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Review of Dr. Roland Fryer's Apollo 20 Report - *Injecting Charter School Best Practices into Traditional Public Schools: Evidence from Houston*

Introduction

The Apollo 20 program is a bold effort to turn around the lowest performing schools in HISD, whose student populations are almost entirely minority and economically disadvantaged. HISD leaders and the Houston community have made significant investments in order to combat the unacceptably large racial and economic achievement gaps that have persisted too long. We applaud these efforts and consider it a privilege to partner with HISD in their work to close these gaps.

The HISD school board and superintendent asked HERC to review Dr. Fryer's report of the Apollo 20 program. Although Dr. Fryer's report has already been reviewed for journal publication purposes, this review focuses on issues likely to be of interest to decision makers.

General Comments

Overall, the methods selected for these analyses are appropriate and were carried out well, with proper attention to many of the complexities associated with comprehensive school reform evaluation. However, there are several significant concerns – including missing data, student mobility, and some unsubstantiated assumptions – which we describe in more detail below. Most importantly, even if we set these concerns aside, the reported effects on math gains are good but not sustained, and the reported effects on reading gains are negligible. These limited effects must be considered in light of the cost and sustainability of the program. **The key issue moving forward will be to focus on the specific components of the program that seem to be most effective, which was the small group, high-dosage tutoring. We recommend continuing this component of the program and expanding it to include reading tutoring, along with additional grade levels.**

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Specific Comments

1: Definition of Treatment – There are two main types of analyses in this report: (1) those that focused on the effects of being offered a chance to participate in the Apollo program (ITT analyses), and (2) those that focused on the effects of actually participating in the program (LATE analyses). Larger effects resulted from the ITT analyses, which defined the treatment as being zoned to – rather than enrolled in – an Apollo school. This definition dramatically increased the number of students defined as "treated" since the number of students zoned to Apollo schools is much larger than the number of students actually enrolled in these schools. Tables 1-3 below (calculated by HERC staff) indicate that the percentage of students who were zoned to but not enrolled in Apollo schools was about 35% of elementary students, about 50% of middle school students, and closer to 60% of high school students – meaning that a *majority* of high school students zoned to Apollo schools, and defined as "treated," were not actually enrolled in an Apollo school.

An anonymous journal reviewer recommended using this definition of treatment in order to minimize selection into or out of the sample. However, the tables below show that the number of students zoned to Apollo schools changes from year to year, with the number of high school students decreasing steadily, and that a large proportion of students zoned to Apollo schools are not actually enrolled in Apollo schools. The proportion of non-enrolled students was especially high among high school students, for whom the reported treatment effects were the largest. **In sum, the treatment effects were stronger when the analyses included students that did not actually enroll in an Apollo school, and they were the strongest when the proportion of non-enrolled students was the highest.**

Table 1. Students zoned to but not enrolled in Apollo (A) schools: Elementary Schools

	2010-11 (pre-Apollo)	11-12 (Yr1)	12-13 (Yr2)
Number of students zoned to A schools	8,505	8,422	NA
Number of zoned students not enrolled in A schools	3,008	3,042	NA
Percent of zoned students not enrolled in A schools	35%	36%	NA

Table 2. Students zoned to but not enrolled in Apollo (A) schools: Middle Schools

	2009-10 (pre-Apollo)	10-11 (Yr1)	11-12 (Yr2)	12-13 (Yr3)
Number of students zoned to A schools	6,460	5,991	6,273	NA
Number of zoned students not enrolled in A schools	3,143	3,057	3,259	NA
Percent of zoned students not enrolled in A schools	49%	51%	52%	NA

Table 3. Students zoned to but not enrolled in Apollo (A) schools: High Schools

	2009-10 (pre-Apollo)	10-11 (Yr1)	11-12 (Yr2)	12-13 (Yr3)
Number of students zoned to A schools	9,022	8,721	8,523	NA
Number of zoned students not enrolled in A schools	5,064	5,017	4,967	NA
Percent of zoned students not enrolled in A schools	56%	58%	58%	NA

2: Student Mobility – The ITT analyses focus on a fixed population of students, where "all student mobility after treatment assignment is ignored" (p. 19). However, a significant proportion of HISD students move to a different school each year, and this percentage is expected to be higher among students in disadvantaged schools like those in this study. **Although it is common for school reform efforts to assume that students will remain in a specific school long enough for reforms to take effect, schools in need of reform often have the highest rates of student turnover.**

3: Missing Data – About 45% of teachers and 95% of principals were removed from Apollo schools. The stated purpose was to improve human capital. However, the value-added data that were used to determine which teachers remained in Apollo schools were missing for approximately 66% of elementary teachers and 50% of middle school teachers; for high schools, value-added data were only available at the grade-department level in core subjects. **Most importantly, no descriptive data were reported that allow us to compare the human capital of the staff before and after this drastic treatment.** The absence of teacher comparison data means that we do not know the criteria on which teachers were selected, we are unable to assess whether the unknown criteria were successful in differentiating the best teachers, and this hinders our ability to scale-up the program.

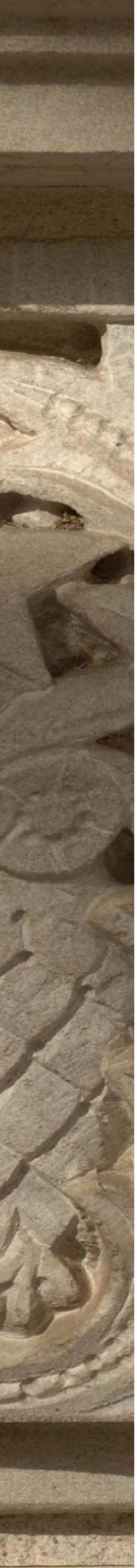
4: Closing the Gaps in Three Years – The conclusion that the reported effects can close the math achievement gap (Blacks and Hispanics vs. Whites) in three years is problematic for several reasons. First, it assumes that the magnitude of the observed effects will persist over time. Total effects were estimated by calculating a yearly impact and multiplying it by the number of years of the intervention – two for elementary school estimates and three for middle and high school estimates (p. 21-22). **However, there is no evidence that the effects will persist; in fact, there is evidence to the contrary.** Descriptive statistics (which were calculated by HERC staff) show that student gains were smaller in Year 2 than in Year 1 of the treatment. Table 4 below shows that this was the case for both math and reading among middle school students that had been exposed to two years of treatment (Year 3 gains are not yet available). Only Stanford test scores are reported because HISD switched from TAKS to STAAR during this time period.

Table 4. Mean gains by year: Middle School students exposed to 2 years of treatment

	Year 1 Gains (2010-11 score minus 2009-10 score)	**Year 2 Gains** (2011-12 score minus 2010-11 score)
Stanford Math	31.1	5.8
Stanford Reading	15.6	13.1

Second, in order to conclude that the racial achievement gap can be closed, the analyses must show the effects of Apollo *separately by race*. However, effects by race were not reported. **In order to close the gaps, the program must either target minorities or be shown to have a stronger impact on Blacks and Hispanics than on Whites.** If the effects are the same across groups, then the groups may improve, but the gap between them remains the same. Given the racial composition of Apollo schools, which consist almost entirely of minority students, these analyses are difficult to conduct. Moving forward, the aim to close the gaps should inform the selection of schools.

5. Tutoring – Due to budget constraints, not all students in Apollo schools received small group, high-dosage tutoring. When students who received tutoring were compared to Apollo students who did not receive tutoring, there were



significant differences in favor of those who received tutoring (p. 23-24). This is corroborated by the fact that only math gains were observed, and the students received math tutoring. **This suggests that tutoring had significant effects, apart from the other components of the Apollo program, for which we have much more limited evidence.**

6. Sustainability – Funding issues aside (which are not insignificant), some of the components of the reform effort are not sustainable in the long run. For example, a significant component of the reform effort (Tenet 2: Human Capital) included removing 19 out of 20 principals and 45% of teachers in the Apollo schools. It is likely that some of the observed effects were a result of the initial shock experienced by teachers and principals (both new and returning). **If some of the gains observed in Year 1 of the program were due to this initial shock, they are unlikely to be sustained in subsequent years.**

Conclusion

In sum, the Apollo program implemented five bold strategies that aimed to improve the achievement of highly disadvantaged students attending the worst-performing schools in HISD. Taken together, these strategies had positive effects on math gains but negligible effects on reading gains. The reported effects were stronger when the analyses included students that were zoned to, but not actually enrolled in, Apollo schools, and there was no evidence that these effects persist over time. There was also no evidence of improved human capital among teachers or principals. **The strongest evidence reported is from the small group, high-dosage tutoring, which we recommend expanding to include reading as well as additional grade levels.** ■

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