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Accessibility
LOW-COST INTERVENTIONS TO REDUCE ANONYMITY IN LARGE CLASSES

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Key Question and Context

The MPP core classes at HKS tend to be large. API-202, for example, is taught in four sections that average close to 60 students each. The size of such classes makes it challenging for faculty to get to know students and vice versa. Though some students participate actively in class or take advantage of office hours, others remain relatively quiet and thus unknown to faculty during the semester.

My concern as a teacher is that the students whom I least get to know during the semester are precisely the ones for whom a deeper relationship with a faculty member might be most beneficial. Students may remain unknown to me because they are unengaged with the class, perhaps because they do not think it useful for their careers, or because they are struggling with the curriculum and do not perceive a way to start a conversation about that fact.

I therefore proposed to SLATE to run a simple study of the impact of two forms of personalized interventions on student performance in my section of API-202. The broad question being addressed is how to effectively engage students in large classes, such as core classes, where students may have relatively little interaction with the teacher. My goal was to see whether low-cost interventions early in the semester can improve such engagement and, I hope, student performance. If these interventions proved helpful to student performance, they would provide other MPP core teachers with relatively low-cost and easily scalable methods of connecting with students outside of the large and thus challenging classroom environment.

The Intervention

Given the time constraints facing faculty members, particularly those teaching core courses, I studied a simple intervention that takes little time to implement and is scalable across large classrooms. To make rigorous causal inferences about the impacts of the intervention, I conducted a randomized experiment in my spring 2014 API-202 class, which introduces students to regression analysis and causal inference. The class consisted of 60 students, 47 of whom were MPP1s, 4 of whom were MPP2s, and 9 of whom were MPAs. I stratified students
by degree program and year (i.e. into these three groups) and in each stratum randomly assigned students to one of three groups.

Half of the students in each stratum were assigned to a control group that received no intervention. Such students received only my standard coursewide e-mails about sources of help during the course term, including my and course staff’s office hours. The remaining half of students in each stratum received such standard information and were randomly assigned to also receive one of two types of e-mails. I sent these e-mails on Monday, February 24, about one month into the semester, at which point two problem sets had been handed in and about two weeks prior to the midterm.

One type of e-mail, which I’ll call “academic”, focused on addressing personalized academic struggles with the course material itself. The goal was to see whether personally contacting students about such struggles might encourage them to engage in conversations that would help with the material. That e-mail read:

Dear [STUDENT’S FIRST NAME],

I’m enjoying teaching API-202 but I’d like to find out more about any specific econometric questions you might have than the large class format allows. If you're willing, would you write me a short e-mail describing any questions that have arisen that would be helpful for me to clarify?

Sincerely, Josh

The other type of e-mail, which I’ll call “personal”, focused on developing a personal connection to the students. My hope was that such a connection might improve their engagement with the course and might inform my own teaching (i.e. by affecting the policy questions or examples I used to illustrate concepts during class). That e-mail read:

Dear [STUDENT’S FIRST NAME],

I’m enjoying teaching API-202 but I’d like to get to know you better than the large class format allows. If you're willing, would you write me a short e-mail describing your personal/professional background and your current feelings about how, if at all, API-202 is relevant to you?
I thought of the academic treatment as addressing specific intellectual challenges but without explicitly addressing issues of personal connection (though this may have been implied in the interaction). I thought of the personal treatment as one emphasizing a personal connection between me and the students, one that clarifies that I am invested in their success as individuals but without addressing specific intellectual challenges. I should also note that after students responded to my initial e-mail, I would write one more brief e-mail in return, usually trying to make clear that I had read their response. A typical example of this looked like:

[STUDENT’S FIRST NAME],

Thanks for telling me more about your background. I’m thrilled you’re planning to stay local, as Boston is always in need of smart people to solve its problems. And glad that API-202 has relevance for your future. See you Wednesday.

Josh

The extent of the intervention was thus two short e-mails from me, plus whatever further interactions might have been prompted by these e-mails.

The randomization of students to the control, academic e-mail and personal e-mail groups allow for unbiased estimation of the effects of these treatments, assuming no spillover effects between the three groups. Given the nature of these interventions, I believe that spillover effects were likely minimal, though I cannot rule them out. Because the interventions were timed to be relatively early in the course, potential outcomes affected that I can measure include class attendance and participation, homework performance, midterm and final exam performance, and final course grade. I also present evidence on students’ responses to the e-mails themselves.

Results

Table 1 shows mean responses of students treated by one of the two e-mails. Across the two groups, 90% of students to whom I sent an e-mail eventually responded to that e-mail, taking an average of between one and two days to do so. Nearly all students expressed some
form of gratitude for having received my e-mail. Such response rates, response speeds and expressions of gratitude did not vary by the type of e-mail I sent.

<table>
<thead>
<tr>
<th>Table 1: Response to E-mails</th>
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<tr>
<td></td>
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<tr>
<td>Academic</td>
</tr>
<tr>
<td>Responded</td>
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<tr>
<td>Days to response</td>
</tr>
<tr>
<td>Expressed thanks</td>
</tr>
<tr>
<td>Words in response</td>
</tr>
<tr>
<td>Expressed struggle</td>
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Notes: Mean values are shown. Asterisk denotes statistically significant difference between academic and personal treatment groups.

One striking difference between students sent personal and academic e-mails is the length of their responses. Among responders, those receiving a personal e-mail replied with responses averaging 216 words in length, compared to only 104 words for those receiving academic e-mails, a difference that is large and statistically significant. Figure 1 shows the distribution of response lengths by treatment status. No response to the academic e-mail exceeded 250 words, while six of the responses to the personal e-mail exceed that length.

**Figure 1: Distribution of Response Length**

![Figure 1](image_url)

This difference was evident to me when reading the responses. Below is a representative e-mail from an MPP1 who received a personal e-mail:

_________
Professor Goodman,

Sure thing! I spent two years post-college at City Year Boston, an AmeriCorps program, where I worked with Boston-area high school students for a leadership development and social justice program. Then I spent a couple years as a Peace Corps Volunteer in Togo, West Africa, where I focused on girls' education and empowerment issues.

After HKS, I'm hoping to go into Boston community economic development at the nexus of nonprofits and government, specifically focusing on developing and managing programs that bolster low-income women's economic and social self-sufficiency. API-202 is relevant for me insofar as it enables me to think critically and systematically about the statistical significance of relevant program implementation. Thanks for making statistics as interesting and applicable as possible so far- I really appreciate your skill in and passion for teaching us the material.

Sincerely, [STUDENT’S FIRST NAME]

The e-mail is two paragraphs long, full of personal detail and enthusiastic about the opportunity to connect career with curriculum. The longest such response, from an MPP2, was 421 words plus a link to a video of the student presenting at a conference. One MPP1 followed his initial response by inviting me to a talk he was giving at the Harvard Coop on a book he had written about piracy and maritime security.

This is in contrast to the typical response I received to the academic e-mail. First, only two-thirds of respondents expressed any struggles with the material (0.62/0.87), which the remaining one-third responding with short e-mails whose gist was “No, but thanks for asking.” Those that did communicate an academic challenge often wrote something like this:

Joshua,

Thank you for your e-mail. So far, I have enjoyed a lot the class and its content. Last week it was not clear to me how to get the signs of the omitted variable bias. However, I have been attending the Friday’s review sessions and even though I still need to internalize some

1 Technically, the longest response I received was from an MPA who wrote 794 words, including the fact that she’d once been a backup singer for Aretha Franklin. The MPA turned out, however, to be an auditor and was thus dropped from the analysis presented here.
concepts and get more familiar with them, I generally feel confident with the course material.

Thank you very much for your attention.

[STUDENT’S FIRST NAME]

The e-mail is relatively brief, mentions a problem, but does not suggest that this will prompt a further conversation to deal with the problem.

Though students seemed grateful for the personalized contact with a faculty member and seemed particularly responsive to an attempt to connect the coursework to their personal goals, the treatments nonetheless had no discernible impact on academic outcomes in API-202. Table 2 lists mean values of many of these outcomes by treatment group. All measures have been standardized across the class to have mean zero and standard deviation one, so that differences can be interpreted as standard deviations. Participation is a measure of how many times a student made a constructive comment in class. Problem sets were graded on a scale of zero to three, then totaled with the lowest grade dropped. The midterm and final exam were each scaled from zero to 100. Students wrote a final memo, often in groups of up to four students, and the assignment was graded on a zero to 10 scale. The total grade refers to the weighted average of these components, where problem sets receive a 10% weight, the memo 20%, the midterm 30%, and the final exam 40%.

<table>
<thead>
<tr>
<th>Table 2: Academic Outcomes</th>
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<tbody>
<tr>
<td>(1) Control</td>
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<tr>
<td>Participation</td>
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<tr>
<td>Problem sets</td>
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<tr>
<td>Midterm</td>
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<tr>
<td>Final</td>
</tr>
<tr>
<td>Memo</td>
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<tr>
<td>Total grade</td>
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</tbody>
</table>

Notes: Mean values are shown. All measures of academic performance are standardized to have mean zero and standard deviation one. None of the differences between the control groups and treatments groups are statistically significant.
If anything, the control group appears to have outperformed the treatment groups on all of these measures. In no case, however, is the difference between the control and the treatment groups statistically significant, whether the treatment groups are taken individually or pooled as a single group. In short, this intervention had little apparent positive effect on observable academic outcomes.

**Discussion**

I believe there are two main reasons the intervention had little impact on academic outcomes, though I cannot definitely say which if either of these reasons is the more important one. The first reason is that the treatment itself was very minimal. I sent students a single e-mail to which they responded, and I then responded once more with a very brief e-mail. This may simply not have been a sufficient interaction to spark further discussion and contact with me. In fact, due to my concerns about the ethics of providing extra attention to a subset of students, I may have undermined the efficacy of the intervention by specifically not putting effort into remembering which students had sent me which e-mails. I did not want to be deliberately treating such students differently and, as a result, may have underestimated the effect of such an intervention if implemented in more dedicated fashion. At no point, for example, did I modify the curriculum in response to any of the information sent to me by treated students.

The second reason the intervention may have had little impact is that the intervention may not have substantially increased the extent of contact students had with me relative to the control group. I try to talk to many of my students both in class and outside of class time. If students in the control group felt relatively engaged in API-202 and comfortable bringing academic problems to me or the teaching staff, then the e-mails may not have had much additional benefit beyond that.

The one constructive lesson I take from this experiment is something I had not previously appreciated, namely students’ strong desire to tell faculty about their own lives and how their trajectories connect to the curriculum. I was surprised that the responses to the personal e-mail treatment were so lengthy, detailed and enthusiastic, particularly relative to the academic responses, which often struck me as underwhelming. This suggests to me that, going forward, I will find other ways to solicit students’ personal stories from them and make sure to incorporate connections to those stories into the curriculum itself. I was also struck by the gratitude students expressed upon receiving an apparently personalized invitation to communicate with a faculty member. This too suggests scope for future improvement, though I am not now certain what form such changes would take.