

# **Evaluation of the Cleveland Scholarship and Tutoring Program**

## **Summary Report 1998 - 2004**

---

**Jonathan Plucker, Ph.D.**  
Director

**Patricia Muller, Ph.D.**  
Associate Director

**John Hansen, MS**  
Research Associate

**Russ Ravert, Ph.D.**  
Research Associate

**Matthew Makel, MA**  
Graduate Research Assistant

**February 22, 2006**



# **CENTER FOR EVALUATION & EDUCATION POLICY**

509 East Third Street  
Bloomington, Indiana 47401  
<http://www.ceep.indiana.edu>

Jonathan A. Plucker, Ph.D.  
Director

812-855-4438  
800-511-6575  
Fax: 812-856-5890  
[ceep@indiana.edu](mailto:ceep@indiana.edu)





## Summary Report 1998 - 2004

---

Researchers from the Indiana Center for Evaluation at Indiana University, now known as the Center for Evaluation and Education Policy (CEEP), have examined the academic and demographic outcomes of the Cleveland Scholarship and Tutoring Program (CSTP) since its inception in 1996. Across the years of the study, academic outcomes have included the impact of the CSTP program on student academic achievement; descriptive outcomes have included characteristics of students and families, qualities of the teachers and classrooms experienced by students, parental opinions of the program, and parental opinions of the education their children receive. The current report provides findings from the analyses of the academic outcome data collected annually from 1998 - 2004 from approximately 4,000 students in 100 different schools. More specifically, the current report provides findings related to the characteristics of students who participate in the CSTP, the characteristics of the classrooms and teachers with whom scholarship students work in private schools, and the impact of participation in the CSTP on students' academic achievement. Additional details are available in the full Technical Report.



# 1 Introduction and Background

---

Educational choice has become one of the most visible and controversial issues facing the field of education. Many states have considered and initiated legislation to increase families' educational choices through a variety of programs, including charter schools (community schools in Ohio), magnet schools, and voucher programs. According to proponents, several benefits can be expected from the introduction of a market-based model to public education, including wider arrays of educational choices for students, enhanced student achievement, greater parental involvement, and increased accountability among school personnel for school-wide student outcomes. Although direct outcomes are primarily expected to occur for voucher students and their families, choice advocates believe that schools may also benefit from increased competition for voucher students.

Ohio has been at the forefront of these issues, with Ohio Revised Code 3313.974-3313.979 authorizing the Ohio Superintendent of Public Instruction to create a pilot publicly-funded voucher program in one district in the state. In October 1995, the Cleveland Scholarship and Tutoring Program (CSTP) began its operation within the boundaries of the Cleveland Municipal School District (CMSD). Despite some years of uncertainty regarding the future of the program, the controversy regarding its legality was resolved in June 2002 when the U.S. Supreme Court ruled that the publicly-funded voucher program in Cleveland was constitutional.

Throughout the duration of the CSTP, the program has remained focused on providing private school choice to families of low income who live within the boundaries of the Cleveland Municipal School District. However, several changes to the program have recently been instituted and should be noted given the potential influence of this changing context on program outcomes. First, during the summer of 2003, the Ohio Legislature made a decision to expand the program into high school. Therefore, in 2003-2004, grade nine scholarships were made available for students who had used a scholarship to attend

private school in eighth grade the previous school year; and in 2004-2005, grade ten scholarships were made available for students who had used a scholarship to attend private school in ninth grade the previous school year. Prior to these legislative changes, scholarships were available only to students through eighth grade. Second, the Ohio legislature increased the funding amount for the private school scholarships. In 2003-2004, the maximum amount of a scholarship was increased to \$3,000 for students in grades kindergarten through eight (from \$2,250), and \$2,700 for students in grades nine and ten.

Until 2004, vouchers were awarded on a monthly basis (from February through July), and applicants were categorized into one of three income groups using the federal poverty index. The first group consisted of applicants whose families earned less than 100% of the federal poverty index; the second group consisted of applicants whose families earned between 100% and 200% of the federal poverty index; the third group consisted of applicants whose families earned more than 200% of the federal poverty index. The award process was designed such that when the number of applicants in the first two groups exceeded the number of available vouchers, a lottery occurred amongst applicants in the first two groups; and if the number of vouchers available outnumbered the applicants in the first two groups, the remaining vouchers were made available to the third group. In practice, the numbers of available vouchers generally outnumbered the applicants in the two lowest income groups, resulting in the lottery system not being used and many relatively higher-income students receiving scholarships.

Starting in 2004, the award process was changed so that available scholarships were first awarded to eligible kindergarten students, with priority given to families who were in the lowest income category. Remaining available scholarships were awarded to families of students in first through eighth grades using a random lottery, again with priority given to families falling within the lowest income levels. Upon being offered a scholarship, families were given 30 days to use the scholarship. After 30 days, the process was repeated with unused scholarships again made available and distributed by lottery to remaining eligible

applicants. For a more complete discussion of how vouchers are awarded, see previous Technical Reports.<sup>1</sup>

In addition to funding the CSTP, the Ohio Department of Education (ODE) also devoted substantial resources to an evaluation of the publicly-funded voucher program. Starting in Spring 1996, ODE contracted with Indiana University (IU) to conduct a longitudinal evaluation of the Cleveland Scholarship and Tutoring Program. The evaluation conducted by IU – the longest running evaluation of any publicly-funded voucher program – has provided a unique opportunity to examine the impact of vouchers on students over time. To date, the evaluation has collected data from a 1997-1998 kindergarten cohort of students through their sixth grade year in 2003-2004.

- 
1. Metcalf, K. K. (1999). Evaluation of the Cleveland scholarship and tutoring grant program 1996-1999; Metcalf, K. K. (September 2001). Cleveland scholarship program evaluation 1998-2000.; Metcalf, K. K., West, S. D., Legan, N., Paul, K. & Boone, W. J. (March 2003). Evaluation of the Cleveland scholarship and tutoring program 1998-2001.; Metcalf, K. K., West, S. D., Legan, N. A., Paul, K. M., & Boone, W. J. (December 2003). Evaluation of the Cleveland scholarship and tutoring program: Student characteristics and academic achievement 1998-2002. Metcalf, K. K., Legan, N. A., Paul, K. M., & Boone, W. J. (October 2004). Evaluation of the Cleveland scholarship and tutoring program 1998-2003.



## 2 Methodology

---

This study utilizes a mixed-model, longitudinal research design to examine the following research questions related to participation in the CSTP:

- What are the characteristics of students who participate in the CSTP, and how do they compare with students who do not participate?
- What are the characteristics of the classrooms and teachers with whom scholarship students work in private schools, and how do they compare with the characteristics of classrooms and teachers in public schools?
- What is the impact of participation in the CSTP on students' academic achievement?

As described in more detail in the current and previous Technical Reports, the variables used as basis for comparison include specific types of funding applied for and received by Cleveland families, various demographic characteristics of those families and students, and school variables. The primary achievement outcome data source is the Terra Nova, a standardized test produced by CTB/McGraw-Hill and administered to students each year by representatives of the evaluation team. Classroom-level data collected in public and private schools by the evaluation staff are another primary source of data used in the study. Student demographic data is drawn from records maintained by the CSTP office and Cleveland Municipal School District (CMSD) records.

### Sampling: Multiple Comparison Groups

Comparison of achievement outcomes in longitudinal and non-randomized interventions are especially challenging, with methodological and theoretical complexities making it difficult to identify a single appropriate comparison group. Therefore, these analyses use multiple comparison groups to best address the impact of the voucher program. To provide the most valid and meaningful evaluation design, the broadest possible sample of participating and non-participating students was selected during their first grade year in 1998-1999; this longitudinal cohort was tracked as they progressed through first grade

(1998-1999), second grade (1999-2000), third grade (2000-2001), fourth grade (2001-2002), fifth grade (2002-2003), and sixth grade (2003-2004). More specifically, the five groups of students used for the multiple comparison groups are noted in Table 1 below.

**TABLE 1.** Multiple Comparison Groups

Student Group / Population	Definition
Scholarship recipient-users	Students who received a scholarship and used it to attend private school
Scholarship applicant non-recipients (public)	Students who applied for but did not receive a scholarship through the lottery system and who attend public schools
Public recipient non-users	Students who applied for and received a scholarship but did not use the scholarship and attend public schools
Former scholarship users (public)	Students who received and used a scholarship for one or more years, subsequently withdrew from the CSTP, and now attend public schools
Public non-applicants	Public school students whose families never applied for a scholarship

For each of these five student groups, the sample sizes for the six testing episodes are provided in Table 2. An ongoing and extensive process of monitoring and updating student status allowed the evaluation to maximize the retention of the various samples across the multiple years of the evaluation. Regardless, these sample sizes vary across the testing administrations due to student transience, retention of target students, absences during the testing episodes, inconsistent school records, and other uncontrollable factors. Given that students moved into and out of the various groups, sample sizes in the table below also vary and even increase in some instances (e.g., each year more students applied for the scholarship, increasing the population of applicants for each respective testing period). The sample sizes in Table 2 represent the maximum sample sizes available for the study, and actual sample sizes for analyses varied depending on the research question addressed (and are noted when appropriate).

**TABLE 2.** Sample Sizes by Student Group and Testing Episode

Student Group	Time of Testing						
	Fall First Grade 1998	Spring 1st Grade 1999	Spring 2nd Grade 2000	Spring 3rd Grade 2001	Spring 4th Grade 2002	Spring 5th Grade 2003	Spring 6th Grade 2004
Scholarship recipient-users	885	878	717	676	651	640	733
Scholarship applicant non-recipients (Public)	492	479	441	378	493	485	368
Public non-applicants	1408	1402	1027	1170	1794	1587	1241
Public recipient non-users	83	82	90	100	223	278	193
Former scholarship users (Public)	30	50	98	129	207	318	188

### Data Analysis Techniques

A mixed-model, longitudinal research design was used to examine the research questions related to participation in the CSTP. For each question, analyses included both descriptive and inferential statistical techniques. Inferential analyses primarily relied upon analysis of variance and analysis of covariance (ANOVA and ANCOVA), and follow-up pairwise comparison techniques as appropriate.

The current report presents findings based on both the replication of methodologies used in previous years of the longitudinal study, as well as new approaches to examining the impact of the CSTP program on student achievement. The Technical Report provides the full set of analyses used to examine impact on student achievement, including replications of previous statistical models conducted to provide consistency across the years of the study. However, to maximize the simplicity and clarity of the findings, the Summary Report presents only findings from the model that adjusted for comparison group differences in minority status, student mobility and prior achievement. This methodology was deemed to be most comprehensive and appropriate by the current evaluation team.



### 3 Summary of Findings by Research Question

---

For each of three primary research questions, this section provides a summary of related findings. More specifically, this section presents an overview of the findings related to the characteristics of students who participate in the CSTP, the characteristics of the classrooms and teachers with whom scholarship students work in private schools, and the impact of participation in the CSTP on students' academic achievement. Further details regarding the analyses and findings for each of the three research questions are presented in the full Technical Report

**What are the characteristics of students who participate in the Cleveland Scholarship and Tutoring Program and how do they compare with students who do not participate?**

The primary intent of the first research question is to examine the extent to which students whose families choose to participate in the CSTP are demographically representative of the larger student population in Cleveland. For the current study, analyses were conducted to examine differences between scholarship recipient users (both current scholarship recipient users and former scholarship recipients who are now attending public school) and the following public school comparison groups: scholarship applicant non-recipients, scholarship recipient non-users, and public school non-applicants. Specifically, differences in gender and minority status (white or non-white) were examined. Table 3 below provides the descriptive data for both gender and minority status. Eligibility for free lunch was not included in the current study for a variety of reasons including the following: estimation of eligibility for free lunch is based on data that are nearly four years old and probably significantly underestimates family income for public school students, and there were concerns with the reliability and coding of the extant data available

for analyses. However, concerns related to the current analyses’ inability to include an indicator of socio-economic status are mitigated by the following factors: analyses reported in prior Technical Reports did not find major differences in eligibility for free lunch between scholarship and public school students; the analyses do control for students’ prior achievement, which is traditionally highly correlated with socio-economic status; and one of the analyses of impact on academic achievement does include an indicator poverty status.

**TABLE 3.** Comparison of Student Groups on Demographics

	Gender	Minority Status
	(% Female)	(% Minority)
Scholarship recipient-users (N=733)	57%	63%
Former scholarship users (Public) (N=188)	51%	89%
Scholarship applicant non-recipients (Public) (N=368)	52%	86%
Public recipient non-users (N=193)	54%	89%
Public non-applicants (N=1241)	51%	82%

Similar to previous years, results from analyses of variance (ANOVA) indicate that there are no demographic differences in terms of gender across any of the student subgroups. Students whose families use a scholarship for private school enrollment are similar to public school students in terms of gender, with each respective student comparison group comprised of slightly more females than males. However, results indicate statistically significant differences ( $p \leq .001$ ) between current scholarship recipient users (including all students who are currently using a scholarship regardless of length of time in the CSTP) and each of the other four groups in terms of minority status. The proportion of current

scholarship students who are minority students is significantly lower than the proportion of minority students in each of the respective public school comparison groups. In other words, as noted in the table above, whereas 63% of current scholarship recipient users are minority students (African-American, Hispanic or multi-racial), approximately 82-89% of the public school comparison groups are minority students. These findings also indicate that a greater percentage of minority students are leaving the scholarship program than are remaining in private schools. Almost 90% of students leaving the scholarship program are minority students, as compared to only 63% of the overall scholarship population that is comprised of minority students.

#### **Demographic Characteristics Based on Year of Entry into the CSTP**

As a secondary research question, the current study also examined demographic characteristics of scholarship students based on the grade level of entry into the CSTP. Table 4 below indicates the percentage of scholarship recipient users that were female, and the percent that were minority, for students entering each respective year of the scholarship program from 1997 through 2004. As shown in the table, those students more recently awarded scholarships tended to include more females and fewer minority students than the earlier years of the CSTP program. In other words, during the latter years of data collection, more female students and more white students received new scholarships than in previous program years.

**TABLE 4.** Gender and Minority Status of First Year Recipients

Year	N	1st Year Recipients	
	(Female / Minority)	% Female	% Minority
1997-98	738 / 830	52%	75%
1998-99	218 / 235	47%	74%
1999-00	94 / 100	46%	72%
2000-01	103 / 109	45%	64%
2001-02	77 / 94	64%	70%
2002-03	109 / 106	56%	55%
2003-04	190 / 190	63%	65%

**Type of School Prior to Entering the CSTP**

Another secondary question addressed in the current study relates to the characteristics of students prior to receiving a scholarship and entering the CSTP. Findings indicate that students who entered the CSTP after first grade were more likely to have attended private than public schools prior to being granted a scholarship. As noted in Table 5, the majority of scholarship students entering the program were already attending a private school immediately prior to receiving the scholarship. Between 61-72% of scholarship students attended a private school during the school year immediately prior to entering the CSTP.

**TABLE 5.** Prior Year School Type for First-Year Scholarship Recipients

Year	N	Attended Public School in Previous Year	Attended Private School in Previous Year
1999-00	58	31%	69%
2000-01	65	29%	70%
2001-02	41	39%	61%
2002-03	75	28%	72%
2003-04	107	38%	62%
Combined 1999-2003	346	33%	67%

Analyses also indicate that these students entering the scholarship program from private schools were more likely to be white than were scholarship students entering the CSTP from public schools. For scholarship recipients entering from public schools during the 2003-2004 academic year, 76% were minority students, compared with 45% minority students who entered the program from private schools. The magnitude and direction of the racial-ethnic disparity in students entering the program from public schools versus private schools is consistent across the years of the study, with the exception of 1999-2000 when the gap was smaller: 68% of scholarship students entering from private school were minority students, as compared to 78% of scholarship students from public schools. However, during other years the gap was even greater than the most current year, such as 2002-2003 when 33% of scholarship recipients entering from private school were minority students while 76% of scholarship recipients entering from public schools were minority students.

Of particular interest is whether scholarship recipient-users who entered the program after attending public schools in previous years possessed demographic characteristics similar to their former classmates in public schools. In the sample of 2003-2004 sixth-grade students, 81% of the public school non-applicants are minority students, and 18% are non-minority (white) students. Analyses were conducted (ANOVA) to compare the proportion of minority status among three groups: 2003-2004 first-year recipient-users who entered the program from public schools, 2003-2004 first-year recipients who entered the program from private schools, and 2003-2004 public school non-applicants. As found in previous CSTP reports, first-year recipients in 2003-2004 who attended public schools before receiving and using a scholarship to attend private schools were comparable to public school non-applicants in terms of minority status, whereas scholarship recipients from private schools were significantly more likely to be non-minority (white) students.

What are the characteristics of the classrooms and teachers to which the scholarship students are exposed in private schools, and how do they compare with the characteristics of classrooms and teachers in public schools?

The second research question for the study examines differences between classrooms and teachers of students attending private schools using a scholarship and students attending public schools. There were 685 unique teachers in the dataset, 590 of them in private schools and 95 in public schools. Table 6 provides the general classroom and teacher characteristics for private schools attended by scholarship students and public schools in CSMD. Analyses indicate that statistically significant differences ( $p \leq .01$ ) between the private and public school teachers and classrooms exist in two areas: the highest degree earned by teachers, and class size. Public school teachers generally have completed substantially more coursework, with 51% versus 18% having a masters degree or higher, and 91% versus 66% having completed at least some coursework beyond their undergraduate degree. This gap in education levels appears to have increased from previous years of the study. For example, in 2001 approximately 34% of public school teachers reported they had a masters degree or higher as compared to 16% of private school teachers.

In addition, differences in class size were found to be statistically significant, with public schools averaging 19.8 students per classroom versus 22.9 in private schools. This may be partly explained by a number of very small class sizes (2 – 10 students) reported for public schools but not private schools. On all other characteristics, classrooms and teachers with whom scholarship students work in private schools were similar to that of classrooms and teachers in CSMD public schools.

**TABLE 6.** Comparison of Private and Public Teachers in Study Sample

	Private School	Public School
# of Unique Teachers	95	590
% of Certified Teachers	90.4%	93.2%
Years Experience	11.3	11.1
Years Experience - Same School	6.3	6.0
M.A. or Higher	18.0%	50.8%
% with Post-Baccalaureate Coursework	66.4%	90.5%
Class Size	22.9	19.8

What is the impact of participation in the Cleveland Scholarship and Tutoring Program on student academic achievement?

A primary focus of the evaluation has been on the academic impact of the CSTP on students participating in the scholarship program. Similar to previous years, this research question is addressed using multiple comparison groups. More specifically, the analyses compare the academic achievement (as measured by Terra Nova standardized scale scores) of students who have used a scholarship continuously from kindergarten through sixth grade with that of two groups of public school students: those who applied for but did not receive a scholarship and who were attending public schools in sixth grade (scholarship applicant non-recipients), and those who have never applied for a scholarship but who were attending public schools in sixth grade (non-applicants). The analyses use longitudinal achievement data collected from the same cohort of students across seven testing episodes: fall and spring of first grade (1998-99), spring of second grade (1999-2000), spring of third grade (2000-2001), spring of fourth grade (2001-2002), spring of fifth grade (2002-2003) and spring of sixth grade (2003-2004).

Analyses of covariance (ANCOVAs)<sup>2</sup> were used to compare the academic achievement (as measured by Terra Nova standardized scale scores) of students who have used a scholarship continuously from kindergarten through sixth grade with that of scholarship applicant non-recipients attending public school, and non-applicants attending public school. Given that the available data do not result from a randomized controlled trial design, the analyses included the following covariates to statistically control for pre-program differences between students in the comparison groups: minority status, student mobility and prior achievement. Although the variable used as a measure of prior achievement (fall 1998 test scores from the beginning of first grade) does not account for program differences that may have occurred during students' participation in the program in kindergarten, this indicator of prior achievement provides the best available extant data to account for pre-program differences in achievement.

Statistically adjusting for these differences in achievement is particularly important given that unadjusted means indicate that 7-year scholarship students begin first grade with substantially higher achievement test scores than their public school peers (537 versus 521/522), and these are not likely to be differences that can be accounted for by participation in the scholarship program in kindergarten. Without accounting for these early differences, it is difficult to attribute any differences in achievement test scores in subsequent years to the impact of the CSTP program. Rather, it is likely that any differences found without accounting for prior achievement are simply artifacts of 7-year scholarship students having started the CSTP program with higher achievement levels. This is particularly true given that the preliminary analyses conducted without adjusting for prior achievement reveal no interaction of time and group. In other words, 7-year scholarship students do not appear to have different rates of achievement than their public school peers.

---

2. Sidak procedures were used to adjust for conducting multiple pairwise comparisons.

For science and social studies, Spring 2001 achievement test scores (when students were third graders) were used as the measure of prior achievement given that this was the first year tests were administered in these subjects. For science and social studies, therefore, it is possible that the analyses may not be accounting for the impact of the CSTP in earlier grade levels. However, using these test scores as a covariate does allow us to examine any impact the CSTP program has on science and social studies achievement starting in fourth grade.

Findings related to both six grade academic outcomes, as well as a longitudinal examination of outcomes, are summarized in the remainder of this section. In addition, findings related to poverty status and impact of the CSTP program are presented; as well as findings related to differential exit from the scholarship program.

### **Sixth grade academic outcomes**

Although analyses were conducted with both adjusted and unadjusted means, for theoretical and practical purposes the findings discussed in this report refer specifically to students' scores adjusted on the basis of minority status, student mobility and prior achievement.<sup>3</sup> Full analyses are available in the Technical Report.

Results indicate that by the end of the sixth grade, after controlling for differences in minority status, student mobility and prior achievement, there are no statistically significant differences in overall achievement scores between students who have used a scholarship throughout their academic career (i.e., kindergarten through sixth grade) and students in the two public school comparison groups. However, there are statistically significant differences ( $p < .05$ ) in three specific subject areas: language, science and social studies. Sixth grade scholarship students who had been in the CSTP since kindergarten outperformed both public school comparison groups in language and social studies; and

---

3. Due to issues with the reliability and validity of extant data related to socio-economic status (i.e., eligibility for free lunch), students' scores in these particular analyses were not adjusted for income.

these sixth grade scholarship students also outperformed public school non-applicants in science.

There were no statistically significant differences in sixth grade mathematics achievement between any of the comparison groups; and no statistically significant differences for any of the achievement areas between public school non-applicants and public school students who applied for a scholarship but did not receive one. Table 7 below provides the adjusted sixth grade achievement score means for each of the three comparison student groups in order to provide a better understanding of the magnitude of these differences. Differences range from approximately 12 scale score points to approximately 16 scale score points for the achievement areas where there are statistically significant differences.

**TABLE 7.** Sixth Grade (Spring 2004) Test Scores by Student Group and Achievement Area

Group		Reading	Language *	Math	Science **	Social Studies *	Overall
7-year Scholarship Recipient-users (N=197)	Adj. mean	649	650	642	650	650	645
	SD	33	39	40	43	35	33
Public Scholarship Applicant Non-recipients (N=259)	Adj. mean	643	638	645	643	638	642
	SD	41	43	52	49	43	40
Public Non-applicants (N=343)	Adj. mean	641	637	642	640	634	641
	SD	43	43	55	51	48	41

\*Statistically significant differences ( $p \leq .05$ ) between scholarship recipients and the two public school comparison groups.

\*\* Statistically significant differences ( $p \leq .05$ ) between scholarship recipients and public school non-applicants only.

### Longitudinal Examination of Academic Outcomes

In addition to examining sixth grade student achievement, the study also examined student achievement over time. Table 8 depicts instances (by grade/year and subject area), in which there are statistically significant differences between students' adjusted achievement scores. The table also indicates the specific student groups between which there are differences, as well as the direction of the relationship (i.e. which student group outperformed which student group). In addition, Table 9 provides the unadjusted and adjusted

---

**Summary of Findings by Research Question**

---

scores for overall achievement for each testing period of the longitudinal study to provide a better context for understanding and interpreting the patterns.

**TABLE 8.** Significant Pairwise Differences ( $p \leq .05$ ) Indicating direction of the relationships by Testing Episode: 7-year scholarship recipients (7), Applicant Non-recipients (ANR), and Public Non-applicants (NA)

Subject	Spring 1st Grade 1999	Spring 2nd Grade 2000	Spring 3rd Grade 2001	Spring 4th Grade 2002	Spring 5th Grade 2003	Spring 6th Grade 2004
Overall	NA>7					
Reading						
Language						7>ANR 7>NA
Math		NA>7		NA>7	NA>7	
Science	Not Tested					7>NA
Social Studies	Not Tested					7>ANR 7>NA

**TABLE 9.** Overall Achievement: Early First Grade (Fall 1998) to Late Sixth Grade (Spring 2004)

Group		Spring 1st Grade 1999	Spring 2nd Grade 2000	Spring 3rd Grade 2001	Spring 4th Grade 2002	Spring 5th Grade 2003	Spring 6th Grade 2004
7-year Scholarship Recipient-users (N=197)	Unadj. mean	555	587	615	632	643	654
	SD	30	32	33	33	32	33
	Adj Mean	545	578	606	622	635	645
Public Scholarship Applicant Non-recipients (N=259)	Unadj. mean	546	577	605	620	636	639
	SD	34	32	33	38	33	40
	Adj Mean	549	580	608	623	639	642
Public Non-applicants (N=343)	Unadj. Mean	548	580	607	624	636	638
	SD	33	30	34	38	38	41
	Adj. mean	551	583	610	628	639	641

After adjusting for differences in minority status, student mobility and prior achievement, there is a statistically significant difference in terms of overall achievement at the end of the first grade with public school non-applicants outperforming 7-year scholarship students. There are no statistically significant differences in any of the individual subject areas at the end of the first grade. In fact, until the end of sixth grade there is only one subject area that reveals any statistically significant differences: mathematics. In mathematics, public school non-applicants outperform 7-year scholarship students in the 2nd, 4th and 5th grades. There are no statistically significant differences in mathematics by the end of the students' sixth grade of school. However, there are statistically significant differences in language and social studies at the end of the sixth grade, with 7-year scholarship students outperforming their public school peers; and statistically significant differences in science at the end of the sixth grade, with 7-year scholarship students outperforming public school non-applicants in science achievement.

In addition, across all analyses, there are statistically significant main effects of minority status, time and prior achievement (i.e. fall 1998 test scores; or spring 2001 for science and social studies). In addition, student mobility (i.e. number of schools) is statistically significant for overall achievement, reading, and mathematics; and the time by group interaction is statistically significant for social studies. In all other subject areas there was no difference in the rates of growth in achievement between the various comparison groups of students.

### **Additional Analyses Including Poverty Status**

Analyses were also conducted that included an indicator of poverty status. Given that valid and reliable socio-economic status data was not available for all three student comparison groups, but yet is deemed to be an important factor to examine as part of the research on the impact of the CSTP program, a separate analysis of impact on student achievement was also conducted including an indicator of poverty status. This analysis

focused specifically on 7-year scholarship recipients and applicant non-recipients; and non-applicants were excluded from the analyses due to the absence of needed extant data.

First, on the complete sample, a comparison between students in poverty and students not in poverty (regardless of scholarship status) was conducted to test whether poverty status had a significant effect on subject-area achievement scores. Following this analysis, the sample was divided in two: those students of poverty status and those students not of poverty status. On these two sub-samples, analyses were conducted comparing 7-year scholarship users to applicant non-recipients.

Based on 1997 income and family size reported by applicants to the scholarship program, and using the 1997 Federal Poverty Guidelines, 62% (N = 121) of students who would be 7-year scholarship recipients and 50% (N = 56) of students who applied for but did not receive a scholarship were considered in poverty. A significant difference was found between students in poverty and students not in poverty (regardless of scholarship status) on the overall achievement and language scores, with students not in poverty outperforming students in poverty. Due to the small sample size the interaction of poverty status and scholarship status was not tested. This finding then led to the subsequent analysis on the two sub-groups of students who were of poverty status and students where were not of poverty status.

### ***Students in poverty***

At the beginning of first grade, fall 1999, students who continued to use a scholarship to attend private schools had a significantly lower adjusted overall mean achievement score than did students in the public school comparison group, ( $p < 0.05$ ). By the end of second grade (spring 2000), this difference was no longer present.

No difference was found between groups for the duration of spring 2000 through spring 2002. In the spring of 2003, students who continued to use a scholarship to attend private

---

**Summary of Findings by Research Question**

---

schools had higher social studies achievement scores ( $p < 0.05$ ) than students in the public school comparison group. At the end of sixth grade (spring 2004) no significant differences were found between 7-year scholarship users and their comparable peers who remained in the public schools. These findings are summarized in Table 10 below.

***Students not in poverty***

The only significant difference found between scholarship users and applicant non-recipients not in poverty occurred during the fifth grade, 2003 on the language achievement test. Here, students attending private school had a higher adjusted mean score than those students attending public school,  $p < 0.05$ . These findings are summarized in Table 10 below.

---

**TABLE 10.** Significant Pairwise Differences Between Seven-Year Scholarship Students (7) and Applicant Non-recipients (ANR) by Testing Episode for Students in Poverty

Subject	Testing Episode						
	Fall 1st Grade 1998	Spring 1st Grade 1999	Spring 2nd Grade 2000	Spring 3rd Grade 2001	Spring 4th Grade 2002	Spring 5th Grade 2003	Spring 6th Grade 2004
Overall	--	In Poverty: ANR>7	a				
Reading	--						
Language Arts	--					Not in Poverty: 7>ANR	
Math	--						
Science	Not Tested			--			
Social Studies	Not Tested			--		In Poverty: 7>ANR	

a. Empty cells indicate no significant difference.

### **Differential Exit from the CSTP: Former Scholarship Recipients and Academic Achievement**

Question three also examines the achievement of students who participated in the scholarship program for at least one year, but who elected to leave the program at some subsequent point and enroll in public schools. The following six groups of former scholarship recipient-users were identified for these analyses:

- Six-year former recipient-users who withdrew from the CSTP after participating in kindergarten and have attended public schools in the CMSD for six years (in first through sixth grade);
- Five-year former recipient-users who withdrew from the CSTP after participating in kindergarten and first grade and have attended public schools for five years (from second through sixth grade);
- Four-year former recipient-users who withdrew from the CSTP after participating from kindergarten to second grade and have attended public schools in third through sixth grade;
- Three-year former recipient-users who withdrew from the CSTP after participating from kindergarten through third grade and have attended public schools from fourth to sixth grade;
- Two-year former recipient-users who used a scholarship from kindergarten through fourth grade but who enrolled in public school in fifth and sixth grade; and
- One-year former recipient-users who used a scholarship from kindergarten through fifth grade but who enrolled in public school in sixth grade.

Given that the primary intent of these analyses is to examine whether differential levels of achievement are related to families' decisions to continue in the CSTP or to move their children to public schools, no adjustment was made in students' scores for minority status or other covariates.

ANOVA and pairwise comparison was used to examine differences in the achievement of each former recipient-users group and 7-year continuous recipient-users. The primary trend revealed in these data is a difference between students who have been in the scholarship program for seven years and all other participants who had dropped out of the program. Overall, students who remained in the scholarship program had higher levels of achievement than those students who left the CSTP program across all subject areas. The

greatest difference between students that remained in the scholarship program and former scholarship recipients is shown to be in language. While former scholarship recipients exhibit similar gains, mean scores are markedly lower than the scores achieved by students who remain in the scholarship program.

## 4 Discussion

---

In general, the analyses from the most current CSTP data available supports the overall conclusions drawn from previous years of the longitudinal study. For example, the following conclusions related to student, teacher and classroom characteristics are similar to previous years:

- Scholarship students are less likely to be African American or Latino/a than their public school peers. In terms of the types of students participating in the state-funded voucher program, the analyses continue to indicate that program participants differ significantly from their public school peers in terms of minority status. Scholarship recipient-users in private schools are less likely to be African American or Latino/a (63%) than their public school peers from all comparison groups (scholarship applicant non-recipient, 86%; scholarship recipient non-user, 89%; and non-applicants, 82%).
- Students who exited the scholarship program were more likely to be African American or Latino/a than were students who remained in the scholarship program; and students who exited the program tended to have lower levels of achievement than students who remained in the scholarship program. Almost 90% of students leaving the scholarship program are racial-ethnic minority students, as compared to 63% of the overall scholarship student population. However, this differential exit alone does not account for the differences between scholarship students and public school students. Analyses of data for students entering the scholarship program (as opposed to only accounting for those remaining in the program) also indicates lower percentages of racial-ethnic minorities being awarded scholarships than the general public school population demographics. In addition, across all six academic measures, those students leaving the scholarship program had lower levels of achievement than those students who remained in the CSTP program.
- The majority of scholarship students were already attending a private school prior to receiving the scholarship. Approximately 61-72% of scholarship students attended a private school during the school year immediately prior to entering the CSTP. Therefore, there appear to be relatively few public school students who are using the CSTP program as a form of school choice to attend private school.
- Although similar in some ways, the teachers that scholarship students and their peers in public schools experience differ in terms of teacher education level. There are many similarities in terms of public and private school teachers and classroom characteristics. The vast majority of both public and private school teachers are certified, have similar levels of previous teaching experience (approximately 11 years), and similar levels of previous experience at their current school (approximately 6

years). There are small, but statistically significant differences in class size (i.e., 22.9 students in private schools versus 19.8 in public). However, the most significant difference, both statistically and practically, between public and private schools is in terms of teachers' highest education level. Whereas, 50.8% of public school teachers have a master's degree or higher, only 18.0% of private school teachers have attained a master's degree or higher.

In terms of impact on student achievement, results were also similar to previous years in that those students who would continue to use a scholarship to attend private schools began their schooling at the start of first grade with higher achievement scores. In other words, seven-year scholarship recipient–users had statistically significant higher achievement test scores than their public school peers in all measured areas (reading, language, math and overall) at the beginning of first grade (Fall, 1998). Therefore, to provide the most valid analyses of the impact of the CSTP program on student achievement, analyses were conducted that adjusted for these early differences between 7-year scholarship students and their public school peers.

Results indicate that by the end of the sixth grade, after controlling for differences in minority status, student mobility and prior achievement, there are no statistically significant differences in overall achievement scores between students who have used a scholarship throughout their academic career (i.e., kindergarten through sixth grade) and students in the two public school comparison groups. However, there are statistically significant differences ( $p < .05$ ) in three specific subject areas: language, science and social studies. Sixth grade scholarship students who had been in the CSTP since kindergarten outperformed both public school comparison groups in language and social studies; and these sixth grade scholarship students also outperformed public school non-applicants in science. Interestingly, these findings favoring 7-year scholarship students do not appear until the students' sixth grade year. Given that these differences are emerging during the early middle school years, it is possible that the impact of the CSTP program is different in the early elementary years than it is during middle school years.

It is also interesting to note that after adjusting for prior differences in academic achievement, public school non-applicants outperform 7-year scholarship students at various points during the study, primarily in the area of mathematics. Although there is no statistically significant difference in mathematics at the end of the sixth grade, this finding warrants further examination.

In examining the impact of the scholarship program on student achievement it is also important to place these findings within a broader context that helps us to understand the practical significance of these findings. First, Table 11 below provides effect size calculations for those subject areas where there were statistically significant differences to provide a better understanding of the magnitude of these differences between scholarship students and the public school comparison group students. Using Cohen’s (1988) guidelines, the effect sizes for statistically significant sixth grade achievement scores are moderate, with the exception of science which has a small effect size.

**TABLE 11.** Effect Sizes for Statistically Significant Sixth Grade Achievement Scores

	Language	Science	Social Studies
7-year Scholarship Recipient-users (N=197) vs. Public Scholarship Applicant Non-recipients (N=259)	0.29		0.31
7-year Scholarship Recipient-users (N=197) vs. Public Non-applicants (N=343)	0.32	0.21	0.38

In addition to examining effect sizes, placing the achievement test scores within a broader context of national norms also helps to provide a context for interpreting these differences. Table 12 below provides both the grade mean equivalent and the national percent-

tile rank for each of the subject areas where there were statistically significant differences in achievement scores. This table helps to provide a better understanding of the types of differences exhibited between scholarship students and the public school comparison groups. For example, in language arts, scholarship students' adjusted grade mean equivalent was 5.4 (interpreted as 5 years and 4 month) as compared to 4.6 for public applicant non-recipients and 4.4 for public non-applicants. In other words, in terms of national norms, sixth grade public school students in the comparison groups are achieving at the equivalent of students mid-way through the fourth grade, whereas scholarship recipients are achieving at a level equivalent to mid-way through fifth grade. Although these scholarship students are still below national norms (i.e., given the timing of the testing period, the expected grade mean equivalent would be approximately 6.9, or 6 years and 9 months), the seven-year scholarship recipients test scores are closer to average for sixth graders than are the scores of their public school peers who are almost two grade levels behind in language arts achievement. In terms of national percentiles, these scholarship recipients are scoring in the 41st percentile nationally in language arts, as compared to the 29th and 28th percentiles for public school non-applicants and public school applicant non-recipients, respectively.

**TABLE 12.** Sixth Grade (Spring 2004) Test Scores by Student Group in Achievement Areas Demonstrating Significant Differences: Grade Mean Equivalent (GME) and National Percentile Rank (NP) Based on Adjusted Means

Group		Language	Science	Social Studies
7-year Scholarship Recipient-users (N=197)	Score	650	650	650
	GME	5.4	5.6	5.4
	NP	41	37	37
Public Scholarship Applicant Non-recipients (N=259)	Score	638		638
	GME	4.6		4.4
	NP	29		25
Public Non-applicants (N=343)	Score	637	640	634
	GME	4.4	4.9	<4.4
	NP	28	27	22

Although the patterns of findings are not as complicated as those in previous years of the study, the changing patterns over time warrant caution in interpreting findings, while also highlighting the importance of further study. The emergence of statistically significant differences in sixth grade, with 7-year scholarship students outperforming public school students in several subject areas (i.e., scholarship students outperform both public school applicant non-recipients and non-applicant in language and social studies after controlling for minority status, prior achievement and mobility; and scholarship students outperform public school non-applicants in science after controlling for minority status, prior achievement and mobility) raises questions about potential differences in impact during the elementary school years versus the middle school years. Given that CMSD public schools are organized such that students generally remain in the same school building from K-8 (similar in structure to most private schools) the higher performance levels of the 7-year scholarship students cannot be attributed to academic losses that might typically be associated with public school students making the transition from an elementary school to a middle school.

Therefore, the question remains as to whether there is something different about these middle school years (e.g., stage of adolescent development, changes in subject matter or curriculum and instruction, different expectations for higher levels thinking) that might account for the emergence of statistically significant differences in some subject areas during the sixth grade. Particularly as students progress through these middle school years and beyond, it will be critical to continue to collect new student achievement data to provide more evidence regarding the long-term impact of publicly-funded school vouchers on student achievement. These data are needed to understand whether the emerging differences during sixth grade in some subject areas are an anomaly, a delayed impact of CSTP, or the beginning of a period of differential impact that might emerge during the middle school years. Given that many of the public school students will begin high school next year, making tracking these students as they transition to new schools both complex and resource-intensive, the 2005-2006 academic year represents a critical year to

collect new achievement data to better understand the achievement differences that emerged during the beginning of these students' middle school years. In addition to administering academic achievement tests to the current eighth grade students, data related to any differences in middle school curriculum and instruction in the respective public and private schools would be useful to disentangle the impact of CSTP.