

COLLEGE COACHING AND COMPLETION GRANTS IN TENNESSEE: ESTIMATED EFFECTS ON PERSISTENCE

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June 2025

Abstract

We evaluate the effect of college coaching and supplemental aid on postsecondary persistence in Tennessee. Findings from a difference-in-discontinuity research design suggest that coaching and grant take-up led to a higher likelihood that students persisted into a second year of college. At average levels of take-up, we estimate large persistence gains of 11.7 percentage points, or 14.9% of the baseline re-enrollment rate. Confidence intervals are wide, however, in main and alternate specifications, and we cannot rule out much smaller or larger effects.

Introduction

Every high school graduate in Tennessee has been eligible for tuition-free community college through Tennessee Promise since 2015. Starting in 2019, nonprofit organization tnAchieves provided supplemental support to Tennessee Promise students from Knox County (Kast, 2019). The additional aid fell under the umbrella term “Knox Promise” and came in two forms.

First, each Knox Promise student was matched with a dedicated tnAchieves **completion coach** who provided personalized degree roadmaps and general academic guidance. Each coach had a roughly 300:1 caseload and proactively communicated with students in person or by text, email, and on virtual platforms.

Second, Knox Promise students were eligible for **completion grants**, funding up to \$1,500 per term for school supplies, class fees, transportation, food, housing, or technology. Completion grant requests were reviewed and approved on an ongoing basis, allowing the program to meet urgent and unexpected student needs.

Eligibility for coaching and emergency grants was limited to Knox County students until 2022, when coverage expanded to all low-income students in the state under a new tnAchieves program known as COMPLETE (Wooten, 2022; WBIR, 2022).

We use the expansion from Knox Promise to COMPLETE along with income-based eligibility rules to estimate the effect of coaching and grants on progress through college. Results from a difference-in-discontinuities research strategy indicate that support from COMPLETE increased the rate at which students persisted from their first semester to their second, and into a second year. Estimated effects are potentially large, suggesting gains in fall-to-fall persistence of 11.7 percentage points (14.9% of the baseline). Persistence rose even more for COMPLETE-eligible Non-White students. Results are imprecise, however, and underpowered to an extent that we cannot rule out much smaller or much larger effects of access to coaching and completion grants.

Related Research

In a series of earlier reports, we documented the relationship between student engagement with Knox Promise coaching, their use of emergency grants, and post-secondary outcomes including persistence and credential completion (Carruthers et al., 2023; Carruthers & Pratt, 2023; Carruthers & Pratt, 2024). Our earlier findings indicate that students who connected more often with their coaches typically had better persistence and completion rates than other Knox Promise students, and that grant recipients were as or more likely than non-recipients to persist in college and/or attain postsecondary credentials. Complementary work on Knox Promise initiatives similarly finds that students who engaged more with program supports tended to have better postsecondary outcomes (Dickason et al., 2023; Kim & Gegenheimer, 2024).

Looking beyond Knox Promise and Tennessee, COMPLETE is programmatically related to other initiatives that provide coaching or supplementary financial aid to college students, or both coaching and additional aid. Here, we highlight three such programs, whose effects on student persistence help us benchmark our estimated effects of COMPLETE.

Most relevant to the COMPLETE model of student support, Kim & Gegenheimer (2024) report on an experimental analysis of **proactive versus reactive modes of tnAchieves coaching** in the 2019 cohort. In the proactive arm of the experiment, coaches reached out to students at least once every three weeks, whereas reactive coaching was initiated by students. Proactively coached students were not more or less likely to persist into a second year of college.¹ Here, we study different cohorts and a different margin: Access versus no access to proactive coaching through COMPLETE, as well as access to supplementary financial aid.

COMPLETE coaching is also related to the **Inside Track** model studied by Bettinger & Baker (2014). Inside Track was a high-frequency, low-touch form of outreach between coaches and students at many public, private, 2-year, and 4-year institutions. Coaches connected with participating students by phone to strategize around institutional requirements and scheduling, study habits, and self-advocacy. Bettinger & Baker (2014) report that randomized access to Inside Track coaching increased 12-month persistence by 5.2 percentage points.

By combining coaching with supplementary financial aid, COMPLETE is structurally similar to the **Stay the Course** intervention studied by Evans et al. (2019, 2020). One major difference between the two programs is that Stay the Course predominantly supported older, nontraditional students, whereas COMPLETE focused on traditional-aged college students who moved directly from high school to college. Another difference is the extent and intensity of coaching. Stay the Course navigators had a 34:1 caseload and met with students in frequent, lengthy sessions (4 times per semester, on average, for 41 minutes each) that covered academic topics as well as issues related to work, family/children, housing, health, and more. In addition, Stay the Course provided students with access to emergency financial assistance, similar to COMPLETE grants but capped at \$500 per term rather than \$1,500. Evans et al. (2020) estimate that Stay the Course tripled associate's degree attainment for women but had no precise effect on degree attainment for men. A separate treatment arm of the experiment found that emergency support alone did not affect college completion.

Our evaluation of COMPLETE adds to the higher education research literature with additional evidence on college coaching and supplementary grants for students' unanticipated expenses. Estimated effects on short-term persistence tend to be larger than what Kim & Gegenheimer (2024) find for proactive versus reactive coaching and very similar to what Bettinger & Baker (2014) find for coaching alone. Down the road, the effects of COMPLETE on degree attainment are not likely to be as large as what Evans et al. (2020) find for women in the more intensive Stay the Course case management program, although it remains to be seen how COMPLETE will compare in terms of its effects on both men's and women's degree completion, or in terms of overall cost-effectiveness.

Data and Methods

We obtained data from tnAchieves describing Tennessee Promise applicants in 12th grade from the high school classes of 2017, 2020, and 2022. Almost all 12th graders in the state apply to at least learn more about tuition-free community college, so these data cover nearly the entire statewide cohort in those classes. Program records include student characteristics such as gender, race, Hispanic ethnicity, first-

¹ Kim & Gegenheimer (2024) report on longer term outcomes including degree completion and transfer within 3 years. Proactively coached students were 3.2 percentage points more likely to complete a degree and/or transfer in that timeframe.

generation status, eligibility for federal need-based Pell grants, “expected family contribution” toward college expenses (defined below), and home county. We limit the sample of applicants to those who enrolled in college in the fall term immediately following high school. For these college-going students, we additionally observe the number of meetings or connections between each student and their coach, by term, as well as amounts received in emergency grants.

We estimate the effect of a student’s first-semester COMPLETE coaching and grants on (1) persistence into the spring term and (2) persistence into the next fall term and thus a second academic year. The program gathers data on these outcomes from the National Student Clearinghouse, which maintains college enrollment and completion data for the vast majority of postsecondary institutions and students in the United States.² Tennessee Colleges of Applied Technology (TCATs), however, do not share enrollment records with the National Student Clearinghouse, and we can only observe TCAT enrollment for tnAchieves students. For consistency, we exclude tnAchieves TCAT enrollees from the college-going sample.

A small number of students attained college credentials within the first year of college and did not return for a second year. This is possible because some certificate programs can be completed within a year, and because some students start college with postsecondary credits that they earned in high school, through dual enrollment. Rather than omit early completers from persistence outcomes, we count them as having satisfied fall-to-spring and fall-to-fall persistence criteria.

Coaching and grant eligibility criteria for these three cohorts are summarized in Table 1. We can evaluate the effect of access to COMPLETE coaching and grant eligibility by comparing persistence rates for eligible students to persistence rates for ineligible students. Some of the eligibility criteria listed in Table 1, however, are likely related to student characteristics and circumstances that affect success in college through other channels. Deciding to participate in a summer bridge program, for example, is a signal of college goals and aspirations that may drive greater persistence regardless of access to additional support. Eligibility for coaching and completion grants based on Knox County residence will comele with other local, time-varying factors that affected enrollment, particularly for post-COVID cohorts who (outside of Knox County) were less likely to go to college.³

Since we would like to isolate COMPLETE effects, we instead focus on Pell grant eligibility, which is largely outside of a student’s control. For these cohorts, Pell eligibility was determined by a federal

² For this study, National Student Clearinghouse data are available through the fall 2023 term. Not enough time has passed since the 2022 COMPLETE expansion to assess effects on longer-term outcomes such as degree receipt and transfer.

³ Tennessee’s new high school graduates were substantially less likely to enroll in college in 2020 and 2022 (Tennessee Higher Education Commission, 2023), in step with declining enrollments nationwide (National Student Clearinghouse, 2023). Among Tennessee Promise applicants, we find a 58% college-going rate in the classes of 2020 and 2022, down from 61% for the class of 2017. Knox County students behaved counter to this trend, however, and were somewhat *more* likely to enroll in the post-pandemic period: 67 – 68% in 2020 and 2022 versus 65% in 2017. Conditional on student characteristics and county fixed effects, the post-pandemic Knox County gap in college going remains statistically significant at 5.7 percentage points. The Knox Promise program may have played a role, since it was announced in 2019, but we cannot isolate the appeal of coaching and emergency grant aid from contemporaneous tnAchieves efforts to sustain pre-pandemic college enrollment rates, or from post-pandemic differences in demand for college that may have affected the Knoxville metro area less than the rest of the state. Accordingly, we evaluate effects of coaching and grant aid at the more localized Pell eligibility margin.

formula that distilled family size, income, and assets down to an “expected family contribution” (EFC) value. Students with EFC below a threshold were eligible for at least \$692 in Pell grant aid in 2022, with grant values increasing at lower EFC values to a maximum award of \$6,895 at zero EFC. We focus on the 2022 Pell eligibility criteria to identify the local effect of coaching and grant eligibility on postsecondary persistence for students whose EFC rendered them marginally eligible for Pell grants, and therefore, marginally eligible for COMPLETE coaching and emergency grants. Both interventions were extended to cover all Pell-eligible students in Tennessee’s high school class of 2022.

We develop a regression discontinuity research design that identifies the effect of coaching and grant usage from the difference in persistence rates between two groups of students: Those whose EFC was just low enough to make them Pell/COMPLETE eligible in 2022, and those with slightly higher EFC that made them ineligible for Pell/COMPLETE. Ours is a fuzzy regression discontinuity since some students with EFC outside of Pell-eligible range would have gained access through summer bridge programs or Knox County residence, and since some COMPLETE-eligible students did not utilize the programs grants or coaching.

We estimate fuzzy difference-in-discontinuity models of the following form for student i in cohort $t = \{2017, 2020, 2022\}$:

$$(1) \ z_{it} = \alpha_0 + Pell_{it}\alpha_1 + Gap_{it}\alpha_2 + Pell_{it}Gap_{it}\alpha_3 + \mathbf{X}_{it}\beta + \Gamma_t[Pell_{it}\alpha_4 + Gap_{it}\alpha_5 + Pell_{it}Gap_{it}\alpha_6] + u_{it}$$

$$(2) \ y_{it} = \delta_0 + Pell_{it}\delta_1 + Gap_{it}\delta_2 + Pell_{it}Gap_{it}\delta_3 + \mathbf{X}_{it}\beta + \Gamma_t[\hat{Z}_{it}\delta_4 + Gap_{it}\delta_5 + Pell_{it}Gap_{it}\delta_6] + \varepsilon_{it},$$

where z_{it} is coaching or completion grant take-up in the first semester of college, y_{it} is fall-to-spring or fall-to-fall persistence (including early credential completion, as noted above), $Pell_{it}$ is a binary indicator equal to one for students with Pell-eligible EFC in cohort t , Gap_{it} is the gap between student i ’s EFC and the Pell-eligible threshold for their cohort, and $Pell_{it}Gap_{it}$ is the interaction of these two measures. Variables in \mathbf{X}_{it} include student gender, race, Hispanic ethnicity, ACT score, an indicator for missing ACT, summer program participation, and indicators for 2020 and 2022 cohorts. The variable Γ_t is an indicator equal to one for the 2022 cohort, which interacts with another local linear RDD specification in brackets.

The difference-in-discontinuity estimators are $\hat{\alpha}_4$ and $\hat{\delta}_4$, which quantify how the discontinuity in coaching and completion grant take-up (Equation 1) or average persistence (Equation 2) differed between the treated 2022 cohort and less-treated 2017 and 2020 cohorts. Post-program Pell eligibility ($\Gamma_t Pell_{it}$) is the excluded instrument identifying local variation in z_{it} near the eligibility threshold. Our preferred sample limits Equations 1-2 to students whose EFC was within \$4,600 of their cohort’s Pell eligibility threshold, although results are robust to larger and smaller bandwidths (Appendix Figure A2).

We cannot separately identify the effect of coaching from the effect of completion grants in this research design, since there is only one point of quasi-experimental eligibility for both interventions: that is, having an EFC that qualifies for Pell. So, we define z_{it} in a way that combines coaching and grant take-up. Specifically, we compute each student’s standardized coaching and grant take-up in proportion

to the average take-up among 2022 Pell-eligible COMPLETE students.⁴ We then define z_{it} to be the average of the two standardized measures. Mean z_{it} is 1.0 for participating students and 0.0 for almost all ineligible students.

Key to this identification strategy is the assumption that Pell eligibility did not correspond with any unobserved factors that would have affected persistence regardless of coaching and grant access. Two leading concerns are (1) student manipulation of EFC in order to gain Pell eligibility, or (2) effects of Pell itself on college going or college persistence.

EFC formulas are known but difficult to game in practice. A very high percentage of Pell-eligible aid applications require verification of income, assets, and other formula components. Verification may be so stringent, in fact, as to reduce college going for Pell-eligible students.⁵ Indeed, Appendix Figure A1 illustrates that there were fewer college enrollees just under the Pell eligibility cutoff for their cohort. A formal test suggests that this change in the density would be highly unlikely under random variation (Cattaneo et al., 2017). This was only the case for the 2017 cohort, however, since the EFC density varies smoothly over the Pell cutoff for the 2020 and 2022 cohorts (panel B of Figure A1). These later cohorts would have benefitted from pandemic-era easing of FAFSA verification requirements (College Aid Services, 2020; AlQaisi, 2022). To check that the 2017 EFC bunching does not affect our results, we limit the analysis to 2020 and 2022 cohorts and find quantitatively equivalent results (Appendix Table A2). To ensure that reported effects are not driven by a change in the composition of students over the threshold, we perform falsification tests also reported in the Appendix. Results reveal little to no difference-in-discontinuity “effect” of COMPLETE eligibility on student characteristics that should not be affected by COMPLETE or Pell, such as gender, race, or first-generation status (Table A1).

In Appendix Table A1, we also show no effect of COMPLETE coaching/grant eligibility on the likelihood of being a tNAchieves participant or enrolling in a 2-year community college as opposed to a 4-year college or university. This is consistent with recent work from Tennessee showing little to no precise effect of minimal Pell eligibility on college enrollment choices (Carruthers and Welch, 2019). EFC-determined aid can improve post-enrollment outcomes for needy students when grants are large (Castleman and Long, 2016) and/or tied to multi-year awards (Denning et al., 2019), but in our setting, Pell grants increased by just \$600 – 700 at the eligibility threshold. Eng and Matsudaira (2021) find that nationwide, this magnitude of additional Pell grant aid has very little effect on postsecondary completion.⁶

This set of contextual and analytical evidence gives us confidence in the assumption that the sample of college-going students was observably and unobservably similar in the small neighborhood around the EFC eligibility cutoff. In other words, we expect that without COMPLETE, persistence outcomes would have been very similar just below and just above the 2022 Pell cutoff. The “differences” aspect of a

⁴ In 2022, COMPLETE-eligible students made an average of 1.6 connections in their first semester of college and received an average of \$181 in grants. Students in the 2022 cohort with any coach connections averaged 2.3 connections, and those with completion grants received \$539, on average.

⁵ There is mixed evidence across research designs and settings that suggests being selected for FAFSA verification may reduce a student’s likelihood of enrolling (Wiederspan, 2019; Holzman and Hanson, 2020; Lee et al., 2021; Gurantz and Tsai, 2023).

⁶ Eng and Matsudaira (2021) study a different threshold of Pell grant determination—that is, the level of adjusted gross income that triggers “automatic zero” EFC and the maximum Pell grant. This threshold affects somewhat lower income students than the minimum eligibility threshold that triggers COMPLETE coaching and grant eligibility. Discontinuous aid at the automatic zero threshold was \$142 – 855 between 2002 and 2014.

difference-in-discontinuities design further mitigates the second possible concern cited above. Even if we acknowledge potential effects of additional financial aid from Pell on student progress through college in these cohorts, the 2017 and 2020 pre-program cohorts allow us to net out these Pell effects and isolate the role of coaching and grant eligibility in raising persistence, since COMPLETE eligibility was tied to the Pell threshold in 2022 and not 2017 or 2020.

The difference-in-discontinuity research design offers a high degree of causal credibility and the best available way to assess the effect of COMPLETE coaching and grants on postsecondary outcomes. The major downside to this approach, however, is limited statistical power to identify precise estimated effects. A regression discontinuity analysis requires 9 – 17 times as many observations as a randomized controlled trial to identify treatment effects of the same magnitude (Deke and Dragoset, 2012). In this setting, power tests indicate that COMPLETE effects would need to be fairly large in order for us to estimate statistically significant coefficients.⁷ We do in fact find large estimated effects on fall-to-fall persistence, but as we show below, confidence intervals are wide and somewhat sensitive to alternate specifications.

Results

Figure 1 illustrates students' coaching and grant take-up (z_{it}). Scatter points measure average take-up (vertical axis) against the gap between students' EFC values and their cohort's Pell-eligibility threshold (horizontal axis). All students to the left of the dashed vertical line were eligible for Pell, and if they were in the 2022 cohort (filled markers) they were also eligible for COMPLETE coaching and completion grants. Students to the right were ineligible for Pell and largely ineligible for coaching and grants across the three cohorts.

In the pre-COMPLETE cohorts (hollow markers and dashed lines), very small levels of program take-up on either side of the Pell eligibility threshold are driven by Knox County students and summer bridge program participants in the 2020 cohort (Table 1). These criteria did not depend on EFC or Pell eligibility, and there is no evident discontinuity in take-up at the threshold for minimum Pell eligibility. Recall that for the 2022 cohort, Pell eligible students statewide became eligible for COMPLETE coaching and grants. We see small positive values of z_{it} on the Pell-ineligible side of the threshold from 2022 Knox County and summer bridge students, which are dwarfed by take-up levels on the Pell-eligible side of the threshold. On average, the 2022 cohort's coaching and grant usage increased by 46% at the eligibility margin.

Table 2 reports Equation (2) estimates for the local average effect of COMPLETE take-up on fall-to-spring and fall-to-fall persistence. Going from zero coach connections and zero emergency grant aid to the mean level of take-up increased the rate of persistence into a second term by a large but statistically insignificant 6.7 percentage points and increased persistence into the following fall term by a statistically significant 11.7 percentage points. Both figures represent a large proportion of average persistence among COMPLETE-ineligible students: 7.7% for fall-to-spring persistence, and 14.9% for fall-to-fall persistence.

⁷ We estimate a power test for a regression discontinuity model limited to the 2022 cohort, following Cattaneo et al. (2019). Results indicate that there is a 71% chance of rejecting a null, zero-effect hypothesis given an 11.7-point treatment effect on fall-to-fall persistence. This is less than the standard 80% threshold, although it does not account for power in the difference-in-discontinuity extension.

Figure 2 illustrates persistence discontinuities at the Pell-eligibility cutoff by cohort and COMPLETE eligibility. Scatter points and linear fits represent average, unconditional persistence rates by EFC from reduced-form versions of Equation (2). Panel A plots results for fall-to-spring persistence, which naturally tends to be much more common (higher on the vertical axis) than fall-to-fall persistence shown in Panel B.

Focusing on the 2017 and 2020 cohorts (dashed lines and hollow markers), whose coaching and grant eligibility was not a function of EFC, we see little to no discontinuity in fall-to-spring or fall-to-fall persistence at the Pell-eligibility threshold. This indicates that Pell grants on their own did not significantly change the likelihood that a student enrolled for a second or third term of college.

For the 2022 cohort (solid lines and markers), COMPLETE eligibility largely depended on Pell eligibility, and we see more of a difference in persistence on either side of the Pell and COMPLETE-eligibility threshold. Students whose EFC put them just barely in range for Pell grants and COMPLETE coaching/grant support were slightly more likely to re-enroll in the spring of their first year of college than students whose EFC was a little larger and on the Pell-ineligible side of the cutoff (Panel A). The difference was small, however, and Table 2 regression results indicate that this was not a statistically significant increase. There is a more visually apparent increase in fall-to-fall persistence, however, such that marginally COMPLETE-eligible students in the 2022 cohort were 5.4 percentage points more likely to re-enroll for a second year of college than marginally COMPLETE-ineligible students. This reduced-form discontinuity corresponds with an estimated 11.7-point effect of average COMPLETE coaching and grant take-up on fall-to-fall persistence when we account for the fact that Pell eligibility increased take-up by 46% of mean usage.

Figure 3 plots Equation (2) estimates by student subgroup. Estimated effects of coaching and grant take-up on college persistence are consistently positive by student gender, race/ethnicity (with the exception of White students, for whom effects on fall-to-spring persistence are close to zero), ACT, and first-generation status. Confidence intervals are generally wide enough to include small or negligible effects as well as much larger effects. A notable exception is for Non-White students, where the confidence interval for fall-to-spring persistence excludes zero. We estimate that Non-White students were significantly more likely to persist into a second term of college at the Pell/COMPLETE-eligibility threshold, by a large margin exceeding 20 percentage points if they had a typical amount of connections and grants.

Appendix Table A2 and Figure A2 report results from alternative specifications. There, we show that inferences are robust to excluding the 2017 cohort (who were significantly less likely to be in the college-going sample if they were marginally eligible for Pell grants), to quadratic rather than linear functional forms in the difference-in-discontinuity specification, to wider or narrower bandwidths, and to regression discontinuity analyses focusing on 2022 and that cohort's Pell/COMPLETE eligibility. In each case, the magnitude and statistical significance of results is similar to or larger than what we report in Table 2. We also show, however, that coefficient estimates are smaller or less precise when we exclude controls for student characteristics, limit the sample to 2-year college students (who account for the large majority of tnAchieves/COMPLETE students), or when we implement Calonico et al.'s (2014) optimal bandwidth and bias-corrected estimator. Mixed findings across alternative specifications underscore our caveats about statistical power and precision.

Conclusions

We study short-term effects of a program that offered college coaching and completion grants to lower-income college students in Tennessee. Results from our difference-in-discontinuity design suggest that a typical level of first-semester engagement with COMPLETE coaching and grants increased the likelihood that a student re-enrolled for a second year of college by an economically meaningful and statistically significant 11.7 percentage points. This is quantitatively robust to alternate specifications, but underpowered and accompanied by a wide confidence interval. We cannot rule out treatment effects as small as 0.7 percentage points, or as large as 22.7 percentage points. The weight of the evidence suggests that COMPLETE was effective at raising student persistence (and especially for Non-White students), and expanding the sample with later COMPLETE cohorts may refine the estimated takeaways.

Holistically, COMPLETE coaching and grant availability represented a somewhat more intensive intervention than other programs that were limited to coaching (Bettinger & Baker, 2014) or testing one form of coaching against another (Kim & Gegenheimer, 2024). Our estimated 11.7 percentage point effect of typical COMPLETE take-up on fall-to-fall persistence corresponds with a 5.4-point intent-to-treat effect of COMPLETE eligibility. This is larger than the insignificant 0.2% effect of proactive rather than reactive tnAchieves coaching (Kim & Gegenheimer, 2024) and essentially equivalent to Bettinger & Baker's (2014) 5.2-point estimated effects of access to Inside Track on 12-month retention.⁸

By comparison, COMPLETE represented a less intensive support system than Stay the Course, where navigators' 34:1 caseload was considerably smaller than 300:1 with COMPLETE. Even an 11.7-point higher rate of fall-to-fall persistence with COMPLETE (14.9% of baseline) is unlikely to grow into a 31.5-point gain in associate's degree attainment, which is what Evans et al. (2020) report for women in Stay the Course. Not enough time has passed to determine the effects of COMPLETE on degree completion, however, or the cost effectiveness compared with other models that blend financial and non-financial support for new college students.

⁸ Baseline persistence was lower for the Inside Track sample than the COMPLETE sample, so 5.2 percentage points was a 12% gain for Inside Track, and 5.4 percentage points was a 7% gain for COMPLETE.

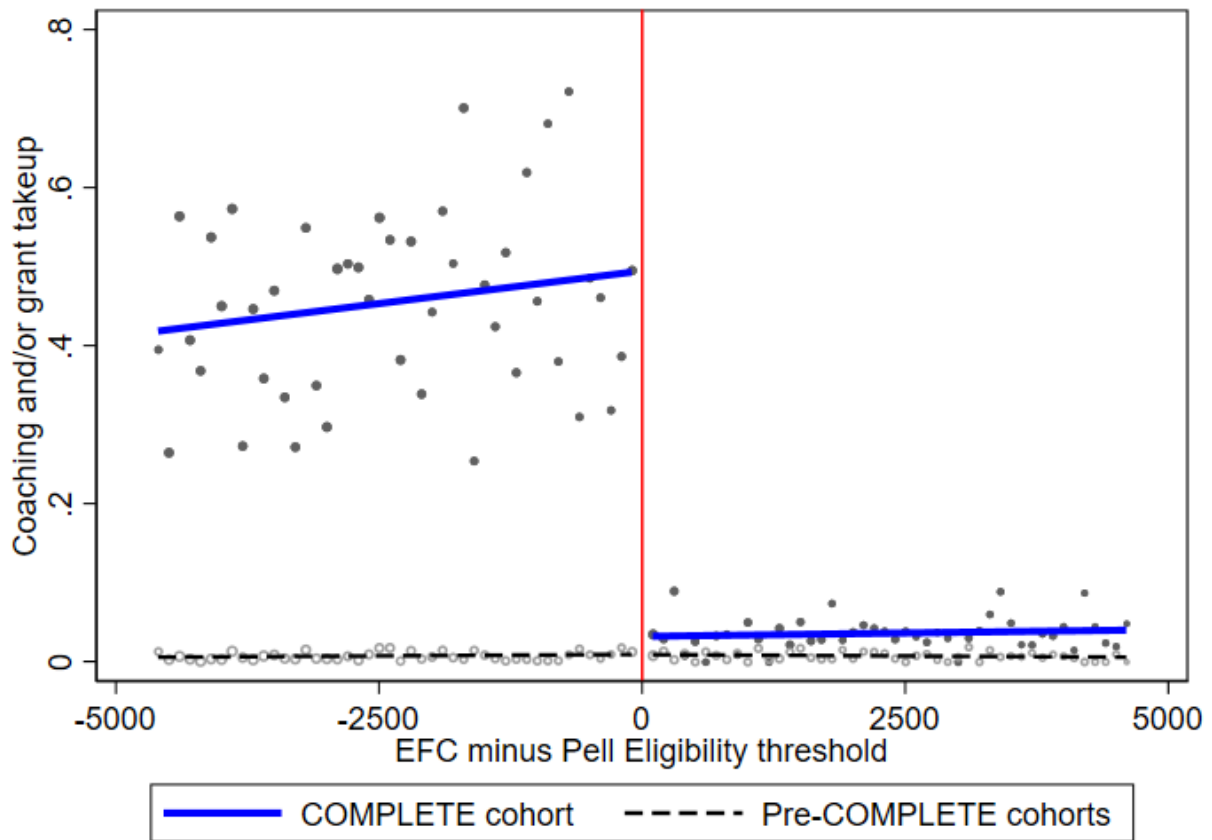
Tables and Figures

Table 1: Eligibility criteria for COMPLETE coaching and completion grants

Cohort	Eligible for coaching	Eligible for completion grants
2017	N/A	N/A
2020	Summer program participants; All Knox County students	All Knox County students
2022	Summer program participants; All Knox County students; All Pell-eligible students	All Pell-eligible students

Notes: From tnAchieves correspondence. The table lists eligibility criteria for COMPLETE coaching and completion grants by cohort. Coach and/or grant eligibility also required participation in Tennessee Promise. Summer programs refer to multiple summer bridge and summer institutes operated by tnAchieves and state community colleges.

Figure 1. First-stage effect of COMPLETE eligibility on coaching and completion grant take-up
 Estimated difference-in-discontinuity: 0.460*** (0.033)



Notes: Authors' calculations of Equation (1). Take-up is defined as the average of standardized first-semester usage of tnAchieves coaching (number of connections between a student and their coach) and first-semester receipt of completion grants. Coaching and completion grants are standardized as a percentage of mean usage.

+ $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 2. Estimated effects of COMPLETE coaching and completion grant take-up on first-year college persistence

	(1) Fall to spring persistence	(2) Fall to fall persistence
Standardized take-up	0.067 (0.047)	0.117** (0.056)
Observations (students)	25862	25862
Control mean	0.868	0.786

Notes: Authors' calculations of Equation (2) difference-in-discontinuity estimates of the effect of eligibility for COMPLETE coaching and completion grant take-up on fall-to-spring persistence (column 1) and fall-to-fall persistence (column 2). Robust standard errors are in parentheses.

+ p<0.10 ** p<0.05 *** p<0.01

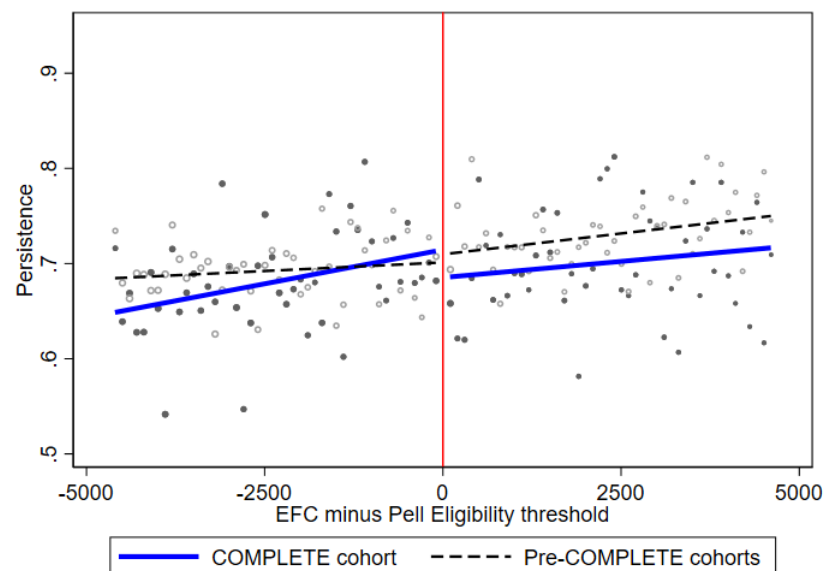
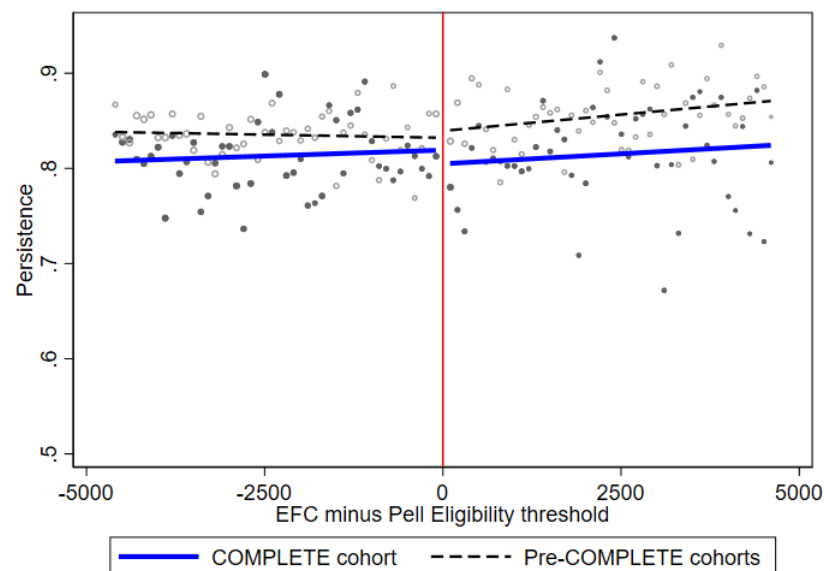
Figure 2. Estimated effects of COMPLETE coaching and grant take-up on first-year college persistence

A. Fall to spring persistence

Difference-in-discontinuity estimate: 0.067 (0.047)

B. Fall to fall persistence

Difference-in-discontinuity estimate: 0.117** (0.056)

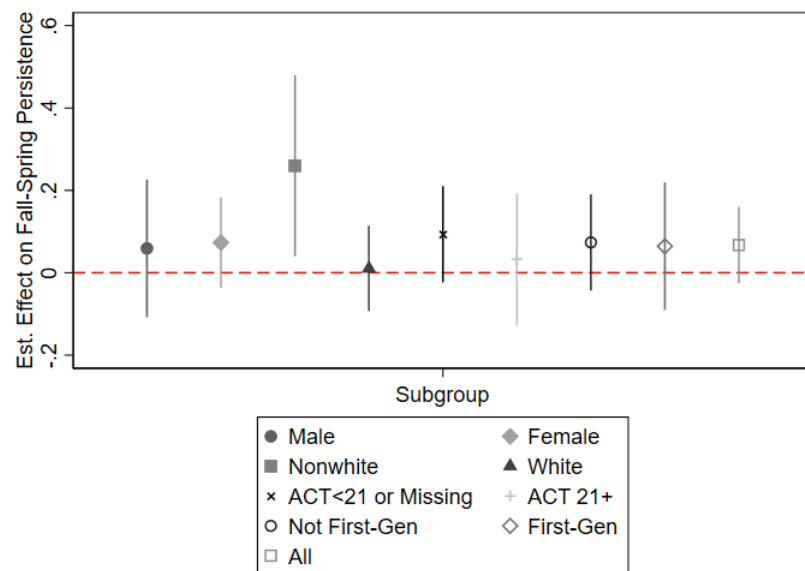


Notes: Authors' calculations of Equation (2) difference-in-discontinuity estimates of the effect of COMPLETE coaching and completion grants on fall-to-spring persistence (panel A) and fall-to-fall persistence (panel B). Solid markers and lines summarize persistence for the 2022 COMPLETE-eligible cohort, and hollow markers and dashed lines summarize persistence for the 2017 and 2020 cohorts. Robust standard errors are in parentheses.

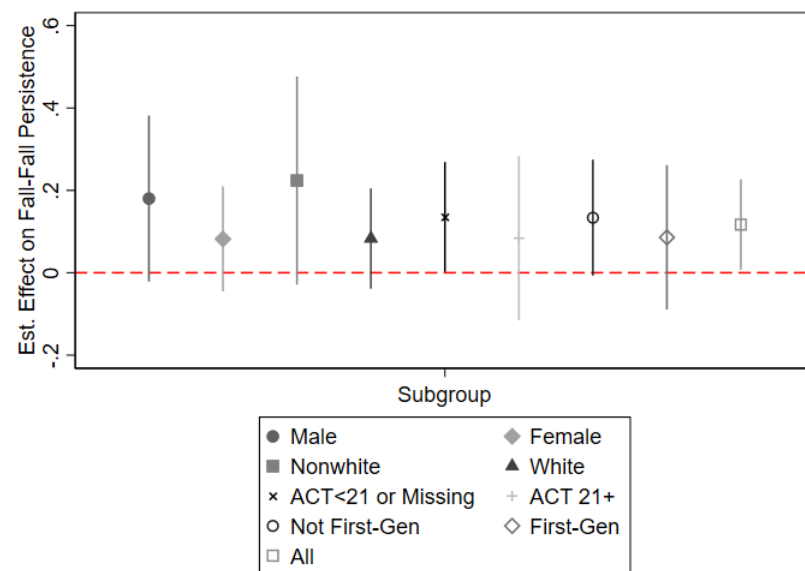
+ $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Figure 3. Estimated effects of COMPLETE coaching and grant take-up on first-year college persistence, by subgroup

A. Fall to spring persistence



B. Fall to fall persistence



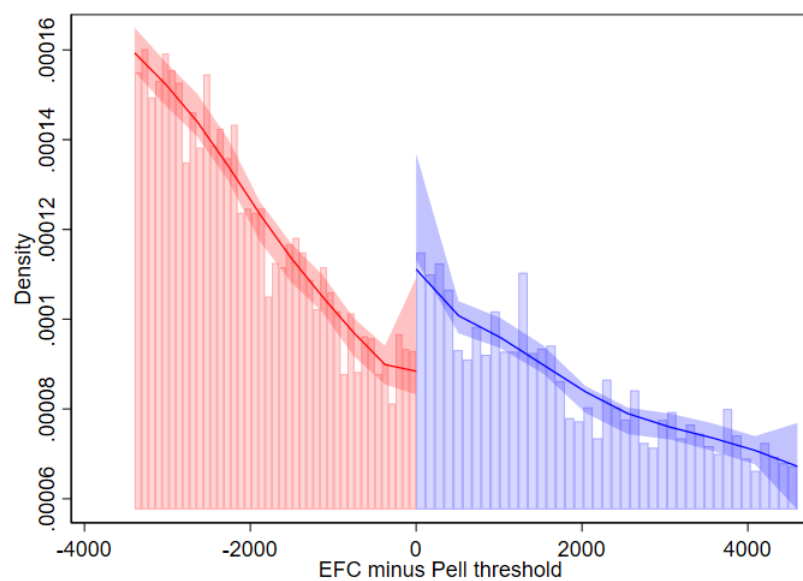
Notes: Authors' calculations of Equation (2) difference-in-discontinuity estimates of the effect of COMPLETE coaching and completion grants on fall-to-spring persistence (panel A) and fall-to-fall persistence (panel B), by student subgroup. Confidence intervals are derived from robust standard errors.

Appendix: Supplementary Tables and Figures

Figure A1. Running variable densities

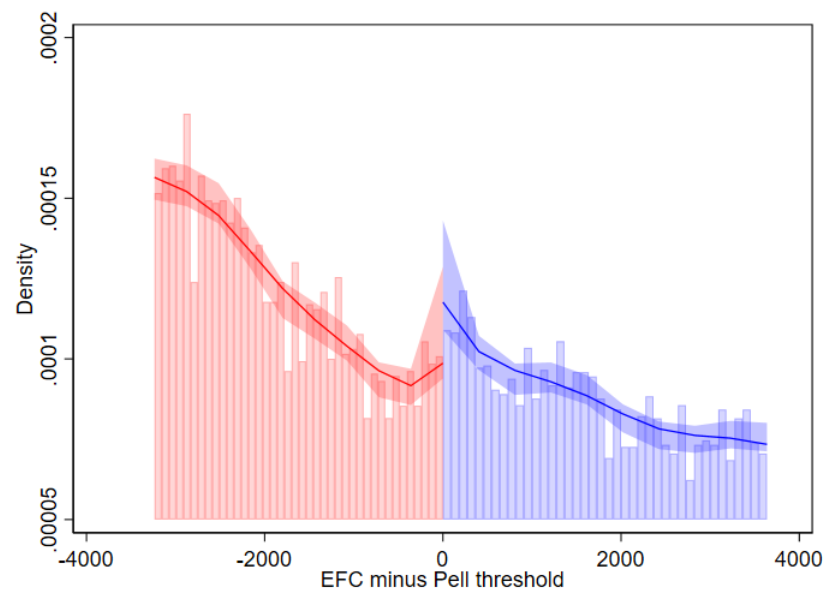
A. 2017, 2020, and 2022 cohorts

t-statistic for estimated density discontinuity: 3.17*** (0.002)



B. 2020 and 2022 cohorts

t-statistic for estimated density discontinuity: 1.18 (0.237)



Notes: Authors' calculation of EFC density discontinuities (Cattaneo et al., 2017). T-statistics for the null hypothesis of no discontinuity in the density of EFC values at the Pell eligible threshold are reported above each figure, with p-values in parentheses.

+ $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table A1. Estimated effect of COMPLETE coaching and grant take-up on college sector and pre-treatment student characteristics

	Difference-in-discontinuity estimate
<u>Enrollment outcomes</u>	
Enrolled in community college	0.018 (0.028)
Enrolled in 4-year college	-0.018 (0.028)
tnAchieves participant	0.032 (0.028)
<u>Student characteristics</u>	
ACT score	-0.746*** (0.286)
Missing ACT score	0.001 (0.011)
Female	-0.012 (0.028)
Black, non-Hispanic	0.033 (0.021)
Hispanic	0.022 (0.014)
Other race, non-Hispanic	0.009 (0.013)
First generation student	0.032 (0.027)
Summer program county	-0.010 (0.017)
Summer program participant	0.009 (0.008)
Joint significance test for all student characteristics: Chi-square	13.00
p-value	0.11
Observations (students)	25,862

Notes: Authors' calculations of Equation (1), substituting the listed pre-treatment student characteristic for first-stage coaching/grant take-up. Robust standard errors are in parentheses.

+ p<0.10 ** p<0.05 *** p<0.01

Table A2. Estimated effects of COMPLETE coaching and completion grant take-up on first-year college persistence: Alternative specifications

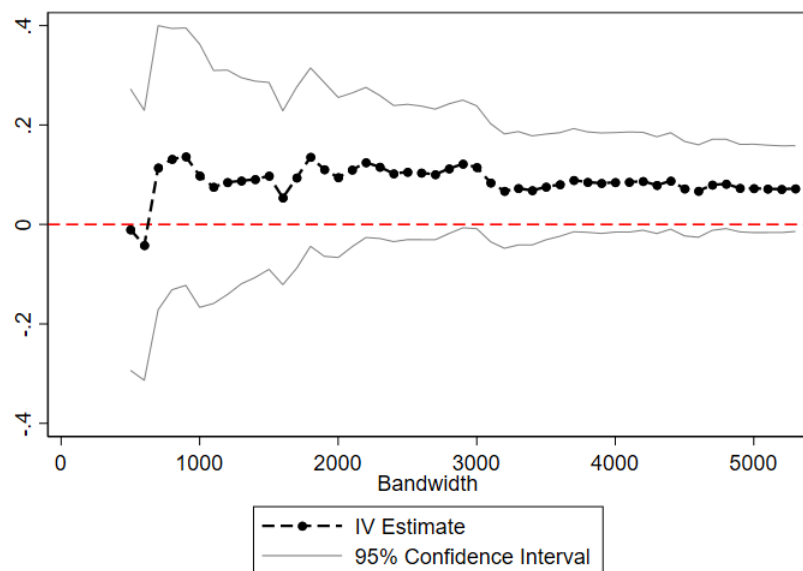
	(1) Fall to spring persistence	(2) Fall to fall persistence
Main results	0.067 (0.047)	0.117** (0.056)
Excluding 2017 cohort	0.068 (0.055)	0.120+ (0.065)
Quadratic polynomial	0.116 (0.077)	0.168+ (0.091)
Excluding 4-year students	0.078+ (0.040)	0.076+ (0.043)
Excluding controls	0.0458 (0.048)	0.080 (0.057)
Regression discontinuity (2022 only)	0.053 (0.042)	0.099** (0.049)
Optimal bandwidth (2022 only)	0.090 (0.100)	0.121 (0.101)

Notes: Authors' calculations. The table lists difference-in-discontinuity from alternative specifications of Equations 1-2: Excluding the 2017 cohort, with quadratic rather than linear functional forms of the running variable, excluding 4-year students, or without pre-treatment controls. Regression discontinuity estimates limit the sample to the 2022 cohort and estimate persistence gaps at the Pell/COMPLETE eligibility threshold. Optimal-bandwidth estimates follow Calonico et al. (2014) in estimating a fuzzy regression discontinuity model for the 2022 cohort.

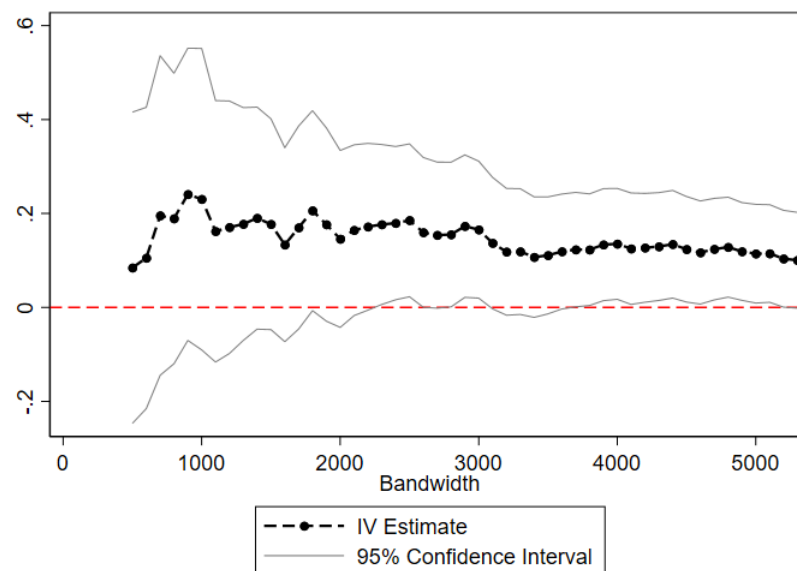
+ $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Figure A2. Estimated effects of COMPLETE coaching and grant take-up on first-year college persistence, by bandwidth

A. Fall to spring persistence



B. Fall to fall persistence



Notes: Authors' calculations of Equation (2) difference-in-discontinuity estimates of the effect of COMPLETE coaching and completion grants on fall-to-spring persistence (panel A) and fall-to-fall persistence (panel B), for bandwidths ranging from 500 to 5,300 EFC values around the Pell eligibility threshold. Confidence intervals are derived from robust standard errors.

Acknowledgments

We are grateful to SCORE for supporting this research, to tnAchieves for providing data, to Ed Taylor for technical assistance, to Diego Guererro and William Fox for collaboration on earlier projects in this series, and to SCORE, tnAchieves, and the Haslam Family Foundation for comments and feedback during interim briefings. Opinions and errors are our own.

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