

WWC Review of the Report “Better Schools, Less Crime?”¹

The findings from this review do not reflect the full body of research evidence on school choice.

What is this study about?

The study examined the effect of school choice on the criminal activity, academic achievement, and high school graduation rate of more than 2,000 male middle and high school students in North Carolina’s Charlotte–Mecklenburg school district.

For the 2002–03 school year, all district students were given the choice to either attend their neighborhood school or to apply to other schools in the district, where admission was not necessarily guaranteed.

The intervention group consisted of male middle and high school students who applied to a non-neighborhood school that determined admission by a lottery and won admission to their first choice school. The comparison group consisted of similar students who lost a lottery for their first choice school.

The study compared the academic achievement of the two groups 1 and 2 years after the lotteries were conducted, as well as the students’ criminal activity and high school graduation rates through 2009, 7 years after the lotteries were conducted.

Characteristics of Charlotte–Mecklenburg School Choice and the Study Sample

Prior to the 2002–03 school year, the Charlotte–Mecklenburg school district switched from forced desegregation to a district-wide open enrollment policy. As a result, in the fall of 2002, 60% of all students in the district enrolled in their neighborhood school, 30% applied to non-neighborhood schools where admission was either not possible or was guaranteed, and the remaining 10% applied to non-neighborhood schools that had more applicants than available slots. These “over-subscribed” schools conducted lotteries to determine admission.

This study focuses on male students in grades 6–11 during the 2002–03 school year who had attended school in the same district the previous year and applied to non-neighborhood schools that used lotteries to determine admission. The intervention group consisted of the subset of these students who won the lottery and the comparison group consisted of those who did not. Those who did not win a lottery for their first choice school could attend their neighborhood school or a school further down their choice list.

What did the study find?

Using student characteristics that have been shown to be highly correlated with future arrests, the author created a “risk index of future crime” for each student in the analysis sample and used it to divide students into low-risk and high-risk groups.

Among all high-risk students, the author reported, and the WWC confirmed, that intervention group students committed crimes with lighter sentences than comparison group students. Additionally, high-risk high school intervention students were arrested for fewer felonies, and high-risk African-American intervention students were incarcerated for fewer days, than students with similar characteristics in the comparison group. There was no difference between the high-risk groups on academic achievement or high school graduation.

Among students in the low-risk group, the study did not find any statistically significant differences between the intervention and comparison groups on criminal activity outcomes. The study author did not examine academic achievement and high school graduation for the low-risk group.

In summary, the study author found that the introduction of school choice resulted in better outcomes related to criminal activity, but not academics, for middle and high school males who were at high risk for committing a future crime.

WWC Rating

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

Strengths: The intervention and comparison groups were formed by a well-implemented random process.

Cautions: The study had high levels of attrition for one outcome, the 2004 reading score. The study author demonstrated that students in the intervention and comparison groups were equivalent at baseline on reading achievement. Therefore, the analysis for this outcome meets WWC standards with reservations.

Appendix A: Study details

Deming, D. J. (2011). Better schools, less crime? *The Quarterly Journal of Economics*, 126(4), 2063–2115.

Setting	The study used administrative data to examine the outcomes of students from North Carolina's Charlotte–Mecklenburg school district from 2002–03 through 2008–09.
Study sample	<p>The Charlotte–Mecklenburg school district implemented a district-wide open enrollment policy for the 2002–03 school year. Under this policy, students were guaranteed admission to their neighborhood school (independent of whether they had been previously attending that school), and 60% of the district's students chose this option. Thirty percent of the students applied to non-neighborhood schools where admission was either not possible because the school was fully subscribed with neighborhood students or where admission was guaranteed because the number of applicants was fewer than the number of slots available.</p> <p>The study focused on the remaining 10% of students who applied to non-neighborhood schools that were oversubscribed. These schools held lotteries to determine which students would be admitted (the intervention group) and which would be denied admission (the comparison group). The study only considered lotteries for students' top school choice, known as "first-choice" schools.</p> <p>The study sample was further limited to males in grades 6–11 in 2002–03 who had been enrolled in a Charlotte–Mecklenburg school in the previous year. The analysis sample included a total of 2,095 students (1,014 high school and 1,081 middle school students) consisting of 915 intervention students and 1,180 comparison students. However, the analytical sample sizes varied by outcome.</p> <p>The author used student characteristics that have been shown to be highly correlated with future arrests to define a risk index of future crime for each student who participated in a lottery. Based on this index, the author divided students into quintiles and analyzed data from low-risk students (the first through fourth quintiles) separately from data from high-risk students (the fifth quintile). The study analyzed outcomes for students in middle school lotteries and high school lotteries both together and separately.</p>
Intervention group	The intervention group consisted of students who applied to attend an oversubscribed non-neighborhood school, won the selection lottery, and were admitted to their first-choice school.
Comparison group	The comparison group was made up of students who applied to attend an oversubscribed non-neighborhood school, lost the selection lottery, and were not admitted to their first-choice school. These students could have attended their neighborhood school or other schools further down on their choice list.
Outcomes and measurement	Criminal activity and high school graduation rates were measured in 2009, 7 years after the lotteries were conducted. Academic achievement was measured 1 and 2 years after the lotteries were conducted. For a more detailed description of these outcome measures, see Appendix B.
Reason for review	This study was identified for review by the WWC by receiving significant media attention.

Appendix B: Outcome measures for each domain

Criminal activity	
<i>Felony arrests</i>	The number of felonies committed by the average student.
<i>Sentence-weighted arrests</i>	The number of crimes committed by the average student, weighted by the crime's expected sentence.
<i>Total days incarcerated</i>	The number of days that the average student was incarcerated.
Math achievement	
<i>Math score (2003)</i>	The score from a standardized math exam for grades 3–8, expressed in standard deviation units.
<i>Math score (2004)</i>	The score from a standardized math exam for grades 3–8, expressed in standard deviation units.
Reading achievement	
<i>Reading score (2003)</i>	The score from a standardized reading exam for grades 3–8, expressed in standard deviation units.
<i>Reading score (2004)</i>	The score from a standardized reading exam for grades 3–8, expressed in standard deviation units.
High school graduation	
<i>High school graduation</i>	The proportion of students who graduated from a Charlotte–Mecklenburg school district high school.

Table Notes: This single study review focuses on criminal activity outcomes, as they were the focus of the study. Within criminal activity outcomes, several are not included in the single study review for various reasons: all non-traffic arrests (because it includes misdemeanor crimes); property felonies, violent felonies, and drug felonies (because they are a subset of felony arrests); and total social cost (because it was defined subjectively). In addition to the criminal activity outcomes, the single study review includes key academic outcomes that were presented in supplementary analyses in the study: math and reading achievement and high school graduation rate.

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	
Criminal activity, middle and high school students, high-risk group								
<i>Felony arrests</i>	Middle and high school students, high-risk group	418 students	0.59 (1.36)	0.73 (1.36)	-0.14	-0.10	-4	> 0.05
<i>Sentence-weighted arrests</i>	Middle and high school students, high-risk group	418 students	26.60 (116.06)	52.50 (171.52)	-25.90	-0.17	-7	< 0.05
Domain average for criminal activity, middle and high school students, high-risk group						-0.14	-6	Statistically significant
Criminal activity, high school students, high-risk group								
<i>Felony arrests</i>	High school students, high-risk group	202 students	0.43 (1.18)	0.77 (1.43)	-0.34	-0.26	-10	< 0.01
<i>Sentence-weighted arrests</i>	High school students, high-risk group	202 students	35.50 (99.70)	58.60 (192.10)	-23.10	-0.15	-6	> 0.05
Domain average for criminal activity, high school students, high-risk group						-0.21	-8	Statistically significant
Criminal activity, middle school students, high-risk group								
<i>Felony arrests</i>	Middle school students, high-risk group	216 students	0.78 (1.54)	0.71 (1.32)	0.07	0.05	2	> 0.05
<i>Sentence-weighted arrests</i>	Middle school students, high-risk group	216 students	17.30 (135.20)	48.30 (156.40)	-31.00	-0.21	-8	< 0.05
Domain average for criminal activity, middle school students, high-risk group						-0.08	-3	Statistically significant
Criminal activity, middle and high school students, low-risk group								
<i>Felony arrests</i>	Middle and high school students, low-risk group	1,677 students	0.11 (0.50)	0.10 (0.48)	0.01	0.03	+1	> 0.05
<i>Sentence-weighted arrests</i>	Middle and high school students, low-risk group	1,677 students	6.90 (45.59)	3.80 (31.46)	3.10	0.08	+3	> 0.05

Domain average for criminal activity, middle and high schools students, low-risk group						0.06	+2	Not statistically significant
Math achievement, middle school students, high-risk group								
<i>Math score (2003)</i>	Middle school students, high-risk group	171 students	-0.98 (1.00)	-1.03 (1.00)	0.05	0.05	+2	> 0.05
<i>Math score (2004)</i>	Middle school students, high-risk group	137 students	-1.02 (1.00)	-0.93 (1.00)	-0.09	-0.09	-4	> 0.05
Domain average for math achievement, middle school students, high-risk group						-0.02	-1	Not statistically significant
Reading achievement, middle school students, high-risk group								
<i>Reading score (2003)</i>	Middle school students, high-risk group	172 students	-1.24 (1.00)	-1.16 (1.00)	-0.08	-0.08	-3	> 0.05
<i>Reading score (2004)</i>	Middle school students, high-risk group	135 students	1.27 (1.00)	-1.19 (1.00)	-0.08	-0.08	-3	> 0.05
Domain average for reading achievement, middle school students, high-risk group						-0.08	-3	Not statistically significant
High school graduation, middle school students, high-risk group								
<i>High school graduation</i>	Middle school students, high-risk group	216 students	0.08 (0.26)	0.11 (0.31)	-0.03	-0.11	-4	> 0.05
Domain average for high school graduation, middle school students, high-risk group						-0.11	-4	Not statistically significant
High school graduation, high school students, high-risk group								
<i>High school graduation</i>	High school students, high-risk group	202 students	0.24 (0.43)	0.27 (0.44)	-0.03	-0.07	-3	> 0.05
Domain average for high school graduation, high school students, high-risk group						-0.07	-3	Not statistically significant

Table Notes: For the criminal activity domain, negative results for mean difference, effect size, and improvement index favor the intervention group, and positive results favor the comparison group. For all other domains, positive results for mean difference, effect size, and improvement index favor the intervention group; negative results favor the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the change (measured in standard deviations) in an average student's outcome that can be expected if the student is given the intervention. 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; the study is characterized as having a statistically significant effect on reducing criminal activity of high-risk high school and middle school students because univariate statistical tests are reported for each outcome measure, the effect for at least one measure within each domain is positive and statistically significant, and no effects are negative and statistically significant. The study is characterized as having no discernible effects on math achievement, reading achievement, and high school graduation rates, because the study did not show a statistically significant or substantively important effect on outcomes in those domains. Throughout the table, the term "middle school student" refers to students who

participated in lotteries for middle school attendance, and “high school student” refers to students who participated in lotteries for high school attendance. Since some outcomes were analyzed 7 years after the lotteries, the terms do not always reflect the school of attendance at the time the outcomes were measured.

Study Notes: No corrections for clustering or multiple comparisons were needed. The p -values presented here were reported in the original study. The comparison group mean and the mean differences between intervention and comparison groups are as reported in the study. The intervention group mean was calculated by the WWC as the comparison group mean plus the mean difference. Effect sizes and improvement indices were calculated using standard deviations provided to the WWC by the study author. Analyses on math achievement, reading achievement, and high school graduation rates were only conducted for high-risk groups.

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	
Criminal activity, African-American subgroups								
<i>Total days incarcerated</i>	African-American middle and high school students, high-risk group	395 students	40.10 (167.95)	70.00 (193.81)	-29.90	-0.16	-7	< 0.01
<i>Total days incarcerated</i>	African-American high school students, high-risk group	190 students	64.70 (217.40)	91.40 (253.40)	-26.70	-0.11	-5	> 0.05
<i>Total days incarcerated</i>	African-American middle school students, high-risk group	205 students	19.30 (165.50)	55.50 (140.40)	-36.20	-0.24	-9	< 0.01
<i>Total days incarcerated</i>	African-American middle and high school students, low-risk group	864 students	13.00 (64.86)	7.80 (51.37)	5.20	0.09	+4	> 0.05

Table Notes: For the criminal activity domain, negative results for mean difference, effect size, and improvement index favor the intervention group, and positive results favor the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the change (measured in standard deviations) in an average student’s outcome that can be expected if the student is given the intervention. 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. Throughout the table, the term “middle school student” refers to students who participated in lotteries for middle school attendance, and “high school student” refers to students who participated in lotteries for high school attendance. Since some outcomes were analyzed 7 years after the lotteries, the terms do not always reflect the school of attendance at the time the outcomes were measured.

Study Notes: No corrections for clustering or multiple comparisons were needed. The p-values presented here were reported in the original study. The comparison group mean and the mean differences between intervention and comparison groups are as reported in the study. The intervention group mean was calculated by the WWC as the comparison group mean plus the mean difference. Effect sizes and improvement indices were calculated using standard deviations provided to the WWC by the study author.

Endnotes

¹ Single study reviews examine evidence published in a study (supplemented, if necessary, by information obtained directly from the author[s]) 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. A quick review of this study was released on March 8, 2012, and this report is the follow-up review that replaces that initial assessment.

Recommended Citation

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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 \(version 2.1\)](#) for additional details.