



**The Impact of Participation in Supplemental Educational Services  
(SES) on Student Achievement: 2009-10**

**Melissa K. Barnhart, PhD**

**Los Angeles Unified School District  
Research Unit  
Publication No. 379**

**May 2011**

## **Acknowledgements**

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The analysis presented in this paper builds off of earlier work conducted with Jeff White, Jordan Rickles, and Alice Gualpa. The statistical modeling and analytic approach utilized in this and previous reports on the impact of SES were borrowed liberally from Glenn Daley's work on value-added. Luis Mora initiated the inquiry into SES effectiveness, providing the necessary data and invaluable insights from a programmatic perspective. Their support made this a better report, but I alone am responsible for any errors contained within.

## Preface

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Ten 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. 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 educational 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 fifth year the Beyond the Bell Branch has asked the Research Unit to examine SES participation and impacts for students in the Los Angeles Unified School District (LAUSD). Similar studies conducted in 2004-05, 2005-06, 2006-07, and 2007-08 found that SES participation had a small overall impact on California Standards Test (CST) performance in English language arts (ELA) and math. In 2006-07, a more in-depth study of SES found that there was no cumulative effect of participation in SES for more than one year; in other words, students who participated in SES for one year performed as well as those who participated in SES for multiple years. This study expands upon the previous work on SES conducted by the Research Unit, and is designed to examine the impact of SES of student performance during 2009-10.

The author of this study may be contacted by email at [melissa.barnhart@lausd.net](mailto:melissa.barnhart@lausd.net) or by phone at 213-241-3386.

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## Introduction

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For the past eight years, low-income students enrolled in LAUSD Program Improvement schools have had the option of receiving free tutoring services under NCLB. These services are referred to as supplemental educational services (SES). Tutoring services are typically offered to students for reading and mathematics<sup>1</sup> during non-school hours, either online or in individual or small group sessions. Providers of SES services must be on a state-approved list, and include for-profit, non-profit, and faith-based organizations.

School districts in Program Improvement status must reserve 20% of their Title I funds for supplemental educational services and school choice options for students (Munoz, Potter, & Ross, 2008). In particular, 5% of their Title I funding must go to SES, another 5% must go to school choice, and the remaining 10% may be split between the two services at the discretion of the district. In 2009-10, the maximum percentage, or approximately 15%, of Title I services for LAUSD were allocated for SES.

Previous studies have examined whether there are accumulating positive effects for students who participate in SES multiple years, and have found mixed results. In 2006-07, LAUSD conducted an in-depth analysis to determine whether multiple year participation had a positive effect on students' performance on the California Standards Test (CST), a test administered to all students in grades 2-11. Overall, the study failed to find a positive effect for multiple years of participation in SES, as students participating for more than one year did not show significantly higher gains on the CST.

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 report explored the effects of SES for multiple years. Unlike the LAUSD study, the study by the Department of Education concluded there were accumulating effects in both reading and math for students who participated in an SES program (Zimmer, Gill, Razquin, Booker, & Lockwood, 2007). The Department of Education study did not specifically identify the impact for LAUSD students, although the magnitude of the overall effects was small and comparable to those found in LAUSD studies.

More commonly, studies have 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; Rickles, Barnhart, & Gualpa, 2008; Barnhart, 2009; Potter et al., 2007; Ross, Potter, Paek, McKay, Sanders, & Ashton, 2008). This single year study examined the impact of SES on CST performance for the 2009-10 school year, using SES participation data provided by the Beyond the Bell Branch and student CST performance data. As in previous LAUSD studies, a value added model was used to estimate the impact of SES participation on CST scores. Appendix A provides a more detailed description of the research methods.

Overall, the findings from SES participation for 2009-10 are similar to those from the previous five years in LAUSD. First, there continued to be a low demand for SES, as only approximately 13% of eligible students applied for SES. In addition, there was a small, positive impact of SES participation on CST performance. This report elaborates on these findings in two separate sections:

1. analysis of the availability and utilization of SES within LAUSD;
2. analysis of the impact of SES on student achievement for 2009-10.

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<sup>1</sup> In 2009-10, students could also receive tutoring in science. However, the total number of students offered tutoring in science was less than 100, so these students were excluded from the analysis.

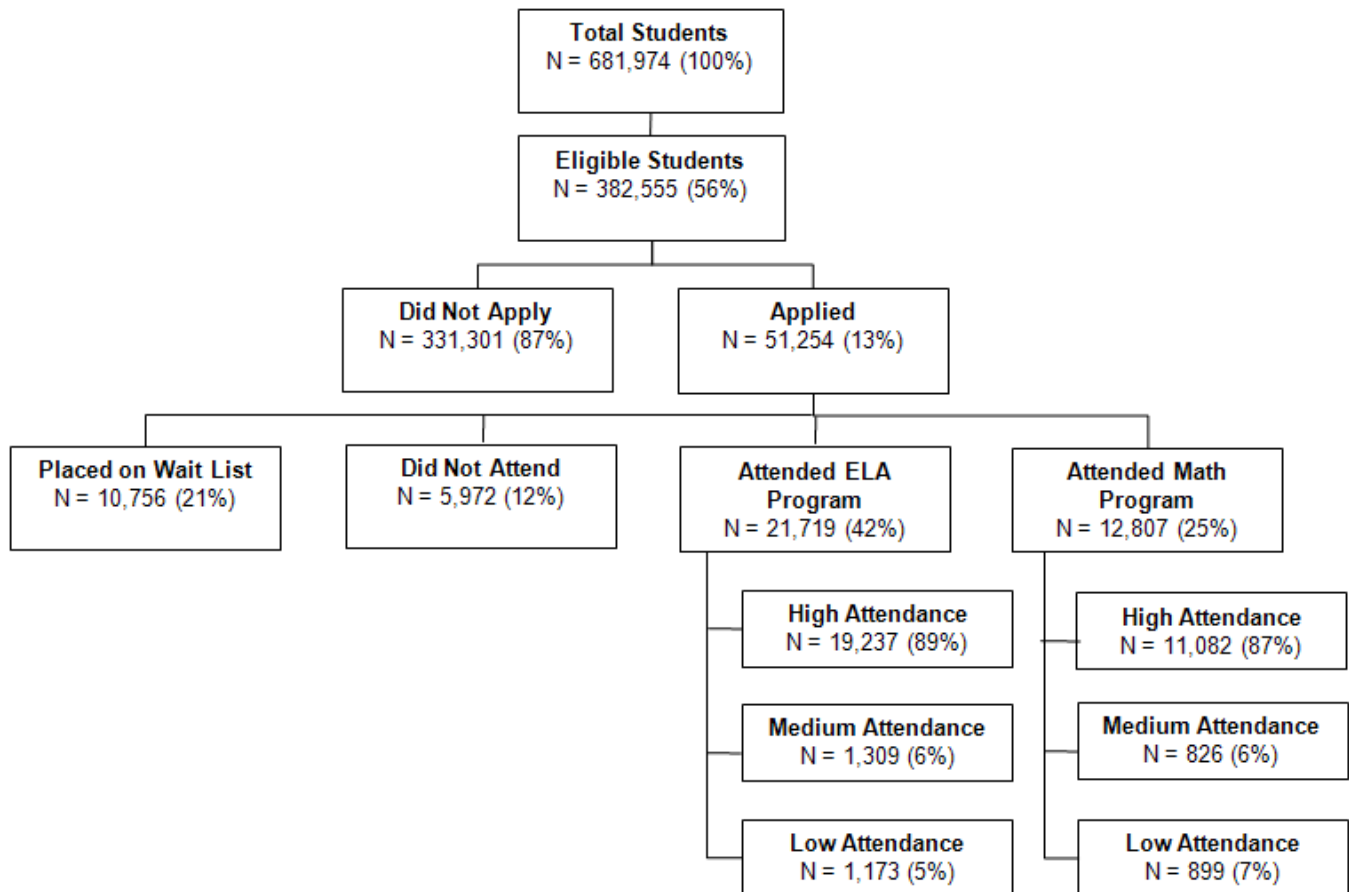
Chapter 1:  
**Utilization of SES**

This chapter has two aims: (1) to examine patterns in SES utilization during 2009-10; and (2) to place SES participation rates in historical perspective, by exploring the trends in utilization during the eight years that SES have been offered to LAUSD students.

**SES Utilization in 2009-10**

Because SES participation is voluntary, it is important to first understand who utilizes the services, before examining the impact of SES on academic performance. An underlying assumption for the provision of SES is that parents will utilize these additional supports to help meet the academic needs of their students. In order to utilize SES, eligible students must first apply for services and be selected for participation. Figure 1 illustrates how many of the District's nearly 682,000 students were eligible for, applied to, or attended an SES program in 2009-10, and Table 1 displays their demographics.

FIGURE 1  
 SES Utilization by LAUSD Students, 2009-10



Notes:  
 Low Attendance = 1% to 49% of program hours  
 Medium Attendance = 50% to 89% of program hours  
 High Attendance = 90% to 100% of program hours

Notes: Data source is the database maintained by the Beyond the Bell Branch of LAUSD for tracking SES applicants and attendance.

The major points regarding the students who were eligible for, applied to, or attended an SES program in 2009-10 are given below:

***Although most eligible students did not apply for SES, approximately 20% of applicants were placed on a wait list for services.***

In 2009-10, the District received applications from approximately 13% of eligible students. Despite the low proportion of students seeking services, it is important to note that there was insufficient funding for all applicants to attend an SES program. As required by NCLB, school districts in Program Improvement status allocate up to 15% of their Title I funding to SES. For LAUSD, this funding formula resulted in sufficient funding for fewer than 10% of eligible students to participate in SES. Because the application rate exceeded 10%, nearly one in five applicants was placed on a wait list for services. Priority for SES selection was given to students who had both far below basic or below basic test scores on the CST, and who belonged to at-risk student groups, e.g., English learners and students with disabilities.

***Approximately two-thirds of applicants attended an SES program, and the majority of these participants attended most or all of the program hours offered to them.***

Despite the low percentage of eligible students applying for SES, two-thirds of applicants ultimately participated in an SES program; approximately 42% participated in an ELA program, and 25% participated in a math program. In addition, close to 90% of participants had high attendance, as demonstrated by their attending at least 90% of the program hours offered to them.

***Elementary students and several historically disadvantaged students were more likely to apply for and attend SES, although African American students were less likely to apply.***

Elementary students were more likely than students in middle and high school to apply for and attend SES services. In general, historically disadvantaged students have been as likely, if not more likely, to utilize SES, and this was true in 2009-10, as Latinos, English Language Learners and students receiving special education services were overrepresented among applicants and attendees. However, African American students were underrepresented among applicants: African Americans made up over 9% of the eligible student population, but they accounted for only 7.6% of applicants.

***Females were more likely than males to attend SES math programs. Middle and high school students were also more likely to attend SES math programs than reading programs.***

The majority of attendees of SES reading programs were male, whereas females represented the majority of attendees of math programs. And whereas elementary students represented nearly three-quarters of the attendees of SES reading programs, middle and high school students were more likely to attend an SES program in math.



TABLE 1  
Demographics of LAUSD Students Eligible for SES, 2009-10

Student Characteristics	All Eligible Students	Application Status		Attendance Status			SES Subject	
		Did Not Apply	Applied	Wait Listed	Did Not Attend	Attended	Attended ELA	Attended Math
Number of Students	382,555	331,301	51,254	10,756	5,923	34,574	21,719	12,807
School Level (%)								
Grades 1-5	38.6%	35.8%	56.6%	52.8%	42.6%	60.3%	71.3%	41.7%
Grades 6-8	30.8%	31.2%	28.5%	29.5%	30.5%	27.8%	22.0%	37.4%
Grades 9-12	30.6%	33.0%	14.9%	17.9%	26.9%	12.0%	6.7%	20.9%
Gender (%)								
Female	48.6%	48.7%	47.9%	49.3%	46.8%	47.3%	44.8%	51.5%
Male	51.4%	51.3%	52.1%	50.7%	53.2%	52.7%	55.2%	48.5%
Ethnicity (%)								
African-American	9.4%	9.6%	7.6%	5.7%	15.2%	6.8%	5.3%	9.4%
Asian/Pacific Islander	3.4%	3.6%	2.4%	2.3%	3.8%	2.2%	2.2%	2.3%
Hispanic	84.4%	83.8%	88.2%	90.0%	77.7%	89.4%	91.2%	86.4%
White	2.4%	2.6%	1.5%	1.7%	2.8%	1.3%	1.1%	1.6%
Other	.4%	.4%	.3%	.3%	.5%	.3%	.2%	.3%
Language Status (%)								
English Only	23.9%	24.5%	19.9%	22.9%	31.8%	17.2%	14.8%	20.4%
Initial Fluent (IFEP)	9.9%	9.9%	10.0%	14.6%	8.9%	10.1%	8.7%	9.0%
Redesignated (RFEP)	33.3%	34.0%	29.0%	37.9%	25.5%	31.8%	23.9%	31.8%
English Learner	32.8%	31.5%	41.1%	24.6%	33.8%	40.9%	52.6%	38.8%
Students with Disabilities (%)	10.3%	9.8%	14.1%	8.3%	12.7%	16.1%	15.6%	17.0%
GATE (%)	7.0%	7.2%	5.3%	7.5%	5.3%	4.6%	4.8%	4.2%
2009 CST Proficiency (%)*								
ELA	31.8%	32.3%	28.0%	42.4%	29.2%	22.9%	22.8%	23.8%
Math	32.4%	32.1%	34.3%	43.6%	30.7%	32.9%	42.8%	18.2%

\*IMPORTANT NOTE: The percentage of students with CST proficiency includes only those students with valid CST data in the 2008-09 school year. Data sources include the annual CST data provided by the California Department of Education as well as the database maintained by the Beyond the Bell Branch of LAUSD for tracking SES applicants and attendance.

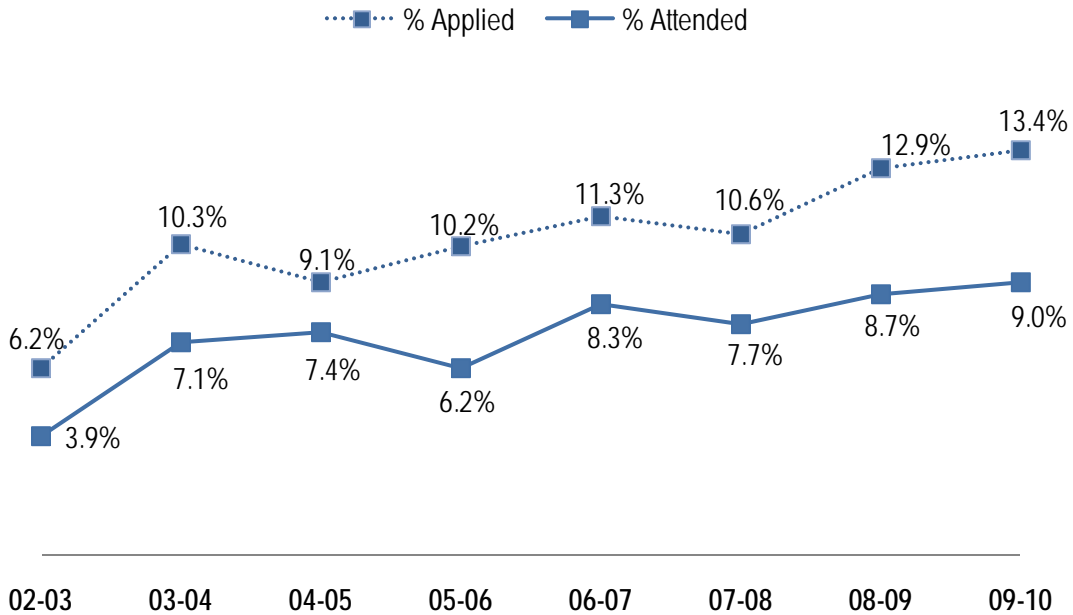
***A value added approach was used to control for differences in student characteristics that may have affected the impact of SES participation.***

It should be noted that the demographics that are described in Table 1 are the same demographics that are controlled for in the value added analysis. One of the main strengths of using a value added approach to analyze SES is that it allows the researcher to “factor out” or control for differences in student performance that are not the result of treatment, but rather are due to student characteristics, characteristics such as gender, ethnicity, language status, and parental education. For more information on the value added analysis used in this report, please see Appendix A.

## Historical Perspective on SES Utilization

Although only a small proportion of eligible students applied for SES in 2009-10, the percent of students applying has nevertheless doubled over the course of the past 7 years (see Figure 2). In 2002-03, the first year that SES were offered to LAUSD students, less than 7% of eligible students applied, whereas over 13% applied in 2009-10. The percent of eligible students attending an SES program has also doubled, from less than 4% in 2002-03 to 9% in 2009-10.

FIGURE 2  
Percent of Eligible Students Who Applied For and Attended SES By Year



Note: Data source is the database for tracking applicants and attendance for students served maintained by the Beyond the Bell Branch of LAUSD.

### ***As in LAUSD, low SES participation rates have been reported throughout the U.S.***

A recent study by RAND and the American Institutes for Research reported low participation rates in SES in school districts across the country (Vernez et al., 2009). In 2004-05 and 2005-06, 19% of eligible students in U.S. Title I schools applied for SES, while 17% actually participated in an SES program. Although the national participation rates were considerably higher than those for LAUSD, both rates suggest that a small percentage of eligible students ever apply for SES, although those that do apply are likely to receive services.

### ***The average number of hours of services offered by SES providers to LAUSD students has remained constant over the past seven years, while the average hours attended by SES participants has increased. However, the range of hours offered to students has narrowed considerably since 2002-03.***

Since SES were first offered in 2002-03, providers have continued to offer LAUSD students an average of approximately 30 hours of service (see Table 2), although the range in the number of hours of service offered to students has narrowed, from 12-95 hours in 2002-03 to 18-41 hours in 2009-10. At the same time, the average number of hours attended by LAUSD students has increased by over 33%, from an average of 18 hours in 2002-03 to nearly 26 hours in 2009-10.

TABLE 2

## Number of Hours of Offered By SES Providers and Attended By LAUSD Students By Year

Year	Number of SES providers	Range of hours offered	Median (hours offered)	Average hours attended (Standard deviation)
2002-03	22	12-95	30	18.4 (8.6)
2003-04	26	15-92	30	20.9 (9.3)
2004-05	24	20-95	30	21.4 (9.5)
2005-06	40	20-80	30	23.6 (11.4)
2006-07	55	20-80	30	24.7 (10.5)
2007-08	38	20-52	30	24.6 (8.9)
2008-09	44	20-37	30	26.5 (7.7)
2009-10	42	18-41	29	25.8 (7.5)

Notes: Data source is the database for tracking applicants and attendance for students served maintained by the Beyond the Bell Branch of LAUSD. *Standard deviation* is a statistic used to measure the variability of a group of scores around its average value. If a set of scores is very spread out, it will have a higher standard deviation than if the scores are relatively close together. *Median* is used to capture the central tendency for a set of scores that are highly skewed, i.e., scores that are not normally distributed. An analysis of SES was not conducted in 2008-09, so data for 2008-09 is unavailable.

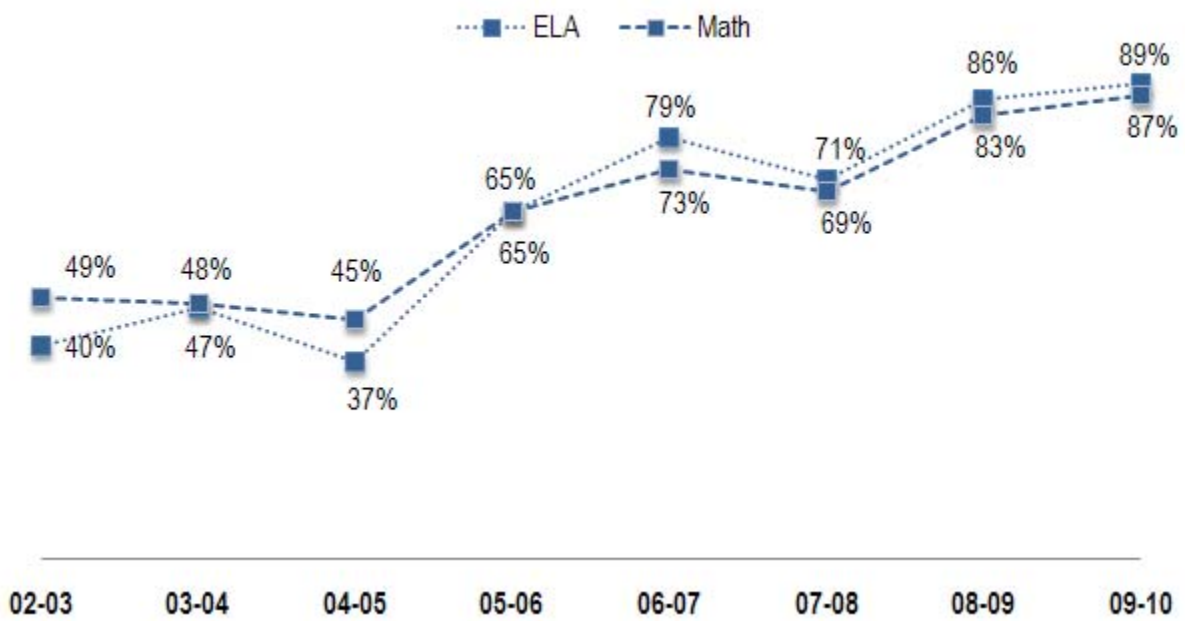
***Since SES were first offered in 2002-03, there has been a marked increase in the percentage of participants with high attendance.***

As shown in Figure 3, the percentage of participants with high attendance (at least 90% of total hours) in an ELA program more than doubled from 40% in 2002-03 to 89% in 2009-10. At the same time, high attendance in a math SES program increased from 49% in 2002-03 to 87% in 2009-10.

A further examination of Figure 3 reveals that there was a marked increase in the percent of students with high attendance between 2004-05 and 2005-06. Prior to 2005-06, LAUSD was an SES provider, and most SES provided by LAUSD took place in Saturday school. However, beginning in 2005-06 most services instead took place after school. The increase in the proportion of students with high attendance may have been due to the fact that after school is a more convenient time for many students and their families.

Between 2007-08 and 2008-09, there was also a sizable increase in the percent of students with high attendance. Beginning in 2008-09, SES providers, as part of their contractual agreement with LAUSD, are required to deliver 80% of the tutoring hours to at least 90% of the enrolled students by a certain date. Failure to do so may result in providers not being reimbursed for services provided. As a result of this contractual stipulation, providers may be incentivized to ensure that students receive the full number of hours of service, and in a timely manner.

FIGURE 3  
Percent of LAUSD Students With High Attendance in SES, By Subject and Year



Notes: Data source is the database for tracking applicants and attendance for students served maintained by the Beyond the Bell Branch of LAUSD.

This section details the analysis of the SES impact on student performance by describing the value added results for students who were eligible for, applied for, and attended SES.

Determining the effectiveness of SES is complicated by the fact that students and their parents self-select for participation in the programs. Due to this self-selection, families who elect to participate in SES may differ from those who do not participate, for reasons that are unrelated to the provision of services. For example, Heinrich and Burch (2011) reported that the number of days absent from school was negatively correlated with the likelihood of applying or attending SES. By not controlling for this difference between applicants and non-applicants, we may erroneously conclude that the effect of attending SES is greater than it actually is, simply because applicants are also receiving, through their higher average attendance, more instruction from their regular school day.

By comparing students who applied but did not attend with those who applied and ultimately attended SES, we are able to *partially* control for self-selection into SES. However, it is important to note that we are unable to completely isolate the impact of SES, and there may be additional differences between attendees and non-attendees, differences such as the one identified by Heinrich and Burch, that influence the impact estimates.

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 in the average value added scores for participants and non-participants in SES, or the difference between those students who attended SES, and those who applied but did not attend. See Appendix A for a more detailed discussion of the value added method.

### ***Impact of SES in 2009-10***

We calculated value added estimates for each level of SES utilization in 2009-10 (see Figure 4). For the group of students that attended an ELA program, their average value added for the CST ELA was .04, while the average value added for the applied but did not attend group was -.01. Similarly, the average value added for the CST math was .02, whereas the average value added for the applied but did not attend group was -.01. Throughout the analysis we only examine ELA CST performance for ELA program participants and math CST performance for math program participants.<sup>2</sup>

***There were statistically significant differences in the average value added between students who applied but did not attend and attendees in SES ELA or Math programs, but the effects were small.***

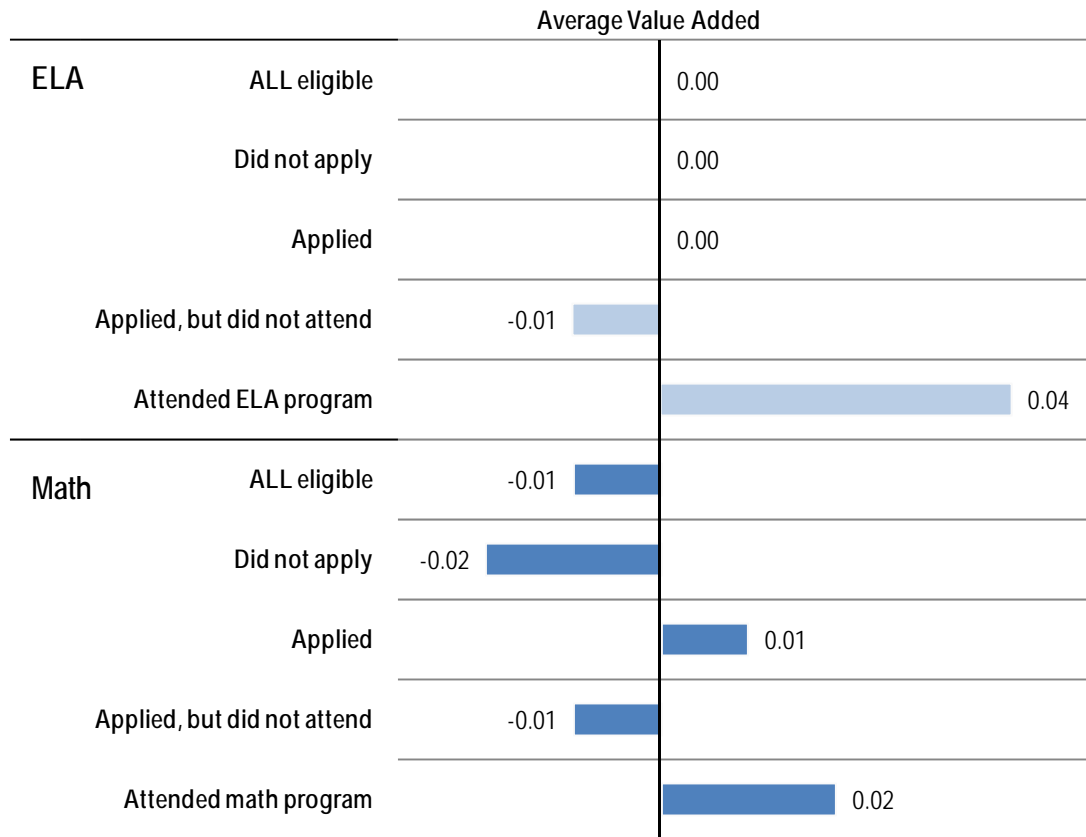
Given these value added results, we can estimate the average impact of the SES policy as the difference in the average value added between the attended and applied but did not attend group. Doing so yields an estimated effect of SES for 2009-10 of  $(.04 - (-.01)) = .05$  for ELA programs and  $(.02 - (-.01)) = .03$

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<sup>2</sup> 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).

for math programs. The size of this impact represents a statistically significant difference, but is substantively small—an effect size of about 0.05 to 0.08, or about 4-5 scale score points.

FIGURE 4  
Average Value Added Scores on the California Standards Test (CST) by Student Group and Subject, 2009-10



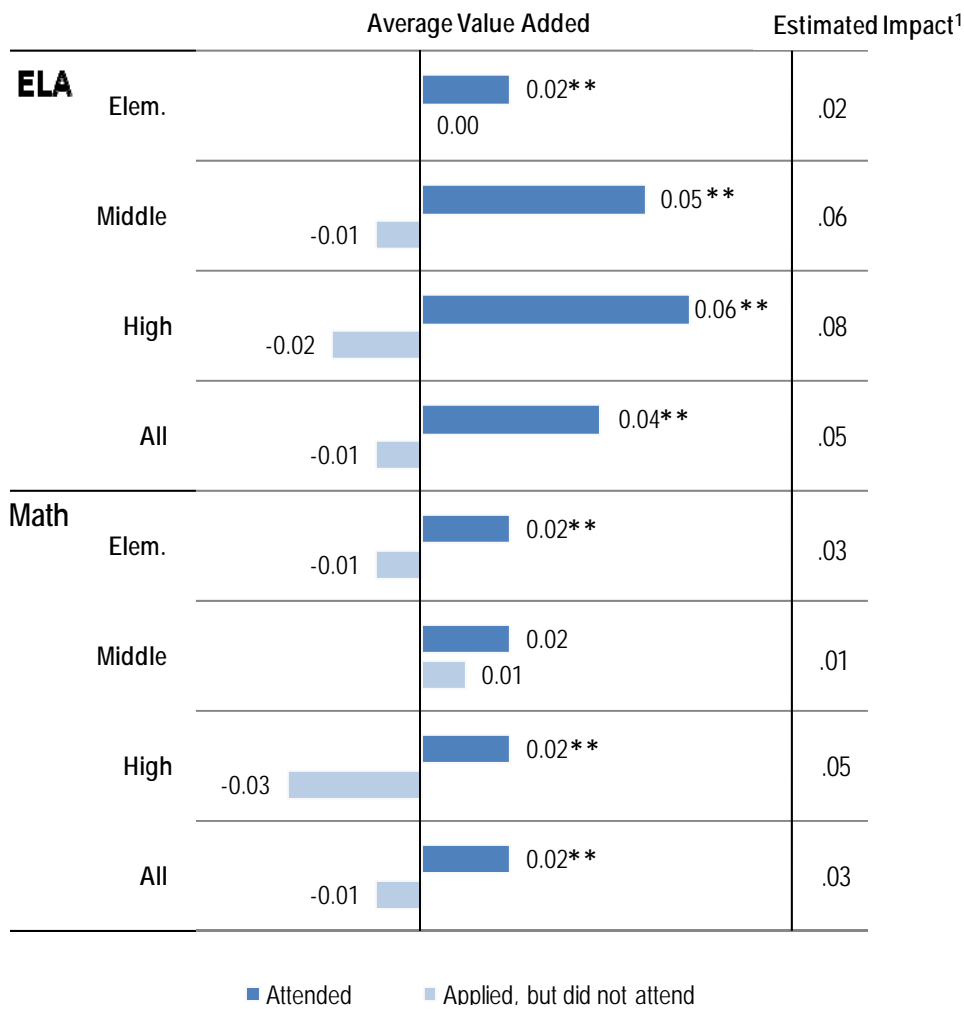
Notes: Data source is the database for tracking applicants and attendance for students served maintained by the Beyond the Bell Branch of LAUSD.

***Unlike previous studies of SES, the estimated impact of SES in both ELA and math was greater for high school students than for elementary students.***

Previous studies have found that SES participation has a greater impact on student performance for elementary grade students than for middle or high school students (Chicago Public Schools, 2007; Rickles & White, 2006; Rickles & Barnhart, 2007). However, in the current study, the estimated impact was higher for high school students.

Figure 5 shows the estimated impact of SES by schooling level. For ELA, the impact estimates are .02, .06, and .08, for elementary, middle, and high school students, respectively. For math, the estimates are .03, .01, and .05 for elementary, middle, and high school students. These findings suggest that the impact of SES in 2009-10 was actually greater for high school students than for elementary school students in both ELA and math.

FIGURE 5  
 Estimated Impact on the California Standards Test (CST) by Schooling Level, 2009-10



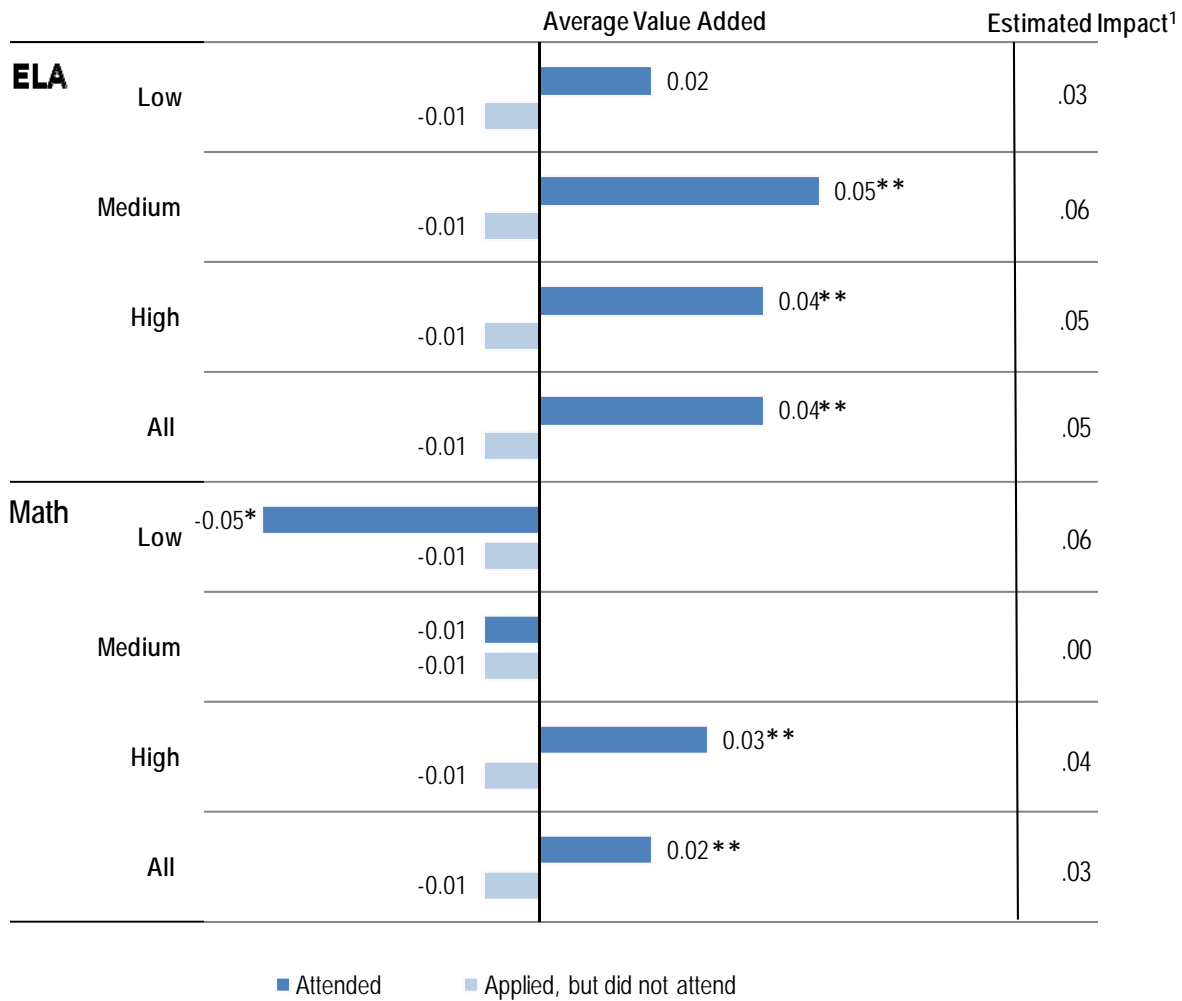
<sup>1</sup>The estimated impact of SES participation is equal to the difference in the average value added between the “attended” and “applied, but did not attend” groups.  
 \*\* Designates that there was a statistically significant difference between the “attend” and “did not attend” group (p<0.05).

***The estimated impact of SES math programs was significantly positive only for students who attended at least 90% of the hours offered to them.***

The attendance level data in Figure 6 shows that students with low attendance in an SES math program, i.e., they attended less than half of the hours provided to them, performed significantly below non-attendees. In addition, students with medium attendance in a math program, i.e., they attended 50-89% of the hours made available to them, had an average value added that was identical to that for non-attendees. Only students who attended 90% of the hours offered to them in a math program had a significantly higher average value added than the non-attending group.

In ELA, both the medium and high attendance groups had average value added scores that were significantly higher than for the group of non-attendees. However, students with low attendance, i.e., those who attended less than half of the hours made available to them in an SES ELA program, did not have a significantly higher average value added on the CST in ELA.

FIGURE 6  
Average Value Added Scores on the California Standards Test (CST) by SES Attendance Level, 2009-10



<sup>1</sup>The estimated impact of SES participation is equal to the difference in the average value added between the “attended” and “applied, but did not attend” groups.

\* Designates that there was a statistically significant difference compared to “did not attend” group (p<0.10).

\*\* Designates that there was a statistically significant difference compared to “did not attend” group (p<0.05).

Low attendance = 1% to 49% of program hours; medium attendance = 50% to 89% of program hours; high attendance = 90% to 100% of program hours

***There was significant variation in the impact of SES program across providers.***

While the focus of this report 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. Average student value added scores did, in fact, differ by provider (see Figures B1 and B2 in Appendix B). For most providers, the average value added for attendees was not statistically higher for non-attendees, but there were five ELA providers and four math providers that showed significant positive effects.



## **Discussion of Findings**

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Based on the results presented in Chapters 1 and 2, this final chapter includes a brief summary of the findings, as well as a set of recommendations for LAUSD staff as well as policymakers regarding SES programs. It should be emphasized that some or all of these recommendations may already have been taken up. They are offered as suggestions for improving the quality of participation in SES.

### ***Summary of Findings***

In 2009-10, thirteen percent of students eligible for SES applied for service. While this represents a low overall proportion of students, it is nevertheless the highest application rate during the eight years that SES have been offered in LAUSD. Because the number of applicants exceeded the number of slots, a wait list for services was established, resulting in 1 in 5 applicants being placed on this list.

The majority of applicants ultimately attended an SES program. Attendees showed a high level of participation in their SES program, with approximately 85-90% of them attending at least 90% of the hours of service offered to them. It should be noted, however, that the range in the number of hours of service offered to students by SES providers continues to decline, with a maximum of 41 hours of service offered by any of the 42 providers.

The impact of attendance in the SES math programs was only discernible among students who attended at least 90% of the hours offered to them. For ELA programs, there were significantly positive effects for students who attended at least 50% of the hours offered to them.

As in years past, the effects of SES participation were significant but small in magnitude for both ELA and math. Unlike in previous years, however, the effect of participation was greater for high school students, particularly in ELA.

### ***Recommendation #1: Provide parents and schools with up-to-date research on the effectiveness of SES providers.***

Now nearly 10 years after the passage of NCLB, numerous studies have been conducted across the country to measure the impact of SES on students' academic performance. In addition, a recent analysis of SES studies (Chappell, Nunnery, Pribesh, and Hager, 2011) found several provider characteristics that have been shown to significantly greater effect sizes. Provider characteristics that had significantly greater effects for ELA and/or math programs are summarized in Table 3. The provision of this information may contribute to informed choices by families regarding the best program for their student.

TABLE 3  
SES Provider Characteristics Linked to Significantly Larger Positive Effects on Student Achievement

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- Locally based provider (vs. nationally based)
- Provides face-to-face services
- Non-profit provider (vs. for profit)
- Offers ELL services
- Offers SPED services
- Offers both ELA and math services
- Uses prescribed curriculum
- Employs only degreed tutors
- Provides initial tutor training
- Provides on-going tutor training

***Recommendation #2: Inform parents and students of the need to attend all of the hours offered by SES providers, especially for math programs.***

As was the case in the 2007-08 SES study, the results for 2009-10 suggest that while many program participants benefitted from attending at least 50% of the hours offered in an ELA SES program, students in math programs did not have significantly higher average value added scores unless they had attended at least 90% of the program hours. Heinrich & Burch (2011) reported in their multi-site examination of SES services that a minimum of 40 hours of tutoring was required before they found significantly positive effects of SES participation on student test scores. These findings should be emphasized to potential SES participants and their families, to make them better aware of the need to participate fully in the program.

***Recommendation #3: Inform parents on what it means for a school to be in Program Improvement (PI) status.***

As reported in this study, the percent of eligible students that actually apply for services is low, at approximately 13%. A recent study by the U.S. Dept. of Education (2009) identified several barriers to participation in SES. First, the study found that less than one-quarter of parents of elementary students were aware that their child's school was in Program Improvement (PI) status, and many claimed to have not received information that their child was eligible for SES. These two findings may go hand-in-hand; if parents do not understand what it means for a school to be in PI status, then they may not fully understand or pay attention to any notices sent by the school that their child is eligible for SES services. In communicating to parents that their child is eligible for SES services, the District may wish to pay careful attention to the language that they use to explain what it means for a school to be in PI status, to increase the likelihood that they will understand what services they are being offered and *why*.

***Recommendation #4: Conduct follow-up communication with the California Department of Education, to make them aware of the latest findings in LAUSD and encourage them to make public any available evidence on the effectiveness of SES providers.***

As was recommended in 2007-08, the results of this study should be forwarded to the State, with an appeal that they make carefully consider the included information on the effectiveness of SES providers in deciding which providers to approve within the State.

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## Appendix A: Data and Methodology

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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 2010:<sup>3</sup>

- 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.

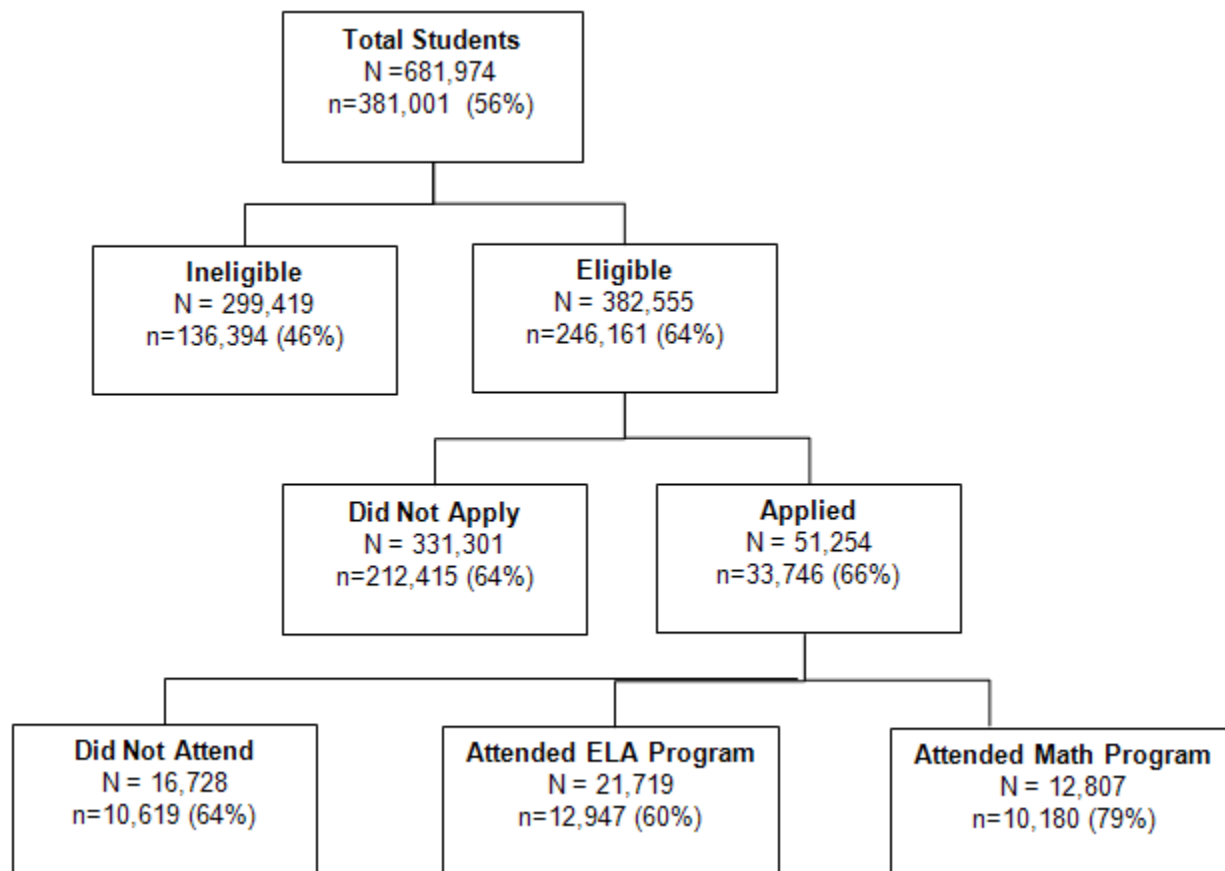
These data allowed us to describe the trends in SES participation for eligible students and to construct comparison groups for estimating the impact of SES attendance on CST performance. Eligible students were included in our value added analyses only if they they had CST data for 2008-09 and 2009-10. 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 2009-10 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 two years of CST data. 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<sup>4</sup>. 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). Student demographics for those students included in the value added analysis are displayed in Table A2.

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<sup>3</sup> For simplicity we use the end-year to denote the school year. For example, we use 2003 instead of 2002-03 and 2010 instead of 2009-10.

<sup>4</sup> Students who took the CMA or CAPA, two alternate assessments for students with disabilities, were excluded from the analyses.

FIGURE A1  
 Number of Students in the SES Population, 2009-10



### ***Describing SES Participation***

We had two main objectives in describing SES participation. 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);

### ***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).<sup>5</sup> 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 participate in an ELA SES program and vice versa. This was consistent with the guidelines offered by LAUSD, which instructed providers to offer services to students in their area of greatest need. 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.<sup>6</sup>

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  $\varepsilon_{it}$ , 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 59 and 82 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.

<sup>5</sup> 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.

<sup>6</sup> 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
<b>All Students in 2010</b>					
ELA CST Scale Score	381,001	336.28	59.47	150.00	600.00
Standardized ELA CST Score	381,001	0.00	1.00	-3.50	4.90
Std. Predicted ELA CST Score	381,001	0.00	0.84	-2.73	4.25
Std. Residual ELA CST Score	381,001	0.00	0.54	-5.12	4.40
Math CST Scale Score	369,805	337.09	82.37	150.00	600.00
Standardized Math CST Score	369,805	0.00	1.00	-3.44	7.99
Std. Predicted Math CST Score	369,805	0.00	0.78	-2.40	4.42
Std. Residual Math CST Score	369,805	0.00	0.63	-4.17	5.12
<b>SES Eligible Students in 2010</b>					
ELA CST Scale Score	235,817	325.72	54.31	150.00	600.00
Standardized ELA CST Score	235,817	-0.16	0.94	-3.50	4.90
Std. Predicted ELA CST Score	235,817	-0.16	0.78	-2.73	4.25
Std. Residual ELA CST Score	235,817	-0.01	0.53	-3.94	4.40
Math CST Scale Score	229,873	321.48	73.00	150.00	600.00
Standardized Math CST Score	229,873	-0.14	0.94	-3.31	6.17
Std. Predicted Math CST Score	229,873	-0.13	0.72	-2.40	4.15
Std. Residual Math CST Score	229,873	-0.01	0.61	-3.88	5.12

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.<sup>7</sup>

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.

<sup>7</sup> 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

TABLE A2

## Demographics of LAUSD Students Included in the Analysis of Supplemental Educational Services, 2009-10

Student Characteristics	All Eligible Students	Application Status		Attendance Status			SES Subject	
		Did Not Apply	Applied	Wait Listed	Did Not Attend	Attended	Attended ELA	Attended Math
Number of Students (% of Total)	167,483 (44%)	143,450 (43%)	24,033 (47%)	5,102 (47%)	2,537 (43%)	16,394 (47%)	12,947 (60%)	10,133 (79%)
School Level (%)								
Grades 1-5	24.3%	22.4%	35.8%	34.3%	24.9%	37.9%	55.3%	32.7%
Grades 6-8	59.5%	60.4%	53.9%	55.1%	54.1%	53.6%	35.4%	45.3%
Grades 9-12	16.2%	17.2%	10.3%	10.6%	21.0%	8.5%	9.3%	22.0%
Gender (%)								
Female	49.4%	49.6%	48.3%	50.9%	46.9%	47.7%	43.3%	51.7%
Male	50.6%	50.4%	51.7%	49.1%	53.1%	52.3%	56.7%	48.3%
Ethnicity (%)								
African-American	8.0%	8.1%	7.5%	4.8%	15.0%	7.2%	5.4%	9.5%
Asian/Pacific Islander	3.9%	4.0%	3.3%	3.0%	5.8%	3.0%	2.8%	2.4%
Hispanic	84.9%	84.5%	86.9%	89.8%	75.0%	87.9%	90.3%	85.9%
White	2.8%	2.9%	1.9%	1.9%	3.6%	1.6%	1.3%	1.8%
Other	.5%	.5%	.4%	.5%	.6%	.3%	.2%	.4%
Language Status								
English Only	21.5%	21.8%	19.5%	19.8%	32.1%	17.2%	14.4%	21.0%
Initial Fluent (IFEP)	11.9%	12.0%	10.4%	16.7%	11.3%	10.1%	9.0%	8.8%
Redesignated (RFEP)	39.2%	39.9%	37.6%	49.4%	29.9%	31.8%	49.5%	39.2%
English Learner	27.4%	26.3%	32.6%	14.1%	26.7%	40.9%	27.1%	31.0%
Students with Disabilities (%)	9.3%	8.8%	12.3%	7.4%	12.4%	13.8%	16.0%	17.7%
GATE (%)	12.1%	12.6%	9.1%	12.9%	10.6%	7.8%	7.8%	5.2%
Parental Education (%)								
College Degree	16.4%	16.3%	17.3%	17.5%	21.3%	16.2%	15.2%	17.3%
High School Degree	20.0%	20.0%	20.5%	21.9%	20.0%	20.2%	20.1%	20.3%
No HS Degree/Unknown	63.6%	63.7%	62.2%	60.6%	58.7%	63.6%	64.7%	62.4%
2009 CST Proficiency (%)								
ELA	32.8%	33.6%	28.4%	41.8%	31.9%	16.8%	17.0%	16.5%
Math	37.4%	37.6%	36.6%	46.6%	34.5%	24.1%	32.5%	13.2%

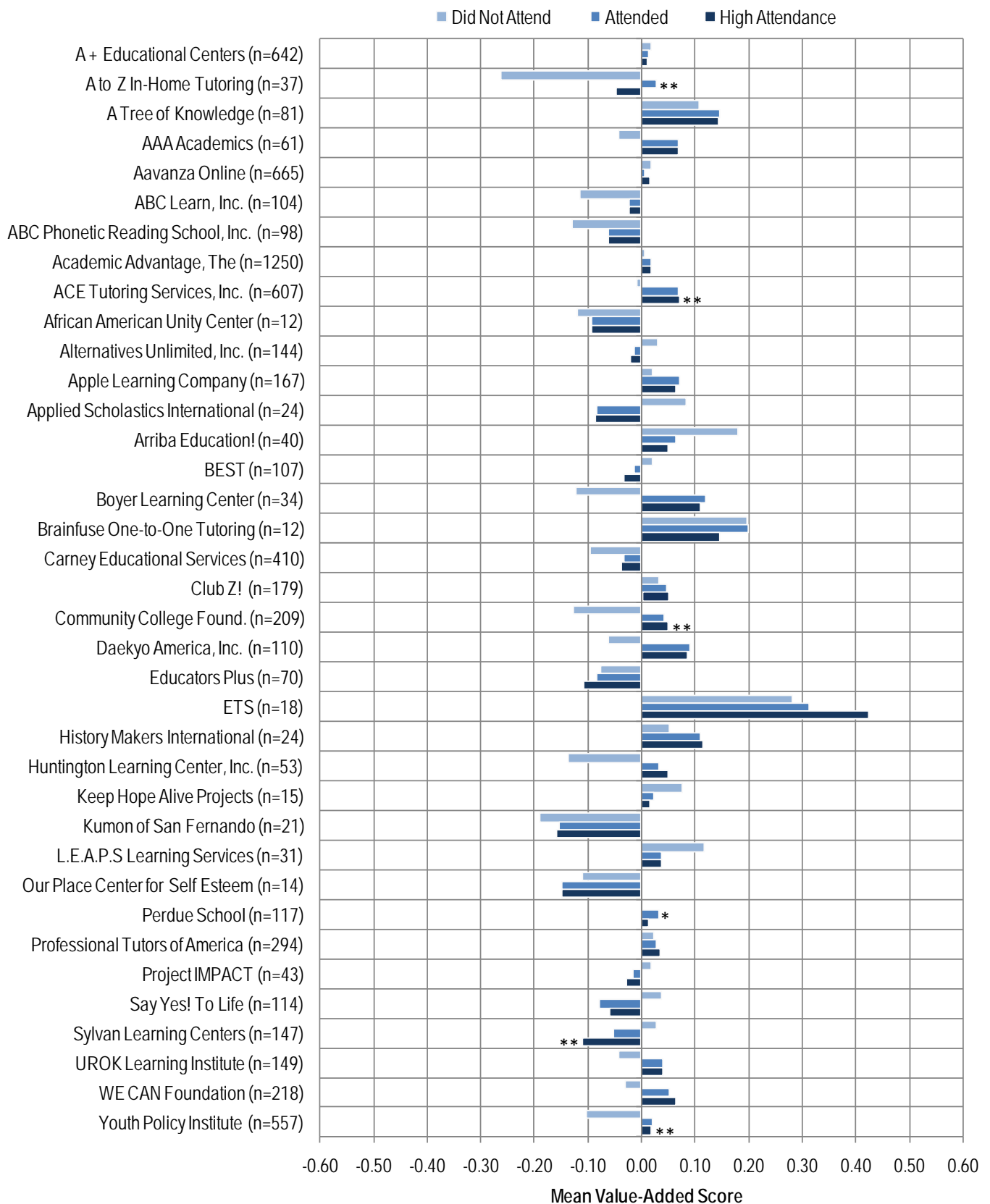
\*IMPORTANT NOTE: This table includes only those students with valid CST data in the 2009-10 school year. Data sources include the annual CST data provided by the California Department of Education as well as the database maintained by the Beyond the Bell Branch of LAUSD for tracking SES applicants and attendance.



## Appendix B: Supplemental Tables and Figures

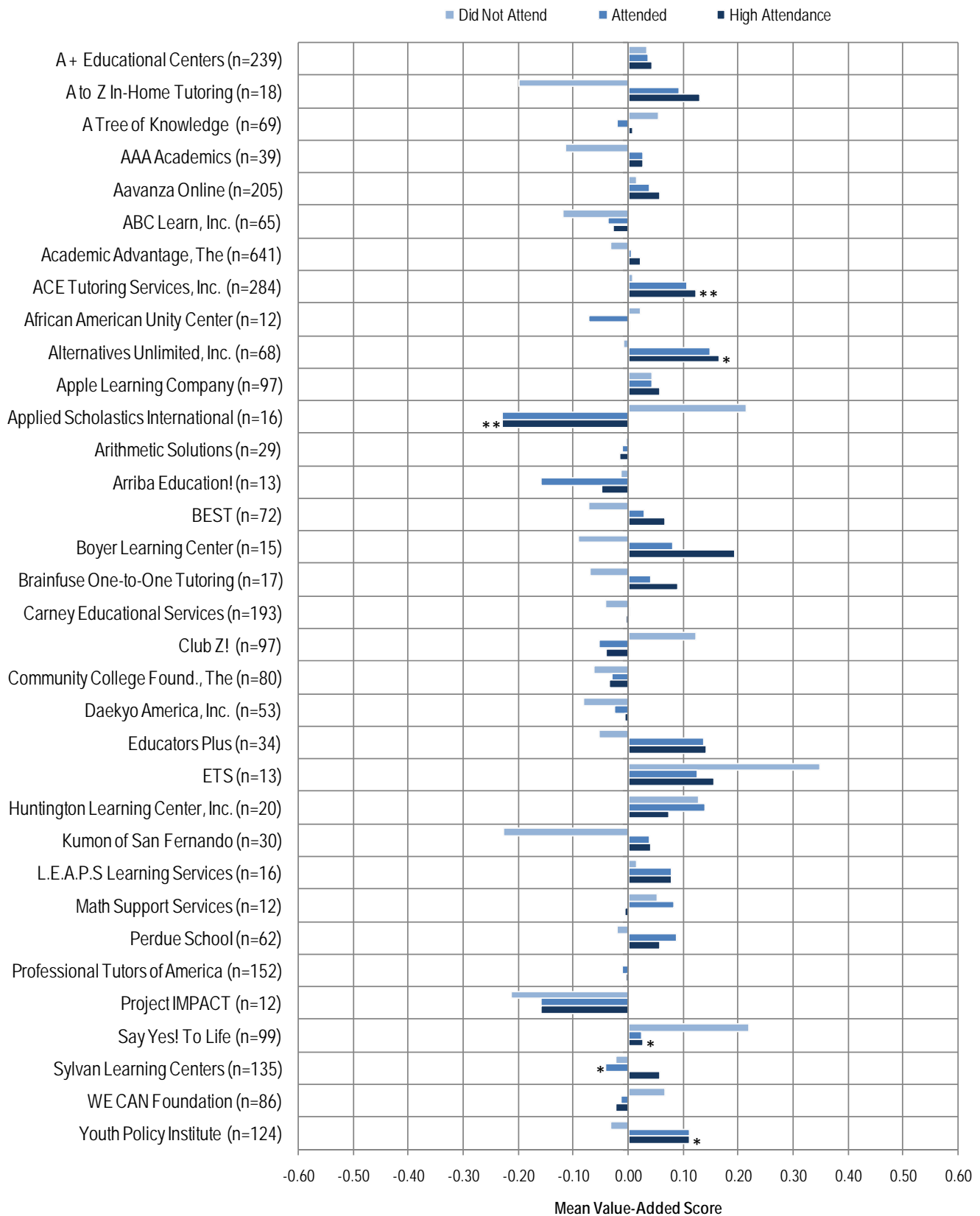
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FIGURE B1  
Average ELA Value Added Scores By Provider, 2009-10



Note: Restricted to providers with at least 10 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<0.10)  
\*\* Statistically significant difference compared to "did not attend" group (p<0.05)

FIGURE B2  
Average Math Value Added Scores By Provider, 2009-10



Note: Restricted to providers with at least 10 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<0.10)\*\* Statistically significant difference compared to "did not attend" group (p<0.05)