ACT Research & Policy

TECHNICAL BRIEF

SEPTEMBER 2016

Dialing for Scholars: An Experiment to Increase ACT Attendance Rates

TY CRUCE, PHD

Abstract

Taking a college entrance exam such as the ACT® or SAT® can be an important step in the college-going process. Although overall, 1 out of 10 students who register for the ACT on a national test date are absent on their registered test day, the absentee rate (at 21%) for students who registered with a fee waiver is substantially higher than the absentee rate (at 5%) for students who paid the registration fee. The current study examined whether a brief telephone reminder of the test date and of the required test materials a few days prior to the test date would result in fee waiver students having higher test day attendance rates. Using a randomized controlled trial with 2,500 students, the findings of this study do not provide evidence that the treatment as delivered had an impact on the attendance rates of fee waiver students. There are several possible rationales for why the treatment was not effective, and these rationales point to areas of future direction for this research initiative.

Introduction

Taking a college entrance exam such as the ACT or SAT can be an important step in the college-going process. According to the most recent data from the National Center for Education Statistics (2015), 1,644 postsecondary educational institutions across the US serving roughly eight million degree-seeking undergraduate students either require or recommend test scores for admissions decisions. Sending an official ACT or SAT score report to a postsecondary institution as part of the application process satisfies this criterion. ACT sent over six million official score reports to postsecondary institutions on behalf of the ACT-tested high school graduating class of 2014 (N=1,845,787)—an average of 3 score reports per student (ACT, 2015).

Ty Cruce is a director in Statistical and Applied Research specializing in the study of student preferences and decision making during the college choice process.

Acknowledgements

The author would like to thank Amos Dupuich, Kyle Jacobsen, and Maggie Krob for their assistance with this study, and Krista Mattern and Kurt Burkum for their comments on previous drafts of this report.

Taking the ACT or SAT can also expand the number and type of postsecondary institutions that students consider during the search stage of the college choice process by providing an opportunity for students to be identified and recruited by institutions that are not currently under consideration. At the time that students register for the ACT or SAT, they may opt into a service such as ACT's Educational Opportunity Service (EOS) or The College Board's Student Search Service. These services allow accredited postsecondary institutions to identify and select the names and contact information (i.e., email address or street address) of prospective students whose backgrounds and academic achievement levels align with the mix of desired characteristics of the students in their applicant pools. For instance, about 86% of the ACT-tested graduating class of 2014 opted into EOS, with over 1,000 postsecondary institutions using EOS to identify and select these students. Overall, these students had their contact information obtained by an average of 17 postsecondary institutions that they were not previously considering. About 16% of these students subsequently enrolled at an institution that selected them through EOS (ACT, 2015).

Although both ACT and The College Board have contracts with a limited number of states to offer the ACT or SAT statewide, most college-bound students continue to take either of these exams on one of six to seven national test dates that are offered on Saturdays during the school year. The current fee to sit for the ACT or SAT is $39.50 ($56.50 with Writing) and $43 ($54.50 with Essay), respectively. These fees may create a financial burden for lower-income students and their families, thus potentially limiting their access to many postsecondary institutions across the US. To offset this financial burden and to increase test-taking and subsequent college attendance among lower-income students, both ACT and The College Board have created programs that provide income-eligible students with fee waivers in order to register to take their respective test on a national test date. These fee waiver programs are large in scope and well-utilized, accounting for a sizable share of the total test registrations per school year. For example, 29% of all ACT test registrations for the 2014-15 school year were completed using a fee waiver. This amounts to $29.2 million offered in fee waivers, covering over 600,000 ACT registrations.

Within both ACT and The College Board's fee waiver programs, eleventh or twelfth grade students who are either enrolled in or eligible to participate in the National School Lunch Program may obtain up to two fee waivers to use for national test day registration.[1] The students' eligibility for a fee waiver is verified by a high school counselor or other designated school official and the fee waiver is distributed locally. Each fee waiver then applies to the registration for an individual test date. If the student does not attend on their registered test date, the fee waiver is forfeited and cannot be applied to a future test date.

Despite the importance of taking a college entrance exam as a step toward increasing postsecondary educational opportunity, a large and disproportionate share of students who register with a fee waiver do not subsequently attend on their registered test date. For example, although overall, 1 out of 10 students who registered for the ACT on a national test date during the 2013-14 school year were absent on their registered

test date, the absentee rate for students who registered with a fee waiver (at 21%) is substantially higher than the absentee rate for students who paid the registration fee (at 5%).

To address this discrepancy in test day attendance rates, ACT announced a new research initiative, known as "Dialing for Scholars," at the White House Summit on College Opportunity in December, 2014 (ACT, 2014). This initiative was designed with the goal of increasing the test-taking rate for students who registered with fee waivers by reaching out to these students via phone or email in the weeks before the scheduled national ACT test dates to proactively share information that would better prepare them for the testing experience and to encourage them to attend.[2]

Numerous studies from the health sciences that employ randomized controlled trials have found that reminders have a positive impact on engaging in various health-related behaviors (e.g., Armstrong, et al., 2009; Fry & Neff, 2009; Hurling, et al., 2007; Lantz, et al., 1995; Liang, et al., 2011; Patrick, et al., 2009; Pop-Eleches, et al., 2011; Stockwell, et al., 2012), including attendance at healthcare appointments (Gurol-Urganci, de Jongh, Vodopivec-Jamsek, Atun & Car, 2013). Although utilized less frequently in the area of education, a few recent randomized controlled trials (e.g., Castelman & Page, 2015, 2016) have found that reminders are an effective means of getting students to follow through on the pre-matriculation (e.g., registering for orientation and completing housing forms) and post-matriculation (e.g., re-filing the Free Application for Federal Student Aid) tasks that in turn lead to higher college enrollment and retention rates, respectively.

The current study was developed as a small pilot experiment to establish a baseline for future efforts under the "Dialing for Scholars" initiative. The question of interest addressed in this pilot experiment is: Does a brief reminder of the test date and of the required test materials a few days prior to the test date result in fee waiver students having higher test day attendance rates? The treatment for this study entailed sending a pre-recorded informational telephone message to a random sample of students a few days prior to the national test date in which they had registered with a fee waiver. This pilot design serves as a baseline, as it requires the least amount of deviation from current ACT business practices regarding the content, mode, and timing of contacts with students for other test registration and reporting processes.

Methods

Design

The design for this study was a randomized controlled trial (RCT) with an intention-to-treat (ITT) analysis. By randomly assigning students to the intervention, an RCT makes sure that, on average, there is balance (i.e., no underlying differences) between the treatment and control groups, and this in turn increases confidence that any between-group difference in the outcome is attributable to the intervention. ITT analyses include every student who was selected to receive the treatment regardless of whether or not that student complied with the treatment, received a deviation in the treatment, or withdrew from the treatment. With an ITT approach to analysis, the research question of interest is the effectiveness of prescribing the treatment—its "use-effectiveness"—as opposed to receiving the treatment—its

"method-effectiveness" (Sheiner & Rubin, 1995). In other words, the results of this research will provide some evidence of the impact of a pre-recorded telephone reminder on the test day attendance of fee waiver students knowing that not all fee waiver students would necessarily receive and subsequently act on that reminder.

Treatment

Content. The treatment for this study comprised a pre-recorded telephone message. The content of the message—which provided the recipient with a reminder of the test date and of the materials that the student is required to bring on test day—was written to be informational in nature and free of any language about the benefits of attending (e.g., increasing college opportunity) or the costs of not attending (e.g., forfeiting one of only two fee waivers). Specifically, the message stated: "This is a call from [insert state-specific ACT legal name] calling to remind you that you have registered to take the ACT on Saturday, April 18. Please report to your assigned test center by 8:00am, and be sure to bring a copy of your ticket and an acceptable photo identification with you to your test center. If you have any questions about your test day, you can contact us at 319-337-1270 between 8:00am-8:00pm CT Monday-Friday or email us at ACT-Reg@act.org. Please press 1 to hear this message again."

Mode. The treatment was delivered the Thursday (i.e., two days) prior to the test date via computerized autodialer to the telephone number that the student provided on the ACT registration form. This mode of delivery was chosen as it is a common mode in which ACT communicates to students prior to the test date. For example, reminders that students must submit their photo identification as part of the registration process are submitted by a pre-recorded message a few weeks before each national test date.

Timing. The Thursday just prior to the national test date was selected for administering the treatment. This particular date was chosen, as the deadline for submitting all necessary test registration materials to ACT was set at one week prior to the test date, and meeting this deadline was a criterion for entry into the target population for the study. A standardized protocol for contacting the students was followed that allowed for up to two attempts to reach the students.

Variables and Analysis

The dependent variable in this study is student attendance at their designated test center during the April 18, 2015 national test date. Operationally, the dependent variable is dichotomous, where:

$$y_i = \begin{cases} 1 \; attended \; on \; national \; test \; date \\ 0 \; did \; not \; attend \; on \; national \; test \; date \end{cases}$$

The independent variable in this study is the students' membership in the treatment group or control group, regardless of whether students in the treatment group received the pre-recorded telephone message. Operationally, the independent variable is also dichotomous, where:

$$x_i = \begin{cases} 1 \; randomly \; assigned \; to \; treatment \; group \\ 0 \; randomly \; assigned \; to \; control \; group \end{cases}$$

Given the categorical nature of the dependent and independent variables, the test day attendance frequencies for each group were arranged in a 2X2 contingency table and a Pearson Chi-square test for two proportions was calculated

using the FREQ procedure in SAS. The null hypothesis for this study is that the treatment and control groups have equivalent test day attendance rates:

$$H_0: p_T - p_C = 0.$$

The alternative hypothesis is that the test day attendance rate for the treatment group is larger than the rate for the control group:

$$H_1: p_T - p_C > 0.$$

Sample

The population for this study comprised students who had registered for ACT's Saturday, April 18, 2015 national test date with a fee waiver. For the prior three years (i.e., 2012, 2013, and 2014) the April test day attendance rates among fee waiver students were consistently around 78%. For this study, I wanted to be able to detect a five percentage-point increase in the attendance rate (i.e., 78% to 83%) due to receiving the treatment with a Type 1 error rate (α) of 0.05 and with a power (1 – β) exceeding 0.80. Given that this was intended to be a small pilot and I wanted to minimize the possibility of contamination (e.g., students in the treatment group communicating with students in the control group about the phone reminder), I opted for an unbalanced sampling ratio of 1:4 between the treatment and control groups. Given these criteria, 500 fee waiver students from the population were randomly selected and assigned to receive the treatment and 2,000 were randomly selected and assigned to the control group.

Descriptive statistics for the self-reported background characteristics of the treatment and control groups are provided in Table 1. As seen in the table, random assignment did a fairly robust job of balancing the observable characteristics of the students in these two groups. However, compared to students in the control group, those in the treatment group were slightly less likely to aspire to earn a graduate-level degree. Students in the treatment group were also slightly less likely to be white and slightly more likely to have parents with no college education.

Results

An initial telephone contact was attempted for 497 out of the 500 students in the treatment group. Among the three students not contacted, one student had provided an invalid telephone number and two students had telephone numbers with area codes that were outside of the 50 states or the District of Columbia. Among the 497 students initially contacted, 441 were successfully contacted on the first attempt. A successful contact was defined as either a live answer or a redirect to voice mail. A second attempt was made an hour later for students where the initial attempt at contact was unsuccessful. The second attempt yielded eight more successful contacts.

In all, 449 of the 500 students who were randomly assigned to the treatment group received the pre-recorded message, 173 of the calls were designated as live answer, and the other 276 calls were designated as having been redirected to voice mail. The median duration for both live answer and answering

machine redirects was 52 seconds, suggesting that many individuals who participated in the live answer listened to the message in its entirety before terminating the call.

Among the 2,500 students sampled for the experiment, 2,013 students (80.5%) attended on the national test date, whereas 487 students (19.5%) were absent. Table 2 provides the attendance rates for the treatment and control groups. As seen in Table 2, only 78.6% of students from the treatment group attended on the test date, compared with 81.0% of students from the control group. This difference, which is not in the hypothesized direction, is not statistically significant from zero. These results support the null hypothesis of no difference in test day attendance rates between the students in the two groups.

Table 1. Background Characteristics of Treatment and Control Groups

Outcome	Treatment Group	Control Group
High School GPA	3.16 (0.59)	3.15 (0.59)
Degree Expectations		
Less than bachelor's degree	7	7
Bachelor's degree	45	46
Graduate degree	30	32
Missing	17	15
Gender		
Female	42	43
Male	58	57
Race/Ethnicity		
African American	29	28
American Indian	3	2
Asian	4	4
Hispanic	31	30
White	24	26
Other race	9	9
Parents' Education		
No college	36	34
Some college	27	27
Bachelor's degree	15	14
Graduate degree	5	6
Missing	17	19
N	500	2000

Table 2. Test Day Attendance by Study Group

Outcome	Treatment Group	Control Group
Present	393 (78.6%)	1620 (81.0%)
Absent	107 (21.4%)	380 (19.0%)

Notes: 1) Pearson Chi-square = 1.4689 (1 df). 2) N = 2500

Discussion and Future Directions

The purpose of this study was to examine whether a brief reminder of the test date and of the required test materials increases the test day attendance rate of fee waiver students. The findings of this pilot experiment do not provide evidence that the treatment as delivered had an impact on the attendance rates of fee waiver students. There are several possible rationales for why the treatment was not effective, and these rationales point to areas of future direction for this research initiative. First, regarding the delivery of the treatment, a pre-

recorded telephone call may no longer be the best mode for reaching these students. Although telephone contact with 449 of the 500 students in the treatment group resulted either in a live answer or a redirect to an answering machine, I do not know who (e.g., parent, student, sibling, or other relation) received the message and if that message was properly conveyed to the student. Other modes of contact (e.g., email) will be part of future studies to determine if modifying the mode of delivery improves the test day attendance rate of these students.

Second, regarding the timing of the treatment, lower-income students (who are the target population for this study) are more likely than their peers to face constraints such as family or work obligations or a lack of transportation that keep them from attending on a Saturday test date. Delivering the treatment just two days before their test date may not provide students and their families with sufficient time to overcome those potential constraints and prior obligations in order to attend. Future research in this area will add a timing component to examine whether earlier contact leads to improved attendance rates.

Finally, informational content alone may not be adequate to encourage students to attend on the test date. It may be the case that some students need some motivation in addition (or as opposed) to a reminder. Examining the impact of different treatment content that informs students of the benefits and costs associated with attendance or absence on their test day will be included within future research in this area.

Notes

[1] Both organizations offer some alternative criteria for determining financial eligibility. For more information, please see their respective websites at act.org and collegeboard.org.

[2] Currently, ACT policy does not allow the company to contact students via text message.

References

ACT (2014, December). *ACT announces new initiatives to help improve college access, increase opportunities for underserved students*. Press Release. Iowa City, IA: Author.

ACT (2015, July). *Expanding Opportunities Part 2: Enrollment Patterns. A College Choice Report for the Graduating Class of 2014*. Iowa City, IA: Author.

Armstrong A. W., Watson, A. J., Makredes, M., Frangos, J. E., Kimball, A. B., & Kvedar, J. C. (2009). Text-message reminders to improve sunscreen use: A randomized, controlled trial using electronic monitoring. *Archives of Dermatology*, *145*, 1230-1236.

Castleman, B. L., & Page, L. C. (2015). Summer nudging: Can personalized text messages and peer mentor outreach increase college going among low-income high school graduates? *Journal of Economic Behavior & Organization*, *115*, 144-160.

Castleman, B. L., & Page, L. C. (2016). Freshman year financial aid nudges: An experiment to increase FAFSA renewal and college persistence. *The Journal of Human Resources*, *51*, 614-645.

Fry, J. P., & Neff, R. A. (2009). Periodic prompts and reminders in health promotion and health behavior interventions: Systematic review. *Journal of Medical Internet Research*, *11*(2): e16.

Gurol-Urganci, I., de Jongh, T., Vodopivec-Jamsek, V., Atun, R., & Car, J. (2013). Mobile phone messaging reminders for attendance at healthcare appointments. *Cochrane Database of Systematic Reviews*. doi: 10.1002/14651858.CD007458.pub3.

Hurling R., Catt, M., De Boni, M., Fairley, B., Hurst, T., Murray, P., Richardson, A., & Sodhi, J. (2007). Using internet and mobile phone technology to deliver an automated physical activity program: Randomized controlled trial. *Journal of Medical Internet Research*, *9*(2), e7.

Lantz, P. M., Stencil, D., Lippert, M. T., Beversdorf, S., Jaros, L., & Remington, P. L. (1995). Breast and cervical cancer screening in a low-income managed care sample: The efficacy of physician letters and phone calls. *American Journal of Public Health*, *85*, 834-836.

Liang, X., Wang, Q., Yang, X., Cao, J., Chen, J., Mo, X., Huang, J., Wang, L. & Gu, D. (2011). Effect of mobile phone intervention for diabetes on glycemic control: A meta-analysis. *Diabetic Medicine*, *28*, 455–463.

Patrick, K., Raab, F., Adams, M., Dillon, L., Zabinski, M., Rock C., Griswold W., & Norman G. (2009). A text message-based intervention for weight loss: Randomized controlled trial. *Journal of Medical Internet Research*, *11*(1), e1.

Pop-Eleches, C., Thirumurthy, H., Habyarimana, J. P., Zivin, J. G., Goldstein, M. P., de Walque, D., & Bangsberg, D. R. (2011). Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: A randomized controlled trial of text message reminders. *AIDS*, *25*(6), 825–834.

Sheiner, L. B., & Rubin, D. B. (1995). Intention-to-treat analysis and the goals of clinical trials. *Clinical Pharmacology and Therapeutics*, *57*, 6–15.

Stockwell , M. S., Kharbanda, E. O., Martinez, R. A., Vargas, C. Y., Vawdrey, D. K., & Camargo, S. (2012). Effect of a text messaging intervention on influenza vaccination in an urban, low-income pediatric and adolescent population: A randomized controlled trial. *The Journal of the American Medical Association*, *307*, 1702-1708.

U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics. (2015, November). Admissions and Test Scores: Admission considerations, applications, admissions, enrollees and test scores (ADM2014). Retrieved from https://nces.ed.gov/ipeds/datacenter/DataFiles.aspx.