Does Simple Information Provision Lead to More Diverse Classrooms? Evidence from a Field Experiment on Undergraduate Economics

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Significant gender and racial/ethnic gaps have been observed in the economics profession, a reality with roots in the decisions of undergraduates and their professors. Nationwide, while 57.3 percent of recent bachelor's recipients are women, only 31.3 of those graduating with economics majors are; similarly, underrepresented racial/ethnic minority (URM) students earn 20.6 percent of bachelor's degrees but only 11.8 percent of economics degrees. These shares compare poorly to those in STEM fields. Women, for instance, earn 43 percent of bachelor's degrees in math.[1]

While disparities in knowledge of economics and its value undoubtedly exist before students set foot on college campuses, economists could do more to directly address student misperceptions and knowledge gaps. This paper reports the results of a field experiment in which faculty provided incoming students with information about economics via two emails sent in the summer as students considered courses for their first semester of college. We evaluate whether this outreach has an impact on course taking using a randomized control trial involving 2,710 students across nine U.S. colleges with a strong record of sending students to PhD programs in economics. We randomly assign all incoming women and URM students to one of three experimental conditions: 1) a control condition with no email messaging; 2) a "Welcome" treatment that consisted of two emails encouraging students to consider enrolling in economics courses; and 3) a "Welcome+Info" treatment of two emails that encouraged students to consider enrolling in economics courses, but also included information showcasing the diversity of research and researchers within economics, with links to educational materials on the

[1] The figures in this paragraph are taken from Bayer and Wilcox (2017). Readers can explore the institution-level data at an interactive website hosted by the Federal Reserve Bank of New York: https://www.newyorkfed.org/data-and-statistics/data-visualization/diversity-in-economics.

AEA's website. We find that while both treatments seem to be effective, the Welcome+Info condition that emphasized the diversity of economics was particularly impactful, raising economics course completion in the first semester by 3.0 percentage points—nearly 20 percent of the baseline rate.

I. The Context

The lack of diversity in the economics profession and the concomitant harm to economic knowledge and policymaking are receiving increasing attention within the profession and in public discourse (e.g., Bayer and Rouse 2016, Brainard 2017, The Economist 2017). Women and members of historically underrepresented racial and ethnic minority groups are relatively absent from economics, and the disparities are particularly severe at the undergraduate level (Avilova and Goldin 2018, Bayer and Wilcox 2017).

Some hypothesize these imbalances reflect gendered and racial/ethnic patterns in prior interest in and perceptions of economics, which students bring to campus with them. As Avilova and Goldin (2018) summarize it, "The die is cast, it would appear, even before students unpack their bags." Others emphasize economists' failure to create an inclusive culture; as Daly (2018) argues, "We're not putting out the welcome mat and truly inviting (women and minorities) into our home." If these not-unrelated hypotheses are indeed correct, then one obvious solution is for economists to do a better job as educators. That work starts by making sure all incoming students feel welcome and are aware of the breadth and effectiveness of economics.

While our experiment is the first, to our knowledge, to intervene before students set foot on campus, prior research involving college students already enrolled in economics courses suggests that informational nudges offering a glimpse of the diverse people and activities in economics may be effective. For example, Porter and Serra (2018) report on a field experiment involving brief visits to introductory courses by women graduates speaking on the importance of economics to their careers. The intervention significantly increased treated women's likelihood of enrolling in intermediate economics classes and reporting that they planned to major in economics.

This experiment involves students attending nine selective private liberal arts colleges (LACs). While the insights it produces can inform practices at all types of institutions, LACs themselves are consequential to the future of the profession. Despite their small size—the institutions in our sample graduated

509 bachelor's degree recipients on average in 2015—a disproportionate number of PhD economists receive their undergraduate education at such institutions. In institution size normalized terms, 19 out of the 27 top undergraduate producers of eventual PhD economists are LACs, and four LACs rank in the top 25 U.S. undergraduate institutions in absolute counts (Stock and Siegfried 2015). The top 50 LACs account for 13.5 percent of all economists earning PhDs over the last ten years who attended American undergraduate institutions, and the nine small schools participating in our experiment account for a full 2.7 percent, or 120 new PhD economists.[2]

Despite their excellence in producing eventual PhD economists, LACs, unfortunately, do not draw representative slices of their undergraduate populations to their economics departments. As reported in Bayer and Wilcox (2017), 16.5 percent of white men at the top 50 LACs graduate with majors in economics, while only 5.4 percent of white women do. Among URM students, 12.5 percent of men and 4.0 percent of women are economics majors. With initial funding from the Alliance to Advance Liberal Arts Colleges in 2015, a group of economists from eighteen LACs are investigating ways to diversify the group of students majoring in economics. Activities include annual workshops, sharing curricula and strategies, and conducting coordinated, randomized evaluations to generate credible evidence on whether these approaches are effective. The experiment reported here is an outgrowth of these efforts.

[2] Authors' calculations using Survey of Earned Doctorates.

II. The Experiment

The treatments were administered in the summer before the 2016-2017 academic year, and course taking and performance were tracked during that academic year. The target population was 2,710 incoming first-year students from underrepresented groups; in other words, the experiment involved all women as well as all Hispanic, Black or African American, Native American, and multiracial students entering their first year of college in Fall 2016. Randomization was done at the student level within schools. Nine schools, all highly selective LACs, participated. The project used deidentified data and went through the IRB process at all institutions, with Swarthmore College serving as the covering institution.

Both of the treatment conditions involved two standardized emails sent by an economist on behalf of the department—one sent mid-summer as students first considered fall course

registration options and the second in late August as the students arrived on campus. Students in a control group received no messaging from the economics department. In the Welcome treatment, incoming students received two summertime emails presenting a friendly welcome and an encouragement to take a course from the school's economics department. In the Welcome+Info treatment, incoming students received two summertime emails presenting the same welcome and encouragement, along with additional information that highlighted the diversity of research and researchers within economics. These emails linked to resources offered by the AEA on its website and included information on what economics is, examples of research by economists, and brief introductions to some individuals and jobs in economics. The emails are available for review in an online appendix.

Some limitations to the design are worth noting, all of which would mute measured treatment effects. First, the treatment dosage of our messaging was very small relative to the impact of the content and culture of the courses we expected students to complete. Second, the emails were not professionally designed and were not always timed ideally, as the course registration period varied across institutions. Third, the treatment may have had spillover effects, if treated students shared information with those in the control group. Finally, enrollment pressures in economics departments presented some problems, as students nudged into taking an economics course were likely not always able to secure a seat in a class.

III. Results

Table 1 presents our main results in columns 1-3, which show the estimated effects of the treatments on the probability that a student completes an economics course during their first semester in college. In column 1, the Welcome treatment is associated with a 1.5 percentage point increase in the probability of taking a course, but this difference is not statistically significant (p=0.38). However, the Welcome+Info treatment increases the likelihood of completing an economics course by 3.0 percentage points; the effect is statistically significant at the 10 percent level (p=0.09) and substantial relative to the 15.2 percent probability that a student in the control group takes an economics course.[3] Note that the coefficients for both treatments remain quite stable when controls for student gender,

[3] The sign and magnitude of the treatment effect relative to baseline rate is consistent with a theoretical model of information nudges and suggests that the Welcome+Info treatment provided "good news" about the nature of economics to students at the margin (Coffman, Featherstone, and Kessler 2018).

URM status, and school fixed effects are included (columns 2 and 3). Columns 4-6 show that the estimated impacts on whether the student took an economics course anytime during the first year of college are positive but smaller and not statistically significant. There are several possible reasons for this, including that some treated students may have shifted their economics enrollment from the spring to the fall semester.[4] Further analysis is needed to better understand the persistence effects.

[Insert Table 1 Here]

In additional exploratory analyses available in the online appendix, we look into treatment effects on four different subgroups of students: white women, URM women, URM men, and first-generation college students.[5] The effects of the treatments on all subgroups are directionally consistent with the estimates reported above. However, the results are particularly striking for first-generation college students, where the Welcome+Info treatment is associated with a 11.4 percentage point increase in the likelihood of taking economics (p=0.07), while the Welcome email has essentially no effect on these same students. This is consistent with the notion that incoming students need more information on the substance and scope of economics, especially those students with less exposure to college education ex ante.

IV. Discussion

Our results suggest that if faculty were to provide more information about the breadth of the field of economics upfront, more students from underrepresented groups would study economics. Specifically, sending two emails with information on a diverse array of economists and economics research during the summer before a student's first year of college substantially increases the likelihood that the student completes an economics course in their first semester. Additional exploratory analyses suggest stronger effects on first-generation college students.

Given the benefits of the outreach in this experiment, economists should do more to welcome college students from diverse backgrounds, increasing awareness of the scope and value of economics and addressing common misperceptions about the field. The typical laissez-faire approach, of doing little to attract and inform students, likely produces disparate impact (Bayer and Rouse 2016). Economics departments end up with a self-

[4] Note, however, that when we analyze the treatment effects on spring enrollment, the point estimates are near zero and statistically insignificant. Estimates are available in the online appendix.

[5] These results are available in our online appendix. At this time, only four schools have reported data on first-generation status, thus we interpret these results with caution. We have no ex ante reason to expect greater treatment efficacy at these schools, and we checked results for all students at the four schools and saw typical estimates.

selected set of insiders, usually white male students who have previous exposure to or encouragement in economics. More careful communication about the richness of economics can draw students with diverse goals, perspectives, and backgrounds into economics classrooms and into the field.

Our research adds to a growing body of evidence suggesting that how economics is presented at the undergraduate level affects who is attracted to the field. If the short emails evaluated in our experiment have an impact, changing the material students see every day to be more inclusive and informative would likely have much larger effects.[6]

In a sense, the treatments used in our intervention represent a lower bound for efforts to broaden participation in economics. Our intervention involved only two short emails, and our results were encouraging. Surely more comprehensive changes in the practices of economists hold the potential to enhance the engagement of women and members of underrepresented racial/ethnic minority groups significantly. There is much work to be done across the profession. The AEA can redouble its outreach efforts and foster relevant research, undergraduate departments can take intentional steps to welcome diverse students and to update their culture and curricula, and individual economists can embrace the responsibility to develop all students' appreciation for and ability in economics. If two emails can move the needle, a more concerted effort across the profession can surely make waves.

[6] In fact, emails such as ours could cause backfire, at least among some students in some classrooms, if the actual courses are not as relevant and inclusive as the emails promised. As an example of the problems pervasive in economics classrooms, men appearing in commonly used principles textbooks account for more than 90 percent of business leaders, policymakers, and economists; women, when they do appear in textbooks, take fewer actions and are more likely to be involved in food, fashion, or household tasks (Stevenson and Zlotnick 2018).

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TABLE 1— AVERAGE TREATMENT EFFECTS ON COURSE COMPLETION

	Fall 2016			Academic Year 16-17		
	(1)	(2)	(3)	(4)	(5)	(6)
Welcome	0.015	0.016	0.015	0.014	0.016	0.013
	(0.017)	(0.017)	(0.017)	(0.021)	(0.021)	(0.021)
Welcome+Info	0.030*	0.030*	0.029*	0.012	0.014	0.011
	(0.018)	(0.018)	(0.018)	(0.021)	(0.022)	(0.021)
Female		-0.126***	-0.125***		-0.158***	-0.163***
		(0.026)	(0.027)		(0.031)	(0.032)
URM		-0.066***	-0.072***		-0.090***	-0.107***
		(0.015)	(0.017)		(0.020)	(0.022)
Constant	0.152***	0.280***	0.209***	0.284***	0.446***	0.335***
	(0.012)	(0.029)	(0.031)	(0.015)	(0.035)	(0.038)
Observations	2710	2605	2605	2710	2605	2605
R^2	0.001	0.012	0.033	0.000	0.012	0.058
School Fixed Effects	No	No	Yes	No	No	Yes

Notes: This table shows the average treatment effects of the Welcome and Welcome+Info treatment conditions. Columns 1-3 show results using completion of a Fall 2016 economics course as the outcome variable. Columns 4-6 show results using completion of an economics course at any time in the 2016-17 academic year as the outcome variable. URM indicates when a student is a member of an underrepresented racial/ethnic minority group. Standard errors are in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.