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# Experimental Evidence of the Impact of Re-Enrollment Campaigns on Long-Term Academic Outcomes

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# Experimental Evidence of the Impact of Re-Enrollment Campaigns on Long-Term Academic Outcomes

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## Abstract

Most students who begin at a community college do not complete their desired credential. Many former students fail to graduate due to various barriers rather than their academic performance. To encourage previously successful non-completers to re-enroll and eventually graduate, a growing number of community colleges have implemented re-enrollment campaigns focused on former students who have already made substantial progress toward graduation. In this study, we randomly assigned over 27,000 former community college students to a control group, "information-only" treatment group, or "information and one-course waiver" treatment group to examine whether re-enrollment campaigns can improve their likelihood of long-term persistence and credential completion. Although we showed in earlier work that the "information and one-course waiver" treatment had a positive impact on former students' likelihood of re-enrollment, our findings reveal the re-enrollment intervention has no effect on students' likelihood of long-term persistence or credential completion for the pooled sample or any subgroup of interest, including low-income students, racially minoritized students, or adult students. Simply put, this particular re-enrollment intervention including one-time, one-course tuition waivers increased former students' likelihood of re-enrollment but was not an effective lever to increase *long-term* academic outcomes among previously successful community college students who departed early without earning a credential.

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## Introduction

Community colleges are open-access institutions that educate a disproportionate share of low-income, racially minoritized, and adult students in the United States (Bailey et al., 2015). While community colleges provide millions of students with the opportunity to pursue higher education at a low cost, most community college students do not complete their degree. Specifically, only 38 percent of students who begin at a community college complete their associate or bachelor's degree within six years (Shapiro et al., 2019). Although the benefits of graduating from college are well-established (Belfield & Bailey, 2011; Jepsen et al., 2014), most students who enroll initially at a community college do not earn their desired credential and are unable to accrue the full benefits associated with completing college (Snyder et al., 2018).

The median earnings of students who earn an associate or bachelor's degree are between $400,000 and $1.2 million more than high school graduates who do not attend college (Carnevale et al., 2021). Despite the compelling research on the benefits of completing a college degree, roughly 20 percent of community college dropouts were academically successful and making substantial progress toward degree completion before their early departure.[1] These previously successful non-completers have been identified in descriptive work as the most likely to graduate from college after re-enrolling (Shapiro et al., 2019).

Many former students dropped out of college due to various informational or financial barriers rather than their academic performance or academic ability (Long, 2007). Community college students, in particular, who departed without earning a credential have limited information pertaining to how to re-enroll and may benefit from a simplified and easy-to-navigate re-enrollment process (Institute for Higher Education Policy, 2011). Multiple studies have shown that financial challenges represent the primary explanatory factor related to former students' decision to drop out of college, particularly among former community college students who had made considerable

[1] Students who return to college after exiting early are described as stopping out, whereas former students who do not return to college are described as dropping out. Our sample includes both students who stop out and eventually return as well as those who drop out and have not returned to college.

progress toward credential completion (Bers & Schuetz, 2014; Ortagus et al., 2021a). In addition, recent research has revealed that challenges associated with attending college during the global COVID-19 pandemic may have exacerbated community college students' likelihood of attrition, especially among part-time students, Black students, and readmitted students (Lackner, 2023).

To encourage previously successful non-completers to re-enroll and finish their degree, a growing number of community colleges have invested in re-enrollment campaigns focused on former students who had already made substantial progress toward completing their degree. Colleges have sent letters, emails, text messages, and scholarship offers to encourage former students to return to college (Schwartz, 2019). In this study, we follow up on a previous study in which we showed that re-enrollment campaigns providing streamlined information and a one-course tuition waiver had a modest positive impact on former students' likelihood of re-enrollment and short-term persistence (Ortagus et al., 2021b). Although our previous work highlighted several positive effects of re-enrollment campaigns on former students' short-term outcomes, little is known regarding the *long-term* impact of re-enrollment campaigns on academic outcomes. The fundamental goal of re-enrollment interventions is to target former students who were close to graduating in order to facilitate their return and credential completion; however, we are not aware of any study providing causal evidence pertaining to the impact of re-enrollment campaigns on the ultimate outcome of earning a postsecondary credential.

In the present study, we examined whether re-enrollment campaigns designed to address informational and financial barriers facing previously successful non-completers can improve their likelihood of long-term persistence and credential completion. To achieve this aim, we randomly assigned over 27,000 former community college students to one of two treatment groups or a control group. One treatment group received numerous text messages designed to simplify and streamline the re-enrollment process, while the other treatment group received very similar information but included a one-course tuition waiver if the student re-enrolled at the same community college. The control group included former community college students who did not

receive information designed to simplify and streamline the re-enrollment process or the one-course tuition waiver. To investigate the long-term impact of re-enrollment campaigns, we address the following research questions:

**Research Question 1**: To what extent does a re-enrollment intervention affect the likelihood of long-term persistence and credential completion among former community college students?

**Research Question 2**: Do the treatment effects vary according to students' academic or demographic characteristics?

To summarize our results, we find no evidence that the "information-only" treatment has a statistically significant impact on students' likelihood of long-term persistence or credential completion. Despite the positive and relatively robust impacts of the "information and one-course waiver" treatment on the likelihood of re-enrolling and persisting in the short term, we show that the "information and one-course waiver" treatment has no effect on students' likelihood of long-term persistence or credential completion for the pooled sample or any subgroup of interest, including low-income students, racially minoritized students, or adult students. Taken together, our findings reveal that this particular re-enrollment intervention including streamlined information and one-time, one-course tuition waivers was not an effective lever to increase *long-term* academic outcomes among previously successful community college students who departed early without earning a credential. While our re-enrollment intervention including a one-time, one-course tuition waiver was able to improve multiple outcomes in the short term, future re-enrollment interventions should prioritize sustained financial and academic support for returning non-completers in order to achieve the ultimate goal of credential completion.

## Literature Review and Conceptual Framework

The completion rate of community college students continues to lag behind graduation rates for students at four-year institutions (de Brey et al., 2019). Causey (2022) reported that only 43.1 percent of community college students received a degree within six years, with only 30.8 percent of

Black students and 37.1 percent of Hispanic students completing a degree during that same period. Persistence and completion rates are especially worrisome for individuals who re-enroll after leaving college for a period of time, as only 18 percent of students who re-enroll at a community college go on to graduate (Shapiro et al., 2019).

The specific reasons why community college students drop out of college, especially those who were relatively close to degree completion, require attention in order to address the completion crisis at community colleges. Previous research has indicated that community college students who leave college without a degree are often facing financial difficulties (Bers & Schuetz, 2014). Recent literature leveraged multilevel regression with poststratification to improve the generalizability of survey data and outlined numerous financial reasons behind community college students' early departure prior to obtaining any type of credential. More specifically, Ortagus and colleagues (2021a) reported that financial difficulties related to tuition and fees, living expenses, and losing financial aid are the specific factors that contribute to early exit for the largest proportion of former students who had made substantial progress toward degree completion.

Prior literature also shows that longer breaks between enrollment decrease former students' likelihood of returning to college (DesJardins & McCall, 2010). Additional work revealed that former students who completed more credits and had higher grade-point averages were more likely to return to college after their early departure; however, former students who were younger and left for non-academic reasons were identified as the most likely to persist to graduation upon re-enrollment (Berkovitz & O'quin, 2006). Community college students' likelihood of persisting and earning a credential has been linked to numerous academic and non-academic factors, but a lack of information and financial support have been identified repeatedly as common barriers to persistence and completion, particularly among students who appeared to be performing well academically (e.g., Dynarski et al., 2022). The remainder of this section focuses on prior research pertaining to informational nudges and financial assistance as strategies to increase student persistence and credential completion.

## Previous Research on Informational Nudges

A growing number of recent information-based interventions are designed to "nudge" students toward optimal decisions by sending or streamlining key information directly to students. Prior studies have reported that informational interventions describing the benefits of college had no effect on prospective college students' likelihood enrolling in college (Bergman et al., 2019; Gurantz et al., 2019). Bird et al. (2021) found that a large-scale nudging campaign reaching over 800,000 students had no impact on individuals' likelihood of enrolling in college. When switching the focus from college enrollment to students' academic outcomes during college, prior work has shown that text-message interventions had no effect on the academic outcomes of college students (Oreopoulos & Petronijevic, 2019), suggesting that informational nudges alone may not be enough to improve students' likelihood of completing college.

Additional research has demonstrated the short-term, positive effects of information nudges (Castleman & Page, 2016; Damgaard & Nielsen, 2018; Marx & Turner, 2019). In an experimental study, Castleman and Page (2016) sent personalized text messages to students to encourage them to re-submit the Free Application for Federal Student Aid (FAFSA), which is required for college students seeking federal financial aid support. Community college students who received the intervention were roughly 13 percentage points more likely to remain enrolled through their fourth semester when compared to their otherwise-similar peers.

## The Impact of Financial Aid on Student Outcomes

Previous literature has shown that college students are often unable to earn their desired credential due, in particular, to a variety of financial barriers (Long, 2007; Nguyen et al., 2019; Ortagus et al., 2021a). In an overview of prior research on financial aid in higher education, Deming and Dynarski (2010) reported that $1,000 of grant aid increased students' likelihood of college enrollment by 3 to 4 percentage points. A recent meta-analysis focused on the causal evidence of the impact of grant aid on persistence and completion and found that an additional $1,000 in grant aid increased the probability of student persistence and degree completion between

1.5 and 2 percentage points (Nguyen et al., 2019). Castleman and Long (2016) used a regression discontinuity design and found that students' eligibility to receive additional need-based financial aid had a positive effect on their credit accumulation and likelihood of degree completion.

Regardless of financial aid receipt, low-income students are more likely to drop out than their peers (Peters et al., 2019). But financial aid can reduce low-income students' likelihood of early departure. As noted previously, many community college students who drop out of college are forced to do so due to a host of financial barriers unrelated to their ability to succeed academically (Rath et al., 2013). This is particularly challenging for community colleges given that non-completers at community colleges were found to be less likely to apply for or receive financial aid when compared to students who completed their degree (Crosta, 2013; McKinney & Novak, 2013). Prior research has indicated that historically underserved subgroups of students with unmet financial need have a lack of accurate, clear, and simple information pertaining to the enrollment and financial aid processes (Long & Riley, 2007).

**Re-Enrollment Campaigns at Community Colleges**

Re-enrollment campaigns represent an increasingly popular institutional strategy to induce former students to return to college (Schwartz, 2019), but there is limited evidence of the effectiveness of re-enrollment interventions. Prior research examined the outcomes of a re-enrollment campaign at Waubonsee Community College, finding that students who were contacted by postcard or phone calls were not more likely to re-enroll than students who were never contacted through the re-enrollment campaign (Lashure et al., 2019). In a much larger study including 41,710 former students from 61 institutions, Project Win-Win implemented a re-enrollment campaign and noted that future re-enrollment interventions should focus solely on students who recently failed to persist and had already made considerable progress toward their degree (Adelman, 2013).

Turner & Gurantz (2023) paired informational nudges towards re-enrollment with one-on-one college coaching guidance for former students who attended a California community college or California State University. The authors found that being assigned a college coach did not increase

enrollment numbers but increased retention by two percentage points one year later. In an experimental study focused on the *short-term* effects of re-enrollment campaigns, Ortagus and colleagues (2021b) reported that streamlining the re-enrollment process and providing a one-course tuition waiver increased former students' likelihood of re-enrolling and persisting to the next semester of coursework after their initial re-enrollment. In this study, we follow up on prior experimental work by investigating the *long-term* effects of a targeted re-enrollment intervention, which we discuss in greater detail in the next section.

**Logical Rationale of the Re-Enrollment Intervention and Long-Term Focus**

The logical rationale of this study is guided in part by the economic theory of human capital to explain why a targeted re-enrollment campaign designed to mitigate informational and financial barriers may impact a former student's likelihood of persisting and completing college. The economic theory of human capital suggests that any individual's ability to generate economic value is associated with the knowledge, skills, and experiences accrued by that individual over time (Becker, 1962). Applications of human capital theory also imply that individuals are rational actors who typically make decisions based on the costs and benefits associated with their decision of interest. In the context of higher education, human capital theory suggests that former students make decisions about whether to return and continue their education based on the costs and benefits associated with persisting and completing college. Therefore, simplifying the re-enrollment process and offering former students one-course tuition waivers would lower near-term costs of returning to college and continuing their college journey until earning their desired credential.

Unfortunately, students often make enrollment and persistence decisions with limited or inadequate information (e.g., Bettinger et al., 2012). The decision to invest in additional education (i.e., year-to-year persistence and credential completion) is subject to a variety of considerations, such as the direct costs of tuition and the opportunity costs of forgone earnings, before determining whether persisting and completing college is a worthwhile investment. Before deciding to re-enroll, persist, and graduate from their previous institution, former students can weigh the costs and

expected benefits of those options and decide whether the costs associated with re-enrolling, persisting, and graduating are outweighed by the expected economic benefits associated with earning their degree (DesJardins & Toutkoushian, 2005; Paulsen & Toutkoushian, 2008). Because a human capital decision in this case may be constrained by the former student's budgetary limitations (Paulsen & Toutkoushian, 2008), interventions directly addressing former students' financial barriers, such as a one-course tuition waiver, may increase their likelihood of re-enrolling, persisting, and completing college.

Non-financial reasons—such as informational barriers related to how to re-enroll or how to decide which courses to take to get back on track toward graduation—may also motivate a theory of change to explain why previously successful former students would accrue positive long-term outcomes when their decision-making is simplified. Prior research has suggested that individuals often have limited information and can vary in their decision-making when decisions are complex , and outcomes are uncertain (Karlan et al., 2016; Meyer & Rosinger, 2019; Thaler & Benartzi, 2004). Due to the barriers associated with the re-enrollment process, former students may miss critical deadlines, fail to apply for the FAFSA, or lack clarity regarding how to talk directly with an academic advisor to facilitate their return and subsequent academic success. The long-term outcomes of a re-enrollment intervention designed to address barriers facing former students may also vary according to their academic and demographic characteristics, including age, race/ethnicity, and socioeconomic status.

Given the theoretical and conceptual underpinnings outlined in this section, our re-enrollment intervention was designed to simplify the re-enrollment process and offer a one-course tuition waiver. However, the re-enrollment intervention also mandated FAFSA completion and facilitated an initial conversation with an academic advisor to ensure students would be able to receive necessary financial aid and the opportunity to clarify which courses would allow them to get back on track toward credential completion. Additional researchers have noted the difficulties students face when exploring the "cafeteria style" of community college coursework, indicating that

community college students can be "overwhelmed by the many choices available, resulting in poor program or course selection decisions, which in turn cost time and money, and likely lead many students to drop out in frustration" (Bailey et al., 2015, p. 22). In this study, we examine the long-term impacts of directly addressing the informational and financial barriers facing non-completers via a re-enrollment intervention designed specifically to foster re-enrollment and provide students with some important tools, such as FAFSA registration to receive financial aid and the contact information of an assigned advisor, to facilitate academic success in subsequent semesters.

## Data and Methods

Our sample consists of former students from five high-enrollment community colleges in the state of Florida: Broward College, Hillsborough Community College, Palm Beach State College, Miami Dade College, and Valencia College. The re-enrollment interventions for each participating community college took place during the 2018-19 academic year. To be included in the sample, former students must have left a participating community college without earning their credential within three years of the beginning of the project period. Specifically, we began data collection work during Summer 2017 to identify eligible former students and conducted a final check during Summer 2018 to ensure former students to be included in the study had not already re-enrolled at the participating community college or elsewhere. Additional eligibility criteria included 30 accrued credit hours, a 2.0 GPA or better, and no behavioral or financial holds that would prevent the former students from being allowed to re-enroll in college.

Due to the text messaging component of our re-enrollment intervention, former students were required to have a cell phone number on file to ensure they could receive the targeted text messages. To check to see if the cell phone number on record was active and facilitate all text-based communication for the intervention, we partnered with a third-party vendor. We excluded 21.9 percent of former students due to not having a cell phone number or having a cell phone number that was not active. Finally, we cross-referenced institutional data with data from the National Student Clearinghouse to exclude any student who was already enrolled at another college

or university at the beginning of the project period. The resulting final sample included 27,027 former community college students, who were randomly assigned to a control group, "information-only" treatment group, or "information + one-course waiver" treatment group.

**Control Group**: Students within the control group did not receive information or financial incentives via this experiment (i.e., the "business as usual" approach).

**Information-Only Treatment**: The "information-only" treatment group included students who received ten text messages encouraging them to re-enroll in college and visit a hyperlinked custom website. We created a custom website for each participating college to streamline the re-enrollment process by providing a single button to allow former students to re-enroll immediately, a single button to apply immediately for financial aid, and the contact information of an assigned academic advisor for each former student. As a component of the text-messaging correspondence, former students also received timely reminders to re-enroll and encouraging appeals to return to college before critical deadlines.

**Information + One-Course Tuition Waiver Treatment**: The "information + one-course tuition waiver" treatment group included students who received the same information described in the information-only treatment plus a one-course tuition waiver offer. This waiver could be conditional (i.e., a last-dollar grant that was only given if the student's tuition and fees were not covered by financial aid) or unconditional (i.e., a first-dollar grant that students could receive as cash regardless of whether their tuition and fees were covered by financial aid). We encouraged all participating community colleges to use unconditional waivers, but three institutions offered conditional waivers and two institutions offered the unconditional waiver. Former students in this treatment group were required to apply for the FAFSA to be eligible to receive their one-course tuition waiver.

Before describing the variables, intervention design, and analytic strategy, we compare the characteristics of the five partner community colleges to both the full Florida College System (FCS; $N$ = 28) and all public community colleges in the United States ($N$ = 931). Data for these

comparisons use the Integrated Postsecondary Education Data System and information from the 2018-19 academic year. Because we targeted high-enrollment institutions, average enrollments at our partner institutions (59,113) are larger than both the FCS (22,578) and national (10,484) averages. In addition, the student population at our partner institutions have a higher relative proportion of Black and Hispanic students as well as students receiving Pell grant aid than the full FCS and national samples (Table A1 in the Appendix). Table 1 shows demographic differences in completions and overall graduation rates (measured at 150 percent) among our partner community colleges relative to the full FCS and national samples.

**[INSERT TABLE 1 HERE]**

**Variables**

To examine the effects of re-enrollment campaigns on former students' likelihood of long-term academic success, we measured long-term persistence and credential completion as the outcome variables for this study. For the long-term persistence outcome, we created a binary indicator to capture whether the former students were either still enrolled at their prior institution, transferred to another institution, or had graduated from *any* college or university by the Spring 2022 semester – three years after the completion of the re-enrollment intervention. For the credential completion outcome, we measured whether the former students had earned a certificate, associate degree, or bachelor's degree by the end of the Spring 2022 semester. We measure outcomes to capture the main effects for the pooled sample and explore heterogeneous effects for subgroups of interest, including students with lower GPAs (below 3.0), near completers (more than the median of 42 credit hours), students who departed recently (after Spring 2016), adult students (25 or older), racially minoritized students, and low-income students.

As indicated previously, we included two treatment variables – one treatment variable capturing the "information-only" treatment and another capturing the "information + one-course waiver" treatment. We also included covariates pertaining to former students' background characteristics, such as gender, age, race/ethnicity, English proficiency, grade-point average,

accumulated credits, enrollment intensity, transfer status, and low-income status as measured by whether the former student received need-based aid.

In addition, we included college fixed effects and included models to account for whether the partner institution used a one-course tuition waiver that was conditional or unconditional. As indicated previously, the distinction between a conditional or unconditional waiver is as follows: a conditional waiver only allows former students to waive tuition and fees for a course if at least one of their courses was not already covered by financial aid; however, the unconditional waiver allows any treated student to waive their tuition and fees for one course.

**Intervention Design**

The re-enrollment interventions used at each participating community college were designed uniformly to allow for random assignment, project activities, and follow-up analyses to occur in similar ways. Prior to sending the first batch of text messages, we randomly assigned former students to the control group, the information-only treatment, or the information and one-course waiver treatment and checked for baseline equivalence, which we discuss in greater detail in the following section. The text messages, which began in May 2018, were sent to former students assigned to both treatment groups prior to matriculation deadlines for Summer 2018, Fall 2018, and Spring 2019. Text messages were sent every few weeks, and treated students received a total of ten text messages if they did not opt out (1,192 former students replied "stop" to opt out). The last batch of text messages was delivered to treated students in December 2018. Table 2 shows the content of each text message.

**[INSERT TABLE 2 HERE]**

Prior to designing the intervention, we explored the "business as usual" approach to the re-enrollment process at each participating community college. The "business as usual" re-enrollment process at partner community colleges was typically complex, difficult to navigate, and inconsistent across institutions. To simplify and streamline the re-enrollment process across all five participating community colleges, we created customized websites for each of the interventions at

each of the participating community colleges (see Figures A1 and A2 in the Appendix for examples of the customized websites).

The information-only website was designed to streamline the re-enrollment process by providing a single button to allow former students to re-enroll immediately, a single button to apply for financial aid immediately, and the contact information (name, title, phone number, email address) of an assigned academic advisor. The information and one-course waiver website included the same information designed to streamline the re-enrollment process but also indicated clearly that former students would receive a one-course tuition waiver, which covered up to three credit hours of in-state tuition and fees, if they returned to college. Each of the ten text messages directed former students to visit their assigned, hyperlinked website. During the period of the re-enrollment intervention, 6,480 students visited our customized websites a total of 12,348 times, with the information and one-course waiver website accruing slightly over two-thirds of total site visits and the information-only website accruing slightly less than one-third of total site visits.

**Randomization and Baseline Equivalence**

Given that the initial purpose of the re-enrollment intervention was to induce individual students to re-enroll at their community college, randomization for this multisite randomized controlled trial (RCT) occurred at the student level. To account for potential differences between sites, randomization was blocked within each college so that each partner community college had relatively equivalent numbers of students in each treatment arm. As noted above, we randomly assigned 9,009 former students to the control group, 9,009 to the information-only treatment group, and 9,009 to the information and one-course tuition waiver treatment group. Table 3 reports the descriptive statistics and balance tests for all baseline characteristics included in our empirical models.

**[INSERT TABLE 3 HERE]**

Columns 2 and 3 of Table 3 compare differences between each treatment sample and the control sample. Other than a small marginally significant difference in GPA between the

information-only treatment and control groups ($\Delta = 0.016$, $p < 0.10$), there are no statistically significant differences between groups. Column 4, which reports *F*-statistics on the test of joint difference between all groups, shows no statistically significant differences. Table 3 indicates that the randomization was successful and baseline equivalence was achieved.

Due to the structure of the re-enrollment intervention, which relied on personal contact information, automated text messages, and pre-specified websites, maintaining random assignment over the course of the study was straightforward. Former students only received (or did not receive in the case of the control group) information that was appropriate to the treatment condition to which they were randomly assigned. While there was potential for spillover or contamination effects due to students in different treatment conditions speaking to each other, we did not find evidence to indicate spillover or contamination happened at any of the partner community colleges. All individuals in our sample were not enrolled in college at the beginning of the intervention and most former students attended previously on a part-time basis, suggesting that individuals in our sample did not have the same cohort connections as full-time students and were therefore unlikely to cross-contaminate among the randomly assigned groups.

**Analytic Strategy**

Given that former students were randomly assigned to the control or treatment groups, we were able to examine the effects of the re-enrollment interventions by employing a series of linear probability models to compare the outcomes of former students assigned to the control group to the outcomes of former students assigned to either the "information-only" treatment or the "information + one-course waiver" treatment. Specifically, we estimated the intent-to-treat (ITT) effects by using the following linear probability model:

$$y_{ij} = \beta_0 + \beta_1 INFO_{ij} + \beta_2 INFO\_WAIVER_{ij} + \beta_3 \mathbf{X}_{ij} + \theta_j + \varepsilon_{ij},$$

where $y_{ij}$ is a binary indicator for whether the individual former student *i* who was enrolled previously in community college *j* persisted or graduated from any college or university. The variable $INFO_{ij}$ is a treatment indicator that equals one if a former student *i* was offered information

regarding how to re-enroll at community college *j* and equals zero otherwise. The variable $INFO\_WAIVER_{ij}$ is another binary treatment indicator that equals one if a former student *i* was offered both information on how to re-enroll and a one-course tuition waiver by college *j*. $\mathbf{X}_{ij}$ indicates a vector of background characteristics of former student *i* who enrolled previously in community college *j*. We also included dummy variables for the last academic term in which each student enrolled. $\theta_j$ is a fixed effect for community college *j* and indicates the randomization was conducted within each community college. The error term is represented by $\varepsilon_{ij}$. To account for heteroscedasticity associated with the use of linear probability models, we used robust standard errors.

In addition to our main specifications for the pooled sample, we examined the following subgroups of interest: students with lower GPAs (below 3.0), near completers (more than the median of 42 credit hours), students who departed recently (after Spring 2016), adult students (25 or older), racially minoritized students, and low-income students. Due to the volume of comparisons we conducted in our subgroup analyses, we implemented the Benjamini–Hochberg correction to control the false discovery rate using a sequential modified Bonferroni correction for multiple hypothesis testing (Benjamini & Hochberg, 1995).

## Results

### Effects of Re-Enrollment Campaign on Long-Term Academic Success

We report the main findings for our experimental interventions in Table 4. The key results are precisely estimated and reveal that neither the information-only intervention nor the combined information and one-course waiver intervention has a statistically significant effect on the likelihood of long-term persistence or college completion. Specifically, we find the information-only treatment decreases the likelihood of long-term persistence by 0.007 percentage points (column 1), where the effect of the combined information and one-course waiver intervention decreases the probability of persistence by 0.004 percentage points. Unsurprisingly, we conduct an F-test and are unable to reject a uniform-effects hypothesis between the distinct treatments.

An important goal of this study is to determine whether or not the interventions improve the chances that someone obtains a certificate or degree. We report the findings on this specific analysis in column 3 of Table 4. The estimates we uncover are not substantively different from the effects of both interventions on long-term persistence. We find that the information-only treatment has essentially no effect on the likelihood of earning a postsecondary credential. Specifically, the point estimate is 0.001 percentage points or essentially zero. The estimated effect of the combined information and one-course waiver treatment is virtually the same and is also not statistically significant.

Although the effect of the interventions on the sample of all institutions does not show evidence of an effect on students' long-term persistence or completion behavior, it is important to recognize that the combined information and one-course waiver treatment was implemented differently across some of the community colleges. Because two community colleges in our study offered unconditional course waivers to those who were treated, we examine whether this differential treatment might be comparatively more beneficial to students in terms of whether they are more likely to persist and complete a credential compared to students who were offered a conditional course waiver at the other institutions. As reported in Table 4, individuals who were offered the information-only or combined information and one-course waiver treatments do not appear to be more likely to persist or obtain a credential, and the differential effects of being offered an unconditional course waiver are not statistically significant. As an exploratory check, we examined whether results varied within any of the five individual colleges and found no significant differences in treatment effects across the five colleges.

**[INSERT TABLE 4 HERE]**

**Heterogeneous Effects**

Thus far, we have only estimated the effects of both interventions on the full sample of college dropouts. However, it may be that the effects of the information-only and combined information and one-course waiver are not uniform and vary based on certain sociodemographic

attributes and prior academic performance. Therefore, we present findings on heterogeneous treatment effects of both interventions. Table 5 reports results for the long-term persistence outcome while the results for college completion are reported in Table 6.

Broadly speaking, we find very little evidence that the effects of the interventions vary based on a range of sociodemographic attributes and prior metrics of academic performance. This result applies to both long-term persistence and college completion. Table 5 reports the results for the heterogeneity analysis for the persistence outcome. The top panel of the table reports findings based on prior academic performance and whether an individual dropped out of community college later or more recently. We find that irrespective of whether a student's prior grade point average is above or below a 3.0, the effects for both interventions are not statistically different from zero. We uncover a similar result for the number of accumulated credits a student earned prior to leaving college. Students who accumulated more or fewer than 42 academic credit hours are not influenced by either intervention. The results based on heterogeneity are voluminous, yet we find little evidence that the effects vary based on sociodemographic attributes, based on age, race or ethnicity, and a student's economic status. The estimates of the heterogeneous effects on college completion are very similar and reported in Table 6.

**[INSERT TABLES 5 AND 6 HERE]**

## Discussion

In this study, we show that simplifying and streamlining the re-enrollment process in the form of an "information-only" treatment had no effect on students' likelihood of long-term persistence or credential completion, which aligned with prior work indicating that information alone does not typically improve students' outcomes (e.g., Bird et al., 2021). Although prior experimental evidence revealed positive, statistically significant, and robust effects of the "information and one-course waiver" treatment on students' likelihood of re-enrolling and persisting in the following semester (Ortagus et al., 2021b), our findings reveal no impact of the

"information and one-course waiver" treatment on students' likelihood of *long-term* persistence or credential completion for the pooled sample or any subgroup of interest.

Our findings offer important insights and rigorous evidence for researchers, policymakers, and administrators seeking to identify the specific levers to address the completion problem facing community colleges and their students throughout the U.S. While an informational nudge and one-course tuition waiver represents an effective strategy to foster re-enrollment and short-term persistence among former community college students (Ortagus et al., 2021b), this study shows that the positive short-term effects of re-enrollment campaigns do not hold in the long term without continued support and course waivers. Despite the critical importance of examining the long-term effects of re-enrollment campaigns, our research in this area indicates that it may be challenging to estimate positive treatment effects in this scenario. More specifically, the provision of streamlined information and a one-time, one-course tuition waiver led to a 1.5 percentage point increase in former students' likelihood of re-enrollment (Ortagus et al., 2021b), but our standard errors in the present study are roughly 0.5 percentage points, suggesting that roughly two-thirds of re-enrolled students would need to graduate to estimate a statistically significant positive treatment effect. This is a challenging undertaking given that these students – although they had made considerable progress toward a degree – had already left college without a degree. We outline considerations and potential strategies for future work in this area in the remainder of this section.

One consideration for any researcher, administrator, or policymaker seeking to understand the implications of our findings is whether the null effects we outline are informative or merely a product of underpowered analyses. By randomly assigning over 27,000 students to the control and treatment groups, we were able to maintain internal validity when exploring the long-term impacts of a short-term re-enrollment intervention designed to address informational and financial barriers facing previously successful former students. If the provision of a simplified re-enrollment process and one-course tuition waiver led to positive long-term effects on degree completion, administrators and policymakers would have a low-cost, low-touch, and evidence-based

mechanism to increase credential completions at community colleges. However, the informative, precisely estimated null effects outlined in this study reveal the potential need for sustained financial and academic support for returning non-completers in order to achieve the ultimate goal of credential completion.

Previous literature has indicated that many low-income community college students are not submitting the FAFSA, which is required for financial aid (McKinney & Novak, 2013). In addition, community college students who do not receive financial aid are more likely to become early dropouts (Crosta, 2013), as even small amounts of grant aid can lead to increases in retention among college students (Deming & Dynarski, 2010). Given that previous research has found some localized success with informational nudges focused specifically on the FAFSA (e.g., Castleman & Page, 2016), administrators should continue to emphasize FAFSA completion alongside enrollment and re-enrollment campaigns. By applying for grant money, students may receive more sustained financial support to complement any corresponding financial incentives.

Policymakers should also consider the costs and benefits of increasing wraparound support and services when seeking to improve the long-term persistence and completion outcomes of students who re-enroll in college. Turner and Gurantz's (2023) study focused specifically on one-on-one coaching found modest positive effects on the retention of students who re-enrolled in college. Additional research focused on the implementation of the City University of New York's ASAP model reported that pairing advising, tutoring, and career services with financial support led to significant increases in degree completion among community college students (Miller & Weiss, 2022). Given that recent research has indicated that the COVID-19 pandemic may have exacerbated community college students' likelihood of attrition (Lackner, 2023), future research should further explore how wraparound support and services can incorporate challenges students, particularly re-enrolled students, faced during a global pandemic.

The implications of our results are clear: a re-enrollment intervention including a one-time, one-course tuition waiver may improve outcomes in the short term, but future research should

examine whether sustained, guaranteed financial support is needed to better support former community college students in the long term. A one-course waiver may increase the likelihood of getting former students through the door, but the same financial or non-financial issues that caused these academically successful students to leave initially do not appear to be mitigated through the receipt of a one-course tuition waiver. Future research should examine why academically successful community college dropouts decide to leave college in the first place, how community colleges or policymakers can prevent their early departure, and whether sustained support and financial aid for academically successful non-completers can increase their likelihood of credential completion.

Students may leave college without a degree but eventually re-enroll for a variety of reasons. Recent research leveraged student-level administrative data from multiple states and found that students' predicted baseline risk of stopping out of college in the first place had no effect on their likelihood to return to college due to a re-enrollment intervention (Bettinger et al., 2022). Past literature has also noted that students with higher numbers of earned credits are more likely to re-enroll (e.g., Adelman, 2013; Berkovitz & O'quin, 2006), and students who have taken less time away from college are more likely to re-enroll than students who have not been enrolled for greater lengths of time (DesJardins & McCall, 2010). The inclusion criteria for the present study included students who had at least 30 credits and had last been enrolled three years prior to the initial data pull (i.e., four years prior to the start of the intervention). This indicates that future researchers may consider focusing on a sample of students with higher numbers of earned credits who left college more recently.

Prior work has repeatedly shown that long-term persistence and credential completion have a positive impact on an individual's lifetime earnings (e.g., Hoekstra, 2009; Zimmerman, 2014). This robust body of literature also suggests that increasing completion rates in higher education can represent a good investment from a tax perspective given that estimated increases on individuals' earnings alone are enough to fully recoup government expenditures on financial aid within ten

years (Denning et al., 2019). As administrators and policymakers continue to pursue levers to increase attainment rates at community colleges, our findings indicate that efforts should be focused on the prevention of students' initial departure via emergency funds or the provision of a streamlined re-enrollment process that continues to allocate course waivers until credential completion rather than a one-time, one-course financial incentive.

## References

Adelman, C. (2013). *Searching for our lost associate's degrees: Project Win-Win at the finish line*. Institute for Higher Education Policy.

Baier, S. T., Markman, B. S., & Pernice-Duca, F. M. (2016). Intent to persist in college freshmen: The role of self-efficacy and mentorship. *Journal of College Student Development, 57*(5), 614-619.

Bailey, T. R., Jaggars, S. S., & Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success*. Cambridge, MA: Harvard University Press.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70*(5), 9–49.

Belfield, C. R., & Bailey, T. (2011). The benefits of attending community college: A review of the evidence. *Community College Review, 39*(1), 46-68.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: a practical and powerful approach to multiple testing. J*ournal of the Royal Statistical Society, Series B, 57*(1), 289–300.

Bergman, P., Denning, J. T., & Manoli, D. (2019). Is information enough? The effect of information about education tax benefits on student outcomes. *Journal of Policy Analysis and Management, 38*(3), 706–731.

Berkovitz, R. A., & O'quin, K. (2006). Predictors of graduation of readmitted "at risk" college students. *Journal of College Student Retention: Research, Theory & Practice, 8*(2), 199-214.

Bers, T., & Schuetz, P. (2014). Nearbies: A missing piece of the college completion conundrum. *Community College Review, 42*(3), 167–183.

Bettinger, E. P., Castleman, B. L., Choe, A., & Mabel, Z. (2022). Finishing the last lap: Experimental evidence on strategies to increase attainment for students near college completion. *Journal of Policy Analysis and Management, 41*(4), 1040-1059.

Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *The Quarterly Journal of Economics, 127*(3), 1205-1242.

Bird, K. A., Castleman, B. L., Denning, J. T., Goodman, J., Lamberton, C., & Rosinger, K. O. (2021). Nudging at scale: Experimental evidence from FAFSA completion campaigns. *Journal of Economic Behavior & Organization*, 183, 105-128.

Carnevale, A. P., Cheah, B., & Wenzinger, E. (2021). *The college payoff: More education doesn't always mean more earnings*. Georgetown University Center on Education and the Workforce.

Castleman, B. L., & Page, L. C. (2016). Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence. *Journal of Human Resources*, *51*(2), 389-415.

Causey, J., Lee, S., Ryu, M., Scheetz, A., & Shapiro, D. (2022), Completing college: National and state report with longitudinal data dashboard on six- and eight-year completion rates. (Signature Report 21), Herndon, VA: National Student Clearinghouse Research Center.

Clark, A. (2020). What works for today's students—microgrants. *Washington, DC: Higher Learning Advocates.*

Crosta, P. (2013). *Characteristics of early community college dropouts*. Community College Research Center, Columbia University Teachers College.

Damgaard, M. T., & Nielsen, H. S. (2018). Nudging in education. *Economics of Education Review*, *64*, 313-342.

de Brey, C., Musu, L., McFarland, J., Wilkinson-Flicker, S., Diliberti, M., Zhang, A., Branstetter, C., and Wang, X. (2019). *Status and trends in the education of racial and ethnic groups 2018* (NCES 2019-038). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Deming, D., & Dynarski, S. (2010). College aid. In P. B. Levine & D. J. Zimmerman (Eds.), *Targeting investments in children: Fighting poverty when resources are limited* (pp. 283–302). Chicago, IL: University of Chicago Press.

Denning, J. T., Marx, B. M., & Turner, L. J. (2019). ProPelled: The effects of grants on graduation, earnings, and welfare. *American Economic Journal: Applied Economics*, *11*(3), 193–224.

DesJardins, S. L., & McCall, B. P. (2010). Simulating the effects of financial aid packages on college student stopout, reenrollment spells, and graduation chances. *The Review of Higher Education*, *33*(4), 513-541.

DesJardins, S. L., & Toutkoushian, R. K. (2005). Are students really rational? The development of rational thought and its application to student choice. In *Higher education: Handbook of theory and research* (pp. 191–240). Springer.

Dynarski, S., Nurshatayeva, A., Page, L. C., & Scott-Clayton, J. (2022). *Addressing non-financial barriers to college access and success: Evidence and policy implications* (No. w30054). National Bureau of Economic Research.

Gaulke, A. P. (2022). Returns to bachelor's degree completion among stopouts. *Economics of Education Review*, *86*, 102218.

Gurantz, O., Howell, J., Hurwitz, M., Larson, C., Pender, M., & White, B. (2019). *Realizing your college potential? Impacts of College Board's RYCP campaign on postsecondary enrollment* (Ed Working Paper No. 19-40). Annenberg Institute at Brown University.

Hatch, D. K., & Garcia, C. E. (2017). Academic advising and the persistence intentions of community college students in their first weeks in college. *The Review of Higher Education*, *40*(3), 353-390.

Herzog, S. (2018). Financial aid and college persistence: Do student loans help or hurt? *Research in Higher Education*, *59*(3), 273-301.

Hoekstra, M. (2009). The effect of attending the flagship state university on earnings: A discontinuity based approach. *The Review of Economics and Statistics*, *91*(4), 717–724.

Institute for Higher Education Policy. (2011). *Crossing the finish line: A national effort to address near completion*. http://www.ihep.org/sites/default/files/ uploads/docs/pubs/brief_crossing_the_line-near_ completion.pdf

Jepsen, C., Troske, K., & Coomes, P. (2014). The labor-market returns to community college degrees, diplomas, and certificates. *Journal of Labor Economics*, *32*(1), 95-121.

Karlan, D., McConnell, M., Mullainathan, S., & Zinman, J. (2016). Getting to the top of mind: How reminders increase saving. *Management Science*, *62*(12), 3393-3411.

Kruger, K., Parnell, A., & Wesaw, A. (2016). Landscape analysis of emergency aid programs. *National Association of Student Personnel Administrators (NASPA)*, 15.

Lackner, E. (2023). Community college student persistence during the COVID-19 crisis of spring 2020. *Community College Review*, *51*(2), 193-215.

Lashure, F., Randall, S., & Hinkle, H. (2019). The retention project and the investigation of a non-returning new student re-enrollment strategy. *Strategic Enrollment Management Quarterly, 7*(1), 25–36.

Long B. T. (2007). The contributions of economics to the study of college access and success. *Teachers College Record*, *109*(10), 2367–2443.

Long, B. T., & Riley, E. (2007). Financial aid: A broken bridge to college access? *Harvard Educational Review*, *77*(1), 39-63.

Marx, B. M., & Turner, L. J. (2019). Student loan nudges: Experimental evidence on borrowing and educational attainment. *American Economic Journal: Economic Policy*, *11*(2), 108-141.

McKinney, L., & Novak, H. (2013). The relationship between FAFSA filing and persistence among first-year community college students. *Community College Review*, *41*(1), 63-85.

Rosinger, K., Meyer, K., & Wang, J. (2021). Leveraging insights from behavioral science and administrative burden in free college program design: A typology. *Journal of Behavioral Public Administration*, *4*(2).

Miller, C., & Weiss, M. J. (2022). Increasing community college graduation rates: A synthesis of findings on the ASAP model from six colleges across two states. *Educational Evaluation and Policy Analysis*, *44*(2), 210-233

Nguyen, T. D., Kramer, J. W., & Evans, B. J. (2019). The effects of grant aid on student persistence and degree attainment: A systematic review and meta-analysis of the causal evidence. *Review of Educational Research*, *89*(6), 831-874.

Oreopoulos, P., & Petronijevic, U. (2019). The remarkable unresponsiveness of college students to nudging and what we can learn from it (No. w26059). *National Bureau of Economic Research*.

Ortagus, J. C., Skinner, B. T., & Tanner, M. J. (2021a). Investigating why academically successful community college students leave college without a degree. *AERA Open*, *7*.

Ortagus, J. C., Tanner, M., & McFarlin, I. (2021b). Can re-enrollment campaigns help dropouts return to college? Evidence from Florida community colleges. *Educational Evaluation and Policy Analysis*, *43*(1), 154-171.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. Jossey-Bass, An Imprint of Wiley. Indianapolis, IN.

Paulsen, M. B., & Toutkoushian, R. K. (2008). Economic models and policy analysis in higher education: A diagrammatic exposition. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 1–48). Springer.

Page, L. C., Kehoe, S. S., Castleman, B. L., & Sahadewo, G. A. (2019). More than dollars for scholars the impact of the Dell Scholars Program on college access, persistence, and degree attainment. *Journal of Human Resources*, *54*(3), 683-725.

Peters, E. E., Roberson, A. J., & Voight, M. (2019). The cost of opportunity: Student stories of college affordability. http://www.ihep.org/sites/default/ files/uploads/docs/pubs/ihep_student_voices_full_ report_v6_web_pages.pdf

Rath, B., Rock, K., & Laferriere, A. (2013). *Pathways through college: Strategies for improving community college student success*. Hartford, CT: Our Piece of the Pie.

Schwartz, N. (2019, June 19). How colleges are bringing back stopped-out students. *Education Dive.* https:// www.educationdive.com/news/how-colleges-arebringing-back-stopped-out-students/556706/

Shapiro, D., Ryu, M., Huie, F., & Liu, Q. (2019). Some college, no degree: A 2019 snapshot for the nation and 50 states (Signature Report No. 17). *National Student Clearinghouse*.

Snyder, T. D., De Brey, C., & Dillow, S. A. (2018). *Digest of Education Statistics 2016* (NCES 2017- 094). National Center for Education Statistics.

Spica, E., & Biddix, J. P. (2021). Prices they pay: Academic achievement and progress to graduation barriers experienced by community college students due to the cost of course materials. *Innovative Higher Education*, *46*(6), 643-662.

Sublett, C., & Taylor, J. (2021). Net tuition, unmet financial need, and cooling out: A national study of degree aspirations among first-time community college students. *Community College Review*, *49*(4), 389-412.

Stewart, S., Lim, D. H., & Kim, J. (2015). Factors influencing college persistence for first-time students. *Journal of Developmental Education*, 12-20.

Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow™: Using behavioral economics to increase employee saving. *Journal of Political Economy, 112*(S1), S164-S187.

Turner, L. J., & Gurantz, O. (2023). *Experimental estimates of college coaching on postsecondary re-enrollment*. (Ed Working Paper No. 23-746). Annenberg Institute at Brown University.

Wang, X. (2009). Baccalaureate attainment and college persistence of community college transfer students at four-year institutions. *Research in Higher Education*, *50*(6), 570-588.

Zimmerman, S. D. (2014). The returns to college admission for academically marginal students. *Journal of Labor Economics*, *32*(4), 711-754.

# Tables

**Table 1**

*Comparison of Completions and Graduation Rates Between our Sample Institutions, All Florida College System Institutions, and All Public Community Colleges in the United States*

| | Sites | Florida College System | National |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Completions* | | | |
| Total | 6831 | 2600 | 826 |
| | (2705) | (2475) | (960) |
| Men (%) | 39.14 | 38 | 38.63 |
| | (1.76) | (3.36) | (8.59) |
| AI/AN (%) | 0.23 | 0.34 | 1.24 |
| | (0.12) | (0.36) | (4.44) |
| Asian (%) | 3.16 | 2.83 | 4.12 |
| | (1.35) | (1.35) | (6.62) |
| Black (%) | 19.04 | 12.83 | 10.85 |
| | (7.32) | (5.89) | (13.5) |
| Hispanic (%) | 40.13 | 20.46 | 16.7 |
| | (16.7) | (13.93) | (18.8) |
| NH/PI (%) | 0.23 | 0.2 | 0.74 |
| | (0.12) | (0.17) | (6.66) |
| White (%) | 24.92 | 54.9 | 58.66 |
| | (13.16) | (17.64) | (24.93) |
| More than one race (%) | 2.4 | 2.95 | 3.28 |
| | (1.09) | (1.23) | (4.03) |
| 18-24 (%) | 64.3 | 61.74 | 56.54 |
| | (4.88) | (7.74) | (13.51) |
| 25-39 (%) | 28.41 | 26.35 | 32.09 |
| | (2.8) | (5.19) | (10.25) |
| 40+ (%) | 6.1 | 7.57 | 10.08 |
| | (1.13) | (2.32) | (5.68) |
| *Graduation Rates (150%)* | | | |
| Total | 35.19 | 39.25 | 29.84 |
| | (4.31) | (7.57) | (11.29) |
| Men (%) | 32.85 | 36.64 | 28.74 |
| | (4.15) | (8.11) | (12.28) |
| AI/AN (%) | 20.5 | 22.75 | 16.65 |
| | (15.63) | (22.87) | (25.4) |
| Asian (%) | 55.52 | 54.72 | 30.68 |
| | (5.56) | (17.9) | (26.95) |
| Black (%) | 26.37 | 25.56 | 17.83 |
| | (3.77) | (8.1) | (13.82) |
| Hispanic (%) | 34.81 | 37.91 | 26.07 |
| | (2.26) | (8.79) | (15.86) |
| NH/PI (%) | 32.21 | 27.48 | 12.16 |
| | (25.36) | (29.01) | (26.23) |
| White (%) | 40.2 | 43.17 | 32.84 |
| | (3.8) | (7.8) | (13.1) |
| More than one race (%) | 33.55 | 33.17 | 22.29 |
| | (2.9) | (14.66) | (18.38) |
| *N* | 5 | 28 | 931 |

*Note*. Estimates are averages within each sample, with standard deviations in parentheses. All data comes from the Integrated Postsecondary Education Data System in the 2018-19 academic year. Values in column (1) are limited to the RCT sample (5 FCS colleges); values in column (2) represent all institutions in the Florida College System; values in column (3) represent all public community colleges in the United States.

**Table 2**

*Example Text Messages for Each Text Message Condition: Information Only and Information Plus Tuition Waiver (Conditional and Unconditional)*

| # | Info | Conditional Wavier | Unconditional Waiver |
|---|---|---|---|
| 1 | Palm Beach State College (PBSC) wants you back! We have simplified the enrollment process. Go to [web link for info site.] for more info. Reply stop to stop | Palm Beach State College (PBSC) wants you back! We will cover the tuition for your next course. See how at [link to waiver website] Reply stop to stop | Palm Beach State College (PBSC) wants you back! We will cover the tuition for your next course. See how at [link to waiver website]. Reply stop to stop |
| 2 | You are so close to finishing your degree! Let Palm Beach State College help you reach your goals. Learn more at [web link for info site.] Reply stop to stop | If financial aid does not already cover your next course, PBSC will waive the tuition for that course. Learn more at [link to waiver website] Reply stop to stop | Need help paying for your degree? HCC can help you apply for financial aid (FAFSA). See how at [link to waiver website] Reply stop to stop |
| 3 | Need help paying for your degree? Palm Beach State College can help you apply for financial aid (FAFSA). See how at [web link for info site.] Reply stop to stop | Need help paying for your degree? Palm Beach State College can help you apply for financial aid (FAFSA). See how at [link to waiver website] Reply stop to stop | Do not miss this special offer to enroll in your next course at HCC for free. Learn more at [link to waiver website] Reply stop to stop |
| 4 | Any questions about registering for classes? PBSC can offer advising or enrollment assistance. More info @ [web link for info site.] Reply stop to stop | Any questions about registering using your tuition waiver? PBSC can offer advising or enrollment assistance. More info @ [link to waiver website] Reply stop to stop | Any questions about registering using your tuition waiver? HCC can offer advising or enrollment assistance. More info @ [link to waiver website] Reply stop to stop |
| 5 | It is not too late to register for classes! The fall semester at PBSC begins on August 23. Learn more @ [web link for info site.] Reply stop to stop | It is not too late to register for classes! The fall semester at PBSC begins on August 23. Claim your tuition waiver @ [link to waiver website] Reply stop to stop | It is not too late to register for classes! The fall semester at HCC begins on August 20. Claim your tuition waiver @ [link to waiver website] Reply stop to stop |
| 6 | You still have time to register! PBSC offers flexible online and night classes to fit your schedule. Get started @ [web link for info site.] Reply stop to stop | You still have time to register! PBSC offers flexible online and night classes to fit your schedule. Get started @ [link to waiver website] Reply stop to stop | You still have time to register! HCC offers flexible online and night classes to fit your schedule. Get started @ [link to waiver website] Reply stop to stop |
| 7 | Palm Beach State College wants you back! Spring registration is now open. Go to [web link for info site.] for more info. Reply stop to stop | Spring registration is now open! Palm Beach State College will cover the tuition for your next course. See how at [link to waiver website] Reply stop to stop | Spring registration at is about to begin! Hillsborough CC will cover the tuition for your next course. See how at [link to waiver website] Reply stop to stop |
| 8 | Need help paying for your degree? Palm Beach State College can help you apply for financial aid (FAFSA). See how at [web link for info site.] Reply stop to stop | Need help paying for your degree? PBSC will cover your next course and help you apply for financial aid. See how at [the waiver site link.] Reply stop to stop | Need help paying for your degree? HCC will cover your next course and help you apply for financial aid. See how at [the waiver site link.] Reply stop to stop |
| 9 | It is not too late to register for classes! The spring semester at PBSC begins on January 4. Learn more @ [web link for info site.] Reply stop to stop | It is not too late to register for classes! The spring semester at PBSC begins on January 4. Claim your tuition waiver @ [the waiver site link.] Reply stop to stop | It is not too late to register for classes! The spring semester at HCC begins on January 7. Claim your tuition waiver @ [the waiver site link.] Reply stop to stop |
| 10 | This is your final reminder to register for classes at PBSC for the Spring semester. Contact your advisor at [web link for info site.] Reply stop to stop | This is your final reminder to claim your tuition waiver at PBSC for the Spring semester. Contact your advisor at [the waiver site link.] Reply stop to stop | This is your final reminder to claim your tuition waiver at HCC for the Spring semester. Contact your advisor at [the waiver site link.] Reply stop to stop |

*Note*. Estimates are averages within each sample, with standard deviations in parentheses. All data comes from the Integrated Postsecondary Education Data System in the 2018-19 academic year. Values in column (1) are limited to the RCT sample (5 FCS colleges); values in column (2) represent all institutions in the Florida College System; values in column (3) represent all public community colleges in the United States.

**Table 3**

*Descriptive Statistics and Balance Tests*

| | Control Mean | Information Vs. Control | Information & waiver vs. Control | F-stat (All = Control) | Observations |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Male | 0.415 | 0.004<br>(0.007) | -0.001<br>(0.007) | 0.246<br>(0.782) | 27,027 |
| Age | 31.55 | 0.003<br>(0.142) | 0.105<br>(0.142) | 0.353<br>(0.703) | 27,027 |
| Black | 0.24 | 0.004<br>(0.006) | 0.004<br>(0.006) | 0.288<br>(0.75) | 27,027 |
| Hispanic | 0.163 | -0.003<br>(0.005) | -0.002<br>(0.005) | 0.19<br>(0.827) | 27,027 |
| Multiracial | 0.292 | -0.002<br>(0.006) | -0.005<br>(0.006) | 0.317<br>(0.728) | 27,027 |
| Other race | 0.027 | -0.002<br>(0.002) | -0.003<br>(0.002) | 0.752<br>(0.471) | 27,027 |
| Limited English proficiency | 0.124 | -0.003<br>(0.005) | -0.005<br>(0.005) | 0.496<br>(0.609) | 27,027 |
| Grade-point average | 2.78 | 0.016+<br>(0.009) | 0.002<br>(0.009) | 1.789<br>(0.167) | 26,550 |
| Accumulated credits | 44.907 | 0.317<br>(0.339) | 0.31<br>(0.339) | 0.571<br>(0.565) | 27,027 |
| Full time | 0.122 | 0.007<br>(0.005) | -0.004<br>(0.005) | 2.396<br>(0.091) | 27,027 |
| Transfer student | 0.199 | -0.007<br>(0.005) | -0.008<br>(0.005) | 1.301<br>(0.272) | 27,027 |
| Need-based aid recipient | 0.456 | 0.004<br>(0.007) | -0.005<br>(0.007) | 0.816<br>(0.442) | 27,027 |
| Grade point average missing | 0.018 | -0.001<br>(0.002) | -0.001<br>(0.002) | 0.08<br>(0.923) | 27,027 |

*Note*. Standard deviations are reported in parentheses in column (1). Standard errors are shown in parentheses in columns (2) and (3). *p* values for *F* tests are reported in parentheses in column (4). The number of non-missing observations are reported in column (5). Significant at $+p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$.

**Table 4**

*Estimated Effects of Re-enrollment Campaign*

| | Persistence | | Graduation | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Information | -0.007 | -0.009 | 0.001 | 0.000 |
| | (0.005) | (0.006) | (0.005) | (0.005) |
| Information and one-course waiver | -0.004 | -0.007 | 0.000 | -0.003 |
| | (0.005) | (0.006) | (0.005) | (0.005) |
| Information * Unconditional waiver | | 0.007 | | 0.006 |
| | | (0.013) | | (0.012) |
| Information and one-course waiver * Unconditional waiver | | 0.013 | | 0.011 |
| | | (0.013) | | (0.012) |
| Control mean | 0.170 | 0.170 | 0.111 | 0.111 |
| $R^2$ | 0.071 | 0.071 | 0.044 | 0.044 |
| *p*-value (F-test of equality of treatment effects) | 0.555 | | 0.706 | |
| *p*-value (F-test of joint significance of interaction effects) | | 0.631 | | 0.620 |
| *N* | 27,027 | 27,027 | 27,027 | 27,027 |

*Note*. Coefficients reported are from linear probability models of the estimated effects of information and financial nudges on persistence and graduation of college dropouts, controlling for baseline covariates and college-level fixed effects. All outcomes are measured three years after the completion of the re-enrollment intervention (end of Spring 2022). Baseline covariates are those variables included in Table 3. Observations with missing grade point average are coded with the median values and we include an indicator for covariate missingness. Robust standard errors are reported in parentheses. Significant at $+p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$.

**Table 5**

*Estimated Effects of Re-enrollment Campaign on Likelihood of Persistence by Academic Performance and Demographics*

| | GPA | | Accumulated credits | | Semesters since dropped out | |
|---|---|---|---|---|---|---|
| | GPA < 3.0 | GPA ≥ 3.0 | Accumulated credits ≤ 42 | Accumulated credits > 42 | Dropout ≤ Fall 2015 | Dropout ≥ Spring 2016 |
| Information | -0.009 | -0.005 | -0.015 | 0.000 | -0.004 | -0.012 |
| | (0.007) | (0.009) | (0.007) | (0.008) | (0.006) | (0.009) |
| Information and one-course waiver | -0.002 | -0.007 | -0.014 | 0.007 | -0.004 | -0.005 |
| | (0.007) | (0.009) | (0.007) | (0.008) | (0.006) | (0.009) |
| Control mean | 0.159 | 0.195 | 0.163 | 0.178 | 0.132 | 0.224 |
| *N* | 16,898 | 9,652 | 13,671 | 13,356 | 16,050 | 10,977 |
| | Age | | Race/ethnicity | | Socioeconomic status | |
| | Age ≤ 24 | Age ≥ 25 | Black or Hispanic | Non-Hispanic White | Low income | Not low income |
| Information | -0.019 | -0.004 | -0.011 | -0.008 | -0.015 | 0.000 |
| | (0.012) | (0.006) | (0.008) | (0.011) | (0.007) | (0.008) |
| Information and one-course waiver | -0.008 | -0.003 | 0.003 | -0.007 | -0.009 | 0.001 |
| | (0.012) | (0.006) | (0.008) | (0.011) | (0.007) | (0.008) |
| Control mean | 0.238 | 0.147 | 0.169 | 0.166 | 0.154 | 0.185 |
| *N* | 6,752 | 20,275 | 10,882 | 6,258 | 13,121 | 13,906 |

*Note*. Coefficients reported are from linear probability models of the estimated effects of information and financial nudges on persistence of college dropouts, controlling for baseline covariates and college-level fixed effects. All outcomes are measured three years after the completion of the re-enrollment intervention (end of Spring 2022). Baseline covariates are those variables included in Table 3. Observations with missing GPA are coded with median values and we include an indicator for missing GPA. Robust standard errors are reported in parentheses. GPA = grade point average. Significant at $+p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$ after Benjamini-Hochberg correction.

**Table 6**

*Estimated Effects of Re-enrollment Campaign on Likelihood of Graduation by Academic Performance and Demographics*

| | GPA | | Accumulated credits | | Semesters since dropped out | |
|---|---|---|---|---|---|---|
| | GPA < 3.0 | GPA ≥ 3.0 | Accumulated credits ≤ 42 | Accumulated credits > 42 | Dropout ≤ Fall 2015 | Dropout ≥ Spring 2016 |
| Information | 0.001 | 0.001 | -0.003 | 0.006 | 0.004 | -0.003 |
| | (0.006) | (0.008) | (0.006) | (0.007) | (0.005) | (0.008) |
| Information and one-course waiver | 0.001 | -0.004 | -0.008 | 0.007 | -0.003 | 0.003 |
| | (0.006) | (0.008) | (0.006) | (0.007) | (0.005) | (0.008) |
| Control mean | 0.101 | 0.135 | 0.097 | 0.126 | 0.081 | 0.155 |
| *N* | 16,898 | 9,652 | 13,671 | 13,356 | 16,050 | 10,977 |
| | Age | | Race/ethnicity | | Socioeconomic status | |
| | Age ≤ 24 | Age ≥ 25 | Black or Hispanic | Non-Hispanic White | Low income | Not low income |
| Information | -0.016 | 0.007 | -0.002 | -0.002 | -0.01 | 0.012 |
| | (0.011) | (0.005) | (0.007) | (0.01) | (0.006) | (0.007) |
| Information and one-course waiver | -0.008 | 0.001 | 0.006 | -0.001 | -0.01 | 0.008 |
| | (0.011) | (0.005) | (0.007) | (0.009) | (0.006) | (0.006) |
| Control mean | 0.164 | 0.093 | 0.112 | 0.108 | 0.113 | 0.11 |
| *N* | 6,752 | 20,275 | 10,882 | 6,258 | 13,121 | 13,906 |

*Note*. Coefficients reported are from linear probability models of the estimated effects of information and financial nudges on graduation of college dropouts, controlling for baseline covariates and college-level fixed effects. All outcomes are measured three years after the completion of the re-enrollment intervention (end of Spring 2022). Baseline covariates are those variables included in Table 3. Observations with missing GPA are coded with median values and we include an indicator for missing GPA. Robust standard errors are reported in parentheses. GPA = grade point average. Significant at $+p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$ after Benjamini-Hochberg correction.

# Appendix

**Table A1**

*Comparison of Admissions and Costs Between our Sample Institutions, All Florida College System Institutions, and All Public Community Colleges in the United States*

| | Sites | Florida College System | National |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Enrollments* | | | |
| Total | 59113 | 22578 | 10484 |
| | (18394) | (20939) | (12276) |
| Men (%) | 41.66 | 39.63 | 42.02 |
| | (0.82) | (2.85) | (7.22) |
| AI/AN (%) | 0.2 | 0.34 | 1.32 |
| | (0.08) | (0.21) | (4.38) |
| Asian (%) | 2.93 | 2.53 | 4.03 |
| | (1.17) | (1) | (6.1) |
| Black (%) | 21.47 | 15.64 | 12.71 |
| | (7.13) | (6.7) | (14.16) |
| Hispanic (%) | 40.24 | 21.04 | 17.57 |
| | (15.84) | (13.49) | (18.53) |
| NH/PI (%) | 0.2 | 0.22 | 0.79 |
| | (0.09) | (0.16) | (6.74) |
| White (%) | 23.4 | 52.15 | 54.48 |
| | (12.32) | (16.68) | (23.29) |
| More than one race (%) | 2..68 | 3.29 | 3.6 |
| | (1.23) | (1.19) | (3.71) |
| *Costs* | | | |
| Net price ($) | 5510 | 5691 | 7586 |
| | (3995) | (3215) | (2947) |
| Average grant aid ($) | 4189 | 4085 | 4213 |
| | (441) | (972) | (810) |
| Pell grant recipients (%) | 45 | 36.11 | 33.9 |
| | (9.95) | (7.52) | (12.31) |
| Any aid recipients (%) | 75.6 | 74.04 | 79.33 |
| | (4.83) | (7.05) | (13.49) |
| *N* | 5 | 28 | 931 |

*Note.* Estimates are averages within each sample, with standard deviations in parentheses. All data comes from the Integrated Postsecondary Education Data System in the 2019 calendar year or the 2018-19 academic year. Values in column (1) are limited to the RCT sample (5 FCS colleges); values in column (2) represent all institutions in the Florida College System; values in column (3) represent all public community colleges in the United States.

**Table A2**

*Estimated Effects of Re-enrollment Campaign (Without Baseline Covariates)*

| | Persistence | | Graduation | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Information | -0.007 | -0.008 | 0.002 | 0.001 |
| | (0.005) | (0.006) | (0.005) | (0.005) |
| Information and one-course waiver | -0.005 | -0.007 | -0.001 | -0.003 |
| | (0.005) | (0.006) | (0.005) | (0.005) |
| Information * Unconditional waiver offered | | 0.006 | | 0.006 |
| | | (0.014) | | (0.012) |
| Information and one-course waiver * Unconditional waiver | | 0.010 | | 0.009 |
| | | (0.014) | | (0.012) |
| Control mean | 0.17 | 0.17 | 0.111 | 0.111 |
| $R^2$ | 0.029 | 0.029 | 0.006 | 0.006 |
| *p*-value (F-test of equality of treatment effects) | 0.729 | | 0.537 | |
| *p*-value (F-test of joint significance of interaction effects) | | 0.769 | | 0.734 |
| *N* | 27,027 | 27,027 | 27,027 | 27,027 |

*Note*. Coefficients reported are from linear probability models of the estimated effects of information and financial nudges on persistence and graduation of college dropouts with college-level fixed effects. Robust standard errors are reported in parentheses. Significant at $+p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$.

**Figure A1**

*Website Landing Page for Palm Beach State College Students in the Information-Only Treatment Group*

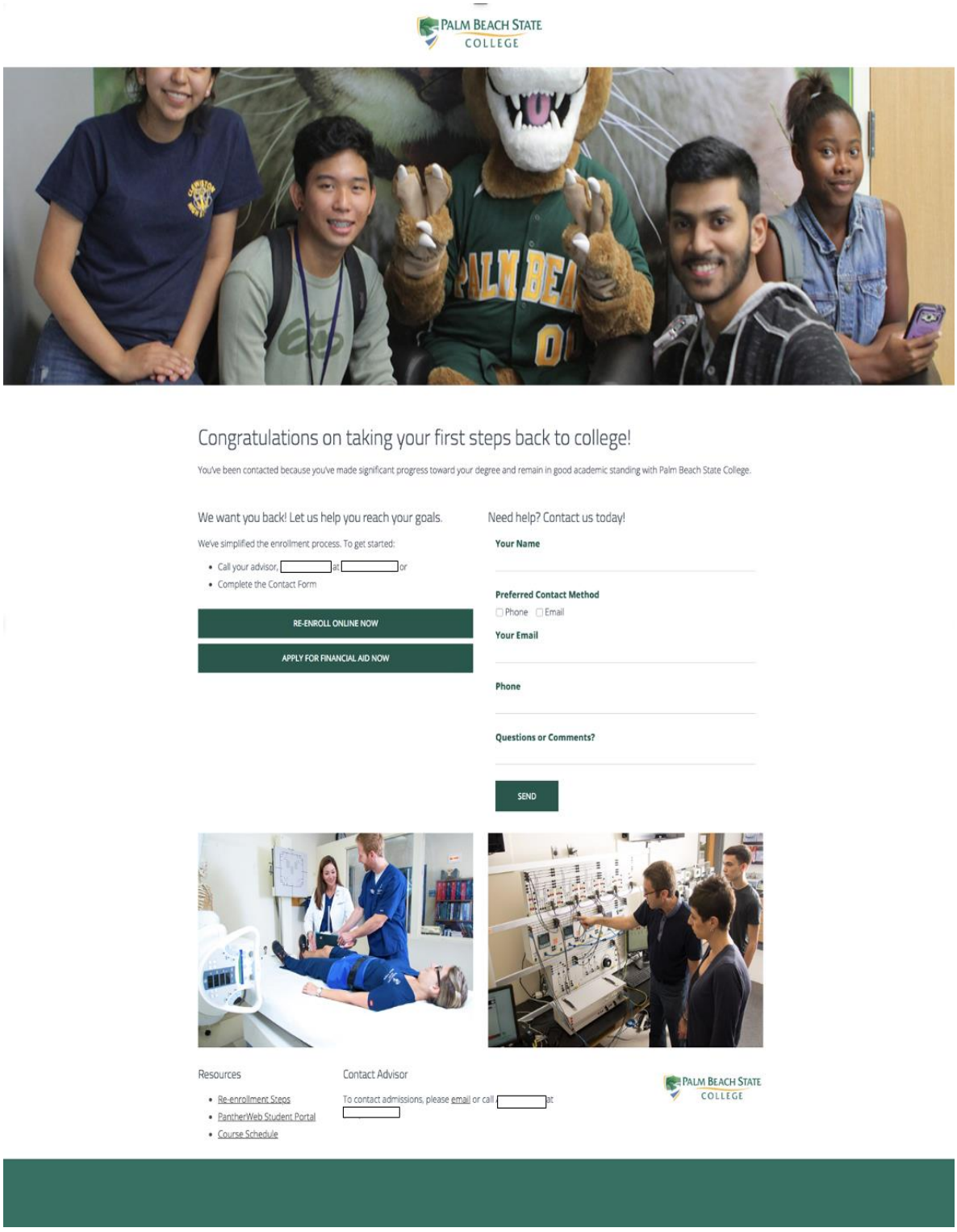

**Figure A2**

*Website Landing Page for Valencia College Students in the Information Plus Tuition Waiver Offer Treatment Group*