# *GO College, Part II: High School Classes of 2015 and 2016 College Going and Persistence*

**(September 2015 to December 2016)**

## *The ETS Evaluation*

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# Executive Summary

This report serves as an extension to the evaluation report *GO College: A Model for Increasing College Access and Success for All Students at a High School (October 2010 to September 2015)* (Millett, Mehrotra, Cullen, & Saunders, 2016), which allows us to examine the college-going outcomes for the 2015 and 2016 GO College cohorts.

Overall, our analyses of the pooled cohorts (Cohorts 2015 and 2016) and the Cohort 2015 combined samples across all six implementation high schools, show no significant differences between the treatment and control groups with regard to any of the outcome variables. However, there were noteworthy findings at the subgroup-level and for the combined sample of Cohort 2016.

## Significant Treatment Effects on Cohort 2016 College Enrollment

For Cohort 2016, we found a significant treatment impact on college enrollment for the fall of their expected year of high school graduation. The treatment students were over 6% more likely to have enrolled in any college (2- or 4-year) than the control students.

## Subgroup Analysis Shows Treatment Effects Found Only in Louisville

In Erie, there were no significant treatment outcomes detected in our analyses.

In Louisville, there were three significant treatment effects found:

1) For Cohort 2016, increased college enrollment for any college (2- or 4-year),

2) For Cohort 2016, increase enrollment for 4-year college,

3) For Cohort 2015, increased high school graduation rates.

## Subgroup Analysis Suggests Treatment Effects for Male Students and Non-Economically Disadvantaged Students

Though results were only marginally significant, our analyses found that male students and non-economically disadvantaged students assigned to GO College were more likely to attend college (2- or 4-year) than those in the control group.

# GO College

*The goal of GO College is to positively impact college enrollment and success, as well as student achievement, student growth and related factors in six schools with large numbers and percentages of high need students by using targeted and whole-school interventions including data collection, data analysis, and the dissemination of analysis. A secondary goal of Using DICAP (GO College) is to validate a new model for Federal Talent Search programs that will allow these projects to meet a new legislative requirement that they provide sufficient support to allow students to succeed in rigorous secondary school curricula.*

COE I3 Grant Application

The GO College program began simultaneously in six public high schools in the cities of Louisville, Kentucky and Erie, Pennsylvania in 2011. The objective of the program was to improve college access and success for low-income, first-generation[1] and minority students (see Appendix A). This 4-year intervention included students from the high school graduating classes of 2015, 2016, 2017 and 2018. While all students in each of the six high schools were exposed to certain aspects of the program through whole school services, a smaller group of students were exposed to a more intensive treatment. This smaller group was selected through random assignment[2] during the first 2 years (i.e., Class of 2015[3] and 2016) and through open enrollment for the next two years (i.e., Class of 2017 and 2018). This study is limited to students from the first two cohorts (i.e., the randomized cohorts, henceforth referred to as Cohort 2015 and Cohort 2016).

In the evaluation report, Millett et al. (2016) *GO College: A Model for Increasing College Access and Success for All Students at a High School (October 2010 to September 2015),* we recognized that due to the limited time frame, we could only track Cohort 2015 until the beginning of grade 12, and Cohort 2016 until the beginning of grade 11, thereby precluding us from following any of the cohorts into college – the stated objective of "GO College." We were able to examine interim high school outcomes such as attendance rates, disciplinary action rates, grade completion, rigorous course taking behavior, and achievement on standardized tests.

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[1] First-generation college students are students whose parents/guardians did not attend college.

[2] Defined as students who were randomly assigned to the pre-ninth grade summer program and follow-up 9th grade Learning Community at the end of grade 8 and who enrolled at one of the six GO College high schools in the fall of grade 9.

[3] Defined as the cohort slated to graduate from high school in 2015 if on time.

Two years later, we are in a position to observe high school graduation for Cohort 2015[4] and college enrollment for Cohorts 2015 and 2016 (see Table 1). For Cohort 2015, we are also in a position to look at college persistence and transfer rates one year after enrollment. Specific outcome measures we explore include: transition to college (2- or 4-year), transition to 4-year college, transition to college dependent on high school graduation (Cohort 2015 only), first-year persistence in college (Cohort 2015 only), first-year college transfer rates (Cohort 2015 only), states of colleges attended and colleges with clusters of three or more students enrolled per cohort. All college transition and persistence data have been obtained from the National Student Clearinghouse.

This report is structured in six sections: the first section provides highlights from the 2016 evaluation report, followed by the new outcomes data and methodology, a review of the findings in key outcome areas, an overview of limitations of research, a discussion section and a look at future research.

[4] In the analyses for the final evaluation report based on the period October 2010 to September 2015, we were unable to report on high school graduation. Since this is an important intermediary outcome on the path to college enrollment, it was decided to include it in this follow-up study. However, due to data constraints, data on high school graduation could only be obtained for the first cohort, i.e., Cohort 2015.

Table 1. GO College Outcomes Available by Cohort

| Outcomes | Cohort 2015 | Cohort 2016 |
|---|---|---|
| High school graduation | X | |
| College enrollment (any) within 6 months of expected high school graduation | X | X |
| College enrollment (4-year) within 6 months of expected high school graduation | X | X |
| College enrollment (any) within 18 months of expected high school graduation | X | |
| College enrollment (4-year) within 18 months of expected high school graduation | X | |
| College enrollment (any) dependent on high school graduation | X | |
| College enrollment (4-year) dependent on high school graduation | X | |
| First year college persistence (any) | X | |
| First year college persistence (2-year) | X | |
| First year college persistence (4-year) | X | |
| First year college persistence (any), dependent on enrollment fall of high school graduation | X | |
| First year college persistence (2-year), dependent on enrollment fall of high school graduation | X | |
| First year college persistence (4-year), dependent on enrollment fall of high school graduation | X | |
| Transferred from 2-year to 4-year college | X | |
| Transferred from 4-year to 2-year college | X | |
| Transferred from 2-year to 4-year college, dependent on enrollment fall of high school graduation | X | |
| Transferred from 4-year to 2-year college, dependent on enrollment fall of high school graduation | X | |

## Highlights from 2016 Evaluation Report

Three points from the *GO College: A Model for Increasing College Access and Success for All Students at a High School (October 2010 to September 2015)* report merit being highlighted. The first is the program design for the GO College Program administered in Louisville, Kentucky and Erie, Pennsylvania. The second is the high-level summary of the impact evaluation findings. The third is a summary of GO College implementation limitations, which may impact our ability to see differences based on the randomized control trials (RCT) design.

### *Program Design*

The goal was for approximately 60 students in the entering 9th grade class at each of the six public high schools to participate in the GO College ***Intensive Services*** (IS) (intended to be 2-

hours per week of contact). In Louisville, The Academy @ Shawnee, Moore Traditional, and Fern Creek high schools and in Erie, Central Career and Technical, East, and Strong Vincent high schools are GO College partners. The following opportunities were offered over their high school careers:

- Access to a college coach on a weekly basis
- Group lessons aimed at goal setting, improving study skills, and career and college exploration
- Weekend and summer activities that provide academic and cultural enrichment
- Access to tutoring and extra academic support
- Access to college student mentors
- Assistance with the college selection (including college visits) and application processes
- Assistance with the federal financial aid process as well as scholarship applications

The remaining students received GO College services through high school-wide activities referred to as ***Whole School Services***. Whole School service events may include school-wide college or science, technology, engineering, or mathematics (STEM) focused assemblies, college fairs, Free Application for Federal Student Aid (FAFSA) completion night events, or a chance to participate in college trips. From the outset, COE guaranteed that no student who wanted GO College services would ever be turned away.

### *High-Level Summary of the 2016 Impact Evaluation Findings*

We focused on grade 10 students pooled across the two randomized cohorts (Cohort 2015 and Cohort 2016). This allowed for two years of program exposure, the maximum given that we could not pool data for grade 11 due to the time frame. For this sample, it appears that the first two years of exposure lowers high rates of absenteeism (defined as being absent more than 10% of the days) for students assigned to Intensive Services (the treatment group) compared to the students assigned to Whole School services (control group). For the grade 10 pooled sample, a typical student randomly assigned to Intensive Services does not seem to exhibit any other significant benefit (other outcomes analyzed were GPA, behavioral incidents, reading and mathematics scores, rigorous courses taking, and grade retention).

### *Implementation Limitations from the 2016 Evaluation Report*

Several limitations affected how the GO College model was implemented such as changes in school personnel and high staff turnover, the introduction of similar college access services funded by other sources, including another i3 grant in the three Louisville high schools (which provided college access time and resources to the entire student body), and the simultaneous development and use of the **empower**™ data tool. While the accelerated development and implementation of the tool aimed to meet larger GO College data use goals, data integrity and confidence were compromised (Millett et al., 2016).As a result, GO College participation data needs to be interpreted with caution.

Another limitation is that impact analyses for this project (including the one conducted for this extension) are limited to students who matriculated into one of the six study high schools, not the entire random sample.  While the two groups were found to be similar on observable variables (Millett et al. (2016), there could be unobserved differences due to attrition during the period between original randomization and enrollment in a study school

## Extension Data and Methodology

Data used in this study were obtained from – (i) the districts of Louisville, Kentucky and Erie, Pennsylvania[5], (ii) the National Student Clearinghouse[6], and (iii) Council for Opportunity in Education. In particular, data on baseline/attrition measures and high school graduation come from the two school districts, program participation data come from the Council for Opportunity in Education's **empower**™ tool[7], and data on postsecondary outcomes come from the National Student Clearinghouse. National Student Clearinghouse reports receiving college enrollment from 96.8 % of the colleges and universities in the United States. However, coverage rates vary by state, region and institution type. In particular, two year colleges and for-profit colleges have lower coverage rates (National Student Clearinghouse, 2018).

All findings reported are based on the intent-to-treat sample (*N* = 1,914) - defined as the subset of students that showed up in one of the treated high schools from the original set of students in the eighth grade randomly selected[8]. In particular, this sample includes the first two cohorts exposed to the GO College treatment – the classes of 2015 and 2016. This includes students who were enrolled in a study high school during any of the first four years for Cohort

[5] This was made possible through data sharing agreements between the school districts and COE.
[6] This was made possible through data sharing agreements between the National Student Clearinghouse and COE.
[7] Provided to us by COE.
[8] A significant proportion of students originally randomized (based on grade 8 rosters) did not show up in any of the study schools (40% in Louisville and 12% in Erie) for reasons that seem unrelated to the intervention. As a result, this study includes only those students from the originally randomized sample that showed up in any of the six study high schools.

2015, and first three years for Cohort 2016. For details related to sample and methodology, see Appendix B.

A little over half of the students selected for treatment were male, approximately the same proportion were minority (with nearly 40% being African American), around two-thirds were on free or reduced-price lunch, and almost 15% were in special education (see Table 2). These are only raw differences. Based on earlier analysis, within randomization blocks, there were no statistically significant differences between the students selected and those who were not. (Millett et al. (2016).

Table 2. Students Background Characteristics (Cohorts 2015 & 2016 combined)

| | All | Selected for treatment | Not selected for treatment |
|---|---|---|---|
| Male | 49.3% | 54.4% | 46.2% |
| Black | 37.7% | 38.9% | 37.0% |
| Hispanic | 11.3% | 12.0% | 10.9% |
| Free/Reduced price lunch/Title 1 | 65.3% | 68.2% | 63.6% |
| ELL/LEP | 9.8% | 11.0% | 9.0% |
| Special Education | 14.3% | 14.8% | 14.0% |
| Reading Proficient | 53.7% | 53.5% | 53.8% |
| Math Proficient | 53.0% | 54.6% | 52.1% |
| Low attendance (<90%) | 17.2% | 17.3% | 17.2% |

Note: Table based on data prior to enrolling in high school (primarily grade 8). Data includes only students who matriculated into one of the six GO College treatment high schools.

## Treatment Impact Findings: Outcomes and Effect Size

Our findings focused on the GO College treatment impact based on multiple regression analysis using the randomized sample. For details related to methodology, see Appendix B. We report the findings by the combined samples from the six participating high schools and then by subgroups including school district, gender, economic disadvantage, minority status, reading proficiency and math proficiency.

### *Analysis of Combined Samples*

Overall, based on pooled cohorts (Cohorts 2015 and 2016) for the combined sample of Erie and Louisville, it seems there were few significant differences between the treatment and control groups with regard to any of the outcome variables. In particular, the *p*-values associated with the estimated average treatment effect for transition to college[9], are all above 0.1 (see Table 3).

Table 3. Outcomes and Effect Size for both Cohorts 2015 & 2016 (Erie and Louisville)

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p*-value |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 31.9% | 3.2% | 2.2% | 0.07 | 0.15 | 0.15 |
| Enrolled in 4-year college by December of expected year of high school graduation | 25.1% | 2.8% | 2.1% | 0.06 | 0.19 | 0.19 |

Note: Sample size is 717 for the treatment group and 1197 for the control group. Effect size is calculated by dividing the treatment effect estimate by the pooled standard deviation of the outcome in the treatment and control groups.

A similar pattern is observed with regard to other outcome variables (see Tables 4 & 5), including high school graduation. For Cohort 2016, we were unable to obtain data on high school graduation. As a result, this outcome is reported only for Cohort 2015. Analysis based on Cohort 2015 for the combined sample of Erie and Louisville shows no significant difference between the treatment and control students for this outcome (see Table 4).

The one statistically different outcome from our analysis was for Cohort 2016, with regard to college transition. In particular, the estimated treatment effect for transition to any college (2- or 4-year) is 6.3% with a control mean of 31.4%. The corresponding figure for transition to 4-year college is 6.6% with a control mean of 24%. These estimates for treatment effects are statistically significant at the .05 level (see Table 5).

Students from Cohort 2015, who potentially had a more intensive exposure to the treatment in grade 12[10], do not demonstrate such an impact. One reason for this could be that Cohort 2016 benefited from the lessons learned during the first year of implementation. For example, it is possible that the coaches were better able to guide Cohort 2016 students with regard to college admissions based on the lessons learned through their experience with Cohort 2015.

[9] We do not have high school graduation data for the 2016 cohort. Transition to college is defined here as enrolling in college by December of the year they were expected to graduate from high school.

[10] The initial GO College grant funding ended in October 2015 and a majority of the funded staff positions were eliminated. Therefore, during grade 12, Cohort 2016 received a modified, and potentially less intensive, version of the GO College treatment.

Table 4. Outcomes and Effect Size for Cohort 2015 (Louisville & Erie)

| | Control Mean (*N*) | Estimated Treatment Effect (*N*) | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| High School graduation | 57.8% (510) | 3.7% (322) | 3.6% | 0.08 | 0.30 | 0.30 |
| Enrolled in college (2- or 4-year) by December of expected year of high school graduation | 32.5% (510) | 1% (322) | 3.4% | -0.02 | 0.83 | 0.84 |
| Enrolled in 4-year college by December of expected year of high school graduation | 26.7% (510) | -2.2% (322) | 3.2% | -0.05 | 0.50 | 0.51 |
| Enrolled in college (2- or 4-year) by December of year following the expected year of high school graduation | 37.3% (510) | 2.2% (322) | 3.5% | 0.05 | 0.52 | 0.54 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation | 29.60% (510) | 0% (322) | 3.3% | -0.01 | 0.92 | 0.92 |
| College persistence - 1-year (2- or 4-year college) | 21% (510) | -.01% (322) | 2.9% | -0.02 | 0.82 | 0.81 |
| College persistence - 1-year (4-year college) | 15.7% (510) | 0% (322) | 2.5% | 0 | 0.95 | 0.95 |
| Enrolled in college (2- or 4-year) by December of year of high school graduation, conditional upon HS graduation | 48.8% (295) | 0% (191) | 4.9% | 0.01 | 0.94 | 0.94 |
| Enrolled in 4-year college by December of year of high school graduation, conditional upon HS graduation | 41% (295) | -1.6% (191) | 4.8% | -0.03 | 0.73 | 0.73 |
| Enrolled in college (2- or 4 year) by December of year following year of high school graduation, conditional upon HS graduation | 54.2% (295) | 3.9% (191) | 4.9% | 0.08 | 0.42 | 0.43 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation, conditional upon HS graduation | 44.4% (295) | 1% (191) | 4.8% | 0.02 | 0.85 | 0.86 |

Table 5. Outcomes and Effect Size for Cohort 2016 (Louisville & Erie)

| | Control Mean (*N*) | Estimated Treatment Effect (*N*) | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 31.4% (687) | 6.3% (395) | 3% | 0.13 | .04** | .03** |
| Enrolled in 4-year college by December of expected year of high school graduation | 24% (687) | 6.6% (395) | 2.8% | 0.15 | .02** | .02** |

Notes: *** $p <= .01$; ** $p <= .05$; * $p <= .1$

### *Subgroup Analysis*

Next, we look at outcomes by subgroups (see Tables 6 & 7). Once again, there is little evidence of any systematic relationship between treatment and improved outcomes except in the case of Louisville, where treated students show a 9.2% higher probability of enrolling in a college (2- or 4-year) and a 5.6% higher probability of enrolling in a 4-year college. Note that with regard to enrollment in 4-year colleges, the impact is statistically significant only at the .10 level.

A positive impact on college going (2- or 4-year) was also found for male students (5.2%) and for students who are not economically disadvantaged (7.0%) While promising, the associated *p*-values ($p <= .1$) suggest only moderate evidence that the effects were caused by the program and not a chance event. Furthermore, when analyses are conducted on multiple subsamples, some of the relationships will show up as statistically significant purely based on chance.  As a result, one needs to be cautious in interpreting these findings.

Table 6. 2- or 4-Year College Enrollment Outcomes and Effect Size (Pooled cohorts – Cohort 2015 & Cohort 2016)

| **Sample** | **College enrollment by end of year 1 (2- or 4-year)** | | | |
|---|---|---|---|---|
| | *Control Group Mean* | *Estimated Treatment Effect* | *Standard Error* | *Effect Size* |
| Erie | 29.6% | -1.2% | 2.9% | -.03 |
| Louisville | 34.4% | 9.2%*** | 3.5% | .20 |
| Male | 25.7% | 5.2%* | 3% | .11 |
| Female | 37.3% | 1.1% | 3.3% | .02 |
| Economically disadvantaged | 27.9% | 1% | 2.7% | .02 |
| Not economically disadvantaged | 38.5% | 7%* | 4.1% | .15 |
| Minority | 27.8% | 4% | 3.1% | .09 |
| Non-minority | 35.9% | 2.8% | 3.3% | .06 |
| Proficient in reading | 44.4% | 0.1% | 3.4% | 0 |
| Not proficient in reading | 17.9% | 3.4% | 3% | .07 |
| Proficient in mathematics | 42.1% | 1.9% | 3.3% | .04 |
| Not proficient in mathematics | 21.7% | 2.5% | 3% | .05 |

Notes: *** $p <= .01$; ** $p <= .05$; * $p <= .1$ (based on Fisher's exact p-values)

Table 7. 4-year College Enrollment Outcomes and Effect Size (Pooled cohorts – Cohort 2015 & Cohort 2016)

| **Sample** | **College enrollment by end of year 1 (4-year)** | | | |
|---|---|---|---|---|
| | *Control Group Mean* | *Estimated Treatment Effect* | *Standard Error* | *Effect Size* |
| Erie | 27.0% | 1% | 2.8% | .02 |
| Louisville | 23.2% | 5.6%* | 3.2% | .13 |
| Male | 29.7% | 4% | 2.8% | .09 |
| Female | 29.8% | 1.5% | 3.2% | .04 |
| Economically disadvantaged | 21.8% | 1% | 2.5% | .01 |
| Not economically disadvantaged | 30.6% | 6.5% | 3.9% | .15 |
| Minority | 21.7% | 2.3% | 2.9% | .05 |
| Non-minority | 28.5% | 3.3% | 3.2% | .08 |
| Proficient in reading | 36.5% | 0.5% | 3.3% | .01 |
| Not proficient in reading | 12.4% | 2.4% | 2.5% | .06 |
| Proficient in mathematics | 35.9% | 2.6% | 3.3% | .06 |
| Not proficient in mathematics | 14.4% | -0.4% | 2.5% | -.01 |

Notes: *** $p <= .01$; ** $p <= .05$; * $p <= .1$ (based on Fisher's exact p-values)

Further break-up by cohort and location reveals that the impact observed on college enrollment is limited to Cohort 2016 in Louisville (see Tables 8 & 9). For Cohort 2015 in Louisville, there is a statistically significant impact on high school graduation. Apart from this, there seems to be no other systematic program impact for Cohort 2015 in Louisville, even when the sample is conditioned on high school graduation (see Table 10). For Erie, there is no observable program impact for either of the two cohorts (see Tables 11-13).

Table 8. Outcomes and Effect Size for Cohort 2, Louisville

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 34.4% | 11.6% | 4.7% | .25 | .014** | .01*** |
| Enrolled in 4-year college by December of expected year of high school graduation | 21.8% | 11.6% | 4.3% | .27 | .007*** | .004*** |

Notes: *** $p <= .01$; ** $p <= .05$; * $p <= .1$

Table 9. Outcomes and Effect Size for Cohort 2015, Louisville

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| High School graduation | 55.9% | 12.4% | 5.4% | .25 | .02** | .03** |
| Enrolled in college (2- or 4-year) by December of expected year of high school graduation | 34.3% | 6% | 5.4% | .13 | .27 | .27 |
| Enrolled in 4-year college by December of expected year of high school graduation | 25.4% | -2.1% | 4.7% | -.05 | .65 | .66 |
| Enrolled in college (2- or 4-year) by December of year following the expected year of high school graduation | 39.8% | 8.3% | 5.4% | .17 | .13 | .14 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation | 27.1% | -1.9% | 4.8% | -.04 | .69 | .7 |
| College persistence - 1-year (2- or 4-year college) | 22.9% | 3.6% | 4.9% | .09 | .46 | .47 |
| College persistence - 1-year (4-year college) | 15.3% | 0% | 3.8% | 0 | .99 | 1 |

Notes: *** $p <= .01$; ** $p <= .05$; * $p <= .1$

Table 10. Outcomes and Effect Size for Cohort 2015, Louisville, conditional upon HS graduation

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 50% | 5% | 7.2% | .1 | .49 | .48 |
| Enrolled in 4-year college by December of expected year of high school graduation | 37.1% | -4.5% | 6.8% | -.1 | .47 | .49 |
| Enrolled in college (2- or 4 year) by December of year following the expected year of high school graduation | 56.1% | 8.6% | 7.1% | .17 | .23 | .24 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation | 38.6% | -3.4% | 6.9% | -.07 | .62 | .63 |
| College persistence - 1-year (2- or 4-year college) | 34.8% | 1.5% | 7.1% | .03 | .83 | .83 |
| College persistence - 1-year (4-year college) | 24.2% | -3.7% | 5.7% | -.09 | .52 | .56s |

Table 11. Outcomes and Effect Size for Cohort 2015, Erie

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| High School graduation | 59.5% | -2.7% | 4.8% | -0.05 | .58 | .58 |
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 31% | -5.7% | 4.4% | -0.12 | .19 | .20 |
| Enrolled in 4-year college by December of expected year of high school graduation | 27.7% | -2.2% | 4.3% | -0.05 | .61 | .62 |
| Enrolled in college (2- or 4 year) by December of year following the expected year of high school graduation | 35% | -2.2% | 4.6% | -0.05 | .63 | .63 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation | 31.8% | 0.8% | 4.5% | .02 | .86 | .86 |
| College persistence - 1-year (2- or 4-year college) | 19.3% | -3.9% | 3.6% | -0.1 | .28 | .3 |
| College persistence - 1-year (4-year college) | 16.1% | -0.3% | 3.4% | -0.01 | .93 | .94 |

Table 12. Outcomes and Effect Size for Cohort 2015, Erie, conditional upon HS graduation

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 47.9% | -3.5% | 6.7 | -.07 | .6 | .61 |
| Enrolled in 4-year college by December of expected year of high school graduation | 44.2% | 1.1% | 6.7 | .02 | .87 | .87 |
| Enrolled in college (2- or 4 year) by December of year following the expected year of high school graduation | 52.8% | 0% | 6.6% | 0 | 1 | 1 |
| Enrolled in 4-year college by December of year following the expected year of high school graduation | 49.1% | 4.5% | 6.7% | .09 | .5 | .5 |
| College persistence - 1-year (2- or 4-year college) | 28.8% | -2.6% | 5.9% | -.06 | .66 | .67 |
| College persistence - 1-year (4-year college) | 25.8% | 1.3% | 5.7% | .03 | .82 | .83 |

Table 13. Outcomes and Effect Size for Cohort 2, Erie

| | Control Mean | Estimated Treatment Effect | Standard Error | Effect Size | *p*-value | *Fisher's exact p-value* |
|---|---|---|---|---|---|---|
| Enrolled in college (2- or 4 year) by December of expected year of high school graduation | 28.4% | 2.3% | 3.8% | .05 | .55 | .56 |
| *Enrolled in 4-year college by December of expected year of high school graduation* | 26.3% | 2.9% | 3.7% | .07 | .44 | .45 |

## Limitations of the Research

As noted in the 2016 report, the implementation of this program had several limitations. For instance, core elements of the original model, in particular the scheduled learning communities during the school day, could not implemented in some schools due to changes in school leadership and issues with scheduling (Millett et al., 2016). Another potential limitation was the contamination of the control group though participation in whole school services component of the GO College model. This design limitation was the main rationale for initially proposing a non-random assignment model for the evaluation. Other limitations included staffing challenges, presence of other similar interventions, and provision of treatment to students in the control group (Millett et al., 2016). Taken together, these limitations made it less likely that assignment to the treatment group would yield detectable differences in outcomes.

In describing GO College participation, the participation variable in the **empower**™ data system is highly reductionist, in that it is a yes/no dummy variable for participation in any event during the year. That said, when we look at the participation variables, it seems possible that one reason for not observing significant differences between the treated and control students could be that many students from the control group ended up with some level of treatment while some of those selected for treatment chose not to participate in the program. There is some evidence that this may indeed be the case. In particular, as students move up the grades, the percentage of control group students who receive treatment (i.e., participate in GO College events) goes up. For the two cohorts combined (Cohort 2015 and 2016), by grade 12, the difference in treatment rates (as measured by program participation rates) between students in the treatment group and those in the control group narrows to just 14 percentage points (51% vs 37%) for the pooled cohorts. It is possible that, in part, this could be a result of events meant for whole school treatment being pooled together with those meant exclusively for the learning community.

It is worth noting that while 87% of the students selected for treatment participated in GO College in at least one out of four grades (i.e., grades 9 through 12), only 34% participated in the program in all four grades. It is also worth noting that 64% of students in the control group received some form of treatment in at least one year. However, only 3% of the students in the control group received treatment in all four grades.

In light of the fact that a significant proportion of students in the control group were exposed to treatment, and a significant proportion of students in the treatment group did not participate as intended, it would be difficult to discern treatment impact even if there was an observable effect on students who fully participated as planned.

## Discussion

There are three main discussion points: (i) a significant treatment effects found for Cohort 2016 college enrollment; (ii) subgroup analysis shows treatment impacts were found only in Louisville; and (iii) subgroup analysis suggest treatment effects for males and non-economically disadvantaged students.

### *Significant Treatment Effects on Cohort 2016 Enrollment*

There is a significant treatment impact on college enrollment for the fall of their expected year of high school graduation for Cohort 2016. The treatment students were over 6% more likely to have enrolled in any college (2- or 4-year) or a 4-year college than the control students.

### *Subgroup Analysis Shows Treatment Impacts Found Only in Louisville*

Subgroup analyses show that all statistically significant positive treatment impacts were limited to Louisville. In particular, for Cohort 2016 from Louisville, enrollment rates in any college (2- or 4-year) or 4-year college were significantly higher for the treatment group as compared to the control group (see Table 8), while for Cohort 2015 from Louisville, high school graduation rates were significantly higher (see Table 9).

All students in the three Louisville high schools were exposed to the school-wide college access intervention as part of another i3 grant, which was being implemented simultaneously. It is highly possible that the presence of a difference between the GO College treatment and control samples within those high schools is in part due to GO College treatment. However, the impact of GO College could have been amplified through the experience of two college access interventions.

In Erie, there were no significant treatment effects detected in our analyses.

One marked contextual (though not explanatory) difference between the two cities was access to community college. While students in Louisville could enroll at the local community college, Jefferson County and Technical College (as many students did), Erie students had fewer options. In Erie, the primary nearby option has been Mercyhurst North East, the private Catholic two-year campus outside the city. Erie students in Cohort 2016 also could have enrolled in the inaugural year of Porreco College of Edinboro University[11], which began offering select associates degrees.

[11] Until 2016, Edinboro University was exclusively a 4-year public college.

### *Subgroup Analysis Suggests Treatment Effects for Males and Non-Economically Disadvantaged Students*

Male students and non-economically disadvantaged students assigned to GO College were more likely to attend college (2- or 4-year) than those in the control group (see Table 6). While these results are only marginally significant ($p <= .1$), they warrant further exploration.

## Future Research

Per the i3 requirements, GO College has been evaluated both externally by ETS and internally by COE and the Pell Institute for the Study of Opportunity in Higher Education. The importance of both internal and external program evaluation in building a results-based monitoring and evaluation system has been well established (Kusek & Rist, 2004).

College access researchers have long held that program dosage can impact outcomes; that continuous treatment, exposure and “face-time” can have an impact (Horng et al., 2013; Lieber, 2009). While, it is difficult to measure the extent to which students take advantage of opportunities provided to them, it stands to reason that, the higher the frequency of program contact, the more chances a student has to take up the learning a program has to offer (Lieber, 2009). Researchers at the Pell Institute are currently analyzing GO College outcomes within the context of the dosage and intensity of student program participation.

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## Appendix A: GO College Program Profile

GO College is a national data-driven initiative that brings communities together to increase college access and success for low-income, first-generation and minority students. The program provides an innovative model for delivering college access services to entire schools that enroll high percentages of low-income students.

GO College began as a joint effort between the General Electric (GE) Foundation and the Council for Opportunity in Education (COE) to help align community- and school-based efforts to promote college access and success.  GO College embeds college coaches — staff of local colleges or community agencies — on-site in select high schools on a full-time basis. Relying heavily on shared data and community collaboration, GO College works to align in-school and out-of-school programming to improve student achievement. Its ultimate goal is to increase college access and success for all students at each GO College high school.

By concentrating the program directly into select high schools, GO College has innovated upon the historical model of the federal Talent Search program. GO College is built on six essential cornerstones that both extend and intensify the traditional Talent Search model.

1. Collaboration among many community partners, which assumes effective programming and requires recognition of student, school and community assets.
2. Using data to improve student outcomes, which assumes an understanding of data about students, services and outcomes that will help improve services and outcomes.
3. Combining a whole-school approach with more intensive services for individual groups, which assumes that college access programs area able to not only assist individual students, but can also be a major partner in improved college and career success for students enrolling in a partner school.
4. Aligning in-school and out-of-school programming to improve student achievement, which assumes that the use of out-of-school time to promote academic success — when aligned with teacher and school leader priorities — will increase students' college-going.

5. Building on existing community resources, which assumes the removal of obstacles for collaboration among schools, colleges and the community in order to increase college access and success.
6. Emphasizing student, school and community strengths, which assumes informed adult and peer support for low-income and first-generation students will not only increase student knowledge about opportunities but also increase their engagement in school.

In 2010, the U.S. Department of Education recognized GO College as one of 49 national efforts to use evidence-based approaches to increase educational attainment and achievement under the Investing in Innovation (i3) Program. As the grantee, COE managed the development and execution of GO College. The GE Foundation provided a $4 million match for the grant. The i3 implementation funding allowed GO College to intensify its efforts in Erie, PA and Louisville, KY and to launch a national evaluation, conducted by Educational Testing Service (ETS) to validate its findings.

## Program i3 Implementation

The i3 implementation of GO College ran between October 2010 and September 2015. Starting in AY 2011-2012, the GO College Collaborative worked in six high schools with high percentages of low-income students. Local college and youth-serving agencies, referred to as College Access Providers (CAPs), were the first line for implementing GO College and hired the College Coaches to work in the local high schools. The College Coaches helped students transition to high school, navigate their high school years, and prepare for college. The high schools were equally important partners: The six principals provided the GO College program with access to their students and their professional staff, as well as valuable space in their schools for the College Coaches to work and meet with students.

GO College was implemented in six low-performing high schools in two cities.

**Erie, PA**
Central High School
East High School
Strong Vincent High School

**Louisville, KY**
Academy @ Shawnee
Fern Creek High School
Moore Traditional High School

## GO College's Two Programmatic Levels

Intensive Services Community: Rising 9th-graders were selected in the spring of their 8th-grade year to participate in the program. Students could participate throughout high school as long at the program was being implemented. For Cohort 2015, this included all four years of high school, and for Cohort 2016, this included the first three years of high school.

Whole-School Services: All other students in the high schools could participate in GO College-sponsored programs (e.g., FAFSA Completion Night).

During the i3 implementation, College Coaches provided intensive services to approximately 180 students in each of the high schools. These 180 students were members of an "intensive services community." The program also made available "whole-school" services and supports that promoted school-wide college readiness and a strong college-going culture.

## Intensive Service Components

The Intensive Service provided by GO College had a number of programmatic components, including:

- Summer programming for rising 9th grade students (and in subsequent years upper-class students)
- 2 hours per week of GO College coaching
- Tutoring & mentoring
- College visits
- Career & college awareness activities

## Data Sharing and Real-Time Use

Another component of GO College was the promotion of real-time data use. Through the implementation of the GO College data tool, the hope was that CAPs, coaches and principals share to share data on a real time basis. Coaches would be able to track students' academic progress and data on other critical indicators, such as attendance, and respond in a way to enable student improvement (e.g., arranging tutoring when students have trouble in their classes). Principals, counselors and teachers would easily be able to track students' academic achievement and progression, their applications to colleges, for financial aid, and their enrollment in college.

# Appendix B: Sample and Methodology

## 1. Stratified random assignment and analysis sample

Students were randomly assigned to treatment or control in the spring of their 8th grade years from two cohorts of rising freshmen lists for the six participating high schools. Students were assigned to blocks based on intended high school and background variables, yielding 62 blocks across the two cohorts. Treated students were eligible to receive intensive services, while control students were to receive only the whole school services. Throughout, our analysis is limited to the subset of students initially randomly assigned that in fact showed up in one of the six study high schools (1,914 of 2,692, or 71.1 percent). We treat the students who are not observed in a study high school as if they had been ex ante ineligible and assume that treatment remains randomly assigned within each block conditional on matriculating at a study high school. We provide evidence that supports this assumption.

## 2. Definition of treatment

We would like to estimate the causal effect of being randomly assigned to the treatment group (T=1) as compared to the control group (T=0) within the study population. Note that this is an intention-to-treat effect, since being assigned to the treatment group affects eligibility for services and students may or may not choose to take those up.

For a given student *i* in block *j* and particular outcome *y*, the impact of being assigned to treatment can be expressed as:

$$\tau_{ij} = Y_{ij}\left(T_{ij} = 1\right) - Y_{ij}\left(T_{ij} = 0\right)$$

We assume that a given student's potential outcomes are stable, in the sense that these do not vary with the specific subset of peers that are assigned to treatment. This is known as the stable unit treatment value assumption (SUTVA). Further, the potential outcomes should be viewed as being specific to the school the student attends and conditional on the proportion of other students assigned to treatment. Since services provided by the study schools may vary, the analysis applies to the case where the school associated with each student is kept fixed.[12]

The average treatment effect for students within a given block is equal to:

$$\tau_j = E\left[Y_{ij} \mid T_{ij} = 1\right] - E\left[Y_{ij} \mid T_{ij} = 0\right]$$

With treatment randomly assigned within blocks, this can be estimated by the difference in average outcomes across those assigned to treatment and control.

## 3. Regression-based approach to estimating average treatment effects

We estimate average treatment effects for the sample using ordinary least squares (OLS) regressions of the following form:

$$Y_{ij} = \tau T_{ij} + \sum_{j=1}^{J} \beta_j Block_j + \varepsilon_{ij}$$

The control set includes an indicator for being assigned to treatment as well as indicators for each of the blocks within which random assignment took place.

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12 Abadie, Athey, Imbens, and Wooldridge (2017) p.8, describe SUTVA from a similar perspective.

The OLS estimate for the coefficient of interest, $\hat{\tau}$, yields an unbiased estimate of a weighted average of the within-block average treatment effects:

$$\tau_w = \frac{\sum_{j=1}^{J} w_j \tau_j}{\sum_{j=1}^{J} w_j} \quad , \quad w_j = n_j p_j (1 - p_j)$$

The weights depend on the number of students in the block (n) and the proportion of students in the block assigned to treatment (p). Holding the selection probability constant, weights are proportional to the number of students in the block. The closer the block is to having half the students assigned to treatment, the more weight it receives. For simplicity, we refer to this weighted average as the average treatment effect.

## 4. Randomization-based inference

We apply the perspective of randomization inference to our linear regression. Holding our population and student potential outcomes fixed, we assume that the only source of uncertainty is whether a given student is assigned to treatment or control. Sampling variability then arises from the fact that we only see one of the two relevant outcomes for each student. We calculate p-values for tests of the sharp null hypothesis of no treatment effects and for tests that the average treatment effect is zero.

### a) Fisher exact p-values for tests of the sharp null hypothesis of no treatment effects

For this randomization-based test, the sharp null hypothesis is that all treatment effects are zero (i.e., $\tau_{ij} = 0 \quad \forall_i$). Note that violations of SUTVA do not undermine the validity of this test since the assumption is automatically satisfied under the null. We choose as our test statistic $\hat{\tau}$ and obtain an approximation to its exact distribution under the null hypothesis by using 5,000 random draws of possible permutations of the treatment vector using ritest.ado, see (Heß, 2017). We then report the probability over the randomization distribution of the statistic taking on a value as large (in absolute value) as the one we observe.

### b) Tests of the null hypothesis that the average treatment effect is zero

Here, our inference should be viewed as conservative. We estimate the sampling variance of $\hat{\tau}$ over is randomization distribution using Huber-Eicker-White (HEW) heteroskedasticity robust standard errors (as implemented in Stata with the finite sample adjustment). We then calculate the p-value based on a normal approximation to the randomization distribution of the t-statistic for $\hat{\tau}$. Though motivated by different sampling perspectives, the HEW regression-based estimator is similar to the commonly used randomization-based Neyman estimator. The differences between the two disappear when the probability of assignment to treatment and control is balanced.[13] Otherwise, the HEW estimates will be larger than the already conservative Neyman estimates.

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[13] Imbens and Rubin (2015), sections 7.4, 9.5 and 9.6; Athey and Imbens (2017) p. 96 and Bugni, Canay, and Shaikh (2016)