

**Social Programs That Work Review**

## **Evidence Summary for KIPP Charter Schools**

### **HIGHLIGHTS:**

- **PROGRAM:** A nonprofit network of 242 college-preparatory, public charter schools that serve a predominantly low-income, minority population of students from pre-K through high school.
- **EVALUATION METHODS:** Three well-conducted randomized controlled trials—RCTs—that evaluated the effectiveness of KIPP elementary and middle schools as implemented on a sizable scale. The schools in the study were located in nine states and the District of Columbia.
- **KEY FINDINGS:** KIPP elementary and middle schools produced sizable, statistically significant effects on reading and math achievement – increases of between 5 and 10 percentile points (compared to the control group) – as measured two to three years after random assignment. One of the KIPP middle school RCTs estimated long-term effects, and found a 6 percentage point increase in four-year college enrollment that approached statistical significance (and is therefore highly suggestive but not yet strong evidence of an effect) and a 4 percentage point increase in persistence in four-year college that was not statistically significant (and is therefore preliminary and not reliable).
- **OTHER:** This evidence of effectiveness applies to KIPP pre-K/elementary schools and middle schools (KIPP high schools have not yet been evaluated in an RCT). A limitation of the findings is that they apply to the subset of KIPP schools that are oversubscribed, and may not necessarily generalize to other KIPP schools that are not oversubscribed.

[Disclosure: Arnold Ventures and members of its board have provided funding support for KIPP schools, and Arnold Ventures provided partial funding support for one of the middle school RCTs (study 3 below).]

**I. Evidence rating:** **TOP TIER**

The standard for Top Tier is:

*Programs shown in well-conducted RCTs, carried out in typical community settings, to produce sizable, sustained effects on important outcomes. Top Tier evidence includes a requirement for replication – i.e., the demonstration of such effects in two or more RCTs conducted in different implementation sites, or, alternatively, in one large multi-site RCT. Such evidence provides confidence that the program would produce important effects if implemented faithfully in settings and populations similar to those in the original studies.*

## **II. Description of the Program:**

KIPP is a non-profit network of 242 college-preparatory, public charter schools educating approximately 87,000 early childhood, elementary, middle, and high school students in the United States. KIPP schools serve a predominantly low-income and minority population – 88% of KIPP students are eligible for free or reduced-price lunch and 95% are African American or Latino.<sup>1</sup> KIPP’s goal is to help students develop the knowledge, skills, and character strengths they need to succeed throughout their education and in the competitive world beyond. KIPP’s approach is based on the following five principles:

- **High expectations:** A culture of support and achievement and personalized learning based on a student’s needs, skills, and interests.
- **Focus on character:** A belief that KIPP students need both a strong academic foundation and well-developed character strengths to succeed in college and the world beyond.
- **Highly effective teachers & leaders:** An emphasis on empowering educators to lead school teams and investment in training to help them grow as professionals.
- **Safe, structured, & nurturing environments:** Schools that are safe, structured, and nurturing environments so that KIPP students thrive and maximize their learning.
- **KIPP through college:** Counselors that support students as they prepare for college and career, and navigate social, academic, and financial challenges while in college.

Estimates of the program’s cost per student per year range from \$12,000 to \$18,500, compared to about \$12,000 for a traditional public school, as [described here](#).<sup>2</sup> (These are rough estimates for the 2007-8 school year.)

[KIPP’s website is linked here.](#)

## **III. Evidence of Effectiveness:**

This summary of the evidence is based on a systematic search of the literature to identify all well-conducted RCTs of KIPP. Our search identified three such studies, summarized as follows.

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<sup>1</sup> KIPP: Who Are Our Students? [linked here](#) (accessed May 1, 2018).

<sup>2</sup> As described in the [link](#), an analysis by Western Michigan University Researchers for the 2007-8 school year found that KIPP schools cost about \$18,500 per student per year, part of which was funded by government and part by private donors. The KIPP organization disputed this number and estimated KIPP’s cost at around \$12,000 per student per year. In our recent email communication with the KIPP organization, they estimated the 2016 cost of KIPP to be \$12,665 per student per year.

## **STUDY 1 (KIPP Middle Schools)**

### **Study Design:**

Of the 60 KIPP middle schools operating in the United States in 2011-12, 16 were significantly oversubscribed and thus used randomized lotteries to determine which KIPP applicants would be admitted. These schools were located in eight U.S. states. A total of 996 5th and 6th graders participated in the lotteries and the study team randomly selected a subsample of 891 for inclusion in the study (459 lottery winners offered KIPP admission and 432 lottery losers who served as a control group). 95% of the study sample was African American or Latino, and 49% came from families with annual income of \$25,000 or less. Student achievement in reading and math was measured with state tests conducted in the spring of the first, second, and third years following the lotteries.

### **Key Findings:**

KIPP middle schools produced sizable, statistically significant effects on reading and math achievement. Two years after random assignment, the average student who won the lottery to attend a KIPP school scored at the 50th percentile in the state in math achievement while the average control group student scored at the 40th percentile (effect size of 0.24 standard deviations,  $p < 0.01$ ). In reading achievement, the average KIPP lottery winner scored at the 44th percentile in the state while the average control group student scored at the 37th percentile (effect size of 0.18 standard deviations,  $p < 0.01$ ). The study also measured reading and math achievement three years after random assignment, and found statistically significant, but slightly smaller, effects (0.18 standard deviations in math and 0.14 in reading). However, we believe the three-year findings are less reliable than the two-year findings because of high sample attrition in year three, as described below under “study quality.”

The effects described above apply to all KIPP lottery winners, whether they actually enrolled in a KIPP middle school or not. KIPP’s effects on the 72% of lottery winners who accepted the admissions offer and thus enrolled in KIPP are approximately 39% larger than the effects on the full sample of lottery winners.<sup>3</sup>

### **Discussion of Study Quality:**

Based on our review, we believe this was a well-conducted RCT. At the two-year follow-up, the study had moderate-to-high sample attrition, but attrition was balanced between the KIPP and control group – specifically, test score outcomes could not be obtained for 37% of both the KIPP and control groups. Sample attrition was higher at the three-year follow-up (49% for the KIPP group and 48% for the control group), which is why we believe the three-year findings are less reliable than the two-year findings. Members of the KIPP and control groups in the two-year follow-up sample were largely similar in their pre-program characteristics (e.g., demographics, test scores), providing some reassurance that attrition did not undermine equivalence of the two groups. In addition, the study appropriately used statistical methods to adjust for the few modest pre-program differences between the two groups. The study’s

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<sup>3</sup> This is known as the “treatment-on-treated” effect, and was calculated using Bloom’s “no-show adjustment.” This adjustment relies on the reasonably-safe assumption that winning the lottery had no effect on educational outcomes for the 28% of lottery winners who never enrolled in KIPP – i.e., the no-shows. More information on the no-show adjustment can be found in Bloom 1984 and Orr 1999, referenced at the end of this summary.

analysis appropriately adjusted for different random assignment ratios across the participating schools, and each school contributed to the overall estimate of KIPP's effects in proportion to the school's sample size. The study appropriately measured outcomes for all students who won the lottery, regardless of whether or how long they actually attended a KIPP school (i.e., the study used an "intention-to-treat" analysis).

This study evaluated the effects of KIPP middle schools as implemented on a sizable scale across multiple U.S. jurisdictions. A limitation of the findings is that they apply to the subset of KIPP schools (roughly one-quarter) that were oversubscribed when the study launched, and may not necessarily generalize to other KIPP schools that are not oversubscribed.

## **STUDY 2 (KIPP Pre-K/Elementary Schools)**

### **Study Design:**

Of the 29 KIPP elementary schools operating in the United States in 2011-12, eight were significantly oversubscribed and so used randomized lotteries to determine which KIPP applicants would be admitted. These schools were located in five U.S. states and the District of Columbia. Students applying for spots in the earliest grade offered by a given school participated in these lotteries. Thus, in five schools, students applying to kindergarten were randomized via lottery while, in the other three schools, students applying to pre-kindergarten for three-year-olds (pre-K3) were randomized. A total of 1,250 pre-K3 and kindergarten students participated in the lotteries, and the study team randomly selected a subsample of 1,097 for inclusion in the study (473 lottery winners offered KIPP admission and 624 lottery losers who served as a control group). 95% of the study sample was African American or Latino, and 50% came from families with annual income of \$25,000 or less.

To measure outcomes, the study team administered four standardized tests (Woodcock-Johnson III) – Letter-Word Identification and Passage Comprehension in reading, and Applied Problems and Calculation in math. Testing took place in the spring of the third year following random assignment, when most of the students who applied at pre-K3 were in kindergarten and most who applied at kindergarten were in second grade.

### **Key Findings:**

KIPP elementary schools produced sizable, statistically significant effects on all of the above measures except Applied Problems. Three years after random assignment, the average student who won a KIPP lottery scored at the 84th percentile in the nation in Letter-Word Identification while the average control group student scored at the 78th percentile (effect size of 0.25 standard deviations,  $p < 0.01$ ). On the Passage Comprehension measure, KIPP lottery winners scored at the 57th percentile while control students scored at the 48<sup>th</sup> percentile (effect size of 0.22 standard deviations,  $p < 0.01$ ).<sup>4</sup> On the Calculation measure, KIPP lottery winners scored at the 68th percentile and control students at the 58th

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<sup>4</sup> The Passage Comprehension test administered in kindergarten to the pre-K3 sample was a misnomer as it tested pre-reading (rather than actual reading) skills. By contrast, the Passage Comprehension test administered in second grade to the kindergarten sample was an assessment of actual reading comprehension, which is widely regarded as the most important, final measure of reading ability. The effect found for the kindergarten sample on that more valid measure of comprehension was 0.14 standard deviations, and statistically significant.

(effect size of 0.28 standard deviations,  $p < 0.01$ ).<sup>5</sup> On the Applied Problems measure, KIPP did not have a statistically significant effect (the non-significant effect size was 0.07 standard deviations).

The effects described above apply to all KIPP lottery winners, whether they actually enrolled in a KIPP elementary school or not. KIPP's effects on the 79% of lottery winners who accepted the admissions offer and thus enrolled in KIPP are approximately 27% larger than the effects on the full sample of lottery winners.<sup>6</sup>

### **Discussion of Study Quality:**

Based on our review, we believe this was a reasonably well-conducted RCT. For the main findings described above (i.e., three years after random assignment), the study had fairly high sample attrition, but attrition was balanced between the KIPP and control group – specifically, test score outcomes could not be obtained for 40% of the KIPP group and 41% of the control group. Members of the KIPP and control groups in the three-year follow-up sample were generally similar in their pre-program characteristics; however, there were a few moderate, statistically significant differences (in mothers' educational attainment and family income) favoring the KIPP group. These differences may somewhat reduce confidence in the study's findings, although the study used appropriate statistical methods to adjust for these and other (smaller) pre-program differences. The study's analysis appropriately adjusted for different random assignment ratios across the participating schools, and each school contributed to the overall estimate of KIPP's effects in proportion to the school's sample size. The study appropriately measured outcomes for all students who won the lottery, regardless of whether or how long they actually attended a KIPP school (i.e., the study used an "intention-to-treat" analysis).

This study evaluated the effects of KIPP elementary schools as implemented on a sizable scale across multiple U.S. jurisdictions. A limitation of the findings is that they apply to the subset of KIPP schools (roughly one-quarter) that were oversubscribed when the study launched, and may not necessarily generalize to other KIPP schools that are not oversubscribed.

## **STUDY 3 (KIPP Middle Schools)**

### **Study Design:**

This was an RCT of 13 oversubscribed KIPP middle schools in 2008-2010 that used randomized lotteries to determine which KIPP applicants would be admitted. These schools were located in five U.S. states and Washington, DC. The study sample comprised 1,179 students who participated in the lottery for 5<sup>th</sup> or 6<sup>th</sup> grade admission (535 lottery winners and 642 lottery losers).

### **Key Findings:**

Like studies 1 and 2 described above, this RCT (study 3) reported positive effects on reading and math achievement two to three years after random assignment. Unfortunately, we believe study 3's findings

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<sup>5</sup> Due to age appropriateness, the Calculation test was administered only to the students who applied to enter KIPP schools at kindergarten (as opposed to pre-K3) and thus were mostly in second grade at the study follow-up.

<sup>6</sup> See footnote 3 for an explanation of this "treatment-on-treated" effect.

on achievement are only suggestive and not reliable due to high rates of sample attrition on these outcomes.<sup>7</sup>

However, the researchers were able to measure longer-term college attainment outcomes for virtually all sample members<sup>8</sup> with data from the National Student Clearinghouse, resulting in highly credible estimates of KIPP's impact on college attainment 10-11 years after random assignment. At that point, all students in the sample were old enough to have potentially attended college for at least two years.

The study found that students who won a KIPP middle school admissions lottery were 6 percentage points more likely to enroll in a four-year college than students who lost the lottery (47% of lottery winners enrolled vs. 41% of lottery losers). We view this finding as highly suggestive but not yet strong evidence of an effect because it did not quite reach statistical significance ( $p=0.085$ ). The study also found a 4 percentage point increase in the rate of persistence through the first two years of a four-year college (30% vs. 26%), but this finding was not statistically significant and therefore is preliminary and not yet reliable evidence of an effect ( $p=0.23$ ). These effects of winning a KIPP lottery (i.e., the “intention-to-treat” effects) are the primary study findings based on the researchers’ pre-registered analysis plan.<sup>9</sup>

However, only 68% of KIPP lottery winners accepted the admissions offer and actually enrolled in a KIPP school. In an exploratory analysis, the study found that the effect on these 68% (i.e., the “treatment-on-treated” effect) was a 9-percentage point increase in enrollment in a four-year college and a 6-percentage point increase in persistence. The enrollment effect approached statistical significance ( $p=0.085$ ); the persistence effect did not.<sup>10</sup>

### **Discussion of Study Quality:**

Based on our review, we believe this was a well-conducted RCT evaluation of KIPP's impacts on college enrollment and persistence. KIPP lottery winners (i.e., the treatment group) and lottery losers (i.e., the control group) were highly similar in their pre-program characteristics. The study had almost no sample attrition in its measurement of college outcomes. The study adhered to its publicly pre-registered analysis plan in estimating KIPP's effects on college outcomes, and appropriately measured outcomes

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<sup>7</sup> Year 2 test data were available for 70% of KIPP lottery winners and 56% of KIPP lottery losers, and year 3 test data were available for 80% of lottery winners and 63% of lottery losers. Such high rates of attrition that differ between lottery winners and lottery losers could potentially have undermined the equivalence of the two groups, leading to erroneous estimates of KIPP's impact on achievement.

<sup>8</sup> The study was able to measure college outcomes for all but two students in the sample (these students did not have a valid birthdate and therefore could not be matched to National Student Clearinghouse records).

<sup>9</sup> The effects we summarize here are based on the researchers’ pre-registered analysis plan. Prior to conducting the analysis, the researchers made a slight update to the pre-registered approach for handling missing baseline data. In their full study report (Coen, Nichols-Barrer, and Gleason 2019), the researchers report results based on the updated approach that are marginally more positive than the results we summarize here (and they include the results we summarize here in a report appendix).

<sup>10</sup> This treatment-on-treated estimate is conservative since it does not adjust for the 16% of students who lost a KIPP lottery, but still subsequently enrolled in a KIPP school (i.e., control group “cross-overs”). Adjusting for such cross-overs is challenging in an RCT analysis because they usually enrolled in KIPP schools later than students who won the lottery, and spent less time in KIPP schools, leading to a different pattern of effects for the two groups.



for all students who won the lottery, regardless of whether or how long they actually attended a KIPP school (per an intention-to-treat analysis, as discussed above).

This study evaluated the effects of KIPP middle schools as implemented on a sizable scale across multiple U.S. jurisdictions. A limitation of the findings is that they apply to the subset of KIPP schools that were oversubscribed when the study launched, and may not necessarily generalize to other KIPP schools that are not oversubscribed.

### **OTHER STUDIES**

There has been one other RCT of KIPP (Angrist 2010) and several non-randomized comparison-group studies. The results of these studies are generally consistent with the results of the three RCTs summarized in this report. However, these additional studies fall outside our initiative's criteria due to limitations that reduce confidence in the findings—namely, lack of random assignment in the case of the comparison-group studies and, in the case of the RCT, use of quasi-experimental analysis methods to estimate KIPP's effects without a reporting of effects for the full KIPP group (i.e., lottery winners) versus the full control group (i.e., lottery losers).

#### **IV. References:**

##### **Studies 1 and 2:**

Tuttle, Christina C., Kevin Booker, Philip Gleason, Gregory Chojnacki, Virginia Knechtel, Thomas Coen, Ira Nichols-Barrer, and Lisbeth Goble (2015). *Understanding the Effect of KIPP as it Scales: Volume I, Impacts on Achievement and Other Outcomes*, Final Report of KIPP's Investing in Innovation Grant Evaluation. Mathematica Policy Research.

##### **Study 2:**

Knechtel, Virginia, Thomas Coen, Pia Caronongan, Nickie Fung, and Lisbeth Goble (2017). *Pre-Kindergarten impacts over time: an analysis of KIPP Charter Schools*. Mathematica Policy Research.

##### **Study 3:**

Coen, Thomas, Ira Nichols-Barrer, and Philip Gleason (2019). *Long-Term Impacts of KIPP Middle Schools on College Enrollment and Early College Persistence*. Mathematica Policy Research.

Tuttle, Christina C., Brian Gill, Philip Gleason, Virginia Knechtel, Ira Nichols-Barrer, and Alexandra Resch (2013). *KIPP Middle Schools: Impacts on Achievement and Other Outcomes*. Mathematica Policy Research.

**Other KIPP Studies:**

Angrist, Joshua D., Susan M. Dynarski, Thomas J. Kane, Parag A. Pathak, and Christopher R. Walters (2010). "Who Benefits from KIPP?" *National Bureau of Economic Research (NBER) working paper 15740*.

**Other References:**

Orr, Larry L. (1999). *Social Experimentation: Evaluating Public Programs with Experimental Methods*, Sage Publications, Inc., pp. 62-64.

Bloom, Howard S. (1984). "Accounting for No-Shows in Experimental Evaluation Designs," *Evaluation Review*, vol. 8, pp. 225-246.