The Effect of the National Institute for School Leadership's Executive Development Program on School Performance Trends in Pennsylvania

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EXECUTIVE SUMMARY

This study examined the impact of NISL's Executive Development Program for principals on student achievement in Pennsylvania schools between 2006-2009. Roughly half of the NISL-trained principals started the program during the 2007 school year and completed it in the 2008 school year, whereas the other half started during the 2008 school year and completed it in the 2009 school year. Schools served by principals participating in the Executive Development Program were individually matched to comparison schools with similar school performance and demographic profiles in 2006, which served as the baseline year. For elementary schools, it was possible to make individual school matches within the same school district for 36 school pairs. An additional 32 elementary schools were included in an out-of-district matched comparison sample. For all middle and high schools, it was necessary to match outside the school district. The percentages of students achieving proficient or above in mathematics and reading or English/Language Arts (ELA) across all grade levels were used to create aggregate school performance indices for each year 2006-2009. Repeated-measures analyses were performed to determine whether there were differences in school performance trends between schools served by NISL-trained principals and matched comparison schools.

At the elementary level, statistically significant differences in school performance trends were observed between the matched within-district NISL and comparison schools in both mathematics and reading/ELA. For both subjects, NISL schools had statistically significantly higher rates of improvement in school performance than did comparison schools. Further, a significant quadratic effect was observed for mathematics, indicating an acceleration in the rate of improvement for NISL schools. In terms of unadjusted results, NISL schools gained 3.9% versus 0.7% for comparison sites in mathematics, and 4.1% versus 3.7% in reading/ELA. For

the matched out-of-district elementary schools, significant trends favoring NISL over comparison schools were also indicated in both mathematics and reading/ELA. Significant quadratic effects in mathematics further revealed acceleration in the rate of growth over time for NISL schools.

As with the elementary school results, statistically significant positive effects of NISL status were observed for both mathematics and reading in the middle school sample. Unadjusted results showed that NISL students improved the percentage of students achieving proficiency in mathematics by 5% from 2006 to 2009, compared to a 1% improvement in comparison schools. In reading/ELA, NISL middle schools improved the percentage of students achieving proficiency by 3% versus 1% in comparison schools. As with elementary schools, a significant quadratic effect on mathematics school performance trends revealed that the rate of improvement was accelerating over time in NISL schools.

NISL high schools had statistically significantly higher rates of improvement, with adjusted differences in 2009 performance equal to 5%. In math, on an unadjusted basis, NISL high schools improved the percentage of students reaching proficiency by 5.9% from 2006 to 2009, compared to a decline of 0.5% in comparison schools. In reading/ELA, performance in NISL sites remained relatively constant (unadjusted difference of +0.6% between 2006 and 2009), while performance in comparison sites declined by 3.1% over the same time period. Overall conclusions are that across the three school levels and two subjects, NISL schools consistently surpassed the comparison schools at a statistically significant level in achievement gains from the baseline year of 2006 to 2009. Predictably, the gains were strongest in 2008 and 2009 as levels of participation in the NSL program (both number of principals and exposure) increased. The significant quadratic effects reflected this trend for program impacts to accelerate

over time. Across the four school cohorts examined (matched within-district elementary schools, matched out-of-district elementary schools, middle schools, and high schools), NISL schools surpassed comparison schools in percentage achieving proficiency in mathematics by 2.69%, 3.71%, 1.70%, and 5.52%, respectively, and in reading/ELA by .37%, 2.55%, 1.63%, and 1.89%, respectively. Given that approximately 40,000 students were included in the combined samples, these advantages appear highly educationally meaningful. For example, across the high school subsample alone, replication of the NSL effects in mathematics and reading/ELA would result in about 275 and 103 more students achieving proficiency on the respective tests. Given the limited amount of post-program program participation for the majority of principals prior to the 2008 and 2009 achievement assessments, follow-up evaluation research is encouraged to determine program effects over a longer time period.

INTRODUCTION

The National Institute of School Leadership's (NISL's) Executive Development Program was established to train school leaders to drive their schools to high performance. The program emphasizes the role of principals as strategic thinkers, instructional leaders, and creators of a just, fair, and caring culture in which all students meet high standards. Its primary goal is to ensure that the participating school leaders have the knowledge, skills, and tools to effectively set direction for teachers, support their staffs, and design an efficient organization. The curriculum, which was designed by experts on leadership training across a number of fields, was developed with an $11 million investment and five years of research and piloting. Professional development goals are to provide high-quality instruction (both online and face-to-face), an advanced research-based curriculum, and an interactive approach to learning that includes simulations, case studies, school evaluations, and online activities.

Key expectancies for NISL-trained principals include:

- Formulating a clear vision to inspire others in the school communities,
- Implementing fully-aligned, standards-based instructional systems,
- Building effective instructional programs in the core academic subjects, particularly math, language arts and science,
- Using data to produce continuous improvements in instruction and student achievement,
- Providing effective training programs to build a professional learning community for school faculty and staff, and
- Creating integrated school improvement plans that reflect strategic and systemic thinking.

The curriculum is organized into four courses: World-Class Schooling (Principal as a Strategic Thinker and School Designer, Standards-Based Instruction), Teaching and Learning, Developing Capacity and Commitment, and Driving for Results. Training sessions are designed to be highly interactive through the use of simulations and assignment of "pre-work" and "homework" to participants.

Prior evaluations of the Executive Development Program have shown that the NISL program can be economically implemented with high fidelity (Meristem Group, 2009). Importantly, positive student achievement patterns have been associated with program participation by school leaders. However, these prior studies have used descriptive or correlational designs lacking comparison groups or strong controls over sample selection bias. Accordingly, to provide more rigorous evidence and support causal conclusions regarding program impacts, the present longitudinal study of student achievement in Pennsylvania schools, from 2006-2009, was conducted . A carefully matched comparison-group ex post facto design was employed in which schools served by principals participating in the program were individually matched to control schools with similar school performance and demographic profiles in the baseline (pre-program) year of 2006. The specific research questions addressed were:

1. How do the trends in school level performance in mathematics differ between schools served by NISL-trained principals and matched comparison schools at the elementary, middle, and high school levels?
2. How do the trends in school level performance in reading and English/Language Arts (ELA) differ between schools served by NISL-trained principals and matched comparison schools at the elementary, middle, and high school levels?

METHOD

Sample

Data from all Pennsylvania elementary schools with complete test score data from 2005-2006 through 2008-2009 were initially considered for inclusion in the analyses. There were a total of 70 NISL elementary schools, 19 NISL middle schools, and 12 NISL high schools. As explained below, 36 of the NISL elementary schools were included in a within-district matched samples analysis, and 32 were included in a separate set of analyses based on an out-of-district matched comparison sample. In the elementary school sample, 19 of the NISL principals completed the NISL program in 2009, and 17 completed it in 2008. In the middle school sample, 7 of the NISL principals completed the NISL program in 2009, and 12 completed it in 2008. In the high school sample, 6 of the NISL principals completed the NISL program in 2009, and 8 completed it in 2008. Thus, roughly half of NISL principals at any given grade level started the program in 2007 and completed in 2008, while half started in 2008 and 2009. The elementary within-district matched sample included an average of 4,565 students in comparison schools each year, and 5,898 students in NISL schools. Corresponding comparison and NISL average annual student sample sizes were 5,233 and 4,847 for elementary out-of-district matched samples, 8,916 and 7,498 for middle school out-of-district matched samples, and 3,017 and 2,552 for high school out-of-district matched samples.

Participation by principals occurred through a multi-step process. Initially, the State Education Agency (SEA) publicized NISL to district superintendents. The latter, in turn, identified principals and assistant principals in their districts and encouraged them to apply. The potential applicants were characterized by the SEA and superintendents as mixed in leadership potential (experiences, accomplishments, and skills), with some demonstrating strong promise

and others regarded as needing professional development support to improve instructional leadership skills. Actual applicants were selected by regional coordinators using an evaluation rubric (see Appendix B). During the first two years of the program, participation was limited to principals or assistant principals in their first three years on the job. The highest weighting on the rubric evaluation was given to candidates from the lowest performing schools. Starting on January 1, 2008, a new state (Act 45 of 2007) policy requiring a principals' induction program went into effect. Based on the law's requirement that all school and system leaders meet approved continuing education requirements, all applicants henceforth were accepted to the program on a first-come-first-served basis. This change in recruitment practices, however, did not affect the present sample of NISL participants.

Elementary school matching procedure. A principal components analysis using 2006 school performance index values in mathematics and reading (see below) and the 2006 percentage of students classified as economically disadvantaged was performed to construct a regression-based factor score to use to identify matched pairs of schools for the analyses. Each NISL school was individually matched to a comparison school in the same school district that had the closest factor score. Matches were considered suitable only if the factor scores were within +/-0.25 standard deviation units. The matching process yielded a final sample for analysis of 36 NISL and 36 comparison schools at the elementary level that had matches within the same school district. Of the remaining 34 NISL elementary schools, two did not have test score data at all four time points. The remaining 32 were matched out-of-district, and these analyses were conducted separately. As shown in Table 1, this matching process yielded very closely matched samples. In 2006, the NISL elementary schools with within-district matches had a slightly lower percentage of economically disadvantaged students (15.8% versus 17.8%), slightly higher

percentages of students with limited English proficiency (18.4% versus 14.8%), and a lower percentage of students who were proficient in math (78.0% versus 80.5%). For the out-of-district matches, all matching variables were within 0.1%, except percentage of limited English proficient students served (1.1% in comparison sites versus 0.6% in NISL sites). Table A1.A in the appendix provides 2006 characteristics for each pair in the within-district matched samples, and Table A1.B provides this information for the out-of-district matched pairs.

Secondary school matching procedure. It was not possible to individually match middle and high school NISL schools to a comparison school within the same school district—in many cases, the NISL secondary school was the only school at that level within the district. At the middle and high school levels, an out-of-district match was made to each NISL school by matching the NISL school to a comparison school with the closest factor score. There were 19 NISL middle schools and 14 NISL high schools. As shown in Table 1, the matching process led to relatively well-matched samples for the middle school analyses, although the NISL sample was slightly more economically disadvantaged (27.6% versus 24.6%), and had somewhat lower initial scores in math (68.2% versus 72.0% proficient) and reading (69.9% versus 73.2%). Table A2 presents characteristics for each middle school pair in 2006. Likewise, the high school samples were relatively well-matched, with comparison schools having somewhat higher percentages of economically disadvantaged students (M = 27.9% versus 23.9%), higher proficiency rates in mathematics (M = 47.8% versus 45.0%), and higher proficiency rates in Reading/ELA (M = 63.8% versus 59.6%). NISL schools served higher percentages of special education students (14.35 versus 10.9%). Table A3 summarizes characteristics for each high school pair in 2006.

Measures

School demographics. The proportions of students in tested grade levels (3-8 and 11) who were economically disadvantaged, received special education services as evidenced by the existence of an individualized education plan (IEP), or who were classified as having limited English proficiency (LEP) were computed for each school. In addition to be used to establish

Table 1

Selected 2006 Characteristics of NISL and Comparison Schools

School Type	Economically Disadvantaged %	IEP %	LEP %	Math % Proficient	Reading/ELA % Proficient
Elementary[1]					
Comparison	17.81	6.41	14.8	80.49	69.20
NISL	15.82	6.61	18.4	78.04	68.10
Elementary[2]					
Comparison	17.0	7.6	1.1	79.0	68.7
NISL	16.9	7.5	0.6	78.9	68.5
Middle[2]					
Comparison	24.6	12.1	0.5	72.0	73.2
NISL	27.6	13.5	0.5	68.2	69.9
High[2]					
Comparison	27.9	10.9	0.2	47.8	63.8
NISL	23.9	14.3	0.2	45.0	59.6

[1]Within-district matches. [2]Out-of-district matches. *N* = 36 NISL and comparison schools for elementary with within-district matches, N = 32 of each type for elementary out-of-district matches, N = 19 of each for middle, and N = 14 of each for high.

matches, these variables were incorporated as covariates in the inferential statistical models.

School performance indices. Summary indices of school performance were constructed for both reading/ELA and mathematics by computing the proportion of students at all tested grade levels (grades 3 to 8 and grade 11) who scored proficient or higher on the Pennsylvania State Assessment. Note that for high schools, test scores were available only for eleventh grade.

Analyses

At each grade-level configuration (elementary, middle, and high school) and for each subject area (reading and math), a repeated-measures analysis were conducted with 2006, 2007, 2008, and 2009 school performance index values as the dependent variable. NISL status was treated as the independent variable. Covariates included the 2006 proportions of students who were economically disadvantaged, had IEPs, or who were designated as limited English proficient. School performance index values in 2006 were also included as covariates to facilitate comparison of trend lines. The analyses were weighted based on the average number of students tested per year for each school between 2006 and 2009 in each respective subject. Importantly, the repeated-measures analyses employed and the fact that there was low principal mobility (only 4 NISL principals, or about 4%, were re-assigned to different schools at any point from 2006-2009) during the period of the study provided direct control over sampling bias, which is often a strong validity threat in evaluating school and teacher leadership programs. That is, the achievement trajectories analyzed for NISL and non-NISL schools reflected pre- and post-program outcomes almost exclusively associated with the same school leaders. Thus, essentially, each school leader served as his/her own control for analyzing longitudinal achievement patterns.

Mauchly's test of sphericity was employed to evaluate the assumption of sphericity, and Levene's test was performed to test the assumption of equal variances for the 18 sets of analysis (3 school levels x 3 years x 2 subjects). Box's test of equality of covariance matrices was performed. The criterion for statistical significance of the diagnostic tests was set at $\alpha = .01$. The criterion for statistical significance of the inferential test of the *program X testing occasion* effect (i.e., the test of the effect of NISL status on school performance trend lines) was set at $\alpha = .05$.

In all but 1 of the 24 diagnostic analyses, the results of the Levene, Mauchly or Box tests were all significant (p's $< .01$), indicating a violation of assumptions. Accordingly, the Greenhouse-Geiser corrected degrees of freedom was employed in tests of statistical significance. The Greenhouse-Geiser correction provides for a conservative, robust test of significance in repeated-measures models in which the foregoing assumptions appear to be violated. A summary of the Levene test results is provided in Table 2.

Summary effects. Summary effects were computed for each set of analyses as the difference in covariate-adjusted 2009 school performance index values in mathematics and reading/ELA. Thus, the summary effects measures indicate the gain or decline in the percentage of students achieving proficient or higher attributable to NISL participation.

Table 2

Results of Levene's tests of equal variances

Subject and Year of Testing							
School Level and Results	Mathematics				Reading		
Elementary (w/in district)	2007	2008	2009		2007	2008	2009
df	1, 10467	1, 10467	1, 10467		1, 10455	1, 10455	1, 10455
F	228.5	239.6	114.5		58.8	104.7	3.39
Prob.	<.001	<.001	<.001		<.001	<.001	.06
Elementary (out of district)	2007	2008	2009		2007	2008	2009
df	1, 10088	1, 10088	1, 10088		1, 10077	1, 10077	1, 10077
F	129.6	0.5	0.4		344.7	724.6	655.8
Prob.	<.001	.50	.55		<.001	<.001	<.001
Middle	2007	2008	2009		2007	2008	2009
df	1, 16128	1, 16128	1, 16128		1, 16416	1, 16416	1, 16416
F	916.4	771.7	37.7		654.9	728.2	1727.5
Prob.	<.001	<.001	<.001		<.001	<.001	<.001
High	2007	2008	2009		2007	2008	2009
df	1, 5796	1, 5796	1, 5796		1, 5795	1, 5795	1, 5795
F	356.3	20.4	172.7		315.1	564.5	50.7
Prob.	<.001	<.001	<.001		<.001	<.001	<.001

Note. Box and Mauchley test results were significant, indicating violations of assumptions in all analyses.

RESULTS

Elementary Schools: Within-district Matched Samples

Mathematics

Descriptive results. The unadjusted mean school performance index values in 2006 were 80.8 for comparison schools and 78.8 for NISL schools. As shown in Table 3, by 2009 NISL

schools (M = 81.7) had surpassed comparison schools (M = 81.5). Figure 1 displays the observed trend lines in math school performance index values for each group. As depicted, the trend lines cross, indicating greater gains over time for NISL schools.

Table 3

Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type and Year, Elementary Schools (Within-district Matched Samples)

School Type	2006	2007	2008	2009
NISL	78.8	80.8	80.3	81.7
Comparison	80.8	82.0	81.1	81.5

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in math school performance index values over time ($F_{2.7,\ 23659} = 620.2$, $p < .01$), suggesting that the percentage of students achieving proficiency in mathematics increased over time across schools in the analysis sample. The economically-disadvantaged ($F_{2.7,\ 23659} = 289.8$, $p < .01$), LEP ($F_{2.7,\ 23659} = 225.4$, $p < .01$), and IEP ($F_{2.7,\ 23659} = 94.1$, $p < .01$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X math* within-

Figure 1. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type (NISL, comparison) and Year, Elementary Schools (Within-district Matched Samples)

subjects interaction effect was observed ($F_{2.7,\ 23659} = 119.3$, $p < .001$), indicating that the trend lines in school-level math performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect of NISL status on math score trends ($F_{1,10463} = 68.2$, $p < .001$). As shown in Figure 2, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools. The statistically significant quadratic effect indicates an acceleration in the rate of gain over time for NISL schools.

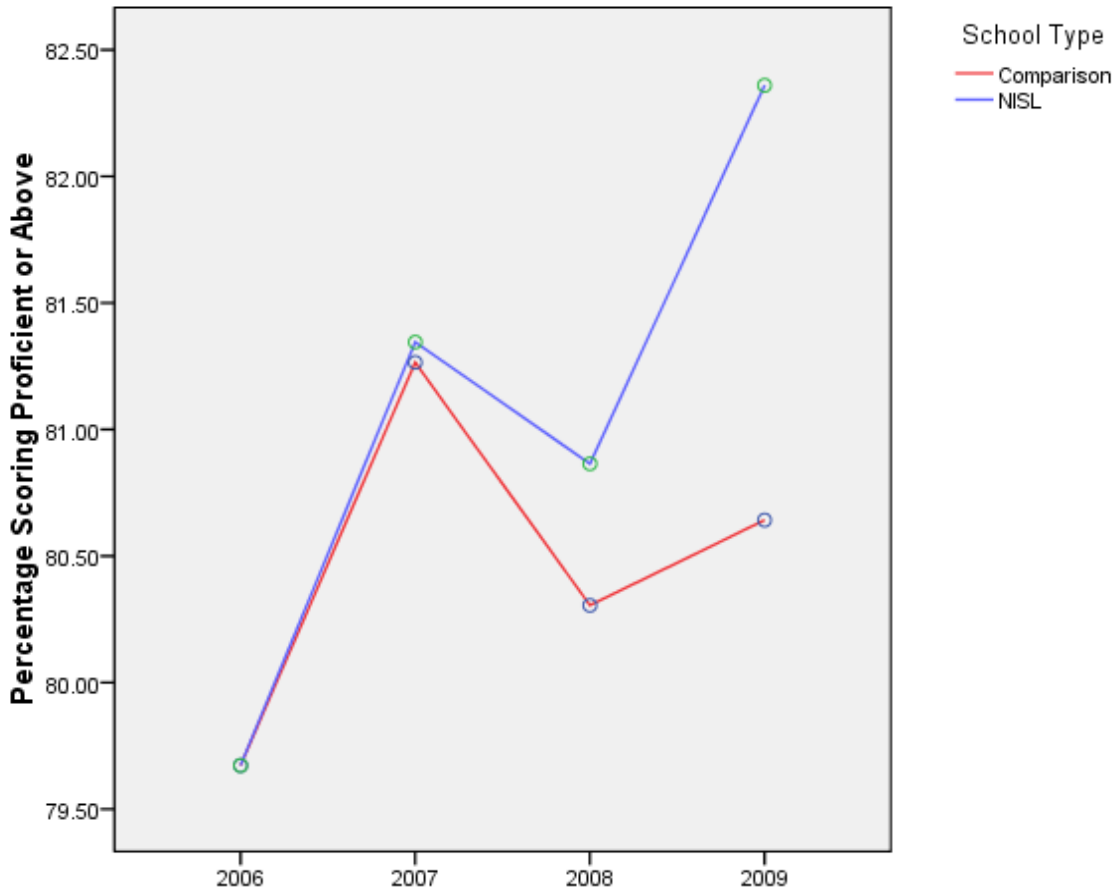

Figure 2. Covariate Adjusted Trend Lines in Math School Performance Index Values by School Type, 2006-2009 Elementary Schools (Within-district Matched Samples).

Reading

Descriptive results. The unadjusted mean school performance index values in 2006 were 70.0 for comparison schools and 69.5 for NISL schools. As shown in Table 4, by 2009 NISL schools (M = 73.6) had virtually equal reading performance as comparison schools (M = 73.7). Figure 3 displays the observed trend lines in reading/ELA school performance index values for each group. As shown, the trend lines were nearly parallel, although comparison schools had a greater "dip" in performance in 2008 than did NISL schools.

Table 4

Mean Percentage of Students Scoring Proficient or Higher in Reading by School Type and Year, Elementary Schools

School Type	2006	2007	2008	2009
NISL	69.5	73.9	72.3	73.6
Comparison	70.0	73.8	71.4	73.7

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

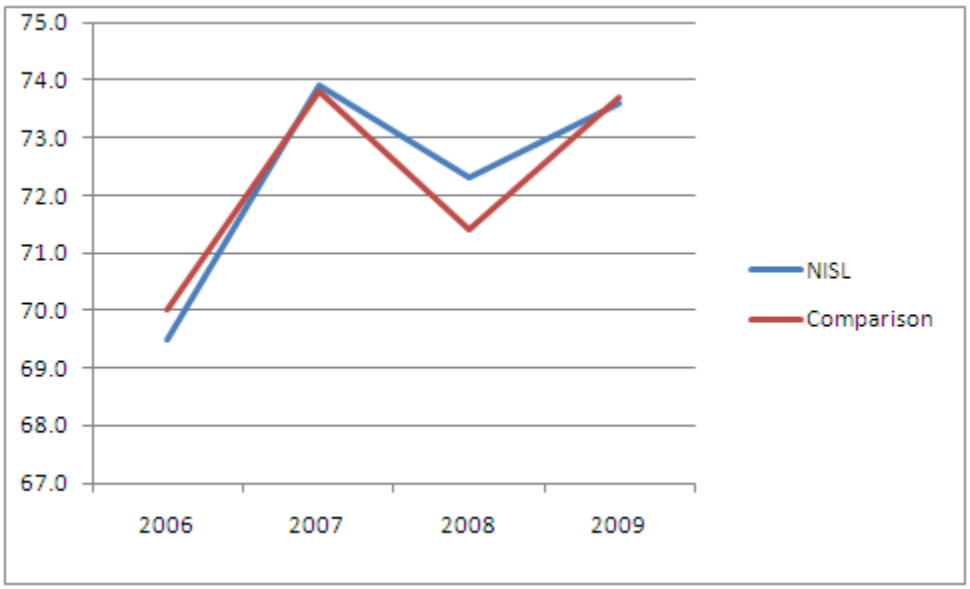

Figure 3. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Reading by School Type (NISL, comparison) and Year, Elementary Schools (Within-district Matched Samples).

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in reading/ELA school performance index values over time ($F_{2.4,\ 25135} = 480.6$, $p < .001$), suggesting that the percentage of students achieving proficiency in reading/ELA increased over

time across schools in the analysis sample. The economically-disadvantaged ($F_{2.4,\ 25135}$ = 226.0, p < .001),), LEP ($F_{2.4,\ 25135}$ = 261.9, p < .01), and IEP ($F_{2.4,\ 25135}$ = 65.9, p < .01) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X reading/ELA* within-subjects interaction effect was observed ($F_{2.4,\ 25135}$ = 28.7, p < .01), indicating that the trend lines in school-level reading/ELA performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant cubic effect of NISL status on math score trends ($F_{1,10451}$ = 42.5, p <.001). As shown in Figure 4, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools after controlling for school demographics. The statistically significant cubic effect was produced because NISL schools had a statistically significantly lower rate of decline from 2007 to 2008 relative to comparison schools.

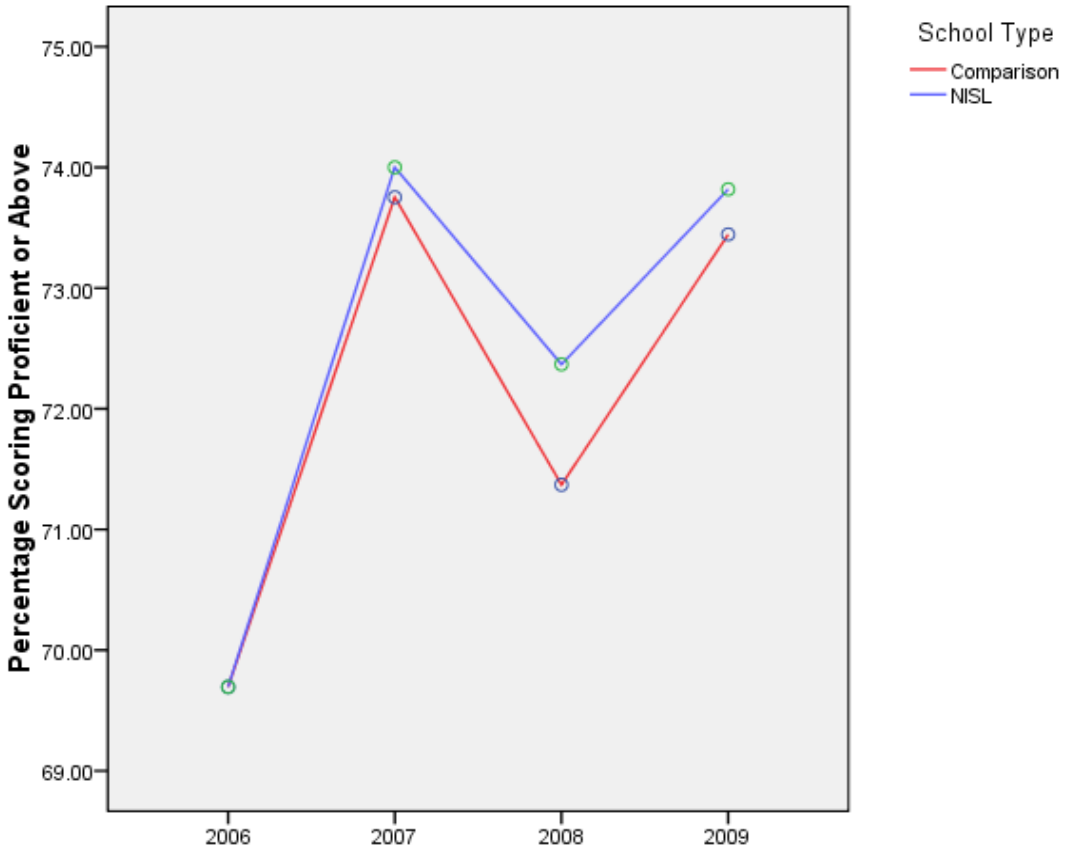

Figure 4. Covariate-adjusted Trend Lines in Reading/ELA School Performance Index Values by School Type, 2006-2009 Elementary Schools (Within-district Matched Samples).

Elementary Schools: Out-of-district Matched Samples

Mathematics.

Descriptive results. The unadjusted mean school performance index values in 2006 were 78.6 for comparison schools and 78.5 for NISL schools. As shown in Table 5, by 2009 NISL schools (M = 81.4) had surpassed comparison schools (M = 77.9). Figure 5 displays the observed trend lines in math school performance index values for each group.

Table 5

Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type and Year, Elementary Schools (Out-of-district Matched Samples).

School Type	2006	2007	2008	2009
NISL	78.5	80.6	79.6	81.4
Comparison	78.6	77.0	77.6	77.9

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

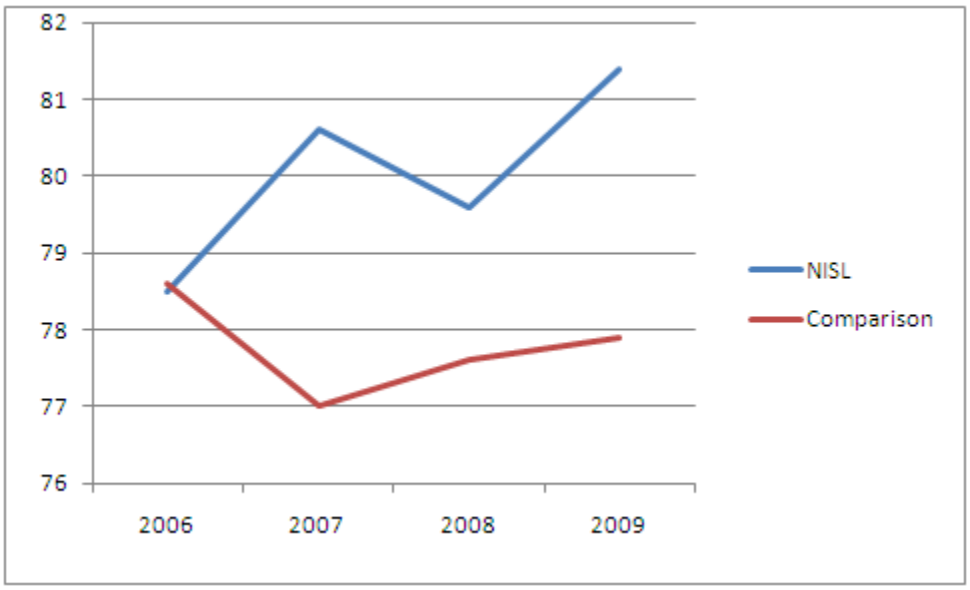

Figure 5. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type (NISL, comparison) and Year, Elementary Schools (Out-of-district Matched Samples).

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in math school performance index values over time ($F_{2.8,\ 28499} = 1259.6$, $p < .001$), suggesting that the percentage of students achieving proficiency in mathematics increased over time across

schools. The economically-disadvantaged ($F_{2.8, 28499} = 74.2$, $p < .001$), LEP ($F_{2.8, 28499} = 260.3$, $p < .001$), and IEP ($F_{2.8, 28499} = 27.1$, $p < .001$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X math* within-subjects interaction effect was observed ($F_{2.8, 28499} = 596.1$, $p < .001$), indicating that the trend lines in school-level math performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect of NISL status on math score trends ($F_{1,10084} = 203.8$, $p < .001$). As shown in Figure 6, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools. The statistically significant quadratic effect indicates an acceleration in the rate of gain over time for NISL schools.

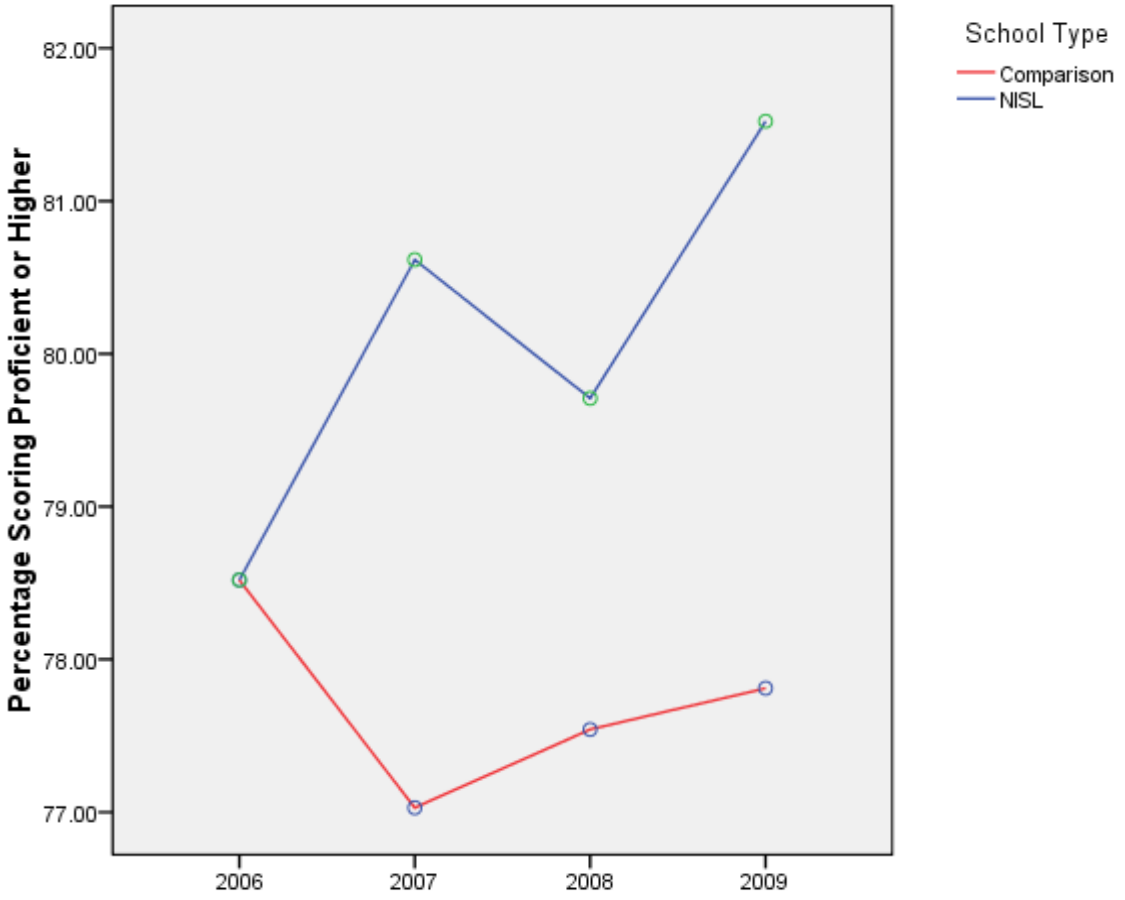

Figure 6. Covariate Adjusted Trend Lines in Math School Performance Index Values by School Type, 2006-2009 Elementary Schools (Out-of-district Matched Samples).

Reading

Descriptive results. The unadjusted mean school performance index values in 2006 were 69.0 for comparison schools and 68.1 for NISL schools. As shown in Table 6, by 2009 NISL schools (M = 72.0) had higher reading performance than comparison schools (M = 70.4). Figure 7 displays the observed trend lines in reading/ELA school performance index values for each group. As shown, comparison school performance remained virtually unchanged during the period 2006-2009, whereas performance improved substantially in NISL schools.

Table 6

Mean Percentage of Students Scoring Proficient or Higher in Reading by School Type and Year, Elementary Schools (Out-of-district Matched Samples).

School Type	2006	2007	2008	2009
NISL	68.1	71.8	70.8	72.0
Comparison	70.0	69.9	70.1	70.4

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

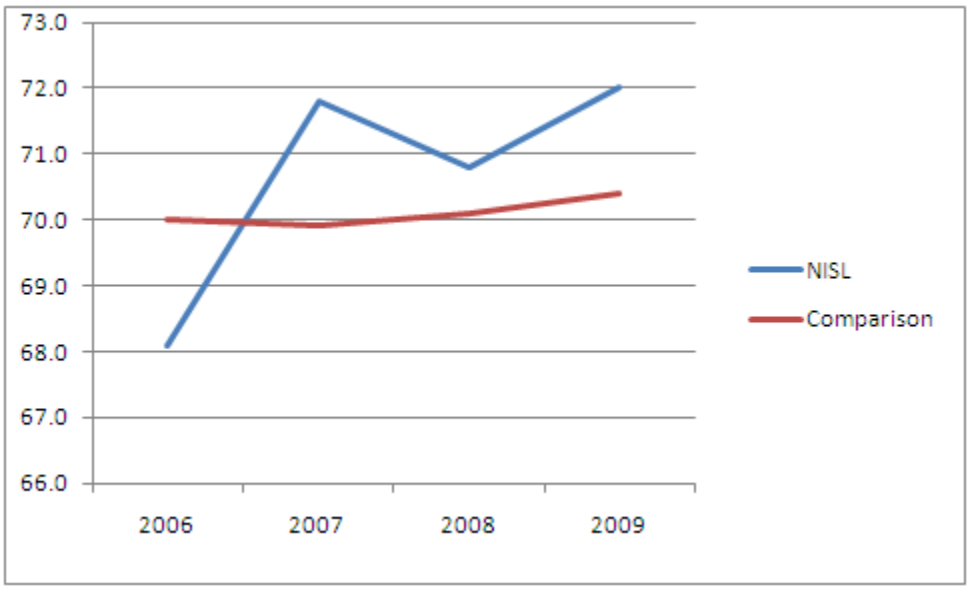

Figure 7. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Reading by School Type (NISL, comparison) and Year, Elementary Schools (Out-of-district Matched Samples).

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in reading/ELA school performance index values over time ($F_{2.8,\ 27774} = 283.7$, $p < .001$), suggesting that the percentage of students achieving proficiency in reading/ELA increased over time across schools in the analysis sample. The economically-disadvantaged ($F_{2.8,\ 27774} = 25.4$, p

< .001), LEP ($F_{2.8, 27774}$ = 204.3, p < .001), and IEP ($F_{2.8, 27774}$ = 220.0, p < .001) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X reading/ELA* within-subjects interaction effect was observed ($F_{2.8, 27774}$ = 274.9, p < .001), indicating that the trend lines in school-level reading/ELA performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant cubic effect of NISL status on reading/ELA score trends ($F_{1,10073}$ = 153.1, p <.001). As shown in Figure 8, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools after controlling for school demographics. The statistically significant cubic effect was produced because NISL schools had a slight dip in performance from 2007 to 2008 relative to comparison schools.

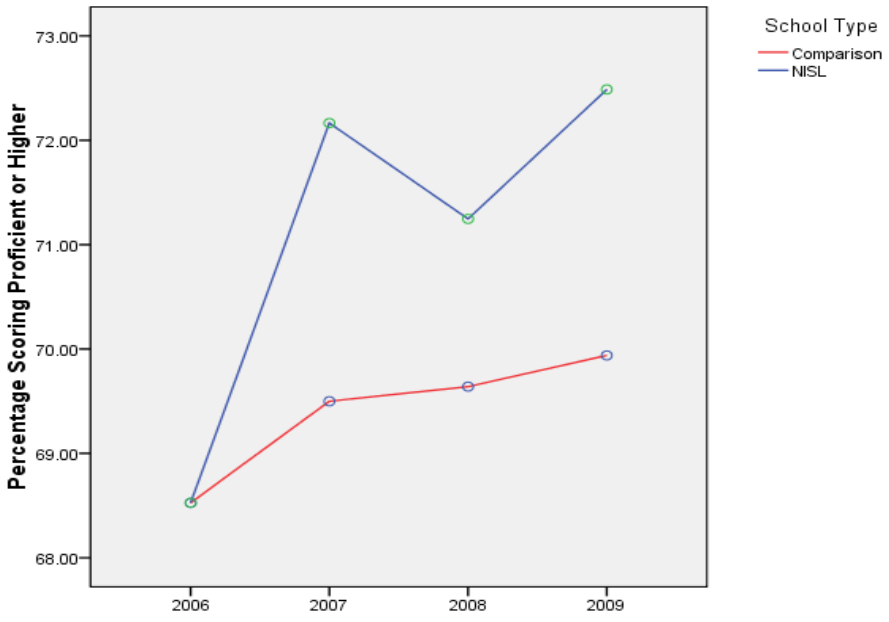

Figure 8. Covariate-adjusted Trend Lines in Reading/ELA School Performance Index Values by School Type, 2006-2009 Elementary Schools (Out-of-district Matched Samples).

Middle Schools

Mathematics

Descriptive results. The unadjusted mean school performance index values in 2006 were 67.5 for comparison schools and 71.5 for NISL schools. As shown in Table 7, by 2009 NISL schools (M = 76.4) had increased proficiency rates by about 5%, whereas comparison schools had improved by about 1% (M = 68.5). Figure 9 displays the observed trend lines in math school performance index values for each group.

Table 7

Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type and Year, Middle Schools

Column1	2006	2007	2008	2009
NISL	71.5	73.1	73.4	76.4
Comparison	67.5	67.1	68.5	68.5

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

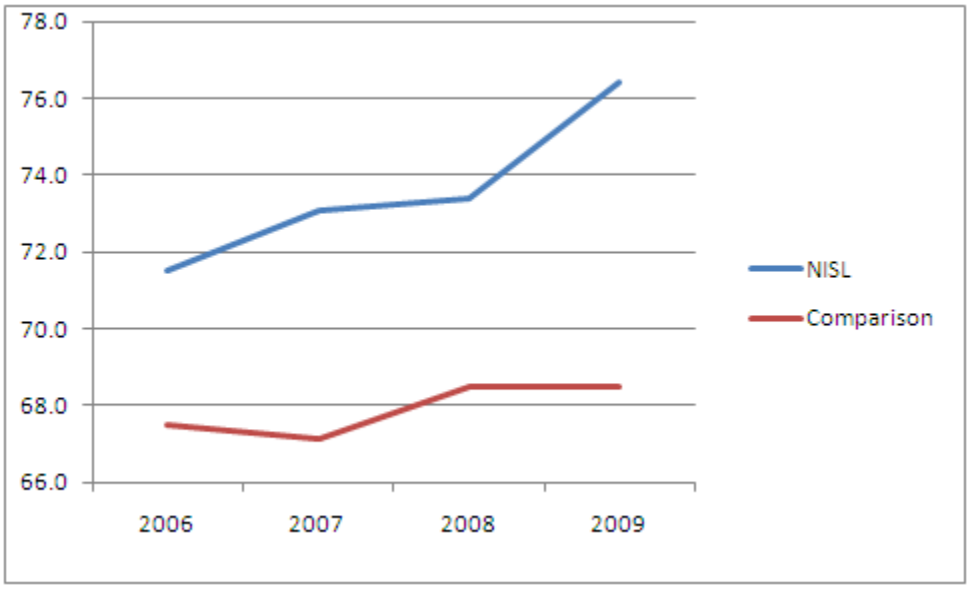

Figure 9. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type (NISL, comparison) and Year, Middle Schools

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in math school performance index values over time ($F_{1.9,\ 32033} = 1655.3$, $p < .01$), suggesting that the percentage of students achieving proficiency in mathematics increased. The economically-disadvantaged ($F_{1.9,\ 32033} = 1293.8$, $p < .01$), LEP ($F_{1.9,\ 32033} = 1102.7$, $p < .01$), and IEP ($F_{1.9,\ 32033} = 95.2$, $p < .01$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X math* within-subjects interaction effect was observed ($F_{1.9,\ 32033} = 320.9$, $p < .01$), indicating that the trend lines in school-level math performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect of NISL status on math score trends ($F_{1,16422} = 19.64$, $p < .001$). As shown in Figure 10, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools. The statistically significant quadratic effect indicates an acceleration in the rate of gain over time for NISL schools.

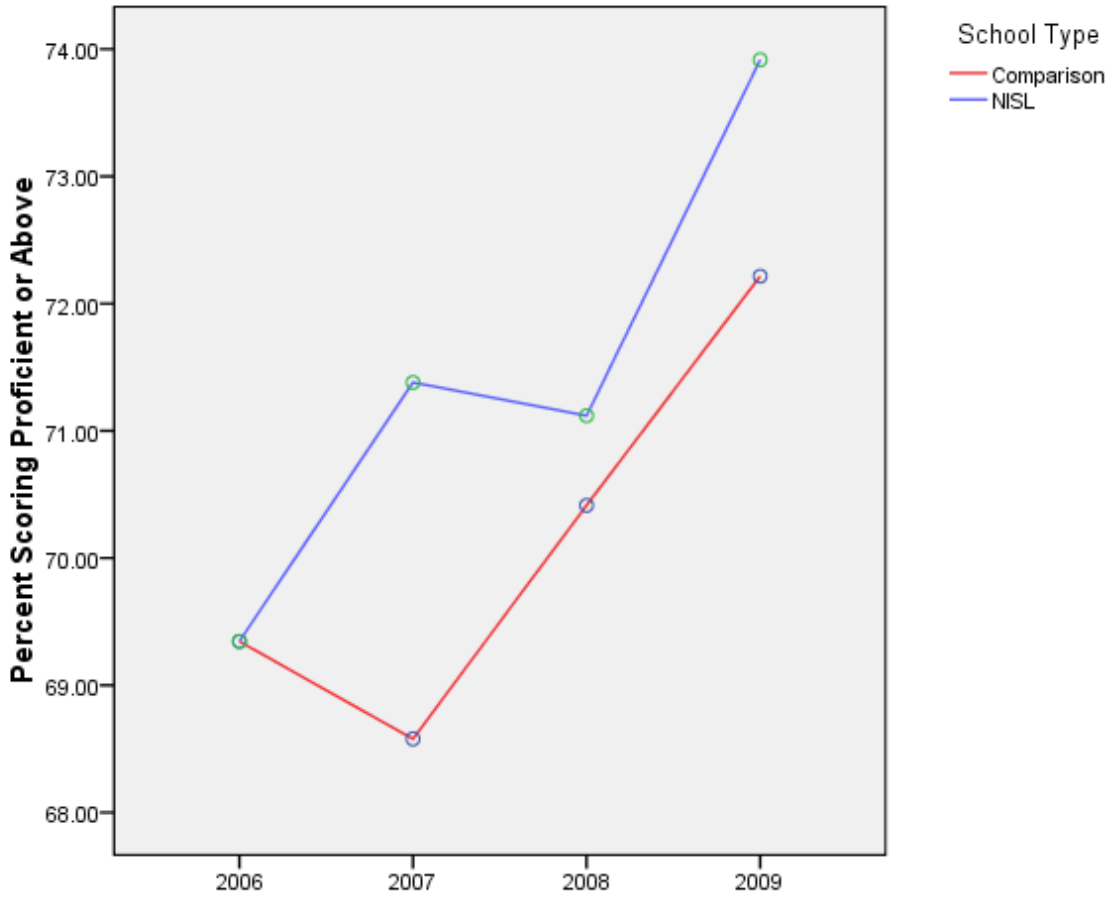

Figure 10. Covariate Adjusted Trend Lines in Math School Performance Index Values by School Type, 2006-2009 Middle Schools.

Reading/ELA

Descriptive results. The unadjusted mean school performance index values in 2006 were 69.5 for comparison schools and 72.2 for NISL schools. As shown in Table 8, by 2009 NISL schools (M = 75.2) had increased proficiency rates by about 3%, whereas comparison schools had improved by about 1% (M = 70.7). Figure 11 displays the observed trend lines in reading/ELA school performance index values for each group.

Table 8

Mean Percentage of Students Scoring Proficient or Higher in Reading/ELA by School Type and Year, Middle Schools

School Type	2006	2007	2008	2009
NISL	72.2	71.9	73.8	75.2
Comparison	69.7	69.9	69.0	70.7

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

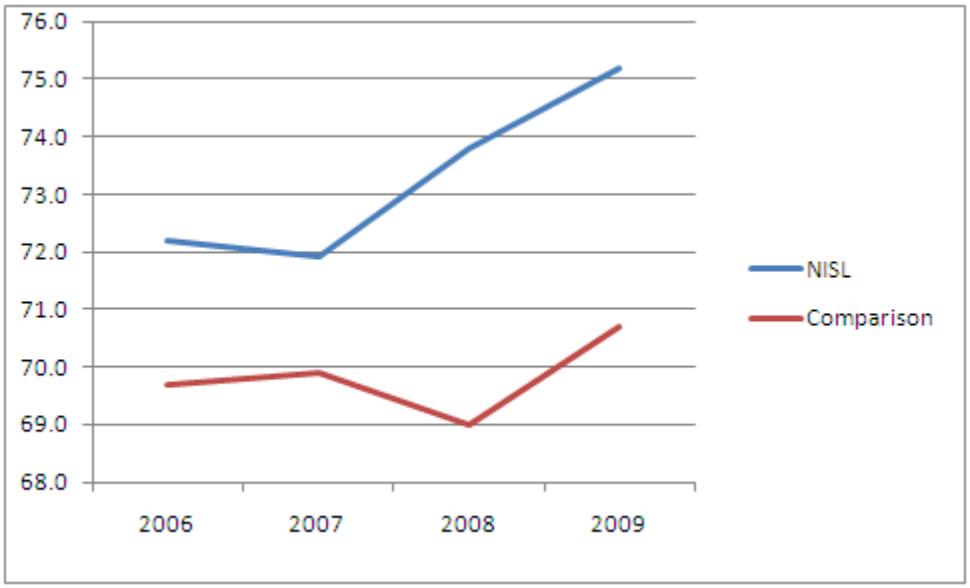

Figure 11. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Reading by School Type (NISL, comparison) and Year, Middle Schools

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in reading/ELA school performance index values over time ($F_{2.9,\ 47970} = 1759.4$, $p < .001$), suggesting that the percentage of students achieving proficiency in reading/ELA increased. The economically-disadvantaged ($F_{2.9,\ 47970} = 1010.9$, $p < .001$), LEP ($F_{2.9,\ 47970} = 422.3$, $p < .001$),

and IEP ($F_{2.9, 47970} = 687.0$, $p < .01$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X reading/ELA* within-subjects interaction effect was observed ($F_{2.9, 47970} = 1196.2$, $p < .001$), indicating that the trend lines in school-level reading/ELA performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect of NISL status on reading/ELA score trends ($F_{1,16412} = 43.05$, $p < .001$). As shown in Figure 12, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools. The statistically significant quadratic effect indicates an acceleration in the rate of gain over time for NISL schools.

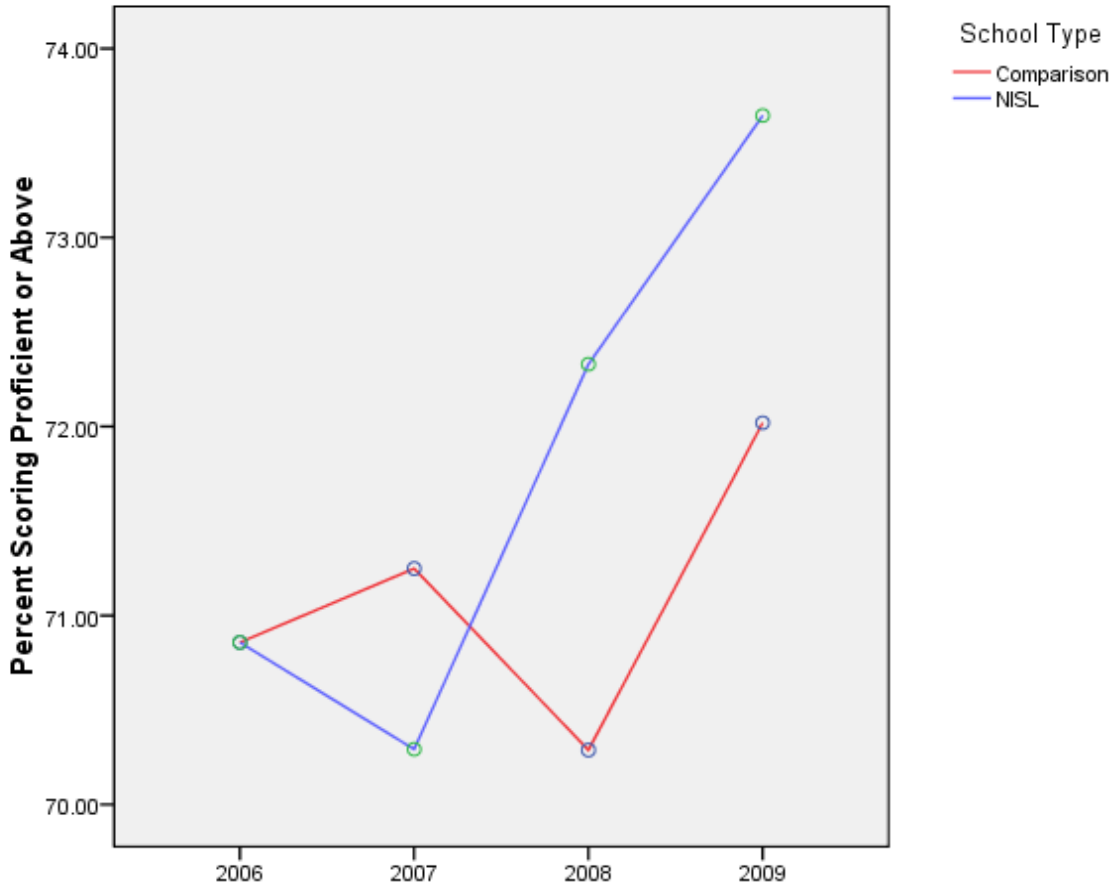

Figure 12. Covariate-adjusted Trend Lines in Reading/ELA School Performance Index Values by School Type, 2006-2009 Middle Schools.

High Schools

Mathematics

Descriptive results. The unadjusted mean school performance index values in 2006 were 44.9 for comparison schools and 46.2 for NISL schools. As shown in Table 9, by 2009 NISL schools (M = 52.1) had increased proficiency rates by about 5%, whereas comparison schools declined by about 0.5% (M = 44.4). Figure 13 displays the observed trend lines in math school performance index values for each group.

Table 9

Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type and Year, High Schools

School Type	2006	2007	2008	2009
NISL	46.2	49.4	53.6	52.1
Comparison	44.9	43.2	46.3	44.4

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

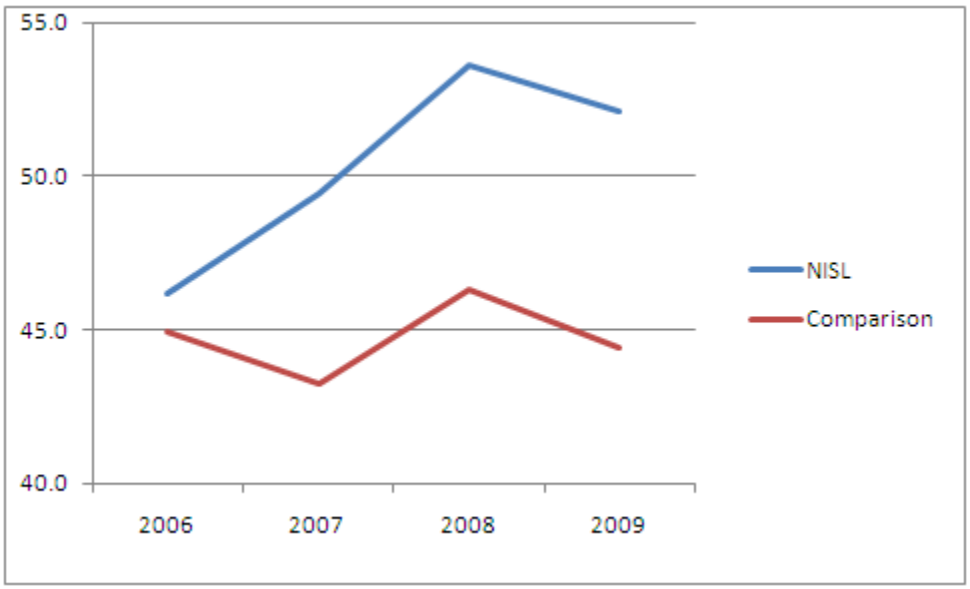

Figure 13. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Mathematics by School Type (NISL, comparison) and Year, High Schools

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in math school performance index values over time ($F_{2.4,\ 14139} = 624.8$, $p < .001$), suggesting that the percentage of students achieving proficiency in mathematics increased. The economically-disadvantaged ($F_{2.4,\ 14139} = 37.7$, $p < .001$), LEP ($F_{2.4,\ 14139} = 158.9$, $p < .001$), and IEP ($F_{2.4,\ 14139}$

= 168.4, $p < .001$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X math* within-subjects interaction effect was observed ($F_{2.4, 14139} = 548.4$, $p < .001$), indicating that the trend lines in school-level math performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect of NISL status on math score trends ($F_{1,5792} = 1316.6$, $p < .001$). As shown in Figure 14, the significant linear effect indicates that, across the time period, NISL schools gained at a greater average rate than comparison schools. The statistically significant quadratic effect indicates a deceleration in the rate of gain over time for NISL schools.

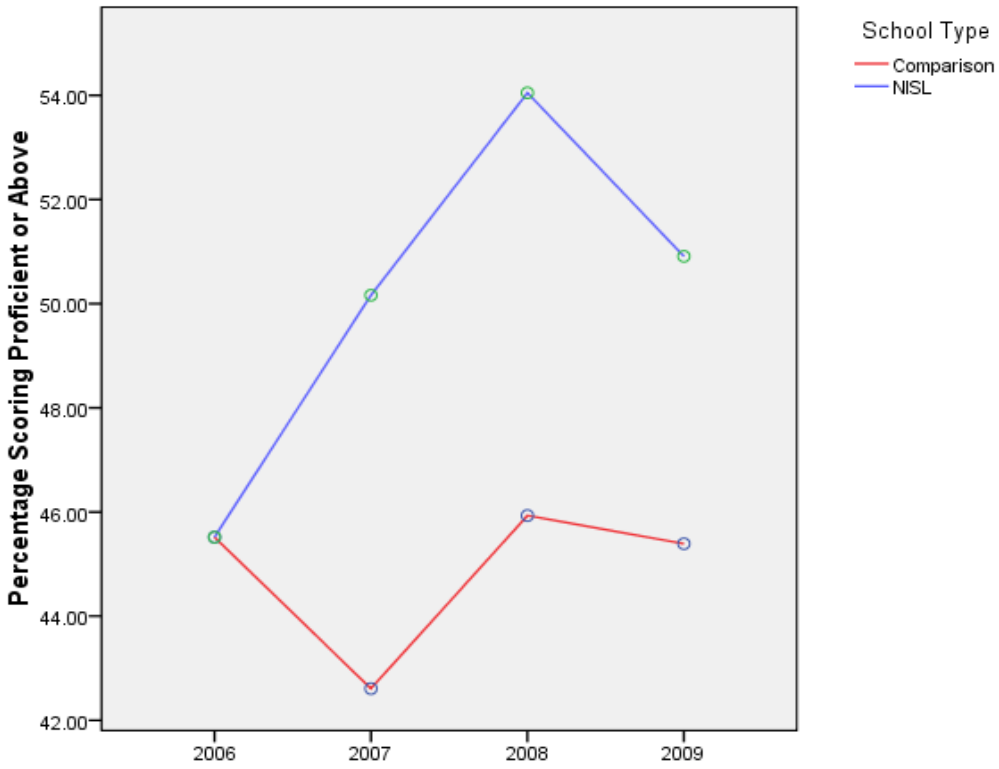

Figure 14. Covariate Adjusted Trend Lines in Math School Performance Index Values by School Type, 2006-2009 High Schools.

Reading

Descriptive results. The unadjusted mean school performance index values in 2006 were 64.9 for comparison schools and 59.6 for NISL schools. As shown in Table 10, by 2009 NISL schools (*M* = 60.2) had increased proficiency rates by 0.6%, whereas comparison schools declined by about 3% (*M* = 61.8). Figure 15 displays the observed trend lines in reading/ELA school performance index values for each group.

Table 10

Mean Percentage of Students Scoring Proficient or Higher in Reading/ELA by School Type and Year, High Schools

School Type	2006	2007	2008	2009
NISL	59.6	62.0	61.2	60.2
Comparison	64.9	60.0	63.6	61.8

Note. Weighted by number of students tested, so figures may not correspond to unweighted means presented in Table 1.

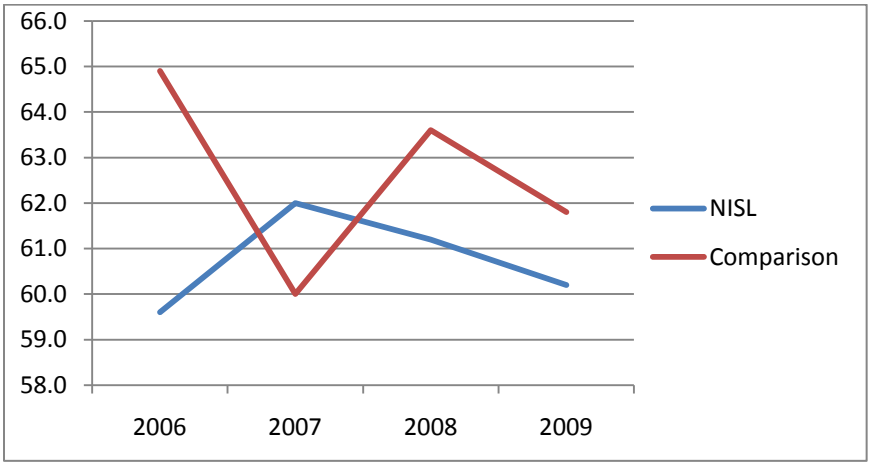

Figure 15. Unadjusted Mean Percentage of Students Scoring Proficient or Higher in Reading/ELA by School Type (NISL, comparison) and Year, High Schools

Inferential tests. Tests of within-subjects effects revealed a statistically significant trend in reading/ELA school performance index values over time ($F_{2.4,\ 14121} = 403.3$, $p < .001$), suggesting that the percentage of students achieving proficiency in reading/ELA declined over time across schools. The economically-disadvantaged ($F_{2.4,\ 14121} = 40.1$, $p < .001$), LEP ($F_{2.4,\ 14121} = 354.2$, $p < .001$), and IEP ($F_{2.4,\ 14121} = 32.5$, $p < .001$) covariates were also statistically significant predictors of trend. A statistically significant *NISL status X reading/ELA* within-subjects interaction effect was observed ($F_{2.4,\ 14139} = 344.1$, $p < .001$), indicating that the trend lines in school-level reading/ELA performance were not equal in NISL and comparison sites. In addition to the significant difference in the linear component of the trend lines, within-subjects contrasts indicated a statistically significant quadratic effect ($F_{1,5791} = 944.9$, $p < .001$) and cubic effect ($F_{1,5791} = 321.2$, $p < .001$) of NISL status on reading/ELA score trends. As shown in Figure 16, the significant linear effect indicates that, across the time period, NISL schools declined at a slower overall rate than comparison schools. The quadratic effect indicates a greater average acceleration in decline for NISL schools from 2007-2009, whereas the cubic effect is reflected in the zig-zag pattern of comparison school results.

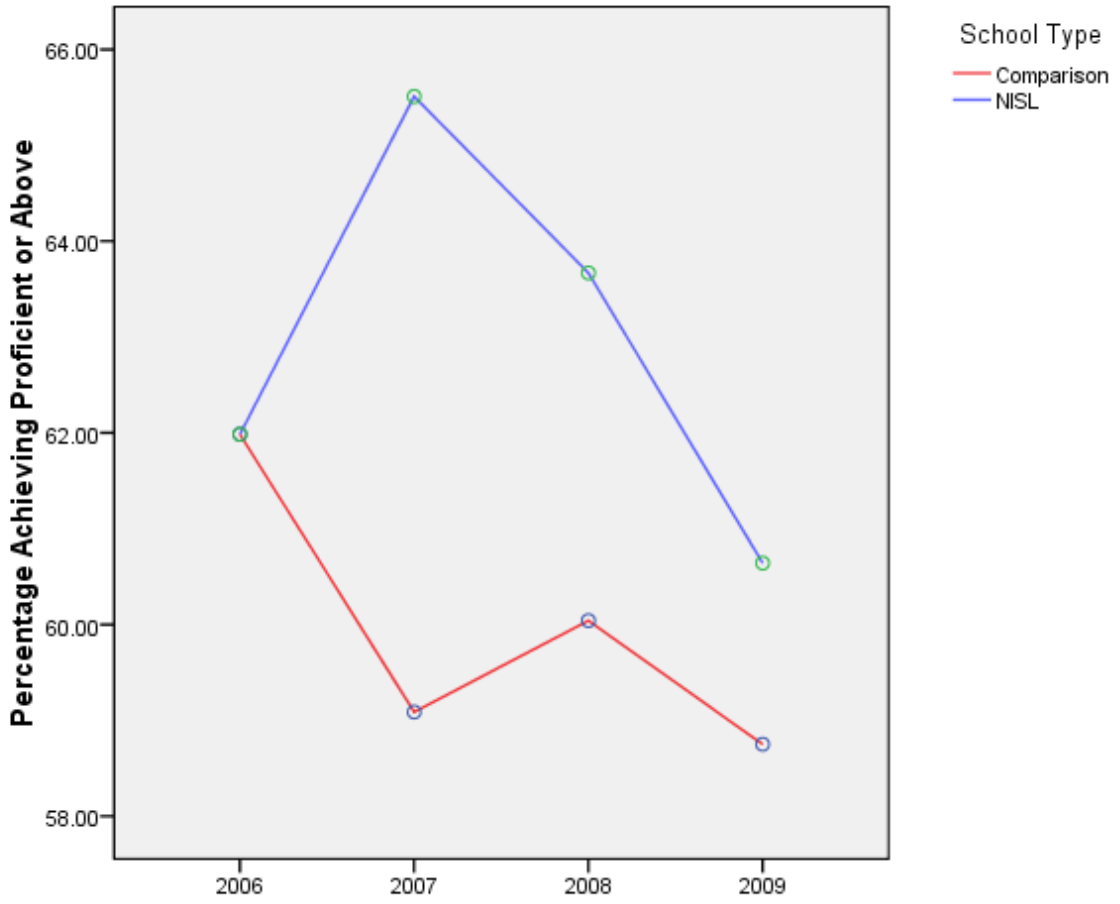

Figure 16. Covariate-adjusted Trend Lines in Reading/ELA School Performance Index Values by School Type, 2006-2009 High Schools.

FINDINGS AND DISCUSSION

Study Overview

This study examined the impact of NISL's Executive Development Program for principals on student achievement in Pennsylvania schools between 2006-2009. The 2006 school year was treated as the baseline year for the analysis. Roughly half of the NISL-trained principals started the program during the 2007 school year and finished in the 2008 school year, whereas the other half started during the 2008 school year and finished in the 2009 school year. Schools served by principals participating in the Executive Development Program were individually matched to comparison schools with similar school performance and demographic profiles in 2006. For elementary schools, it was possible to make individual school matches within the same school district for 36 school pairs. An additional 32 elementary schools were included in an out-of-district matched comparison sample. For all middle and high schools, it was necessary to match outside the school district. The percentages of students achieving proficient or above in mathematics and reading or English/Language Arts (ELA) across all grade levels were used to create aggregate school performance indices for each year 2006-2009. Repeated-measures analyses were performed to determine whether there were differences in school performance trends between schools served by NISL-trained principals and matched comparison schools.

Findings

Summary effects. As shown in Figure 17, NISL schools had higher-than-expected performance in 2009 relative to comparison schools at all grade levels in both subject areas. The largest differences between the percentages of NISL and comparison students achieving proficiency were in mathematics: +2.69%, +3.71%, +1.70%, and +5.52% for elementary within-

district, elementary out-of-district, middle schools, and high schools, respectively. Smaller, but statistically significant gains were observed for reading/ELA: +0.37%, +2.55%, +1.63%, and +1.89%, the four school cohorts, respectively.

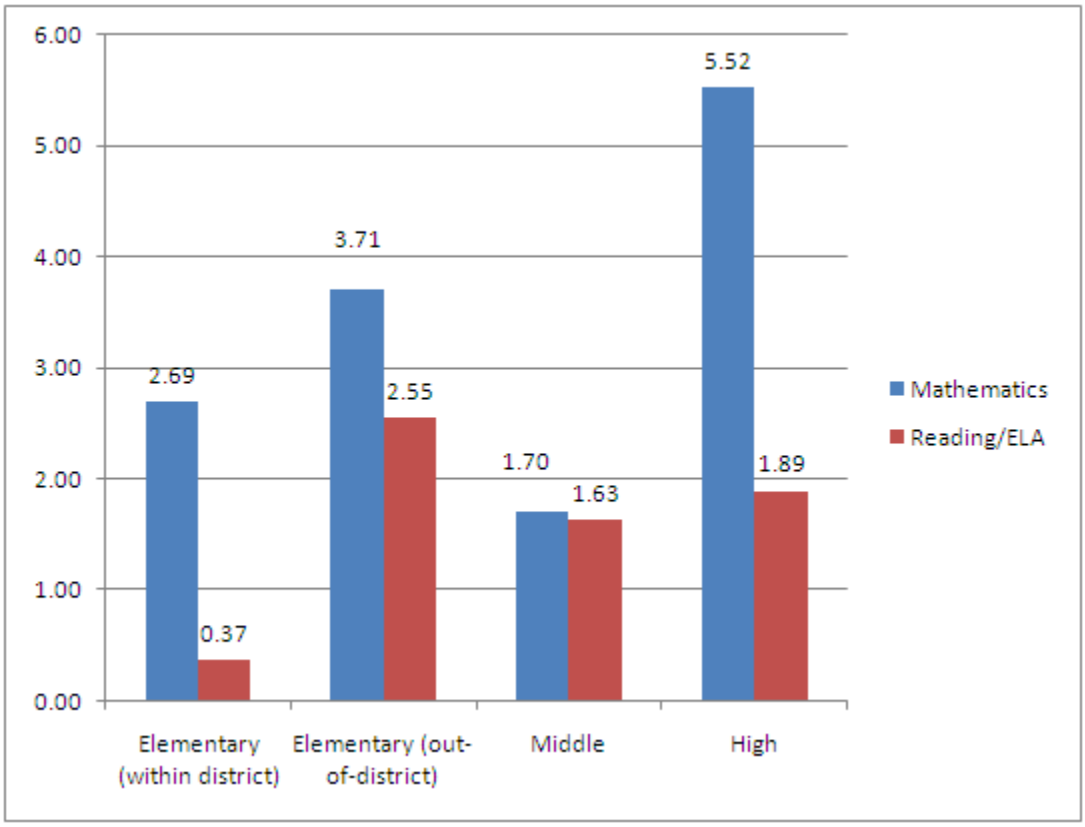

Figure 17. NISL Effects: 2009 Covariate-adjusted Differences in Percentages of Students Achieving Proficiency Relative to Comparison Schools .

Elementary Schools. For the matched within-district elementary school sample, statistically significant differences in school performance trends were observed between NISL and comparison schools in both mathematics and reading/ELA. In both cases, NISL schools had statistically significantly higher rates of improvement in school performance than did comparison schools. After controlling for differences in school demographics and 2006 school performance, NISL elementary schools had about 2% more students achieve proficiency in math than did comparison schools in 2009. The adjusted effects on reading, although statistically

significant, were smaller (about +0.5% difference favoring NISL schools). In terms of unadjusted results, NISL schools gained 3.9% versus 0.7% for comparison sites in mathematics, and 4.1% versus 3.7% in reading/ELA. For the matched out-of-district elementary schools, significant trends favoring NISL over comparison schools were also indicated in both mathematics and reading/ELA. Significant quadratic effects in mathematics further revealed acceleration in the growth rate over time for NISL schools.

Middle schools. As with the elementary school results, statistically significant positive effects of NISL status were observed for both mathematics and reading in the middle school sample. On an adjusted basis, NISL middle schools had about 2% more students scoring proficient or better in both mathematics and reading/ELA than comparison schools. As with elementary schools, a significant quadratic effect on mathematics school performance trends revealed that the rate of improvement was accelerating over time in NISL schools.

High schools. In mathematics, NISL schools had statistically significantly higher rates of improvement, with adjusted differences in 2009 performance equal to 5%. In reading/ELA, covariate adjusted differences significantly favored NISL over comparison sites by about 1.5%, although overall adjusted performance declined between 2007 and 2009 for both groups of schools.

Discussion

NISL schools consistently surpassed the comparison schools in achievement gains at a statistically significant level from the baseline year of 2006 to 2009. A randomized experiment was not feasible given state and district policies for program implementation (e.g., see Appendix B). However, the present ex post facto design appears highly rigorous, particularly in minimizing validity threats frequently associated in evaluations of leadership programs with

sampling bias. Specifically, participants were described by the state and districts as being mixed in their experiences, success rates, and skills, with some targeted due to demonstrating strong potential for leadership and others due to needing professional development to address weaknesses. Also, the repeated-measures design treated nearly all principals as their own controls in analyzing school achievement patterns over time.

Predictably, the achievement gains for NISL principals were strongest in 2008 and 2009 as levels of participation in the NSL program (both number of principals and exposure) increased. The significant quadratic effects obtained in several of the analyses reflected this trend for program effects to accelerate over time. As depicted in Figure 17, across the four school cohorts examined (within-district-matched elementary schools, out-of-district matched elementary schools, middle schools, and high schools), NISL schools surpassed comparison schools in the percentage of students achieving proficiency in mathematics by 2.69%, 3.71%, 1.70%, and 5.52%, respectively; and in reading/ELA by .37%, 2.55%, 1.63%, and 1.89%. Given that approximately 40,000 students were included in the combined samples, these advantages appear highly meaningful. For example, across the high school subsample alone, replication of the present NSL effects in mathematics and reading/ELA in similar schools would result in about 275 and 103 more students achieving proficiency on the respective tests. Given that half of the principals began the program in 2007 and the other half not until 2008, the present usage of 2009 as the most distant assessment year certainly seems likely to under-estimate potential program impacts. An additional consideration is that principals need time to implement new strategies in ways that impact teachers, who in turn, need time to improve instruction, learning, and achievement. Follow-up evaluation research of the present 2007 and 2008 cohorts, therefore, is strongly encouraged to determine post-program effects over a longer time period.

References

The Meristem Group (2009). *National Institute for School Leadership (NISL): Massachusetts program implementation 2005-2008*. Boston, MA: Meristem Group.

Appendix A: Supplementary Tables

Table A1.A

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Within-district Matches

Pair	Program	FRL2006	IEP2006	LEP2006	MATH 2006	READING 2006
1	Control	.4444	.0556	.1111	57.7000	33.9333
	Treatment	.4013	.0382	.0828	51.4000	33.7667
2	Control	.4638	.0298	.0766	63.3000	40.8000
	Treatment	.4267	.0400	.0267	66.7667	47.3000
3	Control	.4478	.0597	.0448	71.8333	61.0333
	Treatment	.3654	.0481	.0721	60.4667	41.0000
4	Control	.1441	.0721	.0495	82.6667	66.9000
	Treatment	.1429	.0771	.0086	83.0000	65.5333
5	Control	.1515	.1111	.0101	70.9000	61.4333
	Treatment	.1192	.0795	.0132	74.0333	68.2333
6	Control	.0479	.0691	.0213	88.7000	80.5000
	Treatment	.0870	.0543	.0000	94.2667	85.9667
7	Control	.1322	.0744	.0000	75.4333	66.1667
	Treatment	.1263	.1579	.0000	74.2667	67.6333
8	Control	.0637	.0764	.0000	87.5667	79.1000
	Treatment	.0625	.0781	.0052	83.7667	78.8333
9	Control	.0616	.1233	.0000	90.3000	82.1000
	Treatment	.0813	.0203	.0041	89.9333	84.6000
10	Control	.0333	.0333	.0000	90.6333	82.1000
	Treatment	.0652	.0000	.0000	91.7333	78.4333
11	Control	.0588	.0515	.0000	95.6750	85.4750
	Treatment	.0665	.0190	.0000	88.4250	81.5500
12	Control	.3165	.0935	.0072	83.8000	70.1333
	Treatment	.2222	.0824	.0000	73.7333	61.4333
13	Control	.1022	.0311	.0044	88.9000	83.9750
	Treatment	.0405	.0743	.0270	91.2000	86.0250

Table A1.A Continued

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Within-district Matches

14	Control	.1222	.0333	.0000	93.5500	82.1500
	Treatment	.0588	.0441	.0000	84.7750	79.2500
15	Control	.0909	.0383	.0000	84.7500	81.2500
	Treatment	.0601	.0802	.0120	86.0667	83.6333
16	Control	.3711	.0619	.1340	51.9000	37.2667
	Treatment	.3711	.1031	.1753	52.0333	32.1667
17	Control	.0661	.0909	.0331	83.8333	78.3000
	Treatment	.1209	.0659	.0549	83.6667	73.1000
18	Control	.0240	.0240	.0080	91.2000	79.4333
	Treatment	.0342	.0160	.0023	87.2667	79.4667
19	Control	.2151	.0645	.0000	82.9333	68.4333
	Treatment	.2273	.0341	.0057	83.0000	72.1333
20	Control	.0882	.0471	.0000	90.2000	83.9000
	Treatment	.0090	.0860	.0000	88.8000	86.1500
21	Control	.0067	.0604	.0067	93.6667	89.0333
	Treatment	.0067	.0470	.0000	92.5333	90.7333
22	Control	.1078	.0686	.0000	92.1500	82.1500
	Treatment	.1048	.1048	.0000	91.3000	85.4000
23	Control	.1338	.0563	.0000	83.2667	73.5333
	Treatment	.1901	.1157	.0083	88.3000	73.2667
24	Control	.3538	.0769	.0000	36.5750	25.2000
	Treatment	.3245	.0479	.0000	31.7750	29.0500
25	Control	.2867	.0559	.0070	56.3500	44.8000
	Treatment	.3099	.0643	.0468	59.2250	41.0750
26	Control	.2326	.0814	.0000	74.4333	62.0333
	Treatment	.2617	.1007	.0470	76.8000	68.4500
27	Control	.0531	.0435	.0000	88.4000	81.3500
	Treatment	.0313	.0208	.0000	92.8250	81.9500
28	Control	.2500	.1000	.0000	86.9000	70.9333
	Treatment	.0275	.0872	.0138	59.6000	53.6000
29	Control	.2222	.0833	.0000	94.6000	80.1000
	Treatment	.1216	.0811	.0000	89.0333	73.7667

Table A1.A Continued

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Within-district Matches

30	Control	.1166	.0429	.0061	79.9667	73.8000
	Treatment	.1495	.0935	.0000	79.4333	74.6333
31	Control	.2111	.0889	.0000	84.0000	67.6667
	Treatment	.1333	.0571	.0000	73.1333	61.0000
32	Control	.2222	.1111	.0000	88.1000	77.3000
	Treatment	.1714	.1286	.0000	90.9000	80.8500
33	Control	.1259	.0769	.0140	88.8750	79.4500
	Treatment	.1127	.0211	.0563	80.6750	73.5250
34	Control	.1410	.0000	.0000	97.8750	77.7000
	Treatment	.0750	.0167	.0000	87.8250	79.9000
35	Control	.2133	.0000	.0000	75.6000	65.5000
	Treatment	.2813	.0781	.0000	77.7000	65.9667
36	Control	.2901	.1221	.0000	51.2750	36.4000
	Treatment	.3059	.1176	.0000	50.0000	32.4500
Total	Control	.1781	.0641	.0148	80.4947	69.2037
	Treatment	.1582	.0661	.0184	78.0461	68.1063

Table A1.B

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Out-of-district Matches

Pair	Program	FRL2006	IEP2006	LEP2006	MATH 2006	READING 2006
101	Control	.3545	.0818	.0000	71.1000	67.1250
	Treatment	.4815	.1852	.0000	86.0500	78.4500
102	Control	.2161	.0549	.0073	58.9000	44.9250
	Treatment	.2066	.0744	.0000	57.8500	47.4750
103	Control	.3981	.1748	.0000	81.8500	58.1000
	Treatment	.3810	.0340	.0000	79.8333	64.2333
104	Control	.1949	.0932	.0000	61.7500	50.6250
	Treatment	.2692	.1154	.0000	70.3667	60.5667
105	Control	.3333	.0805	.0115	87.1000	72.8000
	Treatment	.1429	.1020	.0000	64.4000	64.8250
106	Control	.2755	.0604	.1472	85.0000	62.8000
	Treatment	.2692	.0897	.0128	84.1667	74.0000
107	Control	.1856	.0838	.0000	76.2250	63.2750
	Treatment	.1548	.0595	.0000	72.5000	62.1000
108	Control	.0258	.0774	.0000	57.8333	50.4667
	Treatment	.1313	.0707	.0000	70.2750	70.2250
109	Control	.1935	.0968	.0000	78.5000	62.0000
	Treatment	.1975	.1176	.0000	79.0000	69.8667
110	Control	.1388	.0574	.0000	72.9500	68.9750
	Treatment	.2195	.0854	.0000	82.5000	73.6667
111	Control	.2614	.0980	.0131	88.0500	69.9500
	Treatment	.1293	.0476	.0000	72.4000	73.2500
112	Control	.1719	.0078	.0000	78.7250	70.5000
	Treatment	.1022	.0584	.0000	70.4500	50.0250
113	Control	.1181	.0945	.0000	76.8667	66.4000
	Treatment	.1533	.0657	.0438	81.0333	74.4000
114	Control	.1610	.0341	.0000	82.4000	79.4000
	Treatment	.1698	.1792	.0000	83.4500	72.4000

Table A1.B Continued

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Out-of-district Matches

115	Control	.2895	.2105	.0000	98.7000	85.6000
	Treatment	.0968	.0323	.0000	75.8750	75.2250
	Total	.1931	.1214	.0000	87.2875	80.4125
116	Control	.1557	.0708	.0047	83.1000	70.3333
	Treatment	.2138	.0966	.0000	90.0000	78.7000
117	Control	.0952	.0317	.0000	76.2000	65.6750
	Treatment	.1105	.0407	.0116	78.0250	65.7750
118	Control	.2025	.0331	.0248	90.2250	76.7000
	Treatment	.1654	.0451	.0000	85.8500	71.1500
119	Control	.1618	.1324	.0000	86.4333	79.7000
	Treatment	.0739	.0215	.0107	76.0333	68.6333
120	Control	.1083	.0583	.0000	80.5333	65.9667
	Treatment	.0897	.0552	.0000	78.3333	62.9667
	Total	.0990	.0568	.0000	79.4333	64.4667
121	Control	.2376	.1287	.0000	96.0333	88.1333
	Treatment	.1136	.0114	.0000	81.4250	65.1250
122	Control	.0708	.0548	.0342	77.6667	80.6000
	Treatment	.1204	.0602	.0046	83.5500	73.5500
123	Control	.0645	.0387	.0000	78.7500	67.1000
	Treatment	.1000	.0842	.0000	82.9333	67.5333
124	Control	.1316	.1118	.0000	88.2500	79.1500
	Treatment	.1529	.1059	.0000	90.8000	82.7000
125	Control	.0968	.0565	.0161	85.3000	76.4000
	Treatment	.0299	.0868	.0000	77.3500	66.6000
126	Control	.0559	.0503	.0000	83.9000	71.5250
	Treatment	.1379	.1149	.0000	93.5667	74.3333
127	Control	.0397	.0464	.0000	85.6000	72.3000
	Treatment	.0267	.0600	.0000	84.1000	63.1500

Table A1.B Continued

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Elementary Out-of-district Matches

128	Control	.0386	.0858	.0043	92.5500	86.6750
	Treatment	.0500	.0450	.0000	93.8667	83.1000
129	Control	.0328	.0000	.0000	94.0333	86.8667
	Treatment	.0138	.0690	.0000	91.8000	83.8667
130	Control	.0023	.0254	.0000	95.4500	92.4500
	Treatment	.0068	.0473	.0000	96.0000	87.1333
131	Control	.3256	.1349	.0837	15.2000	10.0500
	Treatment	.4935	.0909	.0866	35.9667	27.1000
132	Control	.3074	.0736	.0000	63.9667	56.3333
	Treatment	.4167	.0389	.0278	77.0333	59.9333
Total	Control	.1702	.0762	.0108	79.0357	68.7156
	Treatment	.1694	.0747	.0062	78.9620	68.5018

Table A2

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Middle Schools

Pair	Program	FRL2006	IEP2006	LEP2006	Math 2006	Reading 2006
1.00	Control	.6856	.1005	.0515	44.3667	38.4000
	Treatment	.8333	.1667	.0000	43.7667	42.1667
2.00	Control	.5279	.1416	.0858	54.4333	54.3000
	Treatment	.4961	.2126	.0157	50.2333	56.0000
3.00	Control	.5399	.1411	.0000	58.2333	57.6000
	Treatment	.4463	.1653	.0000	59.8500	50.1000
4.00	Control	.4301	.0968	.0000	69.0500	62.8500
	Treatment	.3455	.2042	.0000	66.3000	59.8000
5.00	Control	.4118	.1216	.0039	66.2500	72.0500
	Treatment	.2841	.1023	.0000	58.2667	72.1333
6.00	Control	.2159	.1023	.0057	62.3500	69.3000
	Treatment	.3200	.1100	.0000	65.4333	72.9333
7.00	Control	.4110	.1166	.0000	73.9333	71.3333
	Treatment	.3243	.0270	.0000	68.1000	71.4500
8.00	Control	.2870	.1204	.0000	66.4000	72.5500
	Treatment	.1667	.1071	.0000	65.1333	66.3667
9.00	Control	.2346	.2308	.0115	66.3333	70.5000
	Treatment	.2171	.1318	.0000	64.6500	71.4000
10.00	Control	.1713	.1528	.0139	69.4000	72.5333
	Treatment	.2452	.1497	.0223	73.5333	73.3333
11.00	Control	.2041	.0867	.0051	73.6667	72.6333
	Treatment	.1587	.1346	.0000	72.5667	71.0333
12.00	Control	.1878	.1224	.0020	73.8000	75.4000
	Treatment	.1027	.1712	.0205	73.2000	70.6500
13.00	Control	.2879	.1364	.0000	80.3500	76.5500
	Treatment	.2421	.1230	.0198	78.2667	75.8667
14.00	Control	.1423	.0751	.0040	70.2333	81.2333
	Treatment	.1815	.1231	.0000	79.9500	74.3000

Table A2

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: Middle Schools

15.00	Control	.0000	.1224	.0000	73.8000	71.5500
	Treatment	.1480	.1704	.0224	74.9000	79.8000
16.00	Control	.1225	.0909	.0000	75.4000	82.3500
	Treatment	.1721	.1148	.0000	76.6500	84.2000
17.00	Control	.1824	.0818	.0063	80.4333	83.5333
	Treatment	.2316	.1263	.0000	83.5333	83.6667
18.00	Control	.0943	.1639	.0123	90.0500	88.9500
	Treatment	.0367	.0688	.0000	86.7000	88.9000
19.00	Control	.3474	.0947	.0000	55.7667	66.7000
	Treatment	.2941	.1471	.0000	55.3333	63.5333
Total	Control	.2458	.1210	.0053	71.9996	73.1694
	Treatment	.2761	.1345	.0053	68.2298	69.8754

Table A3

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: High Schools

Pair	Program	FRL2006	IEP2006	LEP2006	Math 2006	Reading 2006
1.00	Control	.4309	.0994	.0331	16.2000	28.1000
	Treatment	.4692	.2000	.0000	15.2000	32.4000
	Total	.4597	.1750	.0083	15.4491	31.3290
2.00	Control	1.0000	.0469	.0000	37.6000	51.6000
	Treatment	.5217	.1478	.0000	21.6000	34.3000
	Total	.7488	.0999	.0000	29.1948	42.5119
3.00	Control	.4007	.1300	.0000	44.8000	59.0000
	Treatment	.2021	.1809	.0000	33.7000	56.5000
	Total	.3068	.1540	.0000	39.5514	57.8179
4.00	Control	.2667	.1778	.0000	40.0000	57.7000
	Treatment	.3562	.1003	.0000	43.8000	60.4000
	Total	.3065	.1433	.0000	41.6910	58.9015
5.00	Control	.3082	.0688	.0291	47.2000	61.3000
	Treatment	.2418	.2198	.0000	47.2000	56.2000
	Total	.2589	.1808	.0075	47.2000	57.5162
6.00	Control	.2804	.0847	.0000	46.7000	63.4000
	Treatment	.1348	.1028	.0000	39.4000	60.6000
	Total	.2106	.0934	.0000	43.1985	62.0570
7.00	Control	.4198	.1728	.0000	61.0000	61.9000
	Treatment	.1731	.1635	.0192	47.9000	57.9000
	Total	.3006	.1683	.0093	54.6722	59.9679
8.00	Control	.3196	.1237	.0000	45.2000	74.2000
	Treatment	.2254	.1619	.0000	49.2000	62.9000
	Total	.2762	.1413	.0000	47.0439	68.9910
9.00	Control	.0018	.0458	.0000	33.7000	66.7000
	Treatment	.1389	.1056	.0000	48.5000	60.8000
	Total	.0641	.0730	.0000	40.4276	64.0180

Table A3 Continued

Selected 2006 Characteristics of Matched Comparison and NISL Schools in 2006: High Schools

10.00	Control	.2690	.1066	.0000	56.8000	66.0000
	Treatment	.2917	.1528	.0000	52.1000	73.2000
	Total	.2800	.1290	.0000	54.5175	69.4966
11.00	Control	.0725	.0966	.0000	49.2000	61.1000
	Treatment	.0850	.1275	.0033	49.7000	61.3000
	Total	.0783	.1111	.0015	49.4348	61.1939
12.00	Control	.0601	.0687	.0000	48.4000	68.4000
	Treatment	.1323	.1245	.0078	54.4000	67.2000
	Total	.0941	.0950	.0037	51.2286	67.8343
13.00	Control	.2588	.1529	.0118	65.1000	74.6000
	Treatment	.0854	.1357	.0000	56.3000	71.6000
	Total	.1568	.1428	.0048	59.9218	72.8347
14.00	Control	.0968	.1226	.0000	62.8000	73.9000
	Treatment	.2857	.0794	.0000	70.9000	79.0000
	Total	.1865	.1021	.0000	66.6472	76.3223
Total	Control	.2786	.1092	.0022	47.8340	63.7732
	Treatment	.2388	.1430	.0022	44.9929	59.5929
	Total	.2584	.1264	.0022	46.3920	61.6515

Appendix B: Evaluation Rubric for Selecting Program Participants

PA INSPIRED LEADERSHIP INITIATIVE

Name_____

Position_____

District_____

Intermediate Unit_____

Participant Selection Rubric	Score
Instructional Leadership Responsibilities (0 points)	required
Page One School (1 point)	
District/School is in School Improvement or Corrective Action (5 points)	
District is in Phase II of Strategic Planning (1 point)	
Principal (2 points for first year, 3 points for second year, 4 points for 3rd year)	
Assistant Principal (1 point)	
Signed support statement from direct supervisor (0 points)	required
First principal to participate from district. (1 point)	
Total	