

Symposium Title: Nudging Students through the Postsecondary Pipeline: Information, Reminders, and Advice from Enrollment to Degree Completion

Organizer: James Benson (Institute of Education Sciences)

Discussant: Lashawn Richburg-Hayes (Insight Policy Research)

This symposium will include findings from four evaluations of large-scale nudging campaigns that engage students at key college-going decision points with the aim of helping them navigate the complex postsecondary system. Viewed as a set, the four studies will advance understanding of how students respond to nudges at different stages in their postsecondary careers and provide evidence of whether and under what circumstances nudges can lead to improved student outcomes. Answers to these questions are critical for informing educational policy because although nudging implementation is less expensive than systemic reforms, bringing nudging campaigns to scale requires substantial data integration and messaging coordination within postsecondary institutions. Policymakers need guidance regarding when nudges can be helpful, how to construct effective ones, and whether broader organizational or systemic changes (rather than or in addition to nudges) are necessary for improving student outcomes.

Navigating the college pipeline from start to finish is an extraordinarily complex process. The oft-mentioned college pipeline may be more aptly represented as a multi-level maze, with numerous options, decision points, and obstacles. The decision context, or “choice architecture,” (Thaler & Sunstein, 2008) may be so overwhelming that students respond to it by delaying decisions or making poor choices that lead to sizable delays in their progression to degree; and as delays and mistakes accrue, students may decide to leave school entirely. For these reasons postsecondary researchers have turned their attention to helping students navigate the college pipeline.

Nudging research to date has generally employed relatively small samples at a small number of colleges or in a limited geographic area (e.g. Castleman and Meyer 2016) and has tended to focus on the beginning stages of the postsecondary pipeline, i.e. applying to, transitioning to, and succeeding in the first year of college (e.g. Castleman and Page 2016). This symposium extends research on the transition to college with three large studies. **Paper #1** presents findings from two RCTs of large nudging campaigns that engaged students during the (early) application, enrollment and matriculation stages of the pipeline. Both RCTs employ samples with strong internal validity drawn from significant portions of the target population: low-income students nationally who took the SAT or ACT; and urban high school students in Texas. **Paper #2** employs a national sample to test whether conditional cash incentives can augment nudging campaigns such that they induce high-achieving students to apply to, enroll in, and matriculate to high-performing colleges. **Paper #3** presents findings from an RCT using a nationally-representative sample to test an intervention that engaged students during the second half of their first year of college, with the intent of increasing students’ FAFSA completion and access to financial aid for their second year of college. **Paper #4** extends nudging research into the later

stages of the college pipeline by presenting findings from an RCT employing a large sample across five states to test an intervention that focuses entirely on students who have completed at least half of the credits necessary for their (two- or four-year) degree. Responding to varied effect sizes including null effects in some previous studies (e.g. Phillips and Reber 2018), each of the evaluations also looks closely at potential moderating factors including the extent of implementation, the relevance and framing of information, and varied responsiveness across student groups.

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Paper #1: Digital Messaging to Improve College Enrollment and Success

Authors: Christopher Avery (Harvard University), Benjamin L. Castleman (University of Virginia), Michael Hurwitz (The College Board), Bridget Terry Long (Harvard University), and Lindsay C. Page* (University of Pittsburgh)

Background/Context: Students from low-income backgrounds face substantial barriers to college entry and success. Prior research demonstrates that interventions focused on providing students with information about college and financial aid and access to assistance can increase college enrollment (e.g., Bettinger et al, 2012; Hoxby and Turner, 2013), and text messaging has been shown to be a cost-effective approach to increase students' college and financial literacy and to connect them to professional support when they need help (Castleman & Page, 2015, 2016).

Purpose/Objective/Research Question: In this study, we investigate the efficacy of a text messaging campaign designed to provide high school students with timely and digestible information all along the pathway from college exploration during junior year through to college matriculation in the fall after high school graduation.

Setting & Sample: We conducted this investigation with two distinct samples of students. First, in collaboration with the College Board and uAspire, both national non-profit organizations, we implemented text-message based outreach and advising to students in over 700 US high schools. We selected a sample of schools that primarily served large shares of low-income students, and invited them to participate in the program. Schools who agreed to participate administered an additional form during the October 2014 PSAT administration. From these high schools, students gave consent to be involved in the program when they took the PSAT as high school juniors in October 2014. Based on this recruitment method, we delivered text-based outreach to approximately 70,000 high school students in the class of 2016 to provide important college and financial aid information, with the goal of improving their postsecondary opportunities and outcomes.

Second, we collaborated with several Texas-based school districts to implement a version of the text-based intervention. The Texas sample primarily was made up of urban districts in the Houston and Austin metropolitan areas. All students in the high school graduating class of 2016 for whom the participating schools had cell phone numbers received outreach.

Intervention/Program/Practice: For both samples, the key experimental intervention involved text-message based outreach on a regular basis to remind students about key steps in the college search, application, selection and transition process and to provide them guidance and personalized support in navigating these processes. Within the “national” sample, the messaging was centralized, with all treatment group students receiving the same message content, and the messages being sent on behalf of the College Board by advisors who were employed as full-time at uAspire (headquartered in Boston, MA). The text-outreach to treatment-assigned students invited text-based, two-way communication with a designated advisor. Advisors had extensive

knowledge about the college applications and admissions and FAFSA and financial aid processes and were equipped with location-specific information about postsecondary options. Students assigned to the control condition also received modest text-based communication directly from the College Board that consisted of light-touch, one-way messages with periodic reminders about the college-going process.

Within the Texas sample, messages were generally sent by students' high school counselors, and as such, message content varied modestly across participating Texas high schools to align with the context of each school. Across both samples, the topics covered by the messaging were similar and included: SAT / ACT taking and re-taking, college search processes, college application deadlines, applying for financial aid (including FAFSA and scholarship search), college selection, and college transition tasks. In the national sample, students received outreach approximately once per month, whereas in the Texas sample, students received outreach more frequently (e.g., once each week or every other week). In both samples, outreach began in Spring 2015 and continued through September 2016.

Research Design: We used a cluster randomized control trial design. For both samples, we conducted randomization at the school level. Prior to randomization, we grouped like schools according to prior college-going measures and then randomized within groups to ensure balance along key dimensions of prior college going. For the national sample, we also grouped schools by state and school type (i.e., public or private).

Data Collection and Analysis: We rely on several sources of data to investigate the implementation and impact of this effort. In the national sample, we rely primarily on administrative records from the College Board, college enrollment records from the National Student Clearinghouse, and school-level FAFSA completion data from Federal Student Aid (FSA). In addition, we use data on all text messages exchanged between students and advisors to gauge student engagement with the text outreach. In the Texas sample, we similarly rely on administrative records from the participating districts, National Student Clearinghouse records, and text-message engagement data. By pulling together these multiple sources of data, we are able to examine impacts on key steps in the college-going process as well as initial college enrollment and early patterns of college persistence.

Findings/Results/Conclusions: We are currently analyzing data from both experiments and will be prepared to share comprehensive experimental results and associated conclusions / implications at the SREE 2019 conference.

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Paper #2: Cash for College Apps: The Effects of Conditional Cash Transfers on Selective College Enrollment

Authors: Benjamin L. Castleman (University of Virginia), Zachary Sullivan* (University of Virginia)

Background/Context: Over the last decade, numerous studies have investigated whether providing students with financial incentives can reduce gaps in educational achievement and attainment. Prior research suggests that input incentives (e.g. paying students to read books) can be more effective than output incentives (e.g. paying students for passing an exam) at increasing student academic performance (e.g. Angrist et al., 2009; Leuven et al., 2010; Dee, 2011; Fryer, 2011). Fryer (2011) posits that incentives for inputs are more effective because students can exert better control over them than outputs. Despite evidence that input incentives can positively affect student behaviors, most input-based interventions have focused on routine educational practices among elementary- and middle-school age students. Given the positive impacts on earnings associated with attending high-quality institutions (e.g. Zimmerman, 2015; Hoekstra 2012; Goodman et al., 2015), leveraging input incentives when students are applying to college could be a particularly efficient use of scarce resources.

Purpose/Objective/Research Question: In this study, we investigate the effects of conditional cash transfers on students' decisions to apply to high-quality colleges proximate to their homes, and to colleges located across the country. The incentives were designed to encourage students to attend relatively selective colleges from which they are more likely to graduate compared to less-selective colleges. Because all students in the study received the same information about high-quality proximate and national college options, the study tests the extent to which incentives add to the utility of college-going information when encouraging high-achieving students to attend colleges that match their abilities.

Setting & Sample: We conducted this intervention with a national sample of high-achieving, low- and middle-income students. To be eligible for the intervention, students must meet the following criteria: (1) family income below \$85,000; (2) GPA of 3.5 or higher; (3) score above the 90th percentile on a college entrance exam. We launched the intervention in October 2017 with an experimental sample of 6,300 students, with the goal of increasing the share of students attending high-quality institutions.

Intervention/Program/Practice: The intervention involved providing students with an incentive to apply to specific colleges, locally and across the country. In October and November, all students received a list of target colleges, which was personalized based on a students' state of residence and family (or personal) income. The list included four colleges near where they lived that had graduation rates of at least 70 percent or higher. We also included a link to a broader set of over 200 colleges across the country with graduation rates above 70 percent. Students in the treatment group could earn up to \$400 if they applied to at least two geographically-proximate colleges on their list and two additional selective schools, which could either come from their

local list or from the larger list of eligible, geographically-dispersed colleges. We communicated the list of colleges and the incentive offer via text message and emails. Advisors followed up this digital outreach with personalized phone, email, and text outreach to students. In January, after most application deadlines passed, advisors reached out to the treated students about submitting proof of their applications for verification to qualify for the incentive.

Research Design: We implemented this intervention through a randomized control trial. We randomized students in three waves based on when they signed up for the program. Students were randomized between the control group, which received the list of target colleges, and the treatment group, which received the list of target colleges and the incentive offer. The randomization achieved baseline equivalence of the treatment and control groups, and thus observed differences can be interpreted as causal impacts of the financial incentive.

Data Collection and Analysis: We use data from multiple administrative sources as well as self-reported data to examine whether financial incentives have an impact on where students enroll. To measure college applications, acceptances, and commitment, we administered a survey to students in the spring and summer of their senior year of high school. The response rate for the surveys was approximately 70 percent. In December 2018, we will have college enrollment data from the National Student Clearinghouse. With access to application, acceptance, and enrollment data, we will examine whether an incentive for inputs (college applications) impacted student postsecondary outcomes (college enrollment).

Findings/Results/Conclusions: We found that the incentive offer affected applications to the geographically-proximate colleges but had little effect on the overall numbers of applications to selective colleges. The incentive was structured to encourage students to apply to two target (geographically-proximate) colleges from their list, and a total of four selective colleges. We find that treated students were 6.0 percentage points (or 22 percent) more likely to apply to at least two target schools. At the same time, the incentive did not meaningfully influence the decision to apply to four or more selective colleges. By changing the mix of colleges students applied to, the incentive increased the share of treated students accepted to a selective college. The increase in acceptance rate was concentrated among colleges from their target list. Treated students were 6.6 percentage points (or 13 percent) more likely to be accepted to a college from their list, and no more likely to be accepted to a selective college which was not on their list. Overall, there was no difference in commitment to a selective college, but the incentive increased the likelihood a student committed to a school on their list by 3.2 percentage points (or 11 percent), which in turn led to a decrease in the likelihood of attending a college with a graduation rate below the median among four-year colleges.

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Paper #3: Financial Aid Nudges: A National Experiment to Increase Retention of Financial Aid and College Persistence

Authors: Sara Goldrick-Rab (Temple University), Lindsay Page (University of Pittsburgh), Bruce Sacerdote (Dartmouth College), Ben Castleman (University of Virginia), and Neil Seftor* (Temple University)

Background/Context: The price of college attendance is growing rapidly and is a substantial barrier to college completion for middle- and lower-income students. Financial aid is the main mechanism for reducing the price, but it is distributed using a complex system that includes a lengthy application (the Free Application for Federal Student Aid, or FAFSA) and numerous rules for continued receipt (Kelly & Goldrick-Rab, 2014; Goldrick-Rab, Kelchen, Harris & Benson, 2016). This administrative complexity appears to reduce its effectiveness (Dynarski & Wiederspan, 2012).

Evidence suggests that each year 15-20% of rising second year students eligible for the Pell Grant fail to refile a FAFSA (Novak & McKinney, 2011; Bird & Castleman, 2015). Requirements that students continue to make Satisfactory Academic Progress (SAP) to receive aid also appear to present a challenge. Nearly 40% of first year community college students are at risk of losing financial aid because they do not meet SAP requirements (Schudde & Scott-Clayton, 2014).

While a growing body of empirical evidence demonstrates that personalized information and the offer of assistance can help address informational and behavioral barriers to FAFSA refile and SAP compliance, existing studies were conducted with relatively small samples of students and schools.

Purpose/Objective/Research Question: This study examines the impacts of a nudging intervention aimed at increasing continued receipt of financial aid and continued enrollment in college with a national sample of students. We test the impact of two variants of nudging to examine relative effectiveness, examine impacts on both proximal and distal outcomes to consider mechanisms, and test for heterogeneous treatment effects by institutional characteristics and students' pre-program demographic and financial characteristics including gender, race/ethnicity, age, parental education, marital status, number of dependents, Expected Family Contribution, cumulative GPA, and number of college credits completed. The results may be used by colleges and universities to improve degree completion rates by helping students retain their financial aid.

Research Design, Setting, and Population: We received Institute of Education Sciences approval for experimentation with a nationally representative sample of college students in the 2015-16 National Postsecondary Student Aid Study (NPSAS:16) to implement a large-scale, randomized control trial of a multi-cohort text messaging campaign to increase (1) the share of degree-seeking students in the NPSAS:16 sample who successfully refile the

FAFSA and meet requirements for SAP; and (2) the share of students who persist toward a college degree. We study a national subsample of 7,996 students from the NPSAS:16 sample who had not filed the FAFSA prior to the start of the intervention.

With the intent of helping students continue to receive financial aid and remain enrolled in college, we offered—through our text-messaging partner Signal Vine—two main types of nudging interventions: (a) simplified information and prompts delivered via text messaging “nudges” and (b) text messages coupled with the offer to interact with an advisor from College Possible. For the first type of message, we differentiated the language to try and ascertain *why* prior work finds that this approach can increase FAFSA filing and college persistence (Castleman and Page 2015), using (a) a basic reminder and information, (b) the basic version along with cues about average peer behavior in accomplishing the task, and (c) the basic version along with a prompt for the student to commit to a particular day to accomplish the task.

Data Collection and Analysis: We rely on administrative data collected from the U.S. Department of Education and the National Student Clearinghouse and made available by the National Center for Education Statistics (NCES) through a restricted-use license to track impacts of the interventions on FAFSA filing, financial aid receipt, and college persistence and success. In addition, NCES collected usage data from our text messaging and advising partners to measure proximal outcomes that may be impacted by the intervention.

Given our use of a randomized control trial design, we are able to utilize straightforward regression models and post hoc linear hypothesis tests to answer our research questions related to intervention impact. To investigate whether either of the interventions has a differential impact by salient student- or institution-level characteristics, we will augment the regression models by interacting the relevant treatment indicators with student- and institution-level measures.

Findings: The pooled intervention produced modest but statistically significant impacts on FAFSA filing during the timeframe of active intervention. The effects range from about 1.69% of students offered the intervention filing FAFSA in week 1, up from 1.1% of the control group ($p < .05$), to 15.2% of the students offered the intervention filing FAFSA by week 12, up from 13.3% of the control group ($p < .05$). By the conclusion of the thirty-four week observation period, the intervention’s impacts were no longer distinguishable from zero. However, we detect no differences when examining the three versions of text and the offer of advising separately.

Discussion: At this point in the study, we are only able to observe FAFSA filing behavior, with results indicating that the intervention somewhat accelerated the timing of FAFSA filing for some students, slightly increasing the odds that they filed in spring 2017, but not increasing the odds that they would file before the start of the next school year. We will examine the possibility that filing earlier increased the amount of money that students received from constrained sources, such as state or institutional aid programs, in future analyses.

We offered texting coupled with advising based on the hypothesis that additional interaction with a counselor might help students, but no additional impact was observed. Unlike prior studies on advising via text messaging, students in this study did not have a pre-existing relationship with the advising organization suggesting that advising may be less successful outside of established relationships.

In subsequent analyses, we will consider additional outcomes and examine how student responsiveness to text messages varied by the content of those messages, such as information provided about an income support program like EITC rather than the FAFSA.

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Paper #4: Nudges to the Finish Line: Experimental Evidence on Strategies to Increase College Completion for Students at Risk of Late Departure

Authors: Eric P. Bettinger (Stanford University); Benjamin L. Castleman (University of Virginia); Zachary Mabel* (College Board)

Background: Nearly half of students who enter college do not graduate. Most efforts to increase college completion have focused on supporting students before or soon after they enter college. Several interventions have helped students apply to college, overcome procedural obstacles to matriculation, and improve the effectiveness of remediation policies for academically underprepared students (Bettinger & Long, 2009; Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Carrell & Sacerdote, 2013; Castleman & Page, 2015; Hoxby & Turner, 2013; Martorell & McFarlin, 2011; Pallais, 2015; Scott-Clayton, Crosta, & Belfield, 2014).

Despite these investments, addressing the completion problem may also require supporting students long after they arrive on campus. More than 40 percent of college students who do not earn degrees leave after their second year of college (Bowen, Chingos, & McPherson, 2009; Shapiro et al., 2014). Recent evidence also suggests that one in three dropouts complete at least three-quarters of the credits typically required to graduate before they withdraw (Mabel & Britton, 2018). Initiatives targeting students at risk of leaving late into college may offer a cost-effective strategy for increasing degree attainment.

Purpose/Research Questions: The purpose of this study is to investigate whether low-cost, behaviorally- and psychologically-informed nudges that provide personalized information to upper-division students about how they can finish their degree and encourage them to make use of on-campus resources improve completion rates at broad-access institutions. We hypothesized that students at risk of late dropout would be more likely to misunderstand (or have little knowledge) of their academic requirements to graduate and benefit from academic advising and supports, such as tutoring services. We also posited that late dropouts live busy lives which: 1) makes searching for support on campus difficult; 2) increases the likelihood of forgetting important deadlines; and 3) can incite feelings of stress, anxiety, and frustration. Answers to these hypotheses can provide system and school leaders with evidence to inform future decisions regarding how to best support upper-division students.

Setting: We implemented the pilot year of the Nudges to the Finish Line Intervention (N2FL) during the 2016-17 school year at nine open- and broad-access public higher education institutions. Of the nine institutions, three are community colleges in the City University of New York and Virginia Community College Systems. The remaining six are four-year public institutions in New York City, Texas, Ohio, and Washington. Our partner institutions accept 75 percent or more of the applicants that apply. Forty percent of students attending our partner institutions receive federal Pell Grants, and 61 percent are students of color. The average graduation rate within 150 percent time is 36 percent. In 2017-18 and 2018-19, we have

expanded the study to include 20 broad-access, public institutions in the same five postsecondary systems.

Participants: Students at participating institutions are eligible to participate if they are pursuing an associate or bachelor's degree, have completed at least 50 percent of the credits typically required for degree completion, and have an active cell phone number on record. We recruited 3,804 students during the pilot year and we have recruited over 15,000 students to participate in the scale phase.

Intervention: In partnership with Persistence Plus, a company that designs and delivers mobile student supports using behavioral science principles, we designed a message campaign to address each of the hypothesized barriers. The pilot year intervention prompted students to identify goals associated with finishing their degree, encouraged them to connect with campus-based academic and financial resources, reminded them of upcoming and important deadlines, and addressed feelings of stress, anxiety, and other psychological hurdles that impede student progress. Students in the message group received automated messages approximately three times per week during the school year. Students in the control group had access to on-campus supports but did not receive text messages.

During the scale phase, we are delivering different types of messages to students on each campus. One group of students is receiving messages designed to address academic planning barriers to completion and another is receiving messages intended to address financial barriers to completion. By varying the intervention design, we hope to shed light on the most obstructive barriers for upper-division students.

Research Design: To estimate the causal effects of message outreach on student outcomes, we employed an experimental research design and randomly assigned students to treatment arms within partner schools. We used a block randomization procedure that afforded greater power to examine evidence for heterogeneity of effects by dropout risk. We implemented this procedure by predicting the probability of dropout for currently enrolled students and then randomizing students with similar probabilities of dropout to the treatment and control conditions.

Data Collection and Analysis: We use student-level administrative records maintained by our institutional partners to evaluate the impact of the intervention on students' academic progress and performance. We examine impacts on the probability of re-enrollment, credit attainment, grade performance, and degree completion.

Results: Results from the pilot year indicate that many students within reach of college graduation stand to benefit from additional outreach and guidance. As shown in Figure 1, the intervention decreased fall-to-spring dropout by 14 percent, from 17.4 to 14.9 percent. In Figure 2, we show that graduation rates for students in the top tercile of predicted dropout risk also increased 6 percentage points, from 16.2 percent to 22.3 percent, after one year. We expect to

have results on academic performance, persistence, and completion after 1-2 terms for a subset of scale phase institutions by January 2019.

Conclusions: Our preliminary findings suggest the return on investment to providing high-risk, upper-division students with low-cost support may be large, although it remains unclear whether the impacts on attainment we find after one year represent brief or lasting gains. We are examining effects on persistence and completion over a longer time horizon and at scale for this student population in our ongoing work.

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Figure 1. Effect of the N2FL Pilot Year Intervention on Dropout after One Term

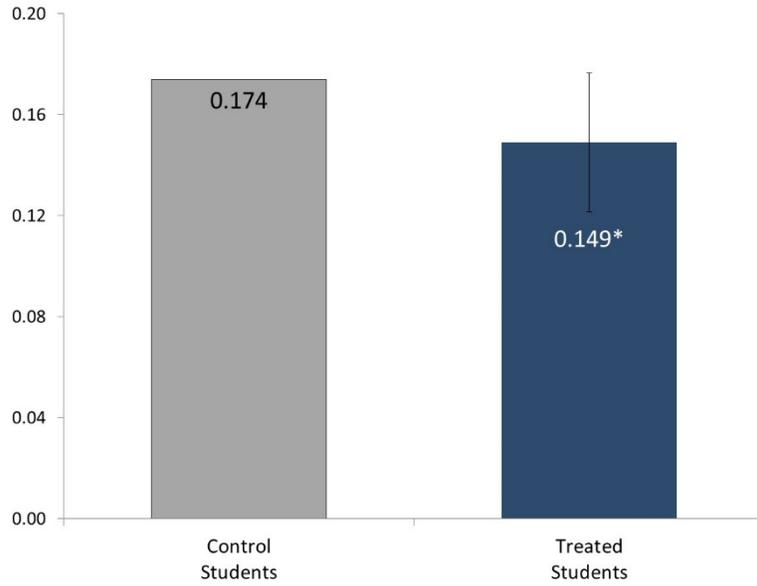


Figure 2. Effect of the N2FL Pilot Year Intervention on Completion after One Year by Risk of Dropout

