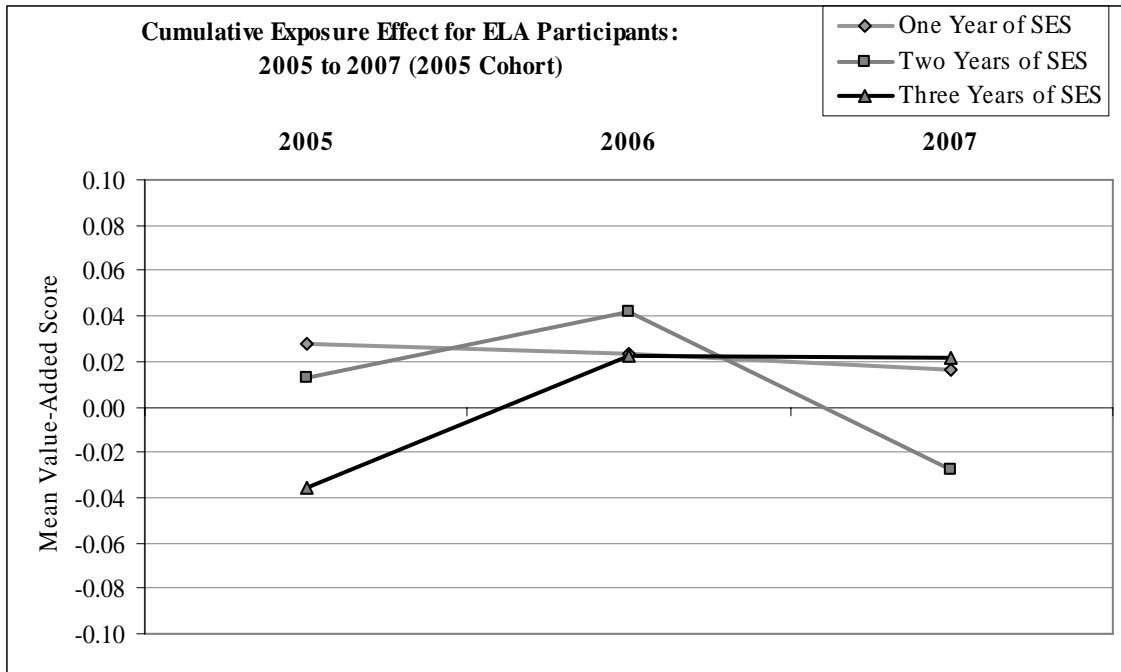
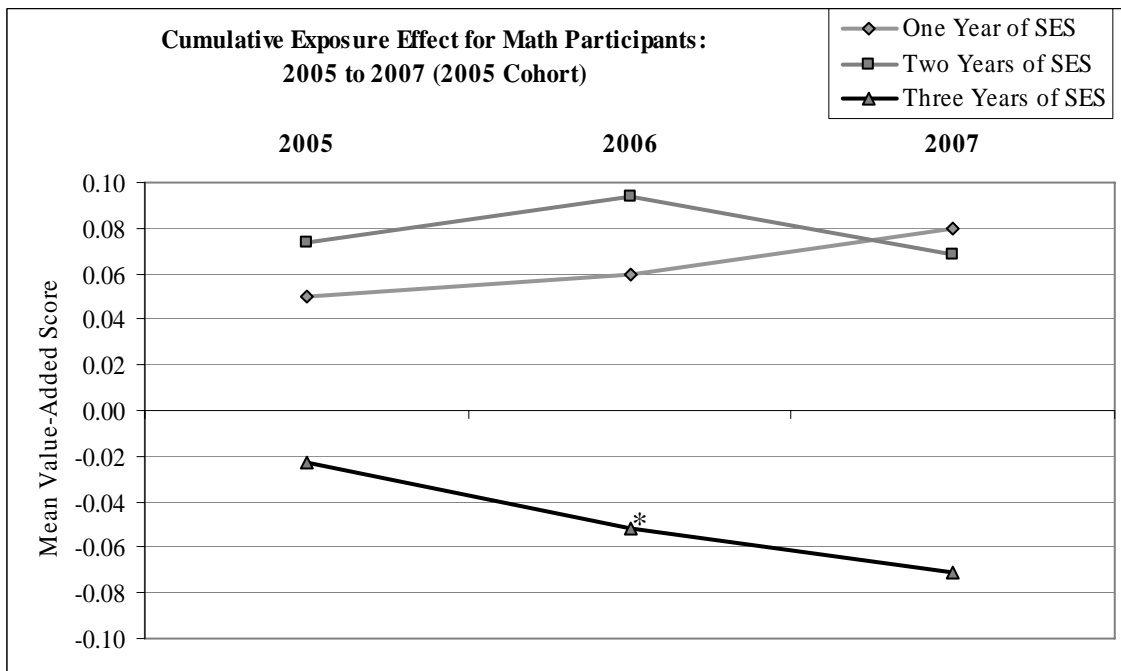


Figure 12: Effect of Attending a Math SES Program Over Multiple Years (2005 Cohort)



* statistically significant difference ($p < 0.05$) from other group values in that year; all other values not statistically different from other group values in a given year.

None of our findings suggest the federal policy to allocate Title I funds for SES has had any meaningful impact on student achievement over its five-year history in LAUSD. In fact, given the limitations of our analysis, we likely over-estimate the impact of SES. Since we were not able to equate participant and non-participant groups on unobserved characteristics like motivation, and one can reasonably expect participants to be more motivated to improve performance than non-participants, our estimates are biased upward. Additionally, we did not take into account the clustering of participants within schools and/or providers. Adjusting the precision of our estimates to account for clustering would result in a more conservative benchmark for statistical significance (i.e., larger standard errors), and a decrease in the few statistically significant effects we report.

The Department of Education study conducted by Zimmer et al. (2007) reported positive SES effects over seven districts. While we did find a statistically positive effect for SES attendance in ELA and math in 2007, this average effect was at best no more than a few scale score points on a standardized test that ranges from 150 to 600 with a standard deviation of about 60 points. Zimmer et al. failed to discuss the practical magnitude of the effects they found.

Any comprehensive analysis of SES, or NCLB more broadly, needs to consider the policy's cost-effectiveness. In 2007, the state-determined maximum per pupil cost of SES was about \$1,500 in California. Does raising student test scores an average of three or four scale score points justify allocating approximately \$1,500 per student from Title I funds? To address this crucial question one needs to know the alternative ways in which Title I funds are spent and their impact on student performance. LAUSD could make more efficient decisions regarding the allocation of Title I funds through a cost-effectiveness study of all the programs funded through Title I funds. At the very least, findings regarding the impact of SES need to be juxtaposed with data on the impact of the school choice programs that also comprise the NCLB-required 20% allocation of Title I funding.

The Department of Education report also identified a cumulative effect for attending SES over multiple years. We found no evidence of a cumulative effect. While our analytic approach for estimating the effect of SES had much in common with the methods employed by Zimmer et al, important distinctions may explain our different results. First, we are only reporting on one district whereas the Department of Education report covers seven districts. It may be that our findings accurately portray the cumulative effect for our population of students, whereas their findings provide a more accurate picture for a broader representation of students in the United States.

However, we believe our research design had two main advantages over the Department of Education report and lends itself to a more valid estimate of multiyear effects. We took a longitudinal approach to investigate the cumulative "value added" effect of SES, focusing on the performance of the 2005 SES cohort over three years. The Department of Education report took a cross-sectional look at the multiyear effect by comparing the "value added" for first year participants and multiyear participants within a given year. Additionally, we examined participants in ELA and math SES programs separately while Zimmer et al included ELA and math test performance for all SES participants regardless of the subject for which they received services.

Further inquiry into the multiyear impact of SES may be a mute point given that we found relatively few students participating in more than one year. The consumer-based policy did create a market for tutoring

services, with over 50 providers supplying services to about 27,000 students in the district in 2006-07. However, the vast majority of eligible students never even applied for SES and most students who attended a SES program did not return for a second year. A more detailed investigation into how services and instructional practices differ across providers—and how those differences influence student performance—could help families make more informed decisions regarding which providers to select.

What are the implications of low participation for a policy based on choice? Our study did not examine the specific factors affecting participation, yet it suggests that even families with enough information and interest in SES to participate in one year did not participate a second year. SES is seen as an opportunity for students to receive free tutoring, but participation is far from free. The lack of uptake among students (or families) may reflect myopic decision-making on their part—placing too high a preference on short-term benefits over long-term investments in education. Or, students and families may rationally find the opportunity costs of attending tutoring before school, after school, or on Saturday to in fact be very high, and the benefits fairly low. It is entirely likely that most students and families instinctively, or through their own experience with SES, already knew what our analysis concludes: SES had little impact on student achievement. The district may be able to more effectively tailor SES, or similar programs, by first investigating the reasons eligible families choose to participate or not.

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Appendix A: Data and Methodology

Ultimately, the available data on SES shaped our analysis. LAUSD began keeping records of eligible and participating students in the 2002-03 school year, which was the first year the district was required to offer SES. These records contain the following information on students eligible for SES in each school year from 2003 to 2007:⁴

- whether the student applied for SES services
- whether the student attended a SES program
- which provider each student applied to and/or received services from
- whether the attending student received services for English/language arts (ELA) or mathematics
- how many hours of services the student received
- how many hours of services were possible for a given provider and subject

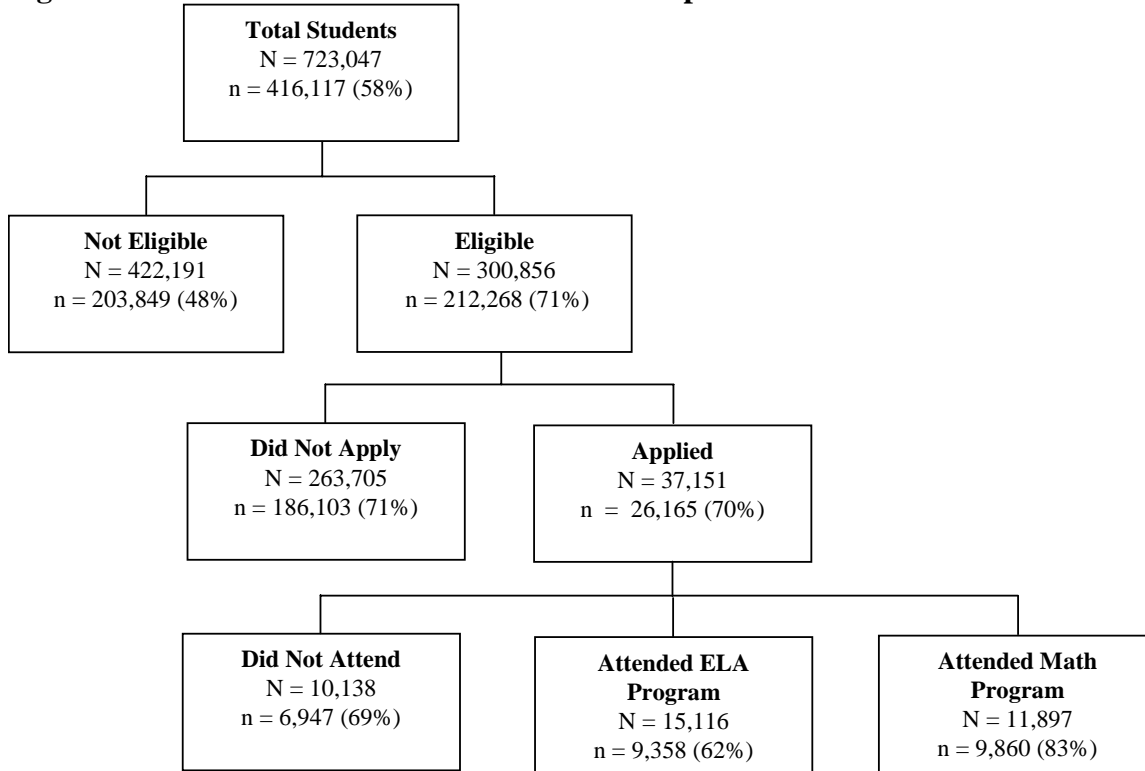
Data on SES participation was linked with student-level demographic characteristics as well as performance data on the California Standards Test (CST). We linked the data on SES participation with two additional sources of student-level information: (1) demographic characteristics from the district's Student Information System (SIS), which includes data such as gender, ethnicity, participation in special education, and eligibility for free and reduced price meals; and (2) annual test scores on the CSTs for students in grades 2-11. We used the combined database to assess the impact of SES participation on changes in CST performance for ELA and math. One might argue that the CST is a blunt tool for measuring SES program effectiveness in a given year. However, because eligibility for SES is based on students' collective performance on statewide assessments, the CST is a relevant tool for measuring the policy effect of SES.

These data allowed us to describe the trends in SES participation for eligible students and to construct comparison groups for estimating the impact of SES attendance on CST performance. Eligible students were included in our analyses only if they were present in the SIS records for a given year.⁵ Included students were subsequently categorized by whether they applied for SES, and if so, whether they actually attended. To get a sense of how many students were in our database for the 2006-07 academic year and how they were categorized, Figure A1 displays the total number of students contained within each category (N) and the number of students that had complete CST and demographic data (n). The main discrepancy between the total number of students in a category and those with complete data is the fact that students in California are only tested in grades 2-11 and our analysis of student performance requires two years of CST data. Our analysis of SES utilization was based on the entire population of eligible SES students (N), but our analysis of student performance was restricted to students in grades 3-11 with at least two years of CST data (n).

⁴ For simplicity we use the end-year to denote the school year. For example, we use 2003 instead of 2002-03 and 2007 instead of 2006-07.

⁵ Approximately 9% of students on the original eligibility list were excluded from our analyses because they did not have demographic data in SIS. In order to be included in the SIS data file, students must have been enrolled in the district for at least one semester. This stipulation provided us with a somewhat more stable eligible population, and was the main reason that students had incomplete demographic data. In addition, the main reason that students had incomplete CST data is that they were missing a CST score for the current year (e.g., students in grades K-1 and grade 12 are not tested) or previous year (e.g., grade 2 students or any student new to the district).

Figure A1: Number of Students in the 2006-07 Population



Describing SES Participation

We had two main objectives in describing SES participation over the course of its five-year history in LAUSD. Since consumer demand may be the ultimate gauge of success for a consumer choice policy such as SES, our first goal was to determine the extent to which families actually took up the option of free tutoring services by characterizing the different levels of participation among the eligible student population. Our second goal was to provide important context for understanding and interpreting the causal analysis of the SES impact on student achievement. To achieve these objectives, we present information on two different levels of SES utilization within a given year:

1. Participation levels—the percent of eligible students who apply for and consequently have some level of participation in an SES program (i.e., they attended); and
2. Attendance levels—the percent of SES participants that attended at least 90% of an SES program’s possible hours (i.e., students who received the full level of services for that specific program);

We then take a longitudinal look at participation levels across the five-year period to examine trends in SES utilization. In Chapter 3 we examine exposure levels, or the overall amount of service hours received by SES participants as it relates to student performance.

A Value Added Approach for Estimating the SES Effect

For this study, we sought to build off of the value added work currently used for research and program evaluation within LAUSD (see Daley & Valdés, 2006). The main benefit of this model is that it enables us to control for potential selection bias in estimating the effect of SES participation. With this value

added approach we created a two-staged method for estimating the impact of SES. In the first stage, we predicted each student’s CST score in a given year (\hat{Y}_{it}), based on CST performance in the previous year and student demographics. To calculate the predicted score for every student with valid ELA and mathematics CST data, we estimated separate OLS regression models for each combination of year, test subject (ELA and math), and grade level progression (or test-taking sequence for high school mathematics).⁶ The regression model for any given year-subject-grade took the following form:

$$\hat{Y}_{it} = \mu + \beta_1 Y_{it-1}^{ELA} + \beta_2 Y_{it-1}^{Math} + \beta_i X_i + \beta_s Z_s$$

In the above equation, Y_{it-1}^{ELA} represents the previous year’s ELA CST score for student i , and Y_{it-1}^{Math} represents the previous year’s mathematics CST score for student i . The prior year ELA and math CST scores were included in the models for both subjects because exploratory analysis of the SES selection process suggested that students with higher prior math CST scores, controlling for ELA performance, were more likely to choose an ELA SES program and vice versa. To improve comparability across grade levels, subject areas, and years, we converted all CST scale scores to standardized scores based on the district mean and standard deviation for each test and year.

As mentioned earlier, we included in the value added model a set of student demographics, X_i , to control for potential differences in student performance that result from pre-existing student characteristics. This set of student demographics included dichotomous variables for the following: gender, ethnicity, English language classification, student with disabilities, gifted and talented student (GATE), and level of parental education. To account for possible differences in performance and SES participation across schools and regions of the district, we also controlled for school-level proportions of the student demographics, Z_s , and the local district of attendance for each student.⁷

Deviations in a student’s predicted CST score (\hat{Y}_{it}) and actual CST score (Y_{it}) that are unaccounted for by the regression model covariates are symbolized by ε_{it} , i.e., the random residual. In a value added framework, the residual can function as the estimated “value added” for the factor of interest, assuming the model controls for all other confounding factors. In the second stage of our design, we compared the average residual for one group (e.g., participants) to the average residual for another group (e.g., non-participants).

Table A1 reports the summary statistics for the overall measures that comprised the design. For the entire population of district students, the CST scale scores ranged from 150 to 600 with a standard deviation of 56 and 75 in ELA and math, respectively. The population means and standard deviations were used to calculate standardized CST scores (with a mean of zero and standard deviation of one) and the standardized scores were used in the regression model to calculate predicted and residual scores.

⁶ For example, separate regressions were used to predict the performance of a student going from Algebra 1 to Algebra 2 and a student going from Algebra 1 to Geometry. Similarly, different regressions were ran for a student taking a 4th grade ELA test two years in a row (presumably due to grade retention) and a student taking the 3rd grade then 4th grade tests.

⁷ It is important to acknowledge the fact that students are nested within schools and, perhaps more relevant to this study, students are nested within providers. We are aware that standard errors may be inflated if such clustering is not taken into account, and address this limitation in the concluding section of the report.

Table A1: Summary Statistics for Student Achievement Measures

	N	Mean	Std Dev	Minimum	Maximum
All Students in 2007					
ELA CST Scale Score	506,640	322.88	55.62	150.00	600.00
Standardized ELA CST Score	506,640	0.00	1.00	-3.34	5.64
Std. Predicted ELA CST Score	414,349	0.03	0.85	-2.50	4.69
Std. Residual ELA CST Score	414,349	0.00	0.52	-3.78	4.38
Math CST Scale Score	492,295	322.76	75.16	150.00	600.00
Standardized Math CST Score	492,295	0.00	1.00	-3.34	5.90
Std. Predicted Math CST Score	403,192	0.02	0.81	-2.35	4.82
Std. Residual Math CST Score	403,192	0.00	0.59	-4.91	4.41
SES Eligible Students in 2007					
ELA CST Scale Score	237,446	310.11	49.31	150.00	600.00
Standardized ELA CST Score	237,446	-0.19	0.90	-3.34	4.64
Std. Predicted ELA CST Score	211,120	-0.17	0.75	-2.50	4.12
Std. Residual ELA CST Score	211,120	0.00	0.51	-3.66	3.53
Math CST Scale Score	230,386	301.72	61.71	150.00	600.00
Standardized Math CST Score	230,386	-0.17	0.90	-3.34	5.90
Std. Predicted Math CST Score	205,092	-0.15	0.70	-2.35	4.82
Std. Residual Math CST Score	205,092	0.00	0.57	-4.85	4.41

Unlike the use of a simple change score in test performance, the use of predicted and value added scores improves our ability to make causal inferences in two important ways. First, the predicted scores help equate participant and non-participant groups, since the regression model controls for differences in prior test performance and pre-existing student characteristics. Similarly, the residuals provide a comparative measure of student performance within a given year, such that the values are relative to all other students enrolled in the district that are in the same test-taking sequence (grade level), and that possess similar prior test performance, demographics, and are in schools with similar student compositions.⁸

Second, since we generate a residual score for all students, we have the flexibility to calculate average value added scores for different sub-classifications of SES participation and make comparisons to different non-participant groups. In doing so, we can conduct different comparisons within the same general research design and model. This flexibility has particular relevance to our study given that we examine cross-sectional annual effects during the five year history of SES and longitudinal, multiyear effects.

⁸ This approach helps equate groups but unlike with a randomized experimental design, unobservable differences still pose a potential threat to validity. It is important to recognize this limitation. A situation in which eligible participants were randomly assigned to providers, or where assignment was based on a known, continuous, variable such as previous year's CST score, would allow for an experimental design or regression discontinuity design. These designs would likely produce less biased estimates of the effect than the design utilized for this study. Unfortunately, the conditions of SES implementation did not allow us to use either an experimental or regression discontinuity design. If in future years more students apply for SES than available funding can support, the opportunity exists to allocate limited slots based on random assignment or a specific cut-off score on the previous year's test.

Appendix B: Supplemental Tables and Figures

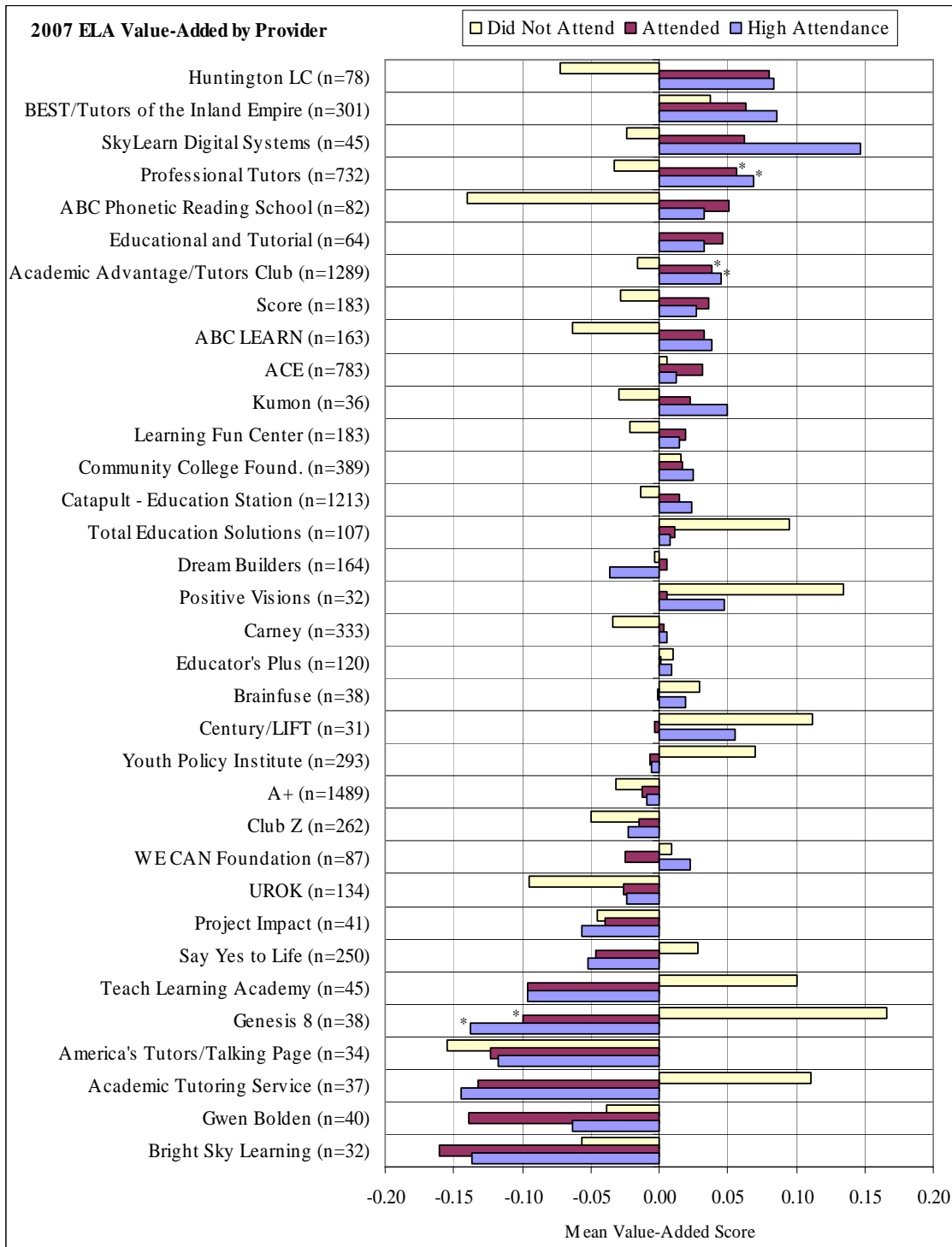
Table B1: Annual SES Utilization Rates, 2003 to 2007

	2003	2004	2005	2006	2007
Number of Students	778,437	779,267	769,231	749,918	723,047
Not Eligible	79%	78%	71%	61%	58%
Eligible	21%	22%	29%	39%	42%
Did Not Apply	94%	89%	88%	89%	88%
Applied	6%	11%	12%	11%	12%
Did Not Attend	37%	31%	36%	38%	27%
Attended	63%	69%	64%	62%	73%
Attended ELA	54%	44%	37%	31%	41%
Low	22%	19%	21%	19%	12%
Medium	38%	34%	42%	16%	8%
High	40%	47%	37%	65%	80%
Attended Math	10%	24%	26%	31%	32%
Low	31%	22%	25%	20%	17%
Medium	20%	31%	30%	15%	10%
High	49%	48%	45%	65%	74%

Table B2: Five-Year Utilization Rates for Student Cohorts

	Eligible Any Year	Eligible 3+ Years	Attended In 2003	Attended In 2005	Attended In 2007
Number of Students	559,441	193,712	6,419	13,950	27,013
Years Eligible					
One Year	34%	0%	8%	6%	28%
Two Years	31%	0%	18%	14%	41%
Three Years	19%	56%	23%	50%	18%
Four Years	9%	26%	21%	16%	6%
Five Years	6%	18%	30%	15%	6%
Years Applied					
None	82%	74%	0%	0%	0%
One Year	14%	17%	53%	66%	63%
Two Years	3%	6%	26%	24%	28%
Three Years	1%	2%	14%	10%	6%
Four Years	0%	0%	5%	0%	2%
Five Years	0%	0%	2%	0%	1%
Years Attended any SES Program					
None	88%	82%	0%	0%	0%
One Year	9%	13%	62%	77%	70%
Two Years	2%	4%	23%	17%	23%
Three Years	0%	1%	10%	6%	5%
Four Years	0%	0%	3%	0%	1%
Five Years	0%	0%	1%	0%	0%
Years Attended ELA Program					
None	93%	89%	13%	39%	37%
One Year	6%	9%	64%	53%	50%
Two Years	1%	2%	16%	7%	11%
Three Years	0%	0%	5%	1%	2%
Four Years	0%	0%	1%	0%	0%
Five Years	0%	0%	0%	0%	0%
Years Attended MATH Program					
None	95%	91%	69%	51%	51%
One Year	5%	7%	24%	41%	40%
Two Years	1%	1%	6%	7%	8%
Three Years	0%	0%	1%	1%	1%
Four Years	0%	0%	0%	0%	0%
Five Years	0%	0%	0%	0%	0%

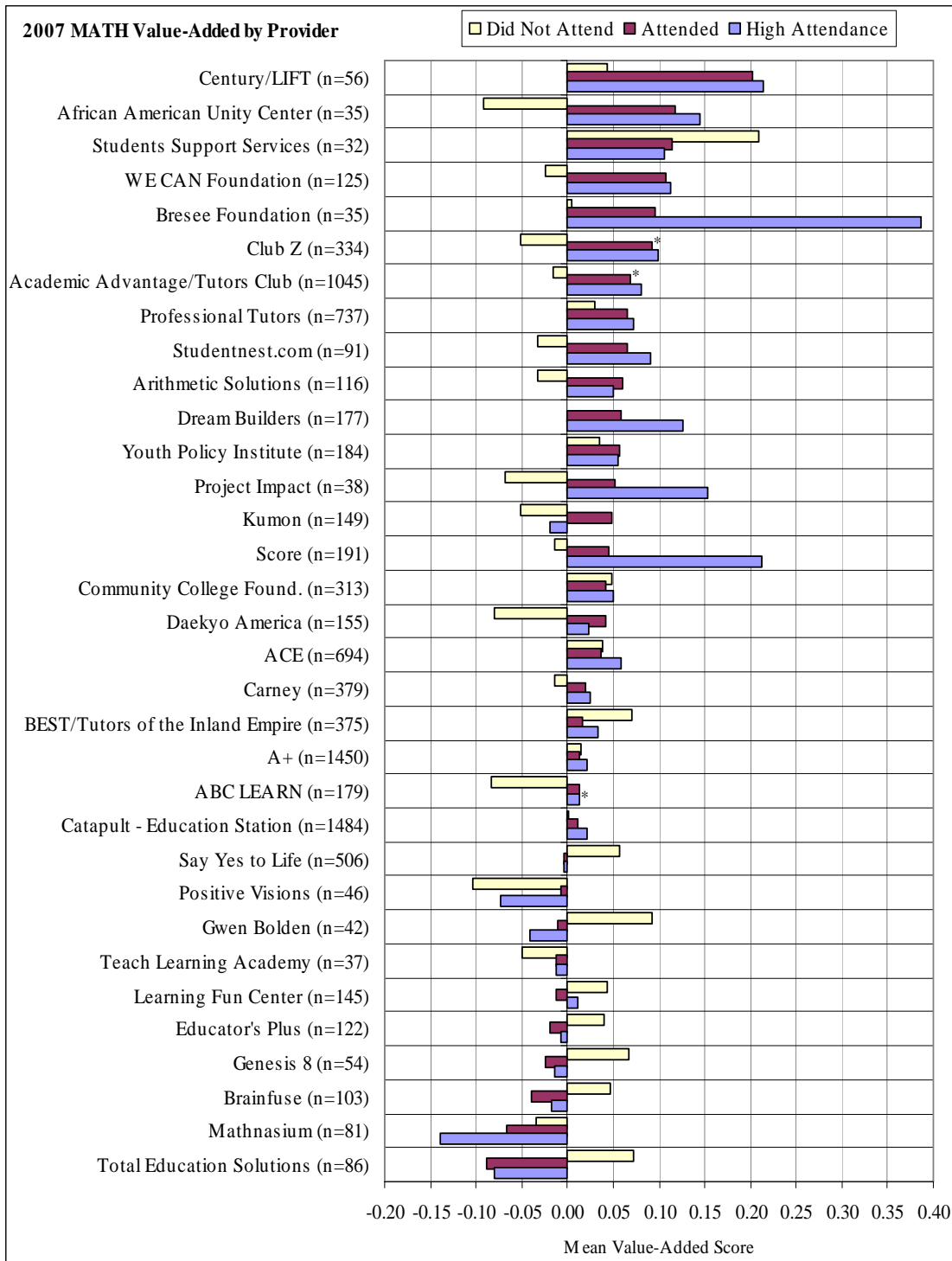
Figure B1: Average ELA Value Added Scores by Provider, 2007



Note: Restricted to providers with at least 30 students attending the program. Reported n reflects number of students who attended that provider's program. Scores are conditional on prior student performance and student characteristics. All the student who applied to Educational and Tutorial attended, so no "did not attend" comparison group was available for that provider.

* statistically significant difference compared to "did not attend" group (p<0.05)

Figure B2: Average Math Value Added Scores by Provider, 2007



Note: Restricted to providers with at least 30 students attending the program. Reported n reflects number of students who attended that provider's program. Scores are conditional on prior student performance and student characteristics.
 * statistically significant difference compared to "did not attend" group (p<0.05)