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Nudging Students Beyond the FAFSA: The Impact of University Outreach on Financial Aid Behaviors and Outcomes

By Benjamin Castleman, Katharine E. Meyer, Zachary Sullivan, William D. Hartog, and Scott Miller

A growing body of research indicates that proactive outreach from high schools and college access organizations about college preparation tasks, and specifically focusing on completing the Free Application for Federal Student Aid (FAFSA), results in increased college enrollment. Comparatively less attention has been paid to the role of colleges and universities in this outreach and outreach relating to additional financial aid barriers that students face while applying to college, such as the CSS PROFILE form. In this article we investigated, through an inter-university collaboration, the effect of sending targeted, semi-personalized text messages to students during the college application process about important financial aid deadlines, making salient the specific forms required and prompting students to plan specific times to complete these tasks. The intervention increased CSS PROFILE filing by 3.1-4.3 percentage points, where the estimates and their significance varied depending on the comparison group. Impacts on student enrollment did not accompany these filing impacts. Results from our collaboration support the idea that colleges and universities have an important role to play in outreach to applicants relating to important financial aid tasks. The paper includes a discussion of the promises and challenges of this outreach with recommendations for practitioners.

Keywords: *financial aid, CSS PROFILE, university outreach, interactive technology*

For over a decade, researchers have demonstrated that the complexity of the Free Application for Federal Student Aid (FAFSA) can deter otherwise college-ready students from enrolling or succeeding in higher education. Approximately one in 10 college students who would be eligible for need-based federal financial aid fails to file the FAFSA. Even among college freshmen who received a Pell Grant and who are in good academic standing, nearly one in six fails to successfully refile the FAFSA for their second year in college (King, 2004; Bird & Castleman, 2016). A growing body of research demonstrates that the financial challenges and anxieties associated with poverty limit the cognitive bandwidth that families can devote to complex tasks like completing the FAFSA (Castleman, 2015; Dynarski & Scott-Clayton, 2006; Mullainathan & Shafir, 2013; Ross, White, Wright, & Knapp, 2013). Barriers associated with the FAFSA, and the financial aid application process more broadly, may contribute to long-running socioeconomic inequalities in college access and success—disparities that persist even after controlling for students’ academic achievement (Bailey & Dynarski, 2012; Belley & Lochner, 2007; Long & Mabel, 2012).

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In recent years, there has been substantial policy investment to provide lower-income students and families with additional information and assistance throughout the financial aid process. These initiatives include both governmental efforts like the U.S. Department of Education FAFSA Completion Project, which provides school districts with real-time information about which students have completed the FAFSA, and privately-funded efforts like College Goal Sunday, which provides students in most states with free FAFSA completion assistance.¹

Researchers have demonstrated, through randomized, controlled trials, that low-cost strategies to support students and families with financial aid filing can also generate substantial improvements in college entry and persistence. In the seminal study, Bettinger, Long, Oreopoulos, and Sanbonmatsu (2012) integrated FAFSA completion assistance into the income tax preparation process at H&R Block. Helping students fill out the FAFSA added less than 10 minutes to the income tax preparation time for families, but this assistance increased the share of treated students who completed at least two years of college by almost 30%. Castleman and Page (2015) demonstrated that sending personalized text message reminders about the key financial aid and procedural tasks students must complete during the summer after high school can increase the share of college-intending high school graduates who successfully matriculate in college. Working with the Common Application organization, researchers also found that sending financial aid planning prompt nudges at scale to over 450,000 high school seniors increased college enrollment for all students with a larger effect for first-generation college students (Bird, Castleman, Goodman, & Lambertson, 2017).

These financial aid filing interventions draw on insights from behavioral science research to develop outreach that overcomes the common behavior barriers students and families face during the college search and funding process. Many individuals, when faced with complex decisions and processes, tend to avoid these hassles and delay action, which may result in failing to complete important tasks, such as completing a financial aid form (Iyengar & Lepper, 2000; Madrian & Shea, 2001; Dynarski & Scott-Clayton, 2006). Given limited attention and a tendency to focus on the present, individuals may struggle to plan ahead or understand the importance of completing various financial aid forms on their long-term financial well-being (Karlan, McConnell, Mullainathan, & Zinman, 2010; Milkman, Beshears, Choi, Laibson, & Madrian, 2012; Rogers, Milkman, John, & Norton, 2015; Bird, Castleman, Goodman, & Lambertson, 2017).

Low-income students and families often lack access to professional advisors and mentors who have experience with the complex college and financial aid application processes and who can help navigate forms and timelines (Castleman & Page, 2014; Lareau, 2003; Ross et al., 2013). Recognizing gaps in access to “college knowledge” between low-income students and their more advantaged peers, and the tendency for all individuals to, in the face of complexity, engage in some of the behavioral responses detailed above, interventions to date have focused on proven behaviorally informed strategies to increase financial aid filing. These strategies include prompting action through timely reminders, simplifying complex concepts and processes by changing the presentation of information, reducing hassles by making it easier for students and families to connect with experts, and personalizing information to make it more salient.

Much of the existing intervention work has focused on initial FAFSA completion, yet a growing body of work demonstrates that lesser-known aspects of financial aid policy can also pose barriers to low-income students receiving financial aid. For instance, most states have priority filing deadlines for allocating state-based financial aid to students. These priority deadlines are often not actively communicated to students and families, and frequently change over time. Bird (2015) shows that moving priority deadlines earlier in the year results in a more regressive distribution of aid, with lower-income students less likely to receive aid dollars that are targeted for financially needy students.

¹ For more information on these programs, see <http://www.ed.gov/blog/2012/05/ed-announces-fafsa-completion-project-expansion/> and <http://www.collegegoalsundayusa.org/pages/about.aspx>

Another understudied potential barrier in the financial aid process is the CSS PROFILE, a supplementary financial aid application administered by the College Board that almost 300 institutions require in addition to the FAFSA. The CSS PROFILE has not received nearly the public attention that the FAFSA has, yet at some institutions students are required to submit both the FAFSA and the CSS PROFILE in advance of priority filing deadlines to maximize the amount of financial aid they receive. Failure to submit both forms before the deadline can result in students foregoing thousands or even tens of thousands of dollars in grant aid. Unlike the FAFSA, there is a fee to complete the CSS PROFILE, and as a result, the College Board does not recommend students complete the form unless their college requires it. While the College Board provides a fee waiver to eligible students to cover submission at up to nine institutions, students must apply for the waiver, creating another obstacle to financial aid submission at certain institutions. Therefore, students face uncertainty about whether and when to complete the form, with the added barrier of paying a fee to process their paperwork fully.

Furthermore, while most colleges and universities include information about financial aid in their application materials, in acceptance packets, and on their websites, there is little rigorous research that investigates the efficacy of this communication at increasing the share of students who successfully apply for financial aid. The literature also lacks studies that evaluate more innovative approaches colleges have pursued to encourage students to complete the FAFSA and/or CSS PROFILE applications.

One intervention at Arizona State University (ideas42, 2015) found that sending emails to students and parents that emphasized FAFSA priority deadlines and encouraged students to set aside time to complete the FAFSA resulted in substantially higher FAFSA filing rates. In their study, half of treated students refiled the FAFSA compared to 29% of students receiving standard emails and no parent emails. We know of no other rigorously evaluated FAFSA completion interventions designed and implemented by individual colleges and universities. This is reflective of a broader trend in which most college access initiatives are pursued by the high schools, community-based organizations, and states in which students completed their secondary education, rather than by the higher education sector to which the students are aspiring. This disparity in effort to improve college access and success has prompted increasing calls to colleges and universities to play a more active role in supporting low-income students to and through college, such as President Obama's 2014 White House College Opportunity Summit.

In this paper, we report on a novel initiative by the University of Virginia (UVA) to support applicants from Virginia to complete the FAFSA and CSS PROFILE in advance of UVA's March 1 priority filing deadline. This deadline has important implications for students' eventual aid awards: students who complete both forms in advance of March 1 are eligible to receive additional institutional grant aid compared with students who file after March 1. During the winter and early spring of 2016, the UVA admissions office sent more than 3,400 early action admitted students and regular decision applicants in the state a series of four text messages encouraging them to send in their financial aid forms before the deadline. The texts were semi-personalized to the student and emphasized the financial benefit to filing their forms before March 1.

Due to our inability to randomize receipt of the text campaign, we use a difference-in-differences estimation approach to evaluate the impact of this program. Specifically, we exploit variation between the treatment and control group in exposure to the text campaign, and compare changes over time in financial aid behaviors between students who were eligible and ineligible for the campaign. While UVA only texted students applying in 2016, we identified students applying in 2015 who would have received the texts had the campaign been enacted.

Our paper makes two primary contributions to the existing literature. First, we focus on an understudied aspect of the financial aid process, the CSS PROFILE, and find suggestive evidence that universities can support students to complete these processes through a low-cost, highly scalable outreach campaign.

Second, we highlight a role for higher education institutions to increase access to college by making a more proactive effort in reaching out to students about financial aid. Particularly given their access to real-time information about the status of students' financial aid applications, colleges and universities are well positioned to provide students with salient, timely nudges as they navigate what remains a highly complex financial aid application process.

To preview our results, we find that the short texting campaign increased the share of in-state admitted students who successfully completed the CSS PROFILE by the March 1 deadline by 3.1-4.3 percentage points, where the estimates and their significance varies depending on the comparison group used. While imprecise, we find that effects were larger for early action applicants, who were notified of their acceptance to UVA prior to the campaign. The difference could reflect the increased salience of the benefit to applying for aid when students know it will result in a financial aid offer. The campaign did not, however, increase the share of students matriculating to UVA or a similarly selective institution. We are unable to examine impacts on the generosity of financial aid packages, which could help explain the null enrollment finding.

The remainder of our paper is structured as follows. First, we provide additional background about UVA's financial aid initiatives and the design of the text messaging campaign. Next, we describe the data we use in our analysis before describing our empirical strategy. We then present our results, and finally we conclude with a discussion of the importance of our findings and direction for future research and policy.

Background and Intervention Design

In 2004, the University of Virginia launched its flagship financial aid program, AccessUVA, to ensure that any student admitted to the university could afford to attend.² To be eligible for AccessUVA, a student must submit two financial aid applications, the FAFSA and CSS PROFILE, before the March 1 priority deadline.³ Under AccessUVA, students receive a combination of grants, need-based loans, and work-study to meet their financial need.⁴ Students who only submit the FAFSA, or who miss the priority deadline, are only considered for federal need-based student aid, which for the lowest-income students results in as much as a \$20,000 reduction in annual grant aid offered.⁵ In the year prior to our study, among the 20% of admitted FAFSA filers who failed to file the CSS PROFILE, 20% would have received at least \$10,000 more in grant aid by filing the CSS PROFILE.

During the 2013-14 academic year, UVA President Teresa Sullivan convened a presidential task force to examine the university's existing policies and communication on access and affordability for socioeconomically disadvantaged students. This task force also sought to identify opportunities for more proactive and comprehensive efforts to communicate with lower-income prospective students about the financial aid resources available to them at the university.

One of the commitments that emerged from the task force was to use a broader range of communications strategies to reach students, recognizing that traditional means of communication (e.g., email or postal mail) might not be having the desired reach to economically disadvantaged communities. Opportunities to integrate a personalized text messaging campaign into its outreach portfolio particularly

² For more details visit <http://www.virginia.edu/accessuva/learn.html>

³ The CSS PROFILE is run by the College Board and is required for more than 240 colleges, universities, and scholarships. Unlike the FAFSA, the PROFILE can contain questions specific to a school, requires a minimum student contribution, and uses a different methodology to determine financial need.

⁴ Demonstrated need is equal to the cost of attendance minus EFC. Loan offers are capped at \$3,500 per year for the lowest-income students and \$7,000 per year for all other students.

⁵ Authors' calculation based on a student with zero EFC and income less than 200% of the federal poverty line.

interested the UVA admissions office, given a growing body of evidence that sending students and families text messages with simplified information, encouragement, and access to professional assistance led to improved outcomes on various educational measures. These interventions have proven effective at improving many student outcomes, from improved cognitive performance for preschool-age children to increased high school GPAs and improved college entry and persistence rates among adolescents (Bergman, 2013; York & Loeb, 2014; Castleman & Page, 2015; Castleman & Page, 2016; Page, Castleman, & Meyer, 2016).

We collaborated with the admissions office to design a texting campaign specifically aimed at encouraging early action admits and regular decision admits from Virginia to file their financial aid applications prior to the priority deadline. The texting campaign consisted of four messages sent to students between February 16, 2016, and February 26, 2016. The messages focused on conveying to the students the financial benefits of filing the FAFSA and CSS PROFILE in advance of the March 1 deadline. Drawing on prior studies, the messages leveraged behavioral principles to encourage students to work on the FAFSA and the CSS PROFILE, rather than put it off and potentially miss the March 1 deadline. For instance, one of the messages provided students with a concrete planning prompt by encouraging them to “set aside a couple hours [this week] to work on these forms” (Rogers et al., 2015). Since the campaign started before UVA made its regular admission decisions, early action students received slightly different messages because they had already been notified of their acceptance. Appendix A presents the full text message content and dates sent. The messages also encouraged early action students to respond to the texts and ask questions of a UVA financial aid counselor.

The Common Application for admissions asks students whether they intend to apply for financial aid, whether the colleges they apply to can contact them, and to provide a cell phone number. The application defaults students into receiving information from any of the colleges to which they have applied. Using this information, UVA considered students “text eligible” if they intended to apply for financial aid, opted to receive messages from all the schools they applied to, and provided a phone number. Around 65% of in-state applicants defaulted to receiving text messages from the schools to which they applied, and 62% of in-state applicants indicated an interest in financial aid. Just over 40% of in-state applicants were text eligible each year. Throughout February 2016, UVA sent messages to all in-state early action admitted students and regular decision applicants who met the eligibility criteria.

UVA had piloted the text message campaign in February 2015 with 58 high schools in the state identified as serving a predominantly low-income population. President Sullivan also sent principals at the schools personalized letters encouraging them to have their students apply to UVA. Because of the pilot rollout, we had the necessary pre-treatment eligibility information for students at non-targeted schools to run a difference-in-differences analysis of the 2016 intervention. We excluded students from the pilot schools, since eligible students received the treatment in both years. In Appendix Table A1, we show how average applicant characteristics at these pilot schools compared to the characteristics of applicants who attended high schools included in our analytic sample. Pilot schools tended to have lower rates of application to UVA, and those applicants were more likely to identify as Black or Hispanic. However, the pilot and rollout schools are comparable, with similar graduation rates, enrollment, and student/counselor ratios.

In addition to examining student enrollment and financial aid outcomes, we also examined the content of students’ text message interactions throughout the intervention (see Appendix A). Due to staffing limitations, UVA administration decided to encourage only early action students to respond to texts with questions (“Text back if you have questions or need help!”). Nevertheless, both early action and regular decision students frequently responded to the automatic messages, and we examined the frequency and content of student replies for all students and some of the in-depth interactions that occurred between the early action students and financial aid administrators.

The texts sent to early action students explicitly asked those students to reply after the second round of texts to let the financial aid office know whether they had “completed” their financial aid forms or if they had “not yet” had a chance to complete the forms. Likely because of that explicit request for a response and other language encouraging students to write back with questions, the majority (67%) of treated early action students sent at least one text to UVA during the intervention. Among students who sent at least one text, the average number of texts was about 1.36 per student, with about 80% of texters only sending one response (although one very engaged student sent 17 text messages over the course of the campaign).

Among the students who sent at least one text, about 21% were directly replying to the prompt, stating they had completed their financial aid forms. About 10% of the students who texted back were asking a question,⁶ and many students had rich interactions with the UVA team. For example, one early action student had questions about how work-study would pay out and how he would know if he had received a work-study award; another student had questions about whether to submit W-2 forms or summaries to finalize financial aid. These questions suggest that there are very real knowledge gaps among prospective students around the financial aid process, and that students trust using text messaging to gather clarifying information.

Although regular decision students did not receive a prompt asking them to reply to the text messages they received, many still did so. About 21% of regular decision students sent a text during the intervention. When they did so, they received a message stating, “These messages are delivered through an automated system. We cannot respond to individuals. If you need assistance please email uvaapplicationinfo@virginia.edu.” Given this clarifying message after a student’s first text, it is unsurprising that about 93% of students who ever sent a text only sent one. Skimming student questions, however, there is evidence that regular decision applicants would have benefited from two-way communication similar to the communication received by the early action admitted students. About 15% of the texts regular decision students sent were coded as a question. Their questions included “What’s the CSS?” and “If I don’t fill out the CSS profile does that mean that [I] won’t get any financial aid at all?” As resources allow, enabling two-way communication for all students would likely be beneficial to address such questions.

Data

We received student-level data from UVA for the cohorts applying in 2015 and 2016. Our dataset contained background information students provided on their application, including gender, race, high school achievement (GPA and standardized test scores), what high school they attended, and whether they applied early action. Because of how UVA stores financial aid application data, we could only access CSS PROFILE filing data for admitted students, and we focused our analysis on the admitted pool. Although UVA and the research team would have liked to examine FAFSA filing and financial aid packages to better understand how filing relates to aid receipt, based on a mutual discussion and review of FSA regulations and U.S. Department of Education guidance on using student data for evaluation, the research partnership team determined we could not access these outcomes at the time of our analysis.

UVA also provided enrollment data for all applicants by matching our sample to the National Student Clearinghouse, which we merged with Barron’s college selectivity rankings. Barron’s Educational Series releases an annual directory of every accredited four-year college and university in the United States, which includes a selectivity ranking of each institution ranging from “noncompetitive” to “most competitive” (Barron’s, 2017).

⁶ We coded a student reply as a “question” if the student included a question mark in their text; therefore, this count may underestimate the number of true questions if students did not use punctuation in their text message communications.

Our main analytic sample included about 8,000 Virginia-resident, first-year students across two cohorts, who were admitted early action or regular decision.⁷ We defined students as eligible for the text messages if they indicated on their application that they planned to apply for financial aid and consented to receive text messages. In the treatment year, 2016, we identified 1,652 students as text-eligible. Our analysis and results used two different definitions of ineligible students for our comparison group: (a) students who expressed an interest in need-based financial aid but opted out from receiving text messages (ineligible due to “opt-out”), and (b) students in the first comparison group plus students who consented to receive text messages but did not express an interest in need-based financial aid (ineligible due to “any reason”). We discuss the validity of each comparison group in the following section.

In addition to student-level applicant data from UVA, we compiled school-level data from the Virginia Department of Education (VADOED) and the Federal Student Aid (FSA) and Common Core of Data (CCD) offices of the U.S. Department of Education. The VADOED data files include information on student enrollment and demographics, including percent of free or reduced-price lunch eligible students, and school graduation rates. The FSA data include the number of students at each high school filing the FAFSA in prior years. The CCD data include additional school-level characteristics such as the number of counselors at each high school.

Table 1 contains mean student characteristics by treatment status over the entire sample period and includes admitted students who applied via regular decision or early action. Slightly less than 60% of admitted students were female. The average SAT (math plus verbal) score was slightly lower among text-eligible students relative to text-ineligible students, 1360 and 1380 respectively, which only results in a difference of one percentile point in the national percentile rankings. Roughly 70% of admitted students were White or Asian, 15% identified as an underrepresented minority (Black or Hispanic), and the remaining balance did not report a race. Relative to the ineligible-for-any-reason sample, the text-eligible and opt-out samples were slightly more likely to be underrepresented minorities and less likely to be White or Asian.

Table 1 also shows how we constructed the text-eligible and text-ineligible groups, as well as the mean values of our main outcomes. The treatment indicators show that all text-eligible students opted in to the text campaign and intended to apply for aid. The opt-out sample all also intended to apply for aid, but did not opt in to the texts. Only 35% of the ineligible-for-any-reason sample intended to apply for aid, and 42% opted in to the text campaign. The difference in filing rate is consistent with the stated difference in intention to apply for aid. Slightly over 80% of students from the text-eligible and opt-out samples submitted the CSS PROFILE, while less than 50% of the students from the ineligible-for-any-reason group filed the CSS PROFILE. The lower filing rate among the ineligible-for-any-reason sample did not rule them out as a valid control group, but it raised concerns, which we discuss below.

Empirical Strategy

To examine the effects of the financial aid text messaging campaign on financial aid filing behavior, we exploited variation between the treatment and control group in exposure to the text campaign. Specifically, the treatment group was only texted in the post-period (Spring 2016), while the control group was never texted. Using a difference-in-differences (DiD) empirical strategy, we compared the change in the filing rate between the pre- and post-period (Spring 2015 compared to Spring 2016) for our treatment group (text-eligible students) to the change in filing rate for our control group (text-ineligible students).

⁷ We dropped all transfer applicants because they were not eligible to receive text messages.

Table 1

In-State Admitted Students, 2015 and 2016 Cohorts

	Treatment-eligible	Ineligible: Opt-out	Ineligible: Any reason
Student characteristics			
% Female	0.580 [0.494]	0.581 [0.494]	0.556 [0.497]
% White	0.492 [0.500]	0.509 [0.500]	0.605 [0.489]
% Black	0.101 [0.301]	0.091 [0.287]	0.050 [0.217]
% Hispanic	0.062 [0.240]	0.069 [0.253]	0.052 [0.222]
% Asian	0.220 [0.414]	0.170 [0.376]	0.152 [0.359]
% Race not reported	0.052 [0.223]	0.094 [0.292]	0.084 [0.277]
SAT (math + verbal)	1361 [180]	1381 [175]	1386 [170]
Missing SAT	0.008 [0.088]	0.006 [0.080]	0.007 [0.082]
% Early action	0.527 [0.499]	0.456 [0.498]	0.523 [0.500]
Treatment indicators			
% Opt in for texts	1.000 [0.000]	0.000 [0.000]	0.420 [0.494]
% Interested in financial aid	1.000 [0.000]	1.000 [0.000]	0.351 [0.477]
Select outcomes			
% Filing CSS	0.821 [0.383]	0.813 [0.390]	0.472 [0.499]
% Matriculate to UVA	0.596 [0.491]	0.510 [0.500]	0.602 [0.490]
% Matriculate to “highly selective” college	0.869 [0.338]	0.858 [0.350]	0.883 [0.321]
<i>N</i> students	3,101	1,707	4,863

Notes: Standard deviations in brackets. This table summarizes student characteristics, treatment eligibility, and select outcomes for our analytic sample, comparing treatment-eligible students to students ineligible for treatment because of opting out from receiving messages and to students ineligible for treatment because of any reason, either opting out or not indicating interest in financial aid (2015 and 2016 cohorts pooled).

Our main difference-in-differences specification was as follows:

$$Y_{ist} = \beta_1 \text{Text Eligible}_{it} * \text{Post}_t + \beta_2 \text{Text Eligible}_{it} + \beta_3 \text{Post}_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} is a financial aid filing or enrollment outcome for student i at time t . Eligible_{it} is an indicator for student text eligibility and controls for constant difference between eligible and ineligible students. Post_t is an indicator for the year when UVA initiated the texting campaign and controls for constant differences between the cohorts applying to UVA in 2015 and 2016. We also ran specifications including student-level characteristics (i.e., gender, race, SAT score), which did not substantially change our results.

Our coefficient of interest, β_1 , represents the effect of receiving the text campaign on whether students applied for financial aid at UVA prior to the priority deadline, and whether they matriculated to UVA. Since we could not observe who actually opened and read the text reminders, we estimated the intent-to-treat (ITT) effect of being sent a text message reminder, rather than the effect of the reminder. From a policy perspective, the ITT is most relevant because an institution cannot mandate that students open their text messages.

The main assumption under which β_1 identifies the effect of the text reminders is that the difference in filing rate between ineligible students in 2015 and 2016 is a good counterfactual for how much filing rates would have increased for eligible students over the same period in the absence of the intervention. Our choice of comparison group presents a tradeoff between precision and bias. The opt-out sample provided a natural comparison group because they also all intended to apply for aid, looked similar on background characteristics to the text-eligible sample, and had a nearly identical financial aid filing rate in the pre-period. Since this sample opted out of being texted by all schools to which they applied, we do not believe the decision to opt out reflects a lack of interest in attending UVA. The opt-out sample was, however, much smaller than the pool of students who were ineligible for any reason. Using the ineligible-for-any-reason group as a comparison would likely bias our results in the positive direction because a lower share intended to apply for aid, which could mean their trend in filing was different than that of the text-eligible students.

One way to test our assumption would be to run a placebo test and compare the trends in outcomes between the eligible and ineligible groups using multiple years of pre-intervention data. If the ineligible students are a valid counterfactual, then the eligible and ineligible student outcomes should be trending similarly prior to the intervention. Unfortunately, we only had access to data from the year prior to the intervention. Ultimately, we relied on the opt-out sample as our main control group and used the ineligible-for-any-reason group for robustness, but we acknowledge the potential bias introduced by using this group.

We also assumed that the delivery of the text campaign was the only policy changing differentially for the text-eligible students between the pre- and post-cohorts. If other university policies changed simultaneously to make text-eligible students more likely to enroll at UVA, then we could not separate the impact of the text campaign from another policy change. This should not be a concern, because eligibility for campaign did not affect how students were treated in the admissions process or how much aid they were offered if accepted.

Lastly, treatment spillover between text-eligible and text-ineligible students presented a potential threat to identification. However, spillovers would bias our results toward finding no effect, since ineligible students would also be more likely to file for financial aid because of the text campaign. We carried out our analysis assuming ineligible students were unaffected by the texts sent to their eligible schoolmates.

To provide support for the main identifying assumption, we tested for any changes in the observable student characteristics for eligible students over the pre- and post-period relative to ineligible students. If our identifying assumption is true, then exposure to the text campaign should be the only change between

eligible and ineligible students. To test for compositional changes, we ran our DiD model without any demographic controls, and replaced the outcome with an observable demographic characteristic. Any statistically significant, observable differences suggest there could also be unobservable compositional differences between the pre- and post-period.

Table 2 reports the β_1 coefficient from these models for all admitted students and then separately for early action and regular decision admitted students, using both the full ineligible group and the subsample of students ineligible for treatment only because they opted out of receiving messages. We observed two consistent, statistically significant changes in student composition: Overall, text-eligible, admitted students in 2016 were more likely to be White and less likely to leave the race category on their application blank, which appears to be driven by early action students. The compositional differences were larger using the opt-out sample; for this reason, we used the ineligible-for-any-reason sample as a control group. To account for changes in relative composition of treatment students, we present results from models including individual-level covariates (i.e., student gender, race, SAT score).⁸

The change in composition of students across cohorts was likely due to the increase in the opt-in rate, and thus the size of our treatment-eligible group, between 2015 and 2016. During 2015, about 60% of applicants (62% of admitted students) defaulted into receiving text messages from colleges and universities. In 2016, the share of students who opted to receive messages increased to about 69%–70% of applicants and admitted students. As far as we can ascertain, the language for that question on the Common Application did not change between application cycles. We surmise that this increase likely reflects a time trend of growing trust of text messages for official purposes such as communication with a college or university.

Results

Our main financial aid filing outcomes are CSS PROFILE filing and on-time filing, and our enrollment outcomes include whether a student enrolled at UVA and whether the student enrolled at a selective college (as defined as an institution being in one of the top two Barron's selectivity categories).⁹ We examined overall selective college enrollment because the text campaign could have caused students to file for financial aid at other colleges as well as at UVA, making all selective colleges more affordable and increasing the likelihood of selective college enrollment. As noted earlier, we could only examine CSS PROFILE filing among admitted students, and we did not observe financial aid offers to link filing behavior with award amounts. This lack of information limited our ability to explore the mechanisms through which effects on filing behavior would translate to enrollment outcomes.

Our main regression results appear in Table 3. Using the opt-out sample as our main comparison group, the text campaign increased the CSS PROFILE filing rate by a statistically insignificant 3.4 percentage points and on-time filing by 3.1 percentage points. For robustness, we used the ineligible-for-any-reason comparison group, and found the impact on ever filing was 5 percentage points and the effect on on-time filing was 4.3 percentage points, both of which were statistically significant. However, as we discussed in the previous section, estimates using this sample could be biased upwards. The impacts on overall filing were slightly larger, suggesting that the text campaign was more effective at raising awareness about the benefit of completing the CSS PROFILE than it was at nudging students to submit the CSS PROFILE prior to the deadline. Across both samples, we found that the text campaign did not impact whether a student enrolled at UVA or at any selective institution.

⁸ We determined which student-level covariates to include based on availability across the two cohorts of students.

⁹ This includes schools that Barron's ranks as "most competitive" or "highly competitive plus." UVA is a Barron's 1, "most competitive" institution.

Table 2

Difference-in-Differences Estimates of Changes to Student Composition

	Admitted pool		Early action admitted pool		Regular decision admitted pool	
	Ineligible: Opt-out	Ineligible: Any reason	Ineligible: Opt-out	Ineligible: Any reason	Ineligible: Opt-out	Ineligible: Any reason
% Female	-0.037 (0.029)	0.013 (0.022)	-0.054 (0.042)	-0.006 (0.029)	-0.019 (0.041)	0.036 (0.033)
% White	0.094*** (0.028)	0.068** (0.022)	0.155*** (0.042)	0.092** (0.031)	0.048 (0.041)	0.044 (0.032)
% Black	-0.032~ (0.017)	-0.013 (0.012)	-0.027 (0.024)	-0.004 (0.016)	-0.038 (0.027)	-0.025 (0.021)
% Hispanic	-0.005 (0.015)	0.003 (0.011)	-0.013 (0.020)	-0.001 (0.013)	-0.001 (0.021)	0.006 (0.017)
% Asian	-0.007 (0.022)	-0.021 (0.015)	-0.035 (0.036)	-0.029 (0.024)	0.012 (0.029)	-0.012 (0.025)
% Race not reported	-0.047** (0.017)	-0.032* (0.013)	-0.061** (0.021)	-0.044*** (0.013)	-0.034 (0.028)	-0.018 (0.023)
SAT (math + verbal)	9.777 (7.821)	-1.332 (10.394)	13.419 (9.665)	1.363 (7.052)	11.658 (12.158)	1.331 (17.352)
Missing SAT	0.001 (0.001)	0.006 (0.006)	-0.002 (0.002)	0.002 (0.002)	0.003 (0.003)	0.011 (0.011)
% Applying early action	-0.039 (0.030)	-0.046* (0.023)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Observations	4,808	7,964	2,413	4,177	2,395	3,787

Notes: Standard errors in parentheses. Each row reports the coefficient on the eligible-for-text and post interaction from a difference-in-difference model with each student characteristic as the outcome of interest. Each column uses a different group of ineligible students as the comparison group for analysis. Within each category (all admitted students, admitted early action, and admitted regular decision students), the first comparison group consists of students who intended to apply for financial aid but opted out from receiving text messages, and the second comparison group consists of those student plus students who consented to being contacted but were ineligible to receive text messages because they did not intend to apply for financial aid.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3
Main Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Filed CSS	Filed CSS on-time	Enrolled at UVA	Enrolled at “highly selective” institution	Filed CSS	Filed CSS on-time	Enrolled at UVA	Enrolled at “highly selective” institution
Post	-0.025 (0.018)	-0.032 (0.019)	0.009 (0.026)	-0.008 (0.017)	-0.037** (0.014)	-0.039** (0.014)	-0.008 (0.014)	0.002 (0.010)
Eligible	-0.009 (0.017)	-0.010 (0.017)	0.079*** (0.019)	0.002 (0.015)	0.312*** (0.018)	0.316*** (0.019)	-0.013 (0.016)	-0.018 (0.011)
Post*Eligible	0.034 (0.024)	0.031 (0.024)	-0.022 (0.028)	0.019 (0.021)	0.050* (0.021)	0.043* (0.022)	-0.005 (0.020)	0.010 (0.015)
Comparison mean	0.813	0.789	0.510	0.858	0.472	0.447	0.602	0.883
Observations	4,808	4,808	4,808	4,808	7,964	7,964	7,964	7,964
R ²	0.005	0.011	0.063	0.008	0.131	0.125	0.061	0.007
Ineligible group	Opt-out	Opt-out	Opt-out	Opt-out	Any reason	Any reason	Any reason	Any reason

Notes: Standard errors clustered at high school in parentheses. Outcomes listed at the top of each column. This table includes in-state student applicants. In panel A, the ineligible group is students who intended to apply for aid but did not opt-in to the messages, and in panel B, the ineligible group also includes students who opted in but did not intend to apply for aid. All models include student-level covariates indicating gender, race, SAT score (and an indicator for SAT missing) and whether the student was an early action applicant.

$\sim p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

We repeated our main analysis separately for early action and regular decision applicants and report findings in Table 4. While our sample size with subsamples limited our ability to detect effects, the treatment point estimates on filing were larger among early action students. There are two potential explanations for this difference. As noted earlier, early action students received slightly different messages than regular decision students, and the differences may have led to differences in their effectiveness. However, we expect the differential responsiveness relates more with students' knowledge of their admission status. While we restricted our analysis to admitted students due to data limitations, early action students knew they had been admitted to UVA when they received messages, while regular decision students had not yet been notified. We hypothesize that students are more responsive to outreach about specific financial aid tasks when they have certainty that completing the task is necessary (as opposed to regular decision students who may or may not need to complete the CSS PROFILE depending on what institution they attend).

We were also interested in examining whether treatment effects varied by student characteristics. In Table 5, we present analyses on the subgroups of above- and below-median SAT scorers (the median score was 1370) and comparing students by underrepresented minority (URM) status.¹⁰ We did not see significant effects for either group, although point estimates were slightly higher for students with above-median SAT scores. Within this sample, above- and below-median SAT scores both represent very high-achieving students, and the two groups may not be substantially different from each other, making a lack of difference in point estimates unsurprising.

In Table 5, we do observe differential responsiveness to the treatment based on student race. We found zero-to-negative and statistically insignificant treatment effects for underrepresented minority students, but treated White and Asian students (non-URM) were 5.3 percentage points more likely to complete the CSS PROFILE, and they were 4.3 percentage points more likely to do so by the March 1 deadline (although the on-time point estimates were not statistically significant). As we discuss below, this finding is similar to results from recent examinations of other college and financial aid information interventions.

Discussion

Our analyses contribute to a growing body of research demonstrating that students face ongoing challenges and obstacles applying for financial aid even after submitting the FAFSA. Most efforts to support students to successfully apply for and receive financial aid have been conducted at the high school or community level, despite increasing calls for higher education institutions to make more investments to increase socioeconomic diversity. Our results provide suggestive and encouraging evidence that students' financial aid decisions, such as whether to submit applications in advance of priority deadlines and whether to complete supplementary forms like the CSS PROFILE, are responsive to outreach from their college or university.

Our heterogeneous treatment effects also shed preliminary light into for whom such interventions may be most successful. This project stemmed from a broad university interest in outreach to low-income and underrepresented minority students across the commonwealth of Virginia, and the pilot version of the program specifically targeted schools with historically low application rates to UVA. Evidence from the 2016 rollout of the program suggests mixed success at achieving this goal. We observed that underrepresented minority students were not significantly responsive to outreach, while their White and Asian peers were more responsive. This is consistent with findings from a few recent studies of how high school students interpret information about college options and financial aid. In 2015, the U.S. Department of Education launched the "College Scorecard," a consumer tool for students and families to use comparing

¹⁰ We define underrepresented minority as a student identifying as Black, Hispanic, Native American, multi-race, or unknown.

Table 4

Filing Results by Application Round

	Regular decision				Early action			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Filed CSS	Filed CSS on-time	Enrolled at UVA	Enrolled at “highly selective” institution	Filed CSS	Filed CSS on-time	Enrolled at UVA	Enrolled at “highly selective” institution
Post*Eligible	0.023 (0.035)	0.018 (0.038)	-0.034 (0.036)	0.022 (0.028)	0.048 (0.035)	0.046 (0.036)	-0.007 (0.044)	0.016 (0.031)
Comparison mean	0.801	0.765	0.511	0.849	0.828	0.818	0.508	0.868
Observations	2,395	2,395	2,395	2,395	2,413	2,413	2,413	2,413
R ²	0.008	0.020	0.061	0.008	0.005	0.005	0.067	0.008

Notes: Standard errors clustered at high school in parentheses. Outcomes listed at the top of each column. This table includes in-state-student admitted students. The ineligible group is students who intended to apply for aid but did not opt-in to the messages.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5

Filing Results by Student Characteristic

	Below-median SAT score				Above-median SAT score			
	(1) Filed CSS	(2) Filed CSS on-time	(3) Enrolled at UVA	(4) Enrolled at “highly selective” institution	(5) Filed CSS	(6) Filed CSS on-time	(7) Enrolled at UVA	(8) Enrolled at “highly selective” institution
Post*Eligible	0.024 (0.038)	0.023 (0.042)	-0.032 (0.045)	0.013 (0.036)	0.042 (0.031)	0.035 (0.032)	-0.014 (0.035)	0.026 (0.026)
Comparison mean	0.786	0.744	0.617	0.840	0.831	0.818	0.439	0.869
Observations	2,122	2,122	2,122	2,122	2,686	2,686	2,686	2,686
R ²	0.140	0.131	0.034	0.013	0.127	0.126	0.058	0.005
	Non-URM				URM			
	(1) Filed CSS	(2) Filed CSS on-time	(3) Enrolled at UVA	(4) Enrolled at “highly selective” institution	(5) Filed CSS	(6) Filed CSS on-time	(7) Enrolled at UVA	(8) Enrolled at “highly selective” institution
Post*Eligible	0.053~ (0.028)	0.043 (0.028)	-0.014 (0.033)	0.016 (0.025)	-0.004 (0.041)	0.006 (0.046)	-0.035 (0.054)	0.031 (0.038)
Comparison mean	0.809	0.794	0.523	0.857	0.821	0.779	0.482	0.859
Observations	3,366	3,366	3,366	3,366	1,442	1,442	1,442	1,442
R ²	0.005	0.010	0.067	0.011	0.005	0.016	0.064	0.007

Notes: Standard errors clustered at high school in parentheses. Outcomes listed at the top of each column. This table includes in-state-student admitted students and examines heterogeneous treatment effects by student characteristics. First, we examine whether a students’ responsiveness differed by if that student’s combined math and verbal SAT score was above or below the median score among UVA matriculates in 2015 (1,370). Then we examine whether a students’ responsiveness differed by if that student was an underrepresented minority (Black, Hispanic, Native American, multi-race, or unknown). The ineligible comparison group includes students who intended to apply for aid but did not opt in to receive messages.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

institutions on various metrics such as graduation rates or student debt. In an analysis of the Scorecard, researchers found that students were more likely to send SAT scores to colleges with higher earnings reported on the Scorecard, but that those results were concentrated among White and Asian students and students whose parents had some postsecondary education (Hurwitz & Smith, 2016). Similarly, while recent changes to FAFSA filing¹¹ appear to have resulted in more students filing the FAFSA, students attending schools with higher shares of White students and with fewer students eligible for free- or reduced-price lunch were more responsive to the policy shifts (Hillman, Bruecker, & Crespín-Trujillo, in progress). To the extent that students with existing cultural capital about college-going are more responsive to these types of interventions, they may fall short of any goals relating to reducing inequality in college outcomes.

Our overall findings are highly relevant to colleges and universities across the country interested in applying similar communication strategies. Many institutions have the resources and data infrastructure in place to replicate a similar campaign; students may be particularly likely to engage and respond to messages they receive from the colleges to which they have applied and hope to attend, rather than from the high school from which they are ready to move on. While our paper focuses on a text campaign to improve completion of FAFSA and CSS PROFILE filing, colleges and universities could leverage what are often very robust student information systems along with periodic opportunities to collect and update contact information to provide students with simplified information and timely prompts to complete other important processes, like early course registration or financial aid renewal.

Furthermore, colleges could harness the predictive analytics strategies that a growing number of institutions employ to provide personalized, behaviorally informed guidance information about pathways students could pursue (e.g. which courses to take) that better position them to complete their program of study. Colleges are also well positioned to communicate directly with students about large-scale policy shifts, such as the changes to FAFSA filing noted above, and helping students navigate new systems.

We caution higher education administrators from interpreting the results of our paper to suggest that text messaging as a communications channel is the primary factor underlying the results of our intervention. While texting is effective at the moment as a means of connecting with and informing young people, it is also becoming increasingly utilized by the postsecondary education sector. As texting becomes increasingly saturated, students will inevitably migrate to other means of communication. The broader principles that we believe underlie our results are the combination of (a) utilizing communications channels that at a point in time are effective at reaching students; (b) communicating from an organization with whom the student has a valued relationship; (c) leveraging behavioral science principles to design campaigns and content in a way that maximizes student engagement and responsiveness. While texting provides an optimal channel through which to implement these strategies in the near term, practitioners and researchers will likely have to explore other channels in the years to come.

In sum, our paper provides further indication that students face a series of complex and confusing junctures on the road to and through college. Strategic, behaviorally informed outreach by higher education institutions can help students navigate these critical junctures and access resources to help them gain access to and succeed in college.

¹¹ Specifically, enabling applicants to use prior-prior year tax data and opening the application in October as opposed to January.

Nexus: Connecting Research to Practice

- Students are responsive to outreach from colleges even before matriculation; colleges and universities are uniquely situated to provide students with school-specific guidance early enough in the application and transition period between high school and college to preempt students encountering barriers to a successful matriculation.
- Students are comfortable engaging with college administrators virtually, and trust text messaging as a legitimate forum for discussing sensitive questions about family finances and aid processes. As technology advances, colleges should adapt, meeting students on the forums where they feel most comfortable communicating.
- Colleges should consider for whom these types of interventions are most effective and the extent to which outreach reduces or exacerbates existing inequalities in higher education engagement.

Authors' Reflections on the Researcher-Practitioner Partnership

In this article, we highlight results from a collaboration between UVA offices of admissions and financial aid and researchers at the UVA Curry School of Education to send text message reminders to early action admitted students and regular decision applicants to the university to encourage higher rates of on-time financial aid filing. Together, we designed messages that focused on (a) clearly communicating specific deadlines, (b) increasing awareness around the CSS PROFILE; a less commonly used financial aid form, and (c) prompting students to plan specific times to complete the necessary FAFSA and CSS forms to ensure they received their maximum aid package. As part of this initiative, we learned valuable lessons to inform future partnerships and outreach efforts, both at UVA and hopefully at other institutions.

Text Message Development

Across both early action and regular decision student pools, students frequently texted in updates about their financial aid filing. It appears that some students took the text message communication as a sign that UVA had not received their forms (e.g., “My dad says he filled out the FAFSA and submitted it. So have you not received it?” or “I thought I had already sent those in?”). Based on these responses, future texting interventions focused on financial aid filing might benefit from direct integration with financial aid data systems, so reminder messages are only sent to students who are missing student forms. We also note in the text of the article that due to staff capacity, UVA was only able to provide two-way communication support to early action applicants. However, regular decision applicants sent several procedural questions in response to intervention messages and might also have benefited from the opportunity to connect with a financial aid counselor. Leveraging these newer forms of interactive technology could assist admissions and financial aid offices with providing as customized and personalized support to students as possible, while still operating within the limits of staff capacity.

Personalized Support

As noted in the text of the article, due to staff capacity, UVA was only able to provide two-way communication support to early action applicants. However, regular decision applicants sent several procedural questions in response to intervention messages and might also have benefited from the opportunity to connect with a financial aid counselor. Leveraging these newer forms of interactive technology could assist admissions and financial aid offices with providing students with the most customized and personalized support possible, while still operating within the limits of staff capacity.

Other Applications

This intervention focused on texting students about two specific financial aid behaviors: filing the FAFSA and filing the CSS PROFILE. However, students must also complete other financial aid tasks during the initial application phase. For example, students must send the financial aid office supporting documents, including student and parent W2 forms. While the office of financial aid currently notifies students about these forms on their website and through the applicant interface, creating an additional text message campaign may increase student submission of these supplementary forms. Use of advanced data analytics to target text message outreach to students and parents during prospective and admitted student events may also increase attendance at financial aid support sessions where financial aid administrators could help guide students through the application process.

Policy Context

Looking forward, the recent legislative changes that enable students to submit the FAFSA during the fall of their senior year of college and use prior-prior tax year documentation have meaningful effects on college and university aid award processes. For example, in 2016-17, when early action applicants to UVA received their acceptance notices in late January, the office of financial aid was able to promptly distribute aid award letters to those students who had already completed their FAFSA and CSS PROFILE documentation. This provided early action admitted students with important cost information much earlier than in prior years, enabling them to make their matriculation decisions sooner. Adapting messaging and outreach strategies as financial aid policy changes, and using whichever interactive technologies are currently most effective at reaching students, can help ensure students have the most up-to-date and comprehensive information to inform their matriculation decisions.

Researcher-Practitioner Partnerships

In this article, we highlight results from a collaboration between UVA offices of admissions and financial aid and researchers at the UVA Curry School of Education. Together, we designed a study to send text message reminders to early action admitted students and regular decision applicants to the university to encourage higher rates of on-time financial aid filing. These messages focused on (a) clearly communicating specific deadlines; (b) increasing awareness around the CSS PROFILE, a less commonly used financial aid form; and (c) prompting students to plan specific times to complete the necessary FAFSA and CSS forms to ensure they received their maximum aid package. As part of this initiative, we learned valuable lessons to inform future partnerships and outreach efforts, both at UVA and hopefully at other institutions.

We believe this intervention exemplified how within-university research-practitioner partnerships can be effectively structured. The admissions and financial aid offices at UVA are at the leading edge of broader university efforts to expand access and affordability to lower-income students in Virginia and around the country. Leaders within those offices were familiar with research conducted by UVA faculty demonstrating that proactive, personalized outreach to students with important college and financial aid information can lead to improved enrollment and persistence outcomes, and those leaders were eager to pilot these strategies at the university. Admissions and financial aid staff have detailed expertise and experience about how those processes function at the university and about the staff resources available to support students. Researchers, for their part, can provide intervention design, technical, and evaluation support to (a) ensure that the messages are constructed in a behaviorally informed way that maximizes student response and engagement, and (b) provide rigorous evaluation of the impact of the intervention on students' outcomes.

This partnership was made possible by engaging in frequent, open communication about the concurrent research and implementation timelines. Communicating early in the academic year about respective busy seasons allowed us to coordinate and time data sharing and reviews of draft write-ups around when all team members were able to give the project attention. Without such coordination, a partnership would likely be stalled by mismatched work cycles. For example, researchers might find early January to be an optimal time to engage in analysis and move the project forward, while admissions staff are deep in guiding prospective students through last-minute submission questions and reviewing completed applications.

Open, early communication also helped facilitate conversations about the different uses of data. Researchers and practitioners prioritize both student privacy and maintaining careful, secure records to protect sensitive information, and by discussing early on what restrictions each group faces in data storage and transmission, we could avoid frustrations around not being able to share data and adjust our analyses to account for data limitations.

Overall, we found this partnership to be beneficial to inform practice, research, and future partnerships. These partnerships hold promise for designing and evaluating innovations to further improve access and success at UVA.

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Appendix A

Text Message Content

	Early Action Admitted Students	Regular Decision Applicants
<p><i>Message Purpose:</i> Introductory Message</p> <p><i>Delivery Date:</i> 2/16/2016</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], this is Kelsey from UVA admissions. We want to make sure you get all the financial aid you're eligible for! (1/2)</p> <p>Stay tuned for 3-4 text messages over the next month w/ important financial aid-related info and reminders. Text back if you have questions or need help! (2/2)</p>	<p><i>Message to Student:</i> AGE TO STUDENT: Hi [STUDENT NAME], this is Kelsey from UVA admissions. We want to make sure you get all the financial aid you're eligible for, if you're admitted to UVA! (1/2) Stay tuned for 3-4 text messages over the next month w/ important financial aid-related info and reminders. (2/2)</p>
<p><i>Message Purpose:</i> Importance of timely filing</p> <p><i>Delivery Date:</i> 2/18/2016</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], it's Kelsey again from UVA. Did you know that getting your FAFSA and CSS/Profile in by March 1 can mean \$1000s in financial aid to you? (1/2) Reply "completed" if you've already done the FAFSA and CSS or "not yet" if you haven't completed either application. (2/2)</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], it's Kelsey again from UVA. Did you know that getting your FAFSA and CSS/Profile in by March 1 can mean \$1000s in financial aid to you?</p>
<p><i>Message Purpose:</i> Provide resources</p> <p><i>Delivery Date:</i> 2/23/2016</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], it's Kelsey again from UVA. Did you know that getting your FAFSA and CSS/Profile in by March 1 can mean \$1000s in financial aid to you? (1/2) Visit virginia.edu/costestimator to see how much aid you would receive from UVA. Complete the FAFSA & CSS/Profile to receive YOUR share of financial aid (2/2)</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME]. Between federal and state grants and financial aid we offer, UVA may be much more affordable than you think! (1/2) Visit virginia.edu/costestimator to see how much aid you would receive from UVA. (2/2)</p>
<p><i>Message Purpose:</i> Timely reminder; scheduling prompt</p> <p><i>Delivery Date:</i> 2/26/2016</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], only 5 days left before the March 1 deadline for the FAFSA & CSS/Profile. Applying by 3/1 can mean \$1000s more in aid. (1/2) Is there a day this week when you could set aside a couple hours to work on these forms? Text back if you need help. (2/2)</p>	<p><i>Message to Student:</i> Hi [STUDENT NAME], only 5 days left before the March 1 deadline for the FAFSA & CSS/Profile. Applying by 3/1 can mean \$1000s more in aid. (1/2)</p> <p>If you can, find a day this week when you could set aside a couple hours to work on these forms. (2/2)</p>

Table A1

Summary Statistics, 2015 Pilot Schools and 2016 Full Implementation Schools

	2015 Pilot schools	2016 Rollout: high FRPL schools	2016 Rollout: low FRPL schools	2016 Rollout: all schools
UVA 2015 applicant individual characteristics				
% Female	0.523 [0.500]	0.546 [0.498]	0.545 [0.498]	0.542 [0.498]
% White	0.482 [0.500]	0.624 [0.484]	0.509 [0.500]	0.549 [0.498]
% Black	0.221 [0.415]	0.082 [0.274]	0.077 [0.266]	0.077 [0.267]
% Hispanic	0.083 [0.277]	0.063 [0.242]	0.059 [0.235]	0.061 [0.239]
Missing SAT	0.019 [0.135]	0.007 [0.082]	0.006 [0.077]	0.009 [0.092]
SAT (math+verbal)	1178 [244]	1306 [185]	1312 [188]	1307 [198]
N of 2015 applicants	539	2078	4755	7391
School characteristics (2014-15 academic year)				
% Students applying to UVA	0.035 [0.024]	0.062 [0.061]	0.076 [0.073]	0.074 [0.071]
% applicants accepted to UVA	0.451 [0.306]	0.357 [0.259]	0.455 [0.197]	0.411 [0.232]
% Students filing FAFSA (March 1)	0.271 [0.070]	0.337 [0.175]	0.326 [0.090]	0.327 [0.104]
% UVA applicants filing CSS	0.374 [0.296]	0.225 [0.227]	0.314 [0.186]	0.267 [0.304]
% UVA admits filing CSS	0.794 [0.262]	0.594 [0.328]	0.673 [0.227]	0.624 [0.337]
Graduation rate	0.876 [0.046]	0.906 [0.061]	0.919 [0.045]	0.917 [0.047]
FRPL %	0.612 [0.126]	0.977 [0.088]	0.313 [0.126]	0.610 [0.349]
Student/counselor ratio	285 [68]	278 [54]	300 [112]	297 [106]
School enrollment	1,064 [618]	1,064 [635]	1,299 [685]	1,269 [682]
N of schools	58	155	192	555

Notes: Standard deviations in brackets. SAT, student/counselor ratio, and enrollment rounded to nearest whole number. Other values rounded to three significant digits. FRPL refers to students eligible for free- or reduced-price lunch. This table compares the average characteristics of schools selected for the 2015 pilot of the text message intervention and the schools that received text messages as part of the 2016 rollout of the program. As a result of merge limitations between UVA student-level and Virginia school-level files, not all schools have a FRPL value, and thus the “all schools” column includes more schools than the sum of high- and low-FRPL schools.