

The Impact of the Rhode Island GEAR UP Program on Educational Outcomes of a Pooled Group of Participants from the 2007-2008 and 2008-2009 Sixth Grade Cohorts

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GEAR UP Program

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Introduction

In two previous papers we have presented findings from the Center for Labor Markets and Policy's evaluation of the impact of the Rhode Island GEAR UP (RI GU) program on educational outcomes on two cohorts of RI GU participants: the first cohort consisted of 249 students those who had entered the RI GU program in 2007 as sixth graders; and the second cohort consisted of 205 students who had entered the RI GU program as sixth graders in 2008.¹

The evaluation of these two cohorts was based on a quasi-experimental design. Using Propensity Score Matching (PSM) technique, a matched group of students from the sixth grade classmates of RI GU participants were selected to serve as the comparison group to produce impact estimates. Comparison group students were matched with RI GU participants on the following pre-program traits: demographic traits of gender, race-ethnicity, disability status in the sixth grade, eligibility for free or reduced price school lunch in the sixth grade, sixth grade standardized test (NECAP) score, sixth grade attendance, and climate of the school that they were attending in sixth grade. The matched comparison group is selected to be similar to RI GU participants on all these pre-program characteristics (that are known to be closely related to educational outcomes) so that the only difference between the two groups is participation in the GEAR UP program.

The earlier evaluation research papers presented impact estimates of the RI GU program on the following four key educational outcomes from the time of participant entry into the RI GU program in sixth grade to high school graduation and enrollment in college: on-time grade attainment (grade promotion and attrition in middle school and high school), on-time high school graduation, immediate college enrollment among high school graduates, and a summary level outcome that measures the share of all 6th graders in the cohort who had enrolled in college in the fall following their on-time high school graduation. The summary level outcome measure is designed to gauge the *cumulative impact* of the RI GU program on on-time grade attainment, on-

¹ Neeta P. Fogg, Paul E. Harrington, and Ishwar Khatiwada, *Estimating the Impact of the Rhode Island GEAR UP Program on the Educational Outcomes of Participants from the 2007-2008 Sixth Grade Cohort*, Center for Labor Markets and Policy, Drexel University, July 2016; Neeta P. Fogg, Paul E. Harrington, and Ishwar Khatiwada, *Estimating the Impact of the Rhode Island GEAR UP Program on the Educational Outcomes of Participants from the 2008-2009 Sixth Grade Cohort*, Center for Labor Markets and Policy, Drexel University, January 2017.

time high school graduation, and immediate college enrollment of GEAR UP program participants.

The two papers provide a detailed account of the method and data used for the evaluation, the traits of RI GU participants and their sixth grade classmates as well as the subset of their sixth grade classmates in the matched comparison group selected with the Propensity Score Matching technique, and findings from the impact evaluation.

A summary of impact findings of each of the two cohorts are presented below:

Outcome 1: On-time grade attainment:

2007-08 sixth grade cohort: by school year (SY) 2013-14 the share of RI GEAR UP participants who had reached twelfth grade was 8.8 percentage points higher than the comparison group (80.7% versus 71.9%); yielding a net impact estimate of 8.8 percentage points ($p < .05$, significant at 95%).

2008-09 sixth grade cohort: by SY 2014-15 the share of RI GEAR UP participants who had reached twelfth grade was 4.9 percentage points higher than the comparison group (81.0% versus 76.1%). This positive difference in favor of RI GEAR UP participants was *not* statistically significant.

Outcome 2: On-time high school graduation of sixth graders:

2007-08 sixth grade cohort: by the expected date of graduation (spring of 2014), nearly three-quarters (74.7%) of RI GEAR UP participants had graduated high school compared to just two-thirds (66.7%) of students in the comparison group; a difference of 8 percentage points which represents the net impact of the RI GEAR UP program on the high school graduation of this cohort ($p < .05$, significant at 95%).

2008-09 sixth grade cohort: By the expected date of graduation (spring of 2015), more than three-quarters (75.6%) of RI GEAR UP participants had graduated high school compared to just two-thirds (68.3%) of students in the comparison group; a difference of 7.3 percentage points; ($p < .10$, significant at 90%).

Outcome 3: College enrollment among high school graduates:

2007-08 sixth grade cohort: By the fall of 2014, 69.9 percent of RI GU participants who had graduated from high school had enrolled in college immediately after graduating high school compared to 56 percent of high school graduates in the comparison group. The difference of 13.9 percentage points in favor of RI GU participants was statistically significant ($p < .01$, significant at 99%).

2008-09 sixth grade cohort: By the fall of 2015, 56.8 percent of RI GU participants who had graduated from high school had enrolled in college immediately after graduating high school compared to 48.6 percent of high school graduates in the comparison group. The difference of 8.2 percentage points in favor of RI GU participants was *not* statistically significant.

The college enrollment rate of the 2008-09 cohort of RI GU participants who had graduated high school on time was lower than that of their counterparts in the 2007-08 cohort. And, a similar decline in the college-going rate occurred among students in the 2008-09 comparison group relative to the 2007-08 comparison group. As a result, the RI GU college enrollment rate of the 2008-09 cohort of RI GU participants remained higher than that of the comparison group; but the difference was not statistically significant.

Outcome 4: Cumulative Measure of Impact: College enrollment as a share of all sixth graders in each cohort:

This outcome measures the cumulative effect of the RI GEAR UP program on the entire pathway from sixth grade to college enrollment including on-time grade attainment through to twelfth grade, on-time high school graduation, and immediate enrollment in college upon graduation from high school. It is measured as the percent of all sixth grade participants and all sixth grade comparison group students that were enrolled in college in the fall term after their expected on-time high school graduation.

2007-08 sixth grade cohort: Our analysis found that 56.2 percent of the original 249 6th grade RI GEAR UP participants and 41 percent of the 249 comparison group students had enrolled in college in fall 2014; immediately after graduating

high school in spring 2014. The difference of 15.3 percentage points in favor of RI GU participants was statistically significant ($p < .01$, significant at 99%).

In relative terms, this difference (15.3 percentage points) represents a net impact of the RI GEAR UP program in increasing the likelihood of enrolling in college among RI GU participants by 37 percent ($15.3/41=37.3$).

2008-09 sixth grade cohort: Our analysis found that 51.7 percent of the original 205 6th grade RI GEAR UP participants and 42.4 percent of the 205 comparison group students had enrolled in college in fall 2015; immediately after graduating high school in spring 2015. The difference of 9.3 percentage points in favor of RI GU participants was statistically significant ($p < .10$, significant at 90%).

In relative terms, this difference (9.3 percentage points) represents a net impact of the RI GEAR UP program in increasing the likelihood of enrolling in college among RI GU participants (relative to the comparison group) by 21.9 percent ($9.3/42.4=21.9$).

Because of the small size of each of the two cohorts, particularly the second (2008-09) cohort that consisted of just 205 participants, outcomes were measured with lower levels of precision (higher standard errors). Consequently, the size of the impact needed to be large enough to meet the threshold of statistical significance. Although the estimated impacts were substantial for both cohorts, they were considerably greater for the first (2007-08) cohort. As a result the advantage of RI GU participants from the 2007-08 cohort over their sixth grade classmates in the comparison group on each of the four educational outcomes met a high threshold of statistical significance. The second cohort (2008-09) of RI GU participants also outperformed their classmates in the comparison group on each of the four educational outcomes. However, the RI GU advantage for the 2008-09 cohort was statistically significant (at a lower standard $p < .10$) for only two out of the four outcomes.

In this paper we present findings from our evaluation of the impact of the RI GU program based on pooled data combining the two cohorts of 249 and 205 RI GU participants and the corresponding 249 and 205 students in the matched comparison group for each cohort. The pooled data nearly double the number of cases in the analysis resulting in smaller standard errors

in the measurement of outcomes. But there are certain caveats regarding analysis of pooling data for two separate cohorts of participants that need to be highlighted at the outset.

Although the overall GEAR UP treatment does not change from year to year and is targeted to the same educational outcomes, there might be variations in the treatment for different cohorts of students arising from differences in institution specific, programmatic, and environmental context that they encounter as they progress through the middle school and high school. For example, there might be year to year differences in advisors and other GEAR UP personnel, school teachers and other school personnel, the kinds of treatment offered/available in the form of programs and services, the “competition” for services from different cohort sizes and class sizes, and other potential factors that would change the treatment. However, since the two cohorts that are pooled in this study consist of successive cohorts of sixth graders, the difference in these institutional specific, programmatic, and environmental factors might not be as large as it would have been had the two cohorts been several years apart.

Estimates of Impact

In this section we present estimates of impact of the Rhode Island GEAR UP program on four key educational outcomes among the two cohorts of participants combined. These outcomes include:

- on-time grade attainment and attrition,
- on-time high school graduation,
- immediate college enrollment among high school graduates, and
- a cumulative outcome measure of immediate college enrollment as a percent of all RI GU participants.

We have estimated these outcomes from pooled data for two cohorts of RI GU participants and their respective comparison groups: 249 participants and 249 comparison group students from the 2007-08 sixth grade cohort and 205 participants and 205 comparison group students from the 2008-09 sixth grade cohort. The combined cohort consists of 454 RI GU participants and 454 sixth grade classmates of these cohorts of participants that were selected to be in the matched comparison group.

Impact estimates are presented for each outcome for the pooled group of RI GU participants and comparison group students. The four outcome measures are presented for RI GU participants and the comparison group along with the difference for each outcome between the two groups and the statistical significance of the difference. A statistically significant difference between the outcome of RI GU participants and the PSM-based matched comparison group is attributable to the RI GU program and represents the impact of the GEAR UP program on that outcome. Estimates of impact are presented for all participants and for selected subgroups of participants.

On-Time Grade Attainment

Academic performance is considered to be the single most important predictor of whether students dropout or graduate from high school. Promotion from one grade to the next requires that students demonstrate academic proficiency and pass a certain number of classes to earn sufficient credits needed to complete a grade. Students with a poor academic performance fail to earn sufficient credits and are retained in the same grade and continue to be retained until they earn sufficient credits. The research literature consistently finds grade retention to be a predictor of whether students graduate high school. While grade retention by itself cannot be considered a cause of dropping out, the grade retention measure is closely connected to factors such as poor academic performance, lack of motivation, poor engagement in school, and other negative behavioral traits that ultimately contribute to dropping out.²

The expected high school graduation dates for the two cohorts were spring of 2014 for the 2007-08 cohort and their sixth grade comparison group classmates and spring 2015 for the 2008-09 cohort and their classmates in the comparison group. This means that 2007-08 cohort students who were enrolled in the twelfth grade during school year 2013-14 and 2008-09 cohort students who were enrolled in the twelfth grade in 2014-15 must have completed each grade on time from the sixth grade onwards. Conversely students who were not enrolled in the twelfth grade during those two school years must have fallen behind and were either enrolled in a lower

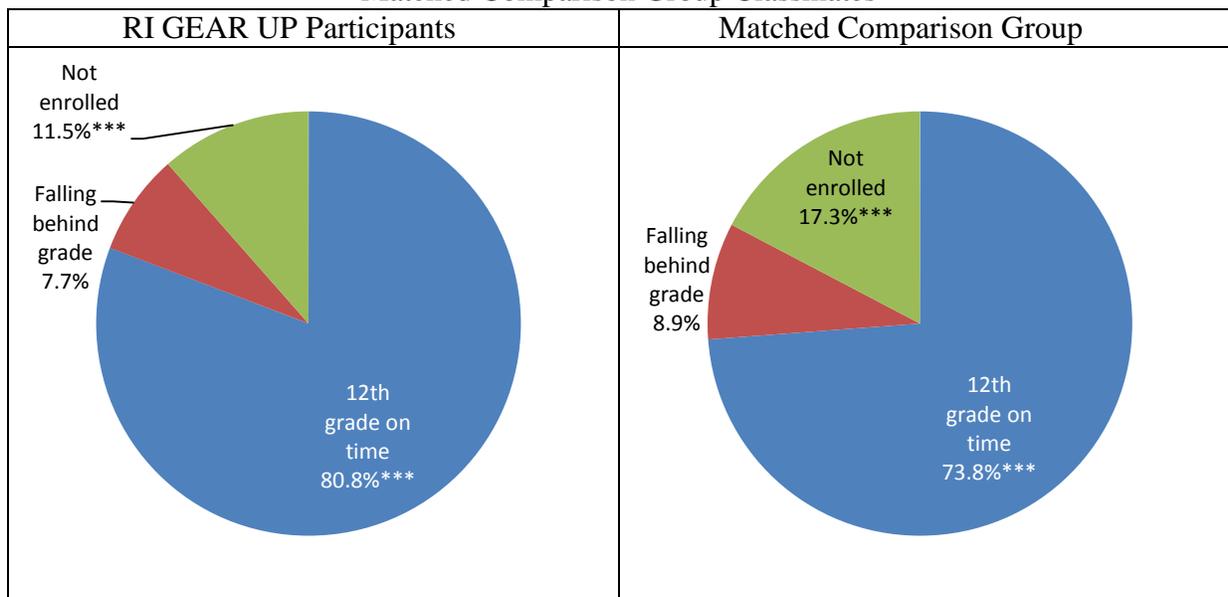
² Rumberger, Russel W. *Dropping Out: Why Students Drop Out of High School and What Can be Done About It*. Boston, MA: Harvard University Press, October 2011; Burrus, Jeremy and Richard D. Roberts, *Dropping Out of High School: Prevalence, Risk Factors, and Remediation Strategies*, Educational Testing Service, R & D Connections, No. 18, February 2012 (https://www.ets.org/Media/Research/pdf/RD_Connections18.pdf); Neild, Ruth Curran and Robert Balfanz, *Unfulfilled Promise: The Dimensions and Characteristics of Philadelphia's Dropout Crisis, 2000-2005*, Philadelphia Youth Network, The Johns Hopkins University, and University of Pennsylvania, 2006.

grade or were no longer enrolled in the Rhode Island public school system—dropped out of school entirely or otherwise exited the Rhode Island public school system.

We have examined the distribution of the pooled cohorts of RI GEAR UP participants and students in the matched comparison group by their school enrollment status during the school year of their expected year of high school graduation (when they are expected to be in the twelfth grade), into the following three groups: i) twelfth grade on-time grade students (those enrolled in the twelfth grade, ii) behind grade students (those enrolled below the twelfth grade), and iii) not enrolled students (those who were not enrolled in a RI public school).

The share of students that had reached twelfth on time was much higher among RI GU participants than among students in the matched comparison group (80.8% versus 73.8%); the difference of 7 percentage points was statistically significant at the .01 level.³ The share of

Chart 1:
Percentage Distribution by Status during School Year 2013-14 (2007-08 Cohort) and School Year 2014-15 (2008-09 cohort) of RI GU Participants and their Sixth Grade Non-Participating Matched Comparison Group Classmates



*** p <.01, ** p<.05, * p<.10

students that had fallen behind grade 12 was 7.7 percent among RI GU participants and 8.9 percent among their classmates in the matched comparison group; yielding a difference of 1.2 percentage points that was not statistically significant. Attrition by the time they reached twelfth

³ Statistical significance in this paper is based on the Mann-Whitney U test.

grade was considerably higher in the comparison group than among RI GU participants; 11.5 percent of RI GU participants were not enrolled in RI public schools in school year when they were expected to be in twelfth grade compared to 17.3 percent of students in the matched comparison group and the difference was statistically significant at the .01 level.

On-Time High School Graduation

The 249 RI GU participants and their 249 sixth grade classmates in the matched comparison group were expected to reach twelfth grade in the 2013-14 school year and graduate high school at the end of the school year in spring 2014. The second cohort of 205 RI GU participants and their 205 sixth grade classmates in the matched comparison group were expected to reach twelfth grade in the 2014-15 school year and graduate high school at the end of the school year in spring 2015. In other words, if these students were to advance each grade on time and not quit school before graduating, these two cohorts of sixth graders were expected to enter 12th grade on time; in school years 2013-14 (2007-08 cohort) and 2014-15 (2008-09 cohort), and graduate high school on time; in the spring of 2014 (2007-08 cohort) and spring of 2015 (2008-09 cohort). Students who graduated high school on time would have followed a path of on-time grade attainment from the sixth grade to the twelfth grade ending with on-time graduation at the end of the twelfth grade.

Three-quarters of RI GU participants (341 out of 454) had graduated high school on time. Students in the matched comparison group, as noted in the previous section, had a much lower rate of on-time grade attainment and a higher attrition rate that translated into a much lower rate of on-time high school graduation. A total of 306 out of 454 or 67.4 percent of comparison group students graduated high school on time. The difference of 7.7 percentage points in on-time high school graduation rates was statistically significant at the .10 level.

The on-time high school graduation advantage of RI GU participants over the comparison group varied by gender, race/ethnicity, and free or reduced price lunch (FRL) status. Among both RI GU participants as well as the matched comparison group, the share of female sixth graders who had graduated on time was between 5.5 and 5.8 percentage points higher than the share of male sixth graders who had graduated high school on time. The on-time graduation advantage of female RI GU participants over female students in the matched comparison group also stood at 7.8 percentage points; the difference was statistically significant at the .05 level.

Male RI GU participants also had a higher share of on-time graduates than their counterparts in the comparison group (71.8% versus 64.3%); but the difference was not statistically significant.

African-American participants in the RI GEAR UP program had the highest share of on-time high school graduates (78.2%) exceeding the share of their matched comparison group counterparts by 10.7 percentage points; the difference was statistically significant at the .10 level. The share of on-time high school graduates among RI GU participants exceeded that of their counterparts in the matched comparison group by 5 percentage points among Hispanic students and 9 percentage points among White students; however, these differences were not statistically significant.

Table 1:
Percent of Two Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group that had Graduated High School Graduation On Time, by Gender, Race-Ethnicity, and Sixth Grade Free or Reduced Price Lunch (FRL) Status

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Total Number	454	454	-
Percent who Graduated High School On Time			
All	75.1	67.4	+7.7***
Gender			
Male	71.8	64.3	7.5
Female	77.6	69.8	7.8**
Race-Ethnicity			
Non-Hispanic Black	78.2	67.5	10.7*
Hispanic	74.1	69.0	5.1
Non-Hispanic White	64.0	54.9	9.1
Sixth Grade FRL Status			
FRL in 6 th Grade	74.2	66.7	7.5**
No FRL in 6 th Grade ¹	---	---	---

*** p <.01, ** p<.05, * p<.10

¹Note: Number of students too small for precise estimates.

Low income RI GU participants (those with free or reduced price school lunch in the sixth grade) were found to have a 7.5 percentage point advantage in earning a high school

diploma on time compared to low income students in the comparison group. Over 74 percent of low income RI GU participants had graduated high school on time compared to two-thirds of their matched comparison group counterparts. The difference was statistically significant at the .05 level.

An examination of on-time high school graduation by sixth grade attendance finds that among RI GU participants as well as their classmates in the matched comparison group, students with better attendance in the sixth grade were considerably more likely than those with poor attendance to graduate high school on time. In comparison to RI GU participants with the lowest sixth grade attendance (those in the lowest sixth grade attendance quartile) those in the highest sixth grade attendance rate quartile were 1.7 more likely to graduate high school on time (48.3% versus 82.1%). Among students in the matched comparison group, the share of on-time high school graduates among students in the highest sixth grade attendance quartile was 1.6 times higher than among those in the lowest sixth grade attendance quartile (47.4% versus 76%).

Table 2:
Percent of Two Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group Who had Graduated High School Graduation On Time, by Quartiles of the Sixth Grade Attendance Rate

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Total Number	454	454	---
Percent of Sixth Graders who had Graduated High School On Time:			
All	75.1	67.4	+7.7***
Sixth Grade Attendance Rate Quartile			
Lowest Quartile	48.3	47.4	1.0
Second	78.5	63.2	15.3***
Third	76.7	71.4	5.3
Highest Quartile	82.1	76.0	6.1

*** p <.01, ** p<.05, * p<.10

Shares of sixth graders who had graduated high school on time by sixth grade attendance rate quartiles of RI GU participants and their comparison group classmates are presented in Table 2. Shares of on-time high school graduates were higher among RI GU participants than among their matched comparison group classmates in all four sixth grade attendance rate quartiles. However, the size of the on-time graduation advantage varied widely.

In the second quartile of sixth grade attendance rate, RI GU participants were 15.3 percentage points more likely than their matched classmates to graduate from high school (78.5% versus 63.2%). The difference was statistically significant at the .01 level. The on-time high school graduation rate advantage for RI GU participants over their matched peers in the highest quartile (6.1 percentage points) and the second highest quartile of sixth grade attendance rate (5.3 percentage points) was not statistically significant. The on-time high school graduation share of RI GU participants in the lowest quartile of sixth grade attendance rate was only 1 percentage point higher than that of their matched comparison group classmates and this difference was not statistically significant.

College Enrollment

The college enrollment outcome for both cohorts is measured immediately after their expected high school graduation. It measures the share of on-time high school graduates from each cohort who were enrolled in college immediately (in the summer or fall semester) following their high school graduation. Immediate college enrollment is defined as enrollment in college immediately after graduating high school. In this paper we have presented two measures of college enrollment. The first measure represents what is commonly known as the *college enrollment rate*, that is, the percent of high school graduates who are enrolled in college at a point in time. In this case we will measure the *immediate college enrollment rate* as: the number of on-time high school graduates (from both cohorts) who were immediately enrolled in college ÷ total number of on-time high school graduates (in both cohorts).

The second measure of college enrollment is a *summary outcome measure of college enrollment* immediately following high school graduation among students in the entire two cohorts of entering sixth graders. It is measured as: the number entering sixth graders (in both cohorts) who were enrolled in college immediately after expected high school graduation (2014 for the 2007-08 cohort and 2015 for the 2008-09 cohort) ÷ total number of sixth graders in both cohorts. This comprehensive outcome measures the entire pathway from sixth grade to college including on-time (or delayed) grade attainment, persistence in middle and high school (or attrition), on-time high school graduation, and immediate college enrollment.

Immediate College Enrollment Rate

Nearly 64 percent of the on-time high school graduates from the two cohorts of RI GU participants had enrolled in college immediately after graduating high school. The college enrollment rate of 2015 high school graduates nationwide in October of 2015 was 69.2 percent and the college enrollment rate of their national 2014 counterparts was 68.4 percent.⁴ The college enrollment of RI GU participants was lower than that of their nationwide counterparts but the gap was smaller than would be expected since the nation's college graduates include all high school graduates regardless of their demographic traits or socio-economic status, whereas the RI GU participants are largely composed of race-ethnic minority students from low income families attending schools in low-income urban school districts—traits that are associated with a considerably reduced likelihood of college enrollment than the average for all high school graduates.

The PSM comparison group of RI GU participants is the more appropriate group for comparison since these students were matched with key traits of RI GU participants in the sixth grade (at the starting line). Our analysis of the data found that only 52.6 percent of high school graduates in the matched comparison group were enrolled in college immediately after graduating high school; a rate that is 11.3 percentage points lower than the immediate college enrollment rate of RI GU participants. The large college enrollment advantage of RI GU participants was significant at .01 the level. RI GU participants from the combined 2007-08 and 2008-09 cohorts have a considerable advantage on this measure over their matched classmates in the comparison group, yielding a statistically significant RI GEAR UP program impact of 11.3 percentage points on the outcome of immediate college enrollment of high school graduates.

On the measure of immediate college enrollment rate, RI GU participants out-performed students in the comparison group across gender and race-ethnicity groups, as well as by FRL status and attendance rate in the sixth grade. Immediate college enrollment rates of RI GU participants and the comparison group for gender, race-ethnicity and sixth grade FRL status subgroups are presented in Table 3. The difference in the immediate college enrollment rate for each of these groups of students was positive and in favor of RI GU participants and these

⁴ Bureau of Labor Statistics, U.S. Department of Labor. "College Enrollment and Work Activity of High School Graduates." Economic News Release, April 16, 2015. (<http://www.bls.gov/news.release/hsgec.htm>); Bureau of Labor Statistics, U.S. Department of Labor, "College Enrollment and Work Activity of High School Graduates," Economic News Release, April 28, 2016 (<https://www.bls.gov/news.release/hsgec.htm>).

differences between the immediate college enrollment rate of RI GU participants and comparison group students were statistically significant for all groups except for Black and Hispanic students.

Table 3:
Percent of On-Time High School Graduates Enrolled in College Immediately among the Two Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group, by Gender, Race-Ethnicity, and Sixth Grade Free or Reduced Price Lunch (FRL) Status

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Total Number of High School Graduates	341	306	-
Percent of High School Graduates Enrolled in College			
All	63.9	52.6	11.3***
Gender			
Male	60.0	49.2	10.8*
Female	66.7	55.0	11.7**
Race-Ethnicity			
Non-Hispanic Black	61.9	53.0	8.8
Hispanic	60.8	52.8	8.0
Non-Hispanic White ¹	---	---	---
Sixth Grade FRL Status			
FRL in 6 th Grade	63.4	52.3	11.1***
No FRL in 6 th Grade ¹	---	---	---

*** p <.01, ** p<.05, * p<.10

¹Note: Number of students too small for precise estimates.

Male RI GU participants from these two combined cohorts had a sizable college enrollment advantage over their comparison group counterparts. Sixty percent of male RI GU participants, who had graduated high school on time, were enrolled in college in the summer or fall of the same year as their high school graduation; a rate that is 10.8 percentage points higher than the immediate college enrollment rate (49.2%) of their comparison group counterparts; the difference was statistically significant at the .10 level.

Immediate college enrollment rate of female RI GU participants was nearly 12 percentage points higher than that of their counterparts in the comparison group (66.7% versus 55%); the difference was statistically significant at the .05 level. Female high school graduates in

both groups (participants and comparison group) were more likely than their male counterparts to enroll in college. The gender gap (in favor of females) in the college enrollment rate was 6.2 percentage points among students in the comparison group and 6.7 percentage points among RI GU participants.

Hispanic high school graduates who were RI GU participants were 8 percentage points more likely than their matched comparison group classmates to enroll in college (60.8% versus 52.8%) and non-Hispanic Black high school graduates among RI GU participants were 8.8 percentage points more likely than their matched group classmates to enroll in college (61.9% versus 53%). However, these differences were not statistically significant.

On average among both cohorts of RI GU participants combined, about 93 percent of RI GU participants received free or reduced price school lunch (FRL) during school year when they were in the sixth grade. And since the comparison group of their sixth grade classmates was selected to match the traits of RI GU participants, the FRL share among the pooled group of comparison group students was the same. Consequently both groups had a large share (93 percent) receiving FRL in the sixth grade. Among RI GU participants with FRL in the sixth grade, nearly 63.4 percent had enrolled in college immediately after graduating high school. In contrast, the college-going rate among comparison group students who received FRL in the sixth grade was 52.3 percent; yielding a difference of 11.1 percentage points in the college-going rate in favor of RI GU participants; this difference was statistically significant at the .01 level.

Attendance in sixth grade is found to be closely related to the likelihood of enrolling in college among those who had graduated on time from high school. The college enrollment rate of students with higher sixth grade attendance rate was generally higher compared to the college enrollment rate of students with lower sixth grade attendance rate. Among RI GU on-time high school graduates the rise in college enrollment rate by quartile of sixth grade attendance was less consistent—rising by just 1.4 percentage points between the lowest to second attendance rate quartiles and falling by 1.2 percentage points between the second and third attendance rate quartiles and then rising sharply by 14.2 percentage points between the third and the highest quartile of sixth grade attendance rate (Table 4).

Among students in the comparison group, the college enrollment rate of on-time high school graduates from each of the sixth grade attendance rate quartiles increased from 40.7

percent in the lowest quartile, 45.6 percent in the second quartile, 54.3 percent in the third quartile, and 60 percent in the highest quartile of sixth grade attendance rate (Table 4).

College enrollment rates of RI GU participants exceeded the comparison group in each of the four sixth grade attendance rate quartiles. Among students in the lowest quartile of sixth grade attendance rate, the college enrollment rate advantage was sizable; nearly 18 percentage points in favor of RI GU participants. However, this advantage of 18 percentage points did not meet the threshold of statistical significance; likely due to the small number of high school graduates upon which the lowest quartile college enrollment rate of RI GU participants and the comparison group is based.

Table 4:
Percent of On-Time High School Graduates Enrolled in College Immediately After Graduating High School among Two Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group, by Sixth Grade Attendance Rate Quartiles

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Number of High School Graduates:			
All	341	306	-
Sixth Grade Attendance Rate Quartile			
Lowest Quartile	29	27	-
Second	95	79	-
Third	102	105	-
Highest Quartile	115	95	-
Percent of High School Graduates who had Enrolled in College:			
All	63.9	52.6	11.3***
Sixth Grade Attendance Rate Quartile			
Lowest Quartile	58.6	40.7	17.9
Second	60.0	45.6	14.4*
Third	58.8	54.3	4.5
Highest Quartile	73.0	60.0	13.0**

*** p <.01, ** p<.05, * p<.10

The number of students in the lowest attendance quartile who had graduated high school on-time was much smaller than the number of on-time high school graduates in each of the remaining three attendance rate quartiles. This is because students in the lowest attendance

quartile were much less likely than their higher attendance peers to progress on time through middle and high school and graduate high school on time. Only 29 RI GU participants and 27 comparison group students from the lowest attendance rate quartile had graduated high school on time. Consequently, the college enrollment rate in the lowest quartile of sixth grade attendance rate is based on just 29 high school graduates among RI GU participants and 27 high school graduates among students in the matched comparison group.

RI GU participants in the remaining three attendance rate quartiles also had higher college enrollment rates than their matched comparison group counterparts. The college enrollment rate advantage of RI GU participants relative to the comparison group was 14.4 percentage points in the second quartile of sixth grade attendance (statistically significant at the .10 level), 4.5 percentage points in the third quartile (not statistically significant), and 13 percentage points in the highest quartile of sixth grade attendance rate (statistically significant at the .01 level).

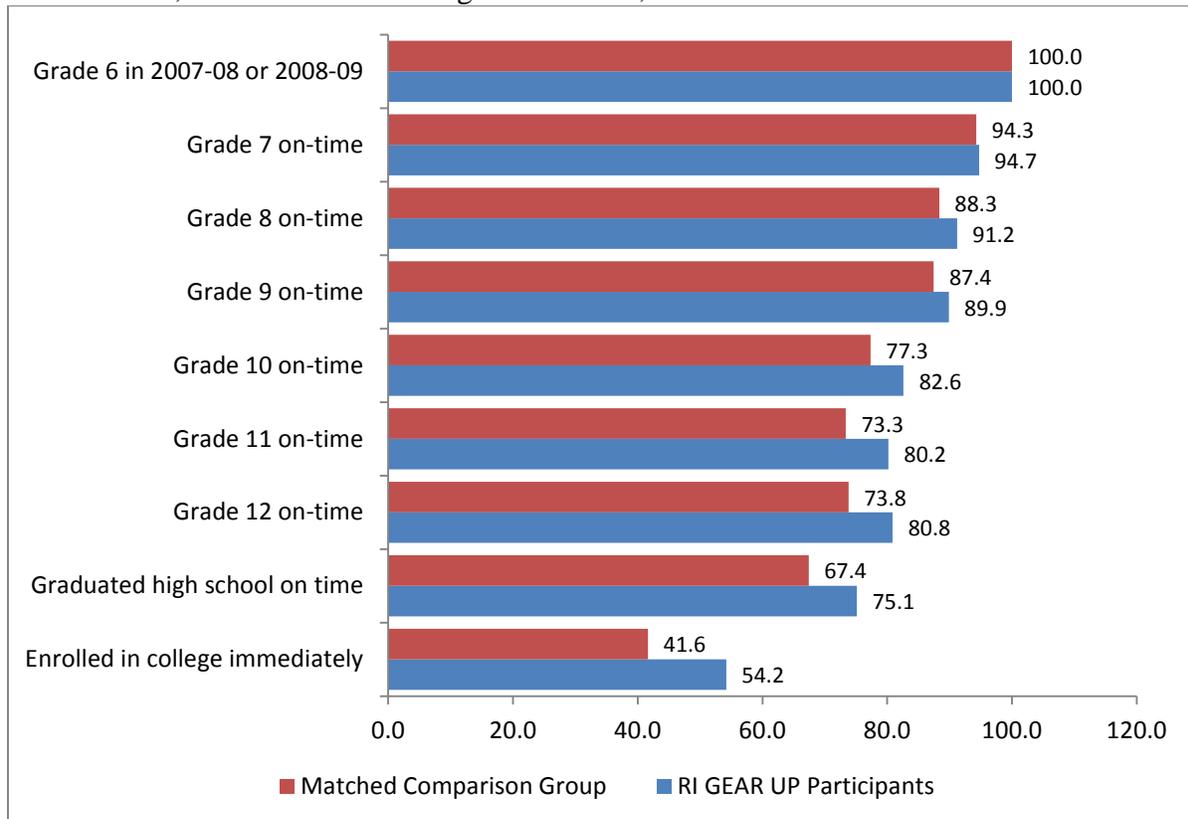
Cumulative Measure of Impact: College Enrollment in 2014 and 2015 among 2007-08 and 2008-09 Sixth Graders

Along the pathway from sixth grade to college, there are a few ways in which students could falter: students could be retained (held back) in one or more grades in middle or high school delaying their progress towards twelfth grade and high school graduation; students could exit the Rhode Island public school system or simply drop out before graduating; they could fail to graduate high school on-time, or they could fail to enroll in college. The outcome of college enrollment is a culmination of positive outcomes along the path from sixth grade to college. The summary college enrollment presented in this section of the paper represents a cumulative measure of outcomes along the pathway from sixth grade to college. This cumulative outcome measure is calculated as the share of all students in the two cohorts who began sixth grade (RI GU participants or comparison group students) who were enrolled in college in the summer or fall of 2014 (among those who began sixth grade in 2007-08) and in the summer or fall of 2015 (among those who began sixth grade in 2008-09).

The pathway from sixth grade to college among RI GU participants and their classmates in the comparison group is illustrated in Chart 2. The first bar (measuring 100% for both groups) represents all 454 RI GU participants and all 454 matched comparison group students consisting

of 249 students who had started grade six in SY 2007-08 and 205 students who had started sixth grade in 2008-09. Each successive (descending) bar represents the share of RI GU participants and comparison group students with on-time grade attainment. So for example, 95 percent of RI GU participants entered eighth grade on time compared to 94 percent of their comparison group counterparts. Each successive year, RI GU participants remained ahead of their comparison group counterparts ending with a gap of 7 percentage points (in favor of RI GU participants) in the percent of 454 students that had reached twelfth grade on time, and a gap of 7.7 percentage points (in favor of RI GU participants) in the percent of students who graduated high school on time. By the fall of following their expected on-time high school graduation, when college-bound on-time high school graduates from these two cohorts could begin college, the gap had widened to 12.6 percentage points in favor of RI GU participants.

Chart 2:
Pathway from Sixth Grade to College Enrollment: Percent of RI GU Participants and the Matched Comparison Group with On-Time Grade Attainment, On-Time High School Graduation, and Immediate College Enrollment, 2007-08 and 2008-09 Cohorts Combined



A comparison of the summary outcome measure between RI GU participants and students in the comparison group presented in Table 5 reveals that in the fall after their expected high school graduation year, 54 percent of all RI GU participants from the two cohorts combined were enrolled in college while only 41 percent of the comparison group students were enrolled in college; a difference of 13 percentage points in favor of RI GU participants; statistically significant at the .01 level (Table 5).

Nearly 48 percent of male RI GU participants who entered the RI GU program in sixth grade in in SY 2007-08 or 2008-09 were enrolled in college by fall of the year of their expected high school graduation, compared to just 37 percent of male matched comparison group students; yielding a difference of 11 percentage points in favor of male RI GU participants; the difference was statistically significant at the .05 level. College enrollment was much higher among female RI GU participants. Fifty-nine percent of female sixth grade RI GU participants had enrolled in college by the fall of their expected high school graduation year; 11 percentage points higher than male RI GU participants and nearly 14 percentage points higher than their female sixth grade classmates in the matched comparison group; the difference was statistically significant at the .01 level.

Table 5:
Percent of Sixth Graders in SY 2007-08 and 2008-09 who were enrolled in College in Fall 2014 and Fall 2015 among Two Combined Cohorts of RI GU Participants and their Sixth Grade Matched Comparison Group Classmates, by Gender

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Total Number	454	454	---
Percent of the Entire Cohort Enrolled in College in Fall 2014:			
All	54.2	41.6	12.6***
Gender			
Male	47.7	36.7	11.0**
Female	59.1	45.3	13.7***

*** p <.01, ** p<.05, * p<.10

As noted in previous sections, a large majority of RI GU participants received free or reduced price lunch in sixth grade; a measure of their low income status and since the

comparison group of students was selected to match RI GU participants, an equally large group of the comparison group (93%) received free or reduced price lunch in sixth grade. College enrollment in fall following their expected high school graduation year among 2007-08 and 2008-09 sixth graders with FRL was 12 percentage points higher among RI GU participants than the comparison group (53% vs. 41%). The difference was statistically significant at the .01 level (Table 6).

The cumulative college enrollment rate among Hispanic students was 52 percent among RI GU participants and 41 percent among students in the comparison group; yielding a difference of 11 percentage points in favor of RI GU participants. The difference was statistically significant at the .01 level. Non-Hispanic African-American students who had participated in the RI GU program were nearly 8 percentage points more likely than their classmates in the matched comparison group to enroll in college; but this difference was not statistically significant. The likelihood of enrolling in college by the fall of their expected high school graduation year was nearly 29 percentage points higher among White RI GU participants in the two combined cohorts than their counterparts in the comparison group (54% versus 25%); the difference was statistically significant at the .01 level (Table 6).

Table 6:
Percent of Sixth Graders in SY 2007-08 and 2008-09 who were enrolled in College in Fall 2014 and Fall 2015 among 2007-08 and 2008-09 Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group, by Race-Ethnicity

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Percent of the Entire Cohort who had Enrolled in College			
Sixth Grade Free or Reduced Price School Lunch Status			
With FRL in 6 th grade	53.2	40.8	12.4***
Without FRL in 6 th grade ¹	---	---	---
Race-Ethnicity			
Non-Hispanic Black	54.0	46.3	7.7
Hispanic	52.2	41.2	11.0***
Non-Hispanic White	54.0	25.5	28.5***

*** p <.01, ** p<.05, * p<.10

¹Note: Number of students too small for precise estimates.

School attendance during the sixth grade is positively related to college enrollment. Among both groups (RI GU participants and the comparison group), the share of students who were enrolled in college by the fall of their expected year of high school graduation was higher among students with better sixth grade attendance (Table 7). Among RI GU participants the share of college-bound students in the year of their expected year of high school graduation among those who had begun sixth grade in 2007-08 or 2008-09 was only 37 percent in the lowest quartile of sixth grade attendance rate, 53 percent in the next two quartiles (second and third) and 65 percent in the highest quartile. The share of college-bound students in the comparison group ranged from just one-quarter among those with the lowest sixth grade attendance rate (lowest quartile) to 47 percent among those with the highest sixth grade attendance rate (highest quartile).

Table 7:
Percent of Sixth Graders in SY 2007-08 and 2008-09 who were enrolled in College in Fall 2014 and Fall 2015 among 2007-08 and 2008-09 Combined Cohorts of RI GU Participants and their Sixth Grade Non-Participating Classmates in the Matched Comparison Group, by Sixth Grade Attendance Rate

	RI GEAR UP Participants	Matched Comparison Group	Difference (Percentage Points)
Total Number	454	454	---
Percent of the Entire Cohort who had Enrolled in College			
All	54.2	41.6	12.6***
6th Grade Attendance Rate Quartile			
Lowest Quartile	36.7	24.6	12.1
Second	52.1	38.4	13.7**
Third	52.6	46.3	6.4
Highest Quartile	65.0	47.2	17.8***

*** p <.01, ** p<.05, * p<.10

A comparison of the share of college-bound students out of all RI GU participants in the two cohorts and the two corresponding comparison groups found that college enrollment among RI GU participants exceeded that of their matched peers in each of the four sixth grade attendance rate quartiles. The cumulative college enrollment rate advantage of RI GU participants was 12 percentage points in the lowest quartile, 14 percentage points in the second quartile, 6 percentage points in the third quartile, and nearly 18 percentage points in the highest

quartile. An examination of the statistical significance of these differences in college enrollment revealed that the difference in college enrollment was statistically significant among two quartile groups—students in the highest quartile of sixth grade attendance rate (significant at the .01 level) and those in the second (second lowest) quartile (significant at the .05 level) (Table 7).

Summary

This paper presents net impact estimates of the Rhode Island GEAR UP program on a pooled group of two cohorts of 454 RI GEAR UP participants who had entered the program as rising sixth graders in school years 2007-08 or 2008-09. Using student level data for sixth graders from RI GEAR UP school districts, a matched group of sixth grade classmates of GEAR UP participants was selected to serve as the comparison group. These 454 GEAR UP participants and their 454 matched comparison group classmates were then tracked year-by-year from sixth grade to high school graduation and into college using de-identified unit record data from the Rhode Island Department of Education and the National Student Clearinghouse (NSC).

The net impact evaluation found advantages on four key educational outcomes for students who participated in the RI GEAR UP program.

Outcome 1: On-time grade attainment:

This outcome measures the percent of sixth grade RI GU participants and their sixth grade classmates in the matched comparison group who reached twelfth grade on time.

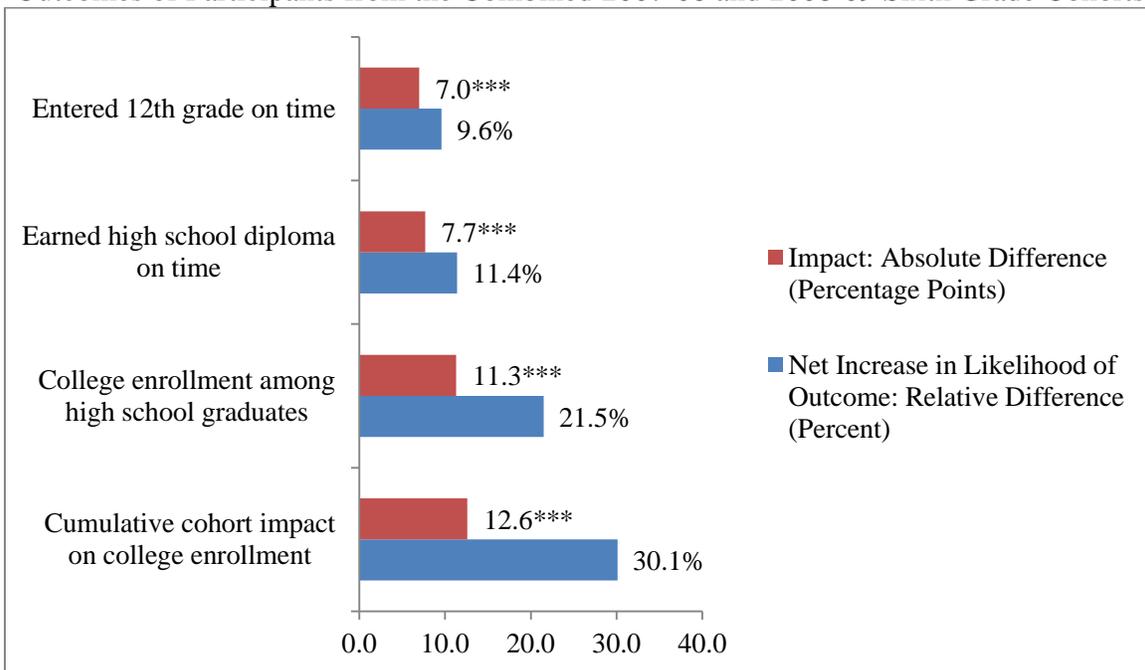
By the school year when they were expected to reach twelfth grade, the share of RI GEAR UP participants who had reached twelfth grade was 7 percentage points higher than the comparison group (80.8% versus 73.8%); yielding a net impact estimate of 7 percentage points; statistically significant at the .01 level ($p < .01$). The advantage of RI GU participants relative to the comparison group of 9.6% ($7.0/73.8=9.6\%$) represents the net increase in the likelihood of on-time grade attainment of RI GU participants attributable to the RI GEAR UP program.

Outcome 2: On-time high school graduation of sixth graders:

This outcome measures the percent of all sixth grade participants and all sixth grade comparison group students who had graduated high school on time (7 years after they had entered sixth grade).

By the expected date of high school graduation, more than three-quarters (75.1%) of RI GEAR UP participants had graduated high school compared to just over two-thirds (67.4%) of students in the comparison group; a difference of 7.7 percentage points that is statistically significant at the .01 level. The advantage of RI GU participants relative to the comparison group of 11.4 percent ($7.7/67.4=11.4\%$) represents the net increase in the likelihood of on-time high school graduation of RI GU participants attributable to the RI GEAR UP program.

Chart 3:
Estimates of the Impact of the Rhode Island GEAR UP Program on Outcomes of Participants from the Combined 2007-08 and 2008-09 Sixth Grade Cohorts



*** p <.01, ** p<.05, * p<.10

Outcome 3: Net College enrollment among high school graduates:

This outcome represents the traditional measure of college enrollment rate, that is, the percent of high school graduates who had enrolled in college upon graduating high school. It is measured in this paper as the percent of RI GEAR UP participants and matched comparison group students who had graduated high school on time and had enrolled in college by the fall of the expected year high school graduation.

Following their on-time high school graduation, 63.9 percent of RI GEAR UP participating high school graduates had enrolled in college, compared to 52.6 percent of comparison group high school graduates. The difference of 11.3 percentage points in favor of RI GU participants is statistically significant at the .01 level. The advantage of RI GU participants relative to the comparison group of 21.5 percent ($11.3/52.6=21.5\%$) represents the net increase in the likelihood of college enrollment of RI GU participants attributable to the RI GEAR UP program.

Outcome 4: Cumulative Measure of Impact: College Enrollment in 2014 and 2015 as a share of all 2007-08 and 2008-09 Sixth Graders:

This outcome measures the cumulative effect of the RI GEAR UP program on the entire pathway from sixth grade to college enrollment including on-time grade attainment through to twelfth grade, on-time high school graduation, and immediate enrollment in college upon graduation from high school. It is measured as the percent of all sixth grade participants and all sixth grade comparison group students that were enrolled in college in the fall following their expected year of high school graduation.

Our analysis found that 54.2 percent of the original 454 6th grade RI GEAR UP participants in the two combined cohorts had enrolled in college right after high school. Among their 454 matched comparison group 6th grade classmates, the proportion that had enrolled in college by the fall of their expected year of high school graduation was only 41.6 percent. The difference of 12.6 percentage points is statistically significant at the .01 level. In relative terms, this difference (12.6

percentage points) represents a net impact of the RI GEAR UP program in increasing the likelihood of enrolling in college among RI GU participants (relative to the comparison group) by 30.2 percent ($12.6/41.6=30.2\%$).

Through interventions beginning in middle school, the GEAR UP program is designed to increase college enrollment among low-income students. Analysis of two combined cohorts of RIGU participants presented in this paper found that the Rhode Island GEAR UP program has created gains in educational outcomes for the two cohorts of participants from middle school to college. RI GEAR UP participating students progressed through middle and high school with a much lower likelihood of faltering along the way. They were substantially more likely to earn their high school diploma on time and, upon graduating from high school, were considerably more likely to enroll in college.

The cumulative impact of GEAR UP on these students who entered the sixth grade back in 2007 and 2008 was to increase their likelihood of enrolling in college by a little under a third (30.1%). The net impact evaluation of the Rhode Island GEAR UP program demonstrates sizable positive impacts of the program on four key educational outcomes of participants.