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Nudging study habits: A field experiment on peer tutoring in higher education☆

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ABSTRACT

More than two of every five students who enroll in college fail to graduate within six years. Peer tutoring offers one approach to improve learning outcomes in higher education. We conducted a randomized controlled experiment designed to increase take-up of university tutoring services. Brief, one-time messages increased tutoring take-up by seven percentage points, or 23% of the control group mean. Attendance at multiple tutoring sessions increased by nearly the same amount, suggesting substantial changes in study habits in response to a simple and inexpensive intervention. The intervention cost $3.32–$14.58 per additional tutoring hour, the lowest reported in the literature on peer tutoring experiments. We find little evidence of advertising-induced tutoring on learning outcomes.

1. Introduction

More than two out of every five students who enrolled in college in 2007 failed to graduate by 2013. Even at selective four-year institutions, more than one-third of students did not graduate in six years (National Center for Education Statistics, 2014).[1] Studying is a fundamental input for student success in college, yet many students study less than necessary to progress to graduation (Beattie, Lalibert, Michaud-Leclerc, & Oreopoulos, 2017). University students who procrastinate, as measured by self-reported cramming for exams (Beattie, Lalibert, & Oreopoulos, 2016) or small delays in course enrollment (Banerjee & Duflo, 2014; De Paola & Scoppa, 2015; Novarese & Di Giovinazzo, 2013), have worse academic outcomes. Stinebrickner and Stinebrickner (2008) and Lindo, Swensen, and Waddell (2012) found that exogenous increases in campus distractions (video games owned by a randomly assigned roommate and the success of the university football team, respectively) led students to study less and earn lower grades. Yet little experimental or quasi-experimental evidence exists on how to change study habits.

Peer tutoring offers one approach to change study habits and improve student outcomes in higher education. This paper evaluates a randomized experiment that advertised peer tutoring services to college students via postcard. The experiment varied the messages used to encourage students to attend tutoring, including framing tutoring as a positive social norm or offering small financial incentives to overcome resistance to attendance. We compare these messages to a benchmark postcard that only provided information about tutoring, and to a pure control group that received no advertising.

We find that advertising increased tutoring attendance by seven percentage points, or 23% of the control group mean. Moreover, the experiment increased attendance at multiple tutoring sessions by 6 percentage points, nearly the same magnitude as the effect on attendance at a single session. This finding suggests durable changes in study behavior for a simple and inexpensive intervention.

Comparing tutoring take-up across postcards, we find no significant differences across messages. At first glance, this finding suggests that students responded to the informational content of the advertisements. However, further exploration reveals similar responses to the postcards across class years, which is not entirely consistent with the informational mechanism, as we expect older students to be more aware of tutoring services prior to postcard receipt. We also find that students more prone to procrastination, as measured by delays in course

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[1] "Selective" refers to admissions rate between 25–49% . Figures for public institutions only.

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registration, respond as strongly to postcards as those less prone to procrastination. Tutoring take-up therefore appears unrelated to information alone or to students' propensity to procrastinate rather than study. Instead, the evidence suggests that simply making the existence of tutoring services salient induced more students to attend.

When using the random variation in postcard receipt as an instrument, we find no evidence that tutoring altered student grades. This finding is consistent with substitution of tutoring with an equally effective alternative form of study, or with substitution of study effort from untutored to tutored courses, leaving overall grades unchanged. Our null findings on grades are also consistent with the potential ineffectiveness of tutoring as a study strategy among the subpopulation of students induced to attend tutoring through the postcard. Nonetheless, our findings on increased attendance at multiple tutoring sessions suggests that students valued the service. Moreover, point estimates of the effect of tutoring on student grades are too imprecise to rule out positive effects.

Universities have employed a range of efforts to increase retention, including better targeting of financial aid, remedial courses, and increased advising. Between 1987 and 2008, expenditure on student services, of which tutoring is a part, grew at nearly double the rate of instructional expenditures across every higher education institutional category (Ehrenberg, 2012, p. 205). Peer tutoring offers at least two advantages relative to other student services. First, it is low cost. Because tutors are also students, they can be hired at the relatively low prevailing wage of student workers. Second, tutoring engages students in behavior directly intended to increase their academic performance. It can therefore complement other efforts, such as removing financial barriers or advising, intended to promote student success.

We make three main contributions to the literature on improving student outcomes in higher education. First, we demonstrate that a low-cost, one-time intervention to promote peer tutoring can meaningfully alter study behavior. Four prior studies (Angrist, Lang, & Oreopoulos, 2009; ideas42, 2015; Paloyo, Rogan, & Siminski, 2016; Parkinson, 2009)—conducted at an Irish university, a Canadian university, a community college in the United States, and an Australian university, respectively—have evaluated peer tutoring using an experimental design.[2] As in our work, each of these studies found that randomly encouraging students to attend peer tutoring sessions increased take-up.[3] Also as in our work, three of the four studies failed to find significant positive effects of tutoring on student performance.[4] We extend these findings to a new setting, bolstering the external validity of the experimental results. At $3.32–$14.58 per additional hour of tutoring, ours has the lowest reported costs among these experiments, yet it was sufficient to alter behavior.

Perhaps more importantly, we provide suggestive evidence that the channel through which tutoring attendance increased was not information alone or reduced procrastination, but the increased salience of tutoring availability. Our work therefore provides new evidence on a common way that colleges provide individualized academic support across the curriculum at low cost.

Second, we contribute to the broader literature applying the insights of behavioral economics to education (Koch, Nafziger, & Nielsen, 2015; Lavecchia, Liu, & Oreopoulos, 2014). Specifically, we provide evidence consistent with the presence of present bias and social stigma among students. Studying, either alone or with a tutor, has salient and immediate costs, with distant and uncertain future benefits. Students with a bias for present utility may therefore make suboptimal studying choices. Making the availability or benefits of tutoring more salient might counter present bias and increase investments.

Another behavioral explanation for suboptimal human capital investment is student concern about identity. Feelings of social exclusion can decrease utility (Akerlof & Kranton, 2002) and reduce cognitive performance (Baumeister, Twenge, & Nuss, 2002). If students place high value on perceived intellectual ability, then seeking assistance through tutoring could carry a stigma that leads to its underuse. On the other hand, interventions to increase a sense of belonging can improve academic performance (Walton & Cohen, 2007; 2011). One treatment arm of our study addresses stigma by framing tutoring as a strategy used by successful students.

Third, our work is part of a burgeoning literature on nudges—changes to the presentation of choices that do not meaningfully alter costs or benefits (Thaler & Sunstein, 2008)—in higher education (ideas42, 2016). These nudges include efforts to increase college applications, enrollment, or financial aid among potential college students currently enrolled in high school (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Castleman & Page, 2015; Castleman, Page, & Schooley, 2014; Hoxby & Turner, 2013), as well as interventions to improve outcomes among students already enrolled (Angrist et al., 2009; ideas42, 2015; Smith, White, Kuzyk, & Tierney, 2017). Nudging students to attend peer tutoring can serve as a low-cost complement or alternative to remedial courses (Bettinger & Long, 2009; Calcagno & Long, 2008; De Paola & Scoppa, 2015; Martorell & McFarlin Jr, 2011; Moss & Yeaton, 2006; Scott-Clayton & Rodriguez, 2014) and student advising (Angrist et al., 2009; Bettinger & Baker, 2013; Ellis & Gershenson, 2016; Visher, Butcher, & Cerna, 2011) as a way to promote student retention and graduation. Our advertising devices are a variant of those used in Wilson, Frade, Rech, and Friedman (2016) and in Friedman and Wilson (2016), studies that examined how to increase household investment in another component of human capital production (preventive health inputs).

In the next section, we describe the research setting and experimental design. Section 3 describes the data and empirical methods. Section 4 presents results and Section 5 concludes.

2. Program description

2.1. Study setting

We conducted this experiment at Reed College, an elite liberal arts college in Portland, Oregon. Reed enrolls 1400 students and has a student-faculty ratio of nine to one.[5] It is highly selective, admitting 35 percent of applicants, with an average high school GPA of 3.9 and mean SAT score of 2060 (95th percentile on a scale of 2400) among admitted students. The student body is 54% female, with a racial and ethnic composition of 60% white, 10% Asian, 10% Hispanic, 5% black, 8% international, and the remaining 7% in other categories. The college offers 40 majors, of which the most popular categories are in mathematics and natural sciences (29%) and history and social sciences (23%). Despite the college's elite status, 20% of students receive Pell Grants, giving Reed a higher share of low-income students than many peer institutions (Burd, 2013). The six-year graduation rate is 79% , whereas many elite liberal arts colleges have six-year graduation rates above 90% (Grove, 2017; US News & World Report, 2016).

[2] Other studies have found positive effects of peer tutoring on student outcomes (Dawson, van der Meer, Skalicky, & Cowley, 2014; Munley, Garvey, & McConnell, 2010), but rely on observational data and may therefore be biased due to student self-selection into tutoring.

[3] Instead of providing randomized encouragement, Parkinson (2009) randomly assigned students to receive tutoring within sections of particular classes.

[4] The exception is Parkinson (2009), which studied a sample of 67 students at an Irish university assigned to tutoring in specific courses, rather than to general tutoring services, as in the other studies including ours. Parkinson (2009) also reclassified students who did not comply with treatment as members of the control group, introducing potential bias in the estimated grade effects. Angrist et al. (2009) studied a program that bundled peer advising and tutoring at a Canadian university. They found positive effects on student grades only when the intervention was combined with a large financial incentive requiring students to maintain high grades in exchange for a scholarship.

[5] All data in this section are from 2015 and made available by the Reed Office of Institutional Research, unless otherwise noted.