

WWC Review of the Report “Staying on Track: Testing Higher Achievement’s Long-Term Impact on Academic Outcomes and High School Choice”¹

The findings from this review do not reflect the full body of research evidence on *Higher Achievement*.

What is this study about?

The study examined the effects of *Higher Achievement*, a multi-year summer and after-school program for incoming fifth and sixth graders attending schools in at-risk communities. The program lasts through eighth grade and aims to improve academic achievement and encourage matriculation into an academically competitive high school. The study authors examined outcomes including: a) student achievement in reading and math up to 4 years after program participation; and b) high school choice activities—application to, admittance to, and matriculation at four different types of high schools with varying selection criteria.^{2,3}

Three cohorts of incoming fifth and sixth graders in Washington, DC and Alexandria, Virginia, were recruited for the study in 2006, 2007, and 2008. About 950 students were randomly assigned through a lottery to an intervention group that was offered the *Higher Achievement* program or to a comparison group that was not. Just over half of the students were offered the opportunity to participate in the program. The analysis included over 800 students. To measure the program’s impacts, the study authors compared outcomes of the two groups.

WWC Rating

The research described in this report meets WWC evidence standards without reservations

This study is a well-executed randomized controlled trial with low levels of sample attrition.

Features of *Higher Achievement*

Higher Achievement is a multi-year program operated out of centers that run from the summer before fifth or sixth grade through the end of eighth grade. The program includes a Summer Academy that offers core classes in math, science, social studies, and literature; two electives; weekly field trips; and academic competitions. In the summer before eighth grade, students also receive supports including group discussions, school visits, and mentoring sessions to prepare them for selecting and applying to high schools. The program also includes an Afterschool Academy that provides academic instruction by a volunteer mentor; an elective; help with homework; dinner; a community gathering; monthly field trips; community service projects; and, in the fall of eighth grade, preparation for selecting and applying to high schools.

What did the study find?

The study authors found that 4 years after randomization, students who were offered participation in *Higher Achievement* had significantly higher standardized test scores in mathematical problem solving. They were also significantly more likely than comparison students to be admitted to and matriculate at private high schools, and were less likely to apply to, be admitted to, and matriculate at noncompetitive public charter/magnet schools. No statistically significant differences were found for standardized tests of reading comprehension; application to private schools; application to, admittance to, or matriculation at competitive public charter/magnet schools; or matriculation at neighborhood public schools. The magnitude and statistical significance of these findings were confirmed by the WWC.

Appendix A: Study details

Herrera, C., Grossman, J. B., & Linden, L. L. (2013). *Staying on track: Testing Higher Achievement's long-term impact on academic outcomes and high school choice*. New York: MDRC.

Additional source:

Linden, L. L., Herrera, C., & Grossman, J. B. (2013). *Achieving academic success after school: A randomized evaluation of the Higher Achievement program* (Working Paper). Retrieved from <http://www.leighlinden.com>

Setting The study was conducted in five *Higher Achievement* centers in Washington, DC and Alexandria, Virginia.

Study sample Researchers recruited incoming fifth and sixth graders for the study through local media and referrals in the spring of 2006, 2007, and 2008, forming three cohorts. To be eligible, students were required to complete an application, attend an interview, be classified as “academically motivated” by *Higher Achievement* staff, and commit to participate for 3 to 4 years. Random assignment was stratified by the following factors: the *Higher Achievement* center to which the student applied, grade, gender, whether the student applied with a sibling, and baseline problem solving score. Siblings applying together (10.3% of students) were randomly assigned as a pair to the same experimental group; siblings of existing attendees were automatically admitted to the program and excluded from the sample. The amount of oversubscription to the program varied by year, so lottery assignment rates were adjusted for each cohort to fill the fixed number of available positions. In the first cohort, two-thirds of the students were assigned to the intervention group and one-third to the comparison group; in the second and third cohorts, half were assigned to the intervention group and half to the comparison group.

Across the three cohorts, 952 students were randomly assigned, with slightly more than half beginning the program in the summer before fifth grade and the rest beginning in the summer before sixth grade. Seventy-five percent of students in the study were African American, and 13% were Latino. Fifty-nine percent of students were female. About 60% of students were eligible for free or reduced-price lunch, 28% lived with both parents, and 12% spoke a language other than English at home. Sixty-five percent of students who applied to be in the study reported earning mostly A's or A's and B's in school, while 6% reported earning mostly C's or lower. The authors indicated that the students in the study scored marginally above the national average on the baseline standardized tests.

Intervention group The intervention group was offered an opportunity to participate in *Higher Achievement*, which is a multi-year program with a primary focus on math and reading achievement, along with assistance preparing for high school application and selection. Starting in the summer after study enrollment (that is, before entering fifth or sixth grade) and continuing through the end of eighth grade, the intervention included a Summer Academy and an Afterschool Academy. The Summer Academy was offered 8 hours/day, 5 days/week, for 6 weeks. Classes of about 13 students received core classes in math, science, social studies, and literature; two electives; weekly field trips; and participation in academic competitions. In the summer before eighth grade, students also received supports including group discussions, school visits, and mentoring sessions to prepare them for selecting and applying to high schools. The Afterschool

Intervention group <i>(continued)</i>	Academy was held for 4.5 hours/day, 3 days/week, for 25 weeks, and included 75 minutes of academic instruction by a volunteer mentor, an elective, help with homework, dinner, a community gathering, monthly field trips, and community service projects. Each center served about 85 students. Of those offered the program, approximately 75%, 70%, and 47% of students attended the program after 1 year, 2 years, and 4 years, respectively.
Comparison group	Comparison students did not participate in <i>Higher Achievement</i> . The study authors did not provide further information.
Outcomes and measurement	<p>Student achievement in math and reading was measured using the abbreviated versions of the Reading Comprehension and Math Problem Solving sections of the Tenth Edition of the Stanford Achievement Test (SAT-10). Tests were administered in the spring during the first, second, and fourth years after random assignment. Since the intervention was a multi-year program running from the summer before fifth or sixth grade through the end of eighth grade, the outcomes measured 4 years after random assignment reflect the maximum exposure to the intervention and are used to determine the WWC effectiveness rating.</p> <p>High school choice outcomes were measured 4 years after random assignment through items on a parent survey that requested the names of high schools to which their children applied, were admitted, and matriculated. The researchers then coded each school as a private school, competitive public charter/magnet school, noncompetitive public charter/magnet school, or neighborhood public school. Competitive magnet schools were defined as those with an academic focus. Competitive charter schools were those classified as Tier 1 by the Washington, DC public school system based on criteria such as high test scores and graduation rates. All other charter and magnet schools were classified as noncompetitive. Ten dichotomous variables were then created, indicating whether students applied to, were admitted to, and/or matriculated at each of the first three types of schools, and whether they matriculated at a neighborhood public high school (which does not require application or admission). For a more detailed description of these outcome measures, see Appendix B.</p>
Support for implementation	The intervention was delivered by staff in the <i>Higher Achievement</i> centers. In the Afterschool Academy, volunteer mentors taught in small group academic sessions. In the Summer Academy, paid teachers taught the courses. During eighth grade, the program's manager of school placement visited each center biweekly to answer student questions and help with high school applications.
Reason for review	This study was reviewed by the WWC in response to a request by the Institute of Education Sciences (IES) and was suggested as a promising intervention through the WWC website's help desk.

Appendix B: Outcome measures for each domain

Mathematics achievement	
<i>Abbreviated version of the Math Problem Solving section of the Tenth Edition of the Stanford Achievement Test (SAT-10)</i>	The SAT-10 is a group-administered, norm-referenced test. The abbreviated version of the Math Problem Solving section was used. Students' scores on the tests taken 4 years after random assignment were used to determine the WWC effectiveness rating as they reflected maximum exposure to the intervention.
Reading achievement	
<i>Abbreviated version of the Reading Comprehension section of the SAT-10</i>	The SAT-10 is a group-administered, norm-referenced test. The abbreviated version of the Reading Comprehension section was used. Students' scores on the tests taken 4 years after random assignment were used to determine the WWC effectiveness rating as they reflected maximum exposure to the intervention.
High school choice	
<i>Type of high school to which a student applied</i>	Four years after random assignment, when the students were in eighth or ninth grade, researchers surveyed the students' parents, asking them to name the high schools to which their children applied. Each school was classified as either: (a) private, (b) competitive public charter/magnet, (c) noncompetitive public charter/magnet, or (d) neighborhood public school. Three binary variables were then created to indicate whether the student applied to a private school, a competitive public charter/magnet school, and/or a noncompetitive public charter/magnet school. (No variable was created for neighborhood public schools, because students do not apply to such schools.)
<i>Type of high school to which a student was admitted</i>	Four years after random assignment, when the students were in eighth or ninth grade, researchers surveyed the students' parents, asking them to name the high schools to which their children were admitted. Each school was classified as either: (a) private, (b) competitive public charter/magnet, (c) noncompetitive public charter/magnet, or (d) neighborhood public school. Three binary variables were then created to indicate whether the student was admitted to a private school, a competitive public charter/magnet school, and/or a noncompetitive public charter/magnet school. (No variable was created for neighborhood public schools, because admission is not required to attend such schools.)
<i>Type of high school at which a student matriculated</i>	Four years after random assignment, when the students were in eighth or ninth grade, researchers surveyed the students' parents, asking them to name the high school in which they chose to enroll their child. Each school was classified as either: (a) private, (b) competitive public charter/magnet, (c) noncompetitive public charter/magnet, or (d) neighborhood public school. Four binary variables were then created to indicate whether the student matriculated at a private school, a competitive public charter/magnet school, a noncompetitive public charter/magnet school, or a neighborhood public school.

Table Notes: Twenty-one additional outcomes were examined in this study but were not included in this report because they were identified as context, fidelity, or attitudinal measures, and were therefore not considered of primary interest for this review. These include: (1) days per week spent in out-of-school-time (OST) programs in the summer, (2) days per week spent in OST programs during the school year, (3) community service or volunteer work, (4) speaking to a group outside of school about his or her ideas/work, (5) visiting a college campus to see what it would be like to be a college student, (6) reading books that are not for school, (7) writing not assigned at school, (8) visiting a business to see what it would be like to work there, (9) going to events outside of his or her neighborhood with his or her OST program, (10) participating in academic contests at his or her OST program, (11) attending a mock interview, (12) attending a test preparation class for the Secondary School Admission Test (SSAT) or High School Placement Test (HSPT), (13) practicing for the SSAT or HSPT but not as part of a class, (14) taking the SSAT or HSPT, (15) applying for a scholarship, (16) receiving a scholarship, (17) visiting a high school of interest, (18) speaking with teachers or other staff at a school of interest, (19) speaking with students who attended these schools about how they liked it there, (20) getting information about specific high schools, and (21) attending a shadow day at a high school.

Appendix C: Study findings for each domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Mathematics problem solving								
<i>Abbreviated SAT-10 Math</i>	Year 4 participants	719 students	nr	nr	0.11	0.11	+4	< 0.05
Domain average for mathematics problem solving						0.11	+4	Statistically significant
Reading comprehension								
<i>Abbreviated SAT-10 Reading</i>	Year 4 participants	719 students	nr	nr	0.04	0.04	+2	> 0.05
Domain average for reading comprehension						0.04	+2	Not statistically significant
High school choice: Private school								
<i>Application to private school</i>	Year 4 participants	719 students	27%	21%	6%	0.20	+8	> 0.05
<i>Admission to private school</i>	Year 4 participants	719 students	21%	14%	7%	0.30	+12	< 0.05
<i>Matriculation at private school</i>	Year 4 participants	719 students	15%	9%	6%	0.35	+14	< 0.05
Domain average for high school choice: private school						0.28	+11	Statistically significant
High school choice: Competitive public charter/magnet school								
<i>Application to competitive public charter/magnet school</i>	Year 4 participants	719 students	54%	55%	-1%	-0.02	-1	> 0.05
<i>Admission to competitive public charter/magnet school</i>	Year 4 participants	719 students	46%	49%	-3%	-0.07	-3	> 0.05
<i>Matriculation at competitive public charter/magnet school</i>	Year 4 participants	719 students	39%	43%	-4%	-0.10	-4	> 0.05
Domain average for high school choice: competitive public charter/magnet school						0.07	-3	Not statistically significant
High school choice: Noncompetitive public charter/magnet school								
<i>Application to noncompetitive public charter/magnet school</i>	Year 4 participants	719 students	14%	22%	-8%	-0.33	-13	< 0.01
<i>Admission to noncompetitive public charter/magnet school</i>	Year 4 participants	719 students	10%	16%	-6%	-0.33	-13	< 0.05
<i>Matriculation at noncompetitive public charter/magnet school</i>	Year 4 participants	719 students	6%	13%	-7%	-0.51	-20	< 0.01
Domain average for high school choice: noncompetitive public charter/magnet school						-0.39	-15	Statistically significant

High school choice: Neighborhood public high school								
<i>Matriculation at neighborhood public high school</i>	Year 4 participants	719 students	40%	35%	5%	0.13	+5	> 0.10
Domain average for high school choice: neighborhood public high school						0.13	+5	Not statistically significant

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student's percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study's domain average was determined by the WWC. nr = not reported.

Study Notes: Corrections for multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The p -values presented here were reported in the original study. The means and standard deviations for SAT-10 scale scores were not reported by the authors. However, the authors standardized student test scores using national norms and recalibrated them to have a mean of 0 and a standard deviation of 1, which means their results are in effect size units. Mean difference and effect sizes were regression-adjusted for pretests, grade at baseline, gender, age, receipt of free or reduced-price lunch, race, and whether the student applied with a sibling; family-level controls including fixed effects for the center to which the student applied; and a set of baseline self-perceptions of abilities, peer academic support, and general adult support. The regression also includes cohort fixed effects (probabilities of random assignment differed by cohort) and standard errors clustered by family (the level of randomization). The study is characterized as having a statistically significant positive impact on the following domains: (1) mathematics problem solving, (2) high school choice: private school, and (3) high school choice: noncompetitive public charter/magnet school (Note – for this outcome, a negative impact estimate indicates a good outcome for students, because they are not attending non-competitive schools). For these three domains, at least one measure in each domain was positive and statistically significant and no effects were negative and statistically significant, after accounting for multiple comparisons. The study is characterized as having an indeterminate effect on the following domains: (1) reading comprehension, (2) high school choice: competitive public charter/magnet school, and (3) high school choice: neighborhood public school. For these three domains, there were no statistically significant or substantively important findings reported. For more information, please refer to the WWC Standards and Procedures Handbook, version 3.0, pages 26–27.

Appendix D: Supplemental findings by domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Mathematics problem solving								
<i>Abbreviated SAT-10 Math</i>	Year 1 participants	815 students	nr	nr	0.03	0.03	+1	> 0.05
<i>Abbreviated SAT-10 Math</i>	Year 2 participants	776 students	nr	nr	0.10	0.10	+4	< 0.05
Reading comprehension								
<i>Abbreviated SAT-10 Reading</i>	Year 1 participants	815 students	nr	nr	0.02	0.02	+1	> 0.05
<i>Abbreviated SAT-10 Reading</i>	Year 2 participants	776 students	nr	nr	0.08	0.08	+3	> 0.05

Table Notes: The supplemental findings presented in this table are additional findings that do not factor into the determination of the evidence rating. For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. nr = not reported.

Study Notes: No corrections for clustering or multiple comparisons were needed. The means and standard deviations for SAT-10 scale scores were not reported by the authors. However, the authors standardized student test scores using national norms and recalibrated them to have a mean of 0 and a standard deviation of 1, which means their results are in effect size units. Mean difference and effect sizes were regression-adjusted for pretests, grade at baseline, gender, age, receipt of free or reduced-price lunch, race, and whether the student applied with a sibling; family-level controls including fixed effects for the center to which the student applied; and a set of baseline self-perceptions of abilities, peer academic support, and general adult support. The regression also includes cohort fixed effects (probabilities of random assignment differed by cohort) and standard errors clustered by family (the level of randomization).

Endnotes

* On April 16, 2014, the WWC modified this report in to correct an error in Appendix B. The text of each of the high school choice outcome was modified to indicate that students were in eighth or ninth grade at the time their parents were surveyed. Originally, the text of each outcome indicated that all students were in eighth grade at the time their parents were surveyed. The WWC rating and the findings of the review did not change.

¹ Single study reviews examine evidence published in a study (supplemented, if necessary, by information obtained directly from the authors or related studies) to assess whether the study design meets WWC evidence standards. The review reports the WWC's assessment of whether the study meets WWC evidence standards and summarizes the study findings following WWC conventions for reporting evidence on effectiveness. This study was reviewed using the single study review protocol, version 2.0.

² There were 21 outcomes included in the study that are not described in this WWC report. See the table notes in Appendix B for more information.

³ A survey was administered to parents of children in the spring of their fourth year of participation, as students were taking the posttest exams. In the survey, parents were asked to name the high schools to which their children had applied, been admitted, and at which they matriculated as of the spring of the eighth grade.

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2014, April). *WWC review of the report: Staying on track: Testing Higher Achievement's long-term impact on academic outcomes and high school choice*. Retrieved from <http://whatworks.ed.gov>

Glossary of Terms

Attrition	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
Clustering adjustment	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
Confounding factor	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
Design	The design of a study is the method by which intervention and comparison groups were assigned.
Domain	A domain is a group of closely related outcomes.
Effect size	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
Eligibility	A study is eligible for review if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
Equivalence	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
Improvement index	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
Multiple comparison adjustment	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
Quasi-experimental design (QED)	A quasi-experimental design (QED) is a research design in which subjects are assigned to intervention and comparison groups through a process that is not random.
Randomized controlled trial (RCT)	A randomized controlled trial (RCT) is an experiment in which investigators randomly assign eligible participants into intervention and comparison groups.
Single-case design (SCD)	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.
Standard deviation	The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample are spread out over a large range of values.
Statistical significance	Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ($p < 0.05$).
Substantively important	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the [WWC Procedures and Standards Handbook \(version 3.0\)](#) for additional details.