

# Explicitly targeting disadvantaged groups prevents take-up of an educational program

Manuel Muñoz-Herrera<sup>\* †</sup>

This versions is an early manuscript - 2023.09.29 (V.18)

**Please do not cite.**

## Abstract

In this paper, I study how rates of participation in an educational program are impacted if individuals from disadvantaged groups are explicitly told they are selected because of their group identity. Organizations tend to emphasize a person's identity as a selection criterion to highlight their commitment to equity. I argue this strategy can backfire, if targets are concerned about how they are perceived for accepting an opportunity because of their demographics. I test this in a field experiment inviting 4,831 university students from various disadvantaged groups to participate in an educational program. Invitations informed some, but not all, students that they were chosen because of their group identities. If identity-based targeting was made explicit, program take-up significantly decreased compared to the *no-information* condition. The policy implications suggest that targeting of underrepresented groups can be done without deterring them, by avoiding emphasizing identity as a selection criterion.

Keywords: Diversity, Equity, Inclusion, Minority, Stereotype, Information disclosure

JEL Classification: C93, D03, D83, I21

---

<sup>\*</sup>Luxembourg Institute of Socio-Economic Research (LISER), Esch-sur-Alzette, Luxembourg (e-mail: [manuel.munoz@liser.lu](mailto:manuel.munoz@liser.lu); website: [manumunoz.github.io](https://manumunoz.github.io)).

<sup>†</sup>I am grateful to Susan Dynarski, Ernesto Reuben, Pedro Rey-Biel, Sharlane Scheepers and participants at a number of seminars for helpful comments. I am grateful to Alejandra Pérez and Jhon Alexis Díaz for excellent research assistance.

# 1 Introduction

Institutions and organizations are persistently developing programs to benefit members of underrepresented or disadvantaged groups (e.g., STEM for women, coding for immigrant children).<sup>1</sup> To reach their intended audiences, such programs usually follow the strategy of publicly emphasizing the identities of their targeted populations. This strategy is motivated by a well-intended desire to explicitly inform targeted individuals and third parties that the institution is committed to support them, which in turn is expected to maximize program take-up. However, explicitly informing individuals that they are targeted because of their group identities can have unintended consequences. If individuals believe they will be perceived negatively for accepting an opportunity offered to them because of their demographics, strategies of explicit targeting can backfire. Instead of equalizing the playing-field, explicit targeting can reduce program participation and even hurt those the program intends to help. As such, an evaluation of how different targeting strategies impact targeted populations is crucial to understand how to promote, instead of discourage, take-up by members of disadvantaged groups.

In this paper, I report the results of a field experiment designed to evaluate different strategies used to promote participation. In partnership with a university in Colombia, I designed an educational program aimed at developing non-cognitive skills to attain personal and professional goals. The program is offered exclusively to students belonging to previously identified groups that are in academic disadvantage: females, mid-low social class,<sup>2</sup> first generation, those from rural origins and ethnic minorities. Instead of making an open call announcing the program and the targeted population, a total of 4,831 students holding at least one of the identified categories received a personalized invitation to the program.

The content of the invitation is used to provide information on selection criteria in three different treatments. Treatments vary whether targets and third parties are informed that selection is based on holding certain group identities. The PUBLIC INFO condition follows the standard approach used by most institutions, where targets as well as third parties are informed that the program is offered to specific individuals because of who they are. When this is revealed to third parties, it can trigger *social image* concerns as targets may worry about how others perceive them for participating in the program. It can also trigger *self-image* concerns, as targets may perceive themselves negatively if they were to accept such an opportunity. The PRIVATE INFO condition only informs targets that they are invited because of who they are, but does not

---

<sup>1</sup> See Alan and Ertac (2018); Alan et al. (2019); Carlana et al. (2022) for examples of educational programs targeting individuals from underrepresented or marginalized social groups.

<sup>2</sup> In Colombia, social stratification follows a six-number ranking assigned by the central government to households, which increases as the quality of the dwelling and its surroundings increase. It is used to define income situation and follows a cross-subsidized system that determines the price households pay for utility bills: higher prices the higher the position of the household in the 1 to 6 ranking (see Bogliacino et al. 2018).

disclose this information to third parties. This strategy keeps the potential for self-image concerns active but turns off any apprehension about their social image. The third condition is NO INFO, in which neither targets nor third parties are informed that group identities are part of the selection criteria. Turning off both social image and self-image concerns.

I run the field experiment in two waves, separately targeting individuals from different performance groups. The first wave focuses on students of high academic performance, who do not fit into the negative stereotype associated to the group identities they hold (e.g., high-performing low-class students). In the second wave, students of low academic performance were invited, who do confirm the negative associations with their social groups. This allows me to test how the targeting strategies, i.e. the information contained in the invitations, impact program adoption for different performance groups.

I measure two outcome variables to assess the impact of targeting strategies on program adoption. The main variable is program *take-up*, and a target is said to take the program up when she completes the registration process after receiving the personalized invitation. The conjecture is that explicit forms of targeting, such as PUBLIC INFO and PRIVATE INFO, will lead to lower levels of take-up than the NO INFO strategy, as they would trigger social image and self-image concerns. The second outcome variable is program *completion*, which occurs when a student attends all sessions of the program. Completion is a more stringent measure because group identities are only made explicit in the invitation to the program, but are not referenced anymore in any of the sessions. So, the effect of explicit targeting may soften as time goes by. Irrespective of this, targeting strategies are conjectured to impact completion in the same direction as they impact take-up.

The main finding of the study shows that targeting strategies that inform targets that their demographics are (part of) the reason why they are selected for an educational program, have a negative and significant impact on take-up and completion. This means that informing a target that she has been chosen because of her group identity is enough to reduce take-up. And, the effect is even more detrimental when the target knows that others are also informed about it. That is, instead of motivating individuals from certain social groups to feel seen and included, and thus to take advantage of the offered opportunities, explicit targeting triggers social image and self-image concerns that hinder program take-up. Specifically, there is a 13% increase in take-up from PUBLIC INFO to PRIVATE INFO as social image concerns are turned off, and there is a 30% increase in take-up from PUBLIC INFO to NO INFO, when both social image and self-image concerns are turned off. Similar patterns are observed for completion rates.

The negative effects of explicit targeting are observed separately for the high and low performance groups. While the levels of take-up are twice as high for targets that elude the negative stereotypes associated to their group identities than for those that conform to them, both groups

display a significant increase in take-up when neither the target nor third parties are informed about the role of their group identities on selection. Such persistence of how negative explicit targeting can be needs to be taken into account, as programs are not only targeting the most disadvantaged individuals, but also the best performers among the members of a minority group (see e.g., [Carlana et al. 2022](#); [Dynarski et al. 2021](#)). Moreover, the results show that the gap between explicit targeting and targeting that provides no information on identities, is largest for the very top performers. The top 10% performers are deterred the most when they are explicitly targeted.

I further evaluate how robust the main result is across subgroups and find that it both affects individuals who belong to a single disadvantaged group, as well as those that belong to multiple groups at the same time. The effect is also observed when looking at specific identities. Females, irrespective of their academic performance, are less likely to join when they are told the program targets female students. Similar effects are found for students from rural origins, those from middle class families, as well as ethnic minorities.

There is, however, one exception for which providing no information actually reduces program take-up: high performers from low class families. When these students and third parties are informed that they have been pre-selected for the program because they are low class and have high academic performance, they respond positively to this information. Their response is weakened when only they know but no one else is informed, and is weakest when neither themselves nor others are told they are chosen because they are high-performing low-class students. A possible reason why this subgroup responds differently to the information provided, is that they in fact are eluding a strong stereotype associated to their group identity. They have already overcome a structural barrier.

This is the flip-side, for which emphasizing identities bundled with salience about success in overcoming a stereotype, turns self-image and social image concerns into pride. To test for this mechanism, I ran an online experiment with 245 students from the same university, and asked them to report their beliefs about the academic performance of different groups: females, males, low class, middle class and high class students. Participants were offered a bonus if their responses were accurate (with some room for error). The results of the experiment show that people do not believe there are big differences in performance between males and females, while they report significantly worse scores for low class when compared to both middle and high class peers. This indicates that there are no negative stereotypes associated to gender in this population, while there are very strong stereotypes associated to social class. As such, explicitly stating that a student has eluded an evident stereotype associated to her group identity, and suggesting she has been invited to the program because of it, motivates this student to participate in the program.

The policy implications of the main findings are as follows: while emphasizing identities can be a powerful strategy in some domains to show organizational commitment to equity, this is not always the case when granting opportunities to members of disadvantaged groups. The social and personal costs imposed on members of disadvantaged groups, when making it explicit that they are being targeted for an opportunity, are high enough to deter a significant share from taking up such an opportunity. Instead, the evidence suggests that organizations and institutions can still target disadvantaged and underrepresented groups without negatively impacting them, through a strategy that avoids disclosing the identity elements in the selection criteria. For this, institutions can make use of administrative data to identify individuals from relevant social groups and then target them directly, without emphasizing their group identities. This is what I tested in the NO INFO condition, which proves to be consistently superior to explicitly targeting individuals.

The paper is organized as follows. In section ??, I summarize the main contributions of this paper to the related literature. In section 2, I describe the setting and experimental design. In section 3, I report the main findings of the study. Section 4 reports how the main findings are robust to targeting different subgroups. Section 5 concludes the paper.

## 2 The experiment and data

### 2.1 The partnership

The project was conducted through a partnership with a private university in Colombia, starting in the Fall of 2021 and concluding in the Spring of 2023. This is illustrated in the timeline below (see Figure 1). I briefly explain each stage of the process here and then elaborate on specific details in the following sections.

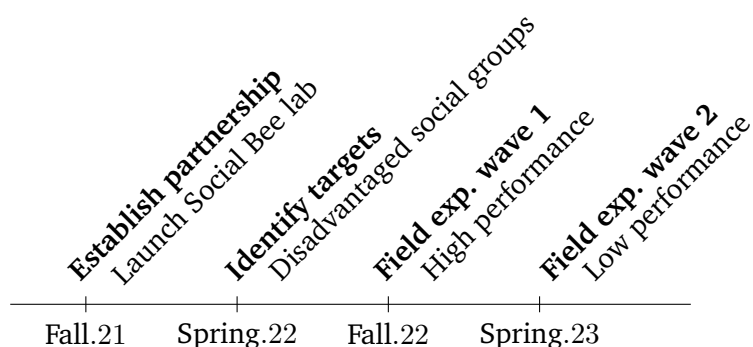


Figure 1 Timeline of the project.

During the academic year of 2021-2022, I established the partnership with a private university in Colombia to support students from disadvantaged social groups. Unlike public institutions in Colombia that are almost exclusively for low income students, private universities are diverse across multiple dimensions (Cardenas et al. 2021).<sup>3</sup> This allows me to reach a wide variety of profiles of students. The partnership was materialized through the creation of the Social Bee Lab (Social behavior and experimental economics laboratory),<sup>4</sup> which channels all opportunities and resources offered to students in this study. Having such an entity mediating all the process is important, as it guarantees that both students and faculty know that the resources offered are coming from an international partner and not from the local university, and thus accepting an opportunity does not mean taking funds away from other initiatives.

Through the establishment of the partnership, I had access to a rich set of administrative data that allowed me to identify which social groups were most disadvantaged academically; as they would be the population targeted in the study. Subjects from pre-identified social groups were offered to participate in an educational program to help them attain the goals they set for their personal and professional life. Details on the identification of social groups, the preselection of students, the invitation messages used to target them, the content of the program, as well as the experimental variations used to test the different targeting strategies (i.e, PUBLIC INFO vs. PRIVATE INFO vs. NO INFO), are all discussed in the following sections.

## 2.2 Disadvantaged social groups: Identification and pre-selection

The partnership aims to support members of disadvantaged social groups by inviting them to participate in an educational program. To do this, the first step was to identify which social groups are (on average) at an academic disadvantage. Subsequently, I used the identified categories to pre-select students that would be invited to the program.

*Identification of disadvantaged social groups.* This process took place during the Spring of 2022. I focused on identifying students from social groups who were at a disadvantage on at least one of two dimensions: academic performance or economic expectations (see details in Appendix A). To identify academic disadvantage, I used administrative data on entry exam scores for 13 cohorts between 2016 and 2022 ( $n = 10,604$ ) and tested differences in performance between multiple social groups. To test for expectations, I conducted a survey under the umbrella of the Social Bee Lab ( $n = 1,924$ ), assessing what students expected after graduation. The survey

---

<sup>3</sup> Tuition fees in public universities are a function of family income and social strata. This means that those in lower strata pay very little and those in higher strata would pay substantial fees. On the contrary, there is no price discrimination in private universities, as they charge flat fees to all their students. An exception among private institutions are the few elite universities in the country, which are mostly for students from high income families (see e.g., Cardenas et al. 2021).

<sup>4</sup> For more information on the Social Bee Lab visit: [www.socialbeelab.github.io](http://www.socialbeelab.github.io).

focused on different indicators such as expected salary and expected time of unemployment before finding the first job after college (see e.g., [Delavande and Zafar 2016](#)). The results from this combined approach indicated that five social groups were consistently in disadvantage with respect to their relevant comparison groups:<sup>5</sup> females (vs. males), lower-middle social class (vs. upper class), first generation (vs. continuous education), rural (vs. urban), and ethnic minorities (vs. non). Individuals holding these categories enter university with lower scores, on average, than their peers, and expect to have lower economic opportunities and success after graduation.<sup>6</sup> Based on these findings, I pre-selected individuals holding at least one of these social categories to be invited to the program.

*Selection of participants for the educational program.* This process took place in two waves in the fall of 2022 and spring of 2023. Students could only participate in the program by invitation. Using administrative data, I first filtered out any student who did not hold at least one of the social categories previously identified as disadvantaged. Then, I used the grade point average as a second selection criterion to divide students into two groups of high and low performers, and invited them to the program in two separate waves.<sup>7</sup> This is a novelty of the study, as I separately target students that confirm the associations of academic disadvantage tied to their social categories, low performers, and students for whom this does not apply, high performers.

## 2.3 The educational program and incentives for take-up

The educational program centers around *goal pursuit*, and is aimed to help students develop non-cognitive skills to better attain the goals they set for their personal and professional lives.<sup>8</sup> The topic of the program was curated so that it could be of interest and benefit to participants irrespective of their major, year of study, and other relevant characteristics.<sup>9</sup> Also, it is designed to promote students' confidence on their chances to succeed in the goals they set, and as such,

<sup>5</sup> I follow here the approach of [Bordalo et al. \(2016\)](#), in which a target group is compared to a relevant reference group, such as females to males.

<sup>6</sup> Female and low social class students have lower subjective expectations than their comparison groups. The other social categories underperform academically, but the disadvantage is not as conclusive in expectations. This can be even more problematic, as having high aspirations without the knowledge to achieve them can be a source of frustration and giving up (see [Genicot and Ray 2020](#), for an overview of the literature).

<sup>7</sup> In Colombia, the gpa ranges between 0 and 5.0, where 3.3 is the passing grade and 5.0 is the highest. To the high performance group, I assigned all students with a gpa of at least 4.0, which is the standard cutoff to be considered for scholarships and awards. To the low performance group, I assigned all students with a gpa below 4.0 but above 3.3, as to include everyone who is at least passing. Students with a gpa below 3.3 were not considered, even when they held one or more relevant social categories. A total of 4,831 students qualified for this opportunity and were invited to participate in the program.

<sup>8</sup> The content of the program is closely based on the research presented in [Milkman \(2021\)](#).

<sup>9</sup> Other types of educational programs focus on more specialized *cognitive* abilities, such as coding or advance math. Although important, these tend to be most relevant for specific academic majors, while the aim of this program was to reach a wide range of heterogeneous individuals.

potentially benefitting academic performance and subjective expectations.

Reasons for taking up or letting go of a beneficial opportunity have been recurrently identified as a combination of extrinsic (benefits and costs), reputational (social image), and intrinsic (self-image) motives (see e.g., [Benabou and Tirole 2006](#)). To increase extrinsic incentives, I put together a bundle of attractive features by reducing participation costs and increasing the associated benefits from taking up the program. In terms of reducing costs, the program is free of charge, it is organized in 9 sessions of about 30 minutes each and all of them are pre-recorded and delivered online. This makes progression self-paced and eliminates conflicts of scheduling. Also, because there are multiple computer rooms as well as free wifi on campus, access to equipments or the internet should not be an impediment.<sup>10</sup> The program had no pre-requisites to participate, aside from being invited, to allow for participation irrespective of which courses students had taken so far.

In terms of benefits, on top of the knowledge acquired, participants would receive a completion certificate which indicated the program was taught by faculty from an internationally recognized institution. The program's name did not include references to any of the targeted social categories to prevent any form of negative signals, if they referenced it in their CVs. So, instead of the standard approach in programs of this type that frequently emphasise the targeted social groups in their titles (e.g., "STEM for women" or "Coding for immigrant children"), I used the name: "How to change: scientific strategies to achieve the goals in your personal and professional life".<sup>11</sup> There were also monetary bonuses randomly assigned in each session plus a lottery of two last-generation iPads, all of this aimed at incentivizing take-up and completion.

By putting together a bundle of low participation costs and both symbolic and material benefits, I aim to control for most common structural barriers preventing participation. This allows me to ascribe any variations on take-up and completion rates between treatments to the way subjects were targeted in their invitation message, and to how their own performance confirms or eludes the stereotypes associated to their identities.

Although the current paper is not an evaluation of the program itself but of the targeting to the program, it is important to highlight that both faculty and students perceived the offered opportunity as very valuable. In Appendix C, I summarize this and show that faculty members expressed that this was a great opportunity for the students. I also summarize results from the course evaluation provided by the 1,135 students that completed the program, where 97.8% evaluated the course as positive or very positive, and 95.24% agreed and completely agreed that the course helped in their way of thinking. This is key, as it helps argue that the results of this

---

<sup>10</sup> At the time the program was launched in 2022, all COVID restrictions had been lifted up on campus and classes were in person.

<sup>11</sup> Evidence through audit studies shows that strong signals on CVs of belonging to stereotyped identities can significantly increase discrimination in the labor market (see e.g., [Bertrand and Duflo 2017](#)).



study could generalize beyond the specifics of the offered educational program, to an evaluation of how to target individuals to take up a wide range of beneficial opportunities.

## 2.4 Invitation to participate

Each pre-selected student received an invitation email from an institutional account created for the program (i.e., the program's email account) signed by the director of the Social Bee Lab and by the head of the Office of International Relations of the local university. This is done to transmit complete legitimacy and increase trust in the quality of the opportunity and the benefits offered (e.g., certificates, bonuses, iPads). Because the office of international relations frequently offers opportunities and organizes events linked to international institutions, there are no reasons to expect students (or faculty) to think they are part of a study.<sup>12</sup> All communications were sent to the students' institutional email addresses, because these accounts are regularly used by faculty to send information from courses students are enrolled in. Thus, ensuring targeted students would see the invitation message.

The email informed targeted students of the partnership agreement between their university and an international institution, and explained that as part of this partnership the international institution was offering an educational program to help them better set and achieve goals in their personal and professional life. The email gives information about the program and the benefits of participating. It explicitly states the student's gpa as a reason why they have been invited, which makes salient their academic performance. It also gives additional information on the *selection criteria*, which I vary to experimentally manipulate how individuals were targeted and, consequently, trigger social image and/or self-image concerns. In the invitation email (see the complete invitation in Appendix B), and irrespective of which performance group they were in or which targeting strategy they were assigned to, everyone received the following message:

You have been chosen among all students at the university... as your cumulative GPA is [Student's GPA].

In addition, a randomly chosen set of students received this second part included in their communication:

... and also because you fulfill at least one of the following requirements: being a woman, being of middle-low social class, belonging to an ethnic minority (indigenous or afro-descending),

---

<sup>12</sup> There is evidence that programs implemented by organizations that have had prior engagement with the targeted population increase effectivity (see [Usmani et al. 2023](#)). This means that having only relied on the newly established Social Bee Lab, without jointly partnering with the well-reputed Office of International Relations, may have been ineffective.

being a first-generation student (neither of your parents has a college degree), or coming from a rural area (or not coming from any of the main cities in the country).

Subjects who received the second part of the message become privately aware that their group identities played a role in guaranteeing them a slot in the program. This is designed to evaluate the effects of triggering self-image concerns on take-up and completion. For those who only received the first part of the message, the role played by their social identities was not disclosed.

The email also informed invited students that in order to ensure a placement in the program, they had to ask a faculty member to send a message on their behalf, to the program's account, endorsing their participation in the program. This is the channel I used to involve third parties in the targeting process, and thus to allow for the potential triggering of social image concerns. For this, I provided each student with a pre-defined message endorsers were required to send. The content of this pre-defined message is part of the experimental variations and follows a similar structure to that of the information already sent to the students in the first part of the invitation. The endorsement message is the following:

I, [Professor's name] recommend student [student's name] to take part in the program... as his/her cumulative GPA is [Student's GPA].

In addition, for a randomly chosen subset of students among those who had received information on the role of their identities in their selection to the program, the endorsement message also included the following text:

... and also because he/she fulfills at least one of the following requirements: being a woman, being of middle-low social class, belonging to an ethnic minority (indigenous or afro-descending), being a first-generation student (neither of his/her parents has a university degree), coming from a rural area (or not coming from any of the main cities in the country).

This means that while all students needed an endorsement to secure placement in the program, only a subset had to reveal to the third-party endorser how their demographics were part of the selection criteria.<sup>13</sup>

The main outcomes of interest are program take-up (i.e., a student registers and provides the endorsement from the third-party), and program completion (a student finishes all sessions of the program).

---

<sup>13</sup> Both the email requesting the endorsement and the response from the faculty member where required to be sent in copy to the program's email account, which allows me to follow the entire process for each invited student.

## 2.5 Treatments and procedures

For the field experiment, I use a  $3 \times 2$  factorial design varying the way invited participants are *targeted* in two separate groups of different *academic performance*. Variations in targeting strategies allow me to *turn-off* or *trigger* different concerns that may impact program take-up/completion (i.e., social image and self-image). Variations in performance allow me to explore the impact of targeting on different groups of individuals, who either confirm (low) or elude (high) the stereotypes associated to their identities. This is summarized in Table 1 below:

Table 1 Experimental treatments

The table summarizes the main variations in the targeting strategies (*Targeting*) and the group they belong to based on their gpa (*Academic Performance*). Values inside the table cells report sample sizes for each experimental condition.

		Targeting		
		PUBLIC INFO	PRIVATE INFO	NO INFO
<b>Academic</b>	HIGH	n=864	n=864	n=833
<b>Performance</b>	LOW	n=776	n=757	n=737

I now explain in detail variations in targeting, as they were implemented in the same way for both high and low performance groups.

**PUBLIC INFO:** targeted students are informed they are invited because of their demographic characteristics (group identities). Similarly, the third-party endorsers receive information that selection was based on demographics, through the pre-defined endorsement message. Therefore, PUBLIC INFO aims to trigger both social-image and self-image concerns.

**PRIVATE INFO:** targeted students are informed they are invited because of their demographics, as with PUBLIC INFO. However, the third-party endorser does not receive any information of selection being based on demographics. As such, PRIVATE INFO aims to trigger self-image concerns while turning off social-image concerns.

**NO INFO:** targeted students are also pre-selected according to their demographic characteristics, the same as with PUBLIC INFO or PRIVATE INFO, but neither the targets nor the endorsers are informed of this. All information provided avoids stating that invitations are based on demographics. Therefore, NO INFO turns off both self-image and social-image concerns.

A total of 4,831 students received the email inviting them to participate in the program, during the 2022-2023 academic year. 2,561 were in the *high* performance group and were invited at the beginning of the fall semester. 2,270 had *low* performance and were invited at the beginning of the spring semester. For each wave of the program, I assigned students into treatments balancing the following categories: female, lower-middle social class, rural, first-generation and ethnic (see Table 2). Students had two weeks to complete their registration (take-up) to the program to guarantee a placement. Then, once the program started, two sessions of the program were

launched each week. So, they have 4.5 weeks to complete all the sessions of the program.

Table 2 Sample balance across experimental conditions

Columns I-III (V-VII) report the average frequency of each social category, with standard errors in parentheses, for the PUBLIC INFO, PRIVATE INFO, and NO INFO conditions. Column IV (VIII) reports the p-values for the Anova test that the means are equal in the three conditions, for the high (low) performance group.

	High Performance				Low Performance			
	(I) PUBLIC INFO	(II) PRIVATE INFO	(III) NO INFO	(IV) p-value	(V) PUBLIC INFO	(VI) PRIVATE INFO	(VII) NO INFO	(VIII) p-value
Female	0.69 (0.46)	0.68 (0.46)	0.66 (0.47)	0.43	0.62 (0.48)	0.62 (0.48)	0.58 (0.49)	0.18
Low-mid class	0.92 (0.26)	0.92 (0.26)	0.92 (0.27)	0.81	0.87 (0.32)	0.90 (0.29)	0.90 (0.29)	0.21
Rural	0.34 (0.47)	0.38 (0.48)	0.38 (0.48)	0.22	0.29 (0.45)	0.29 (0.45)	0.33 (0.47)	0.12
First gen	0.14 (0.35)	0.15 (0.36)	0.16 (0.37)	0.52	0.12 (0.33)	0.12 (0.33)	0.14 (0.35)	0.47
Ethnic	0.02 (0.15)	0.02 (0.15)	0.02 (0.14)	0.78	0.03 (0.17)	0.02 (0.16)	0.03 (0.18)	0.79
Observations	864	864	833		776	757	737	

## 2.6 Hypotheses

The main outcome variables in this paper are the decision to take up and to complete the educational program. To study these, I systematically trigger or turn-off social image and self-image concerns through the targeting strategies, within each group of academic performance.

On the one hand, by publicly informing third parties that an opportunity is offered to some individuals because of their group identities, social image concerns may be triggered (see e.g., [Bursztyn and Jensen 2015](#)). Targeted individuals may then be concerned with what others (e.g., third-party endorsers) think about them if they were to find out an opportunity was offered to them because of their demographics. Their social-image may be affected negatively by accepting an opportunity when it is publicly known it has been offered to them because of who they are. This is summarized in Hypothesis 1:

**Hypothesis 1 (Social image).** *If an individual knows that a third party is informed they accepted an opportunity offered because of their group identity, their social image can be negatively affected. To prevent the negative impact on their social image, individuals are less likely to take-up/complete the program than those for whom the third party is uninformed.*

The social image hypothesis conjectures that if triggered, take-up/completion rates will be lower in PUBLIC INFO than in either PRIVATE INFO or NO INFO. This because the third party

providing the endorsement will be informed of the selection criteria.

Self-image concerns may also be triggered for the targets informed that their slot in the program is assigned to them because of their demographic characteristics (see e.g., [Bursztyn and Jensen 2015](#)). Individuals' self-image may be affected negatively by accepting such an opportunity. This is summarized in the following hypothesis:

**Hypothesis 2 (*Self-image*).** *If an individual accepts an opportunity that is offered because of their group identity, their self-image can be negatively affected. To prevent the negative impact on their self-image, informed individuals are less likely to take-up/complete the program than those who are uninformed.*

The self-image hypothesis conjectures that if activated, take-up and completion rates will be lower in PUBLIC INFO or PRIVATE INFO than in NO INFO, as invited participants are informed of the role their demographics played in the selection process. Any difference in program participation between PRIVATE INFO and NO INFO, would be caused by the effect of self-image concerns alone. Differences between PRIVATE INFO and PUBLIC INFO, would be caused by the effect of social image concerns alone. Consequently, the gap in take-up/completion between PUBLIC INFO and NO INFO will be due to the joint effect of social image and self-image concerns being triggered or turned off.

Finally, with respect to academic performance, the conjecture is that students with high gpa are more motivated and more likely to see the value of opportunities offered to them. This will in turn impact their willingness to participate in the educational program, as summarized in the following hypothesis:

**Hypothesis 3 (*Performance*).** *High performance individuals are more likely to take up and complete the program than low performance ones.*

### 3 Results

In this section, I present the main results of the field experiment. First, I test the effects of targeting on take-up and completion, and show evidence on the negative effect of explicit targeting. This is complemented by how NO INFO can help promote take-up (see [3.1](#)). I then test the effect of academic performance and show that take-up and completion rates among high performers double those of low performers (see [3.2](#)). Last, I look at the interaction of targeting and performance, and show how the main results are not driven by one specific group but hold for both (see [3.3](#)). In Section 4, I conduct a heterogeneity analysis on specific subsets of

the targeted population to understand the impact of different targeting strategies. The analysis shows that the negative impact of explicit targeting is robust, across different subgroups.<sup>14</sup>

### 3.1 The effects of the different targeting strategies

The first aim of the analysis is to assess how the different targeting strategies affect program take-up, as it is the most immediate outcome after targeting takes place. As a second measure, I evaluate the impact of targeting on completion: finishing all sessions of the program. As the entire program eliminates any reference to social categories or academic performance, and the program lasts for 4.5 weeks, one could expect this to smooth some of the effects from targeting on completion.<sup>15</sup> Notably, the results on program completion are consistent with those on program take-up. I describe in detail outcomes on take-up, and complement when necessary what differences arise with respect to program completion.

Recall that, PUBLIC INFO makes explicit to both targets and third parties that selection is based on demographics. Thus, triggering social image and self-image concerns. PRIVATE INFO explicitly informs targets about the selection criteria, but keeps this information concealed from third parties. So that self-image concerns are triggered, but social image concerns are turned off. The NO INFO strategy does not reveal to either targets or third parties the role of demographics on selection. Thus, it turns off both social image and self-image concerns. The main result of the study is that NO INFO targeting significantly outperforms the two types of explicit targeting by increasing take-up and completion.

Figure 2.A illustrates this effect by showing that NO INFO increased take-up by 7 percentage points (p.p.) compared to PUBLIC INFO (23% vs. 30%,  $p < 0.001$ ) and by 4 p.p. compared to PRIVATE INFO (26% vs. 30%,  $p = 0.001$ ). Notably, the average level of take-up is 23% in PUBLIC INFO when both the targets and the third-party endorsers are informed that the group identities were a criterion in the selection process. The levels of take-up increase when social image concerns are turned off in PRIVATE INFO: from 23% to 26% ( $p = 0.045$ ), and also when turning off self-image concerns in NO INFO (from 26% to 30%,  $p = 0.001$ ). This suggests that, in this setting, there is a cumulative negative effect of explicit targeting driven by both social image and self-image concerns. This is observed also for completion rates, as illustrated in Figure 2.B.

---

<sup>14</sup> Results on take-up and completion are based on proportion tests, for which I report one-sided p-values following the direction of the stated hypotheses: PUBLIC INFO  $\leq$  PRIVATE INFO  $\leq$  NO INFO. Also on the hypothesis on performance: LOW  $\leq$  HIGH. Results are also consistent when using two-sided tests.

<sup>15</sup> See for example Ashraf et al. (2020) for a related study that experimentally varies how individuals are recruited for a training (which consequently leads to a job). The authors find that the process of signaling different values (prosociality vs. career advancement) affects who applies for and takes-up the training. But, as the training eliminates any focus on the values signaled in the recruitment, once they receive the training, there are no differences between participants on completing the training with respect to the channel used to recruit them.

## Targeting and program participation

Program take-up and completion, pooling performance groups

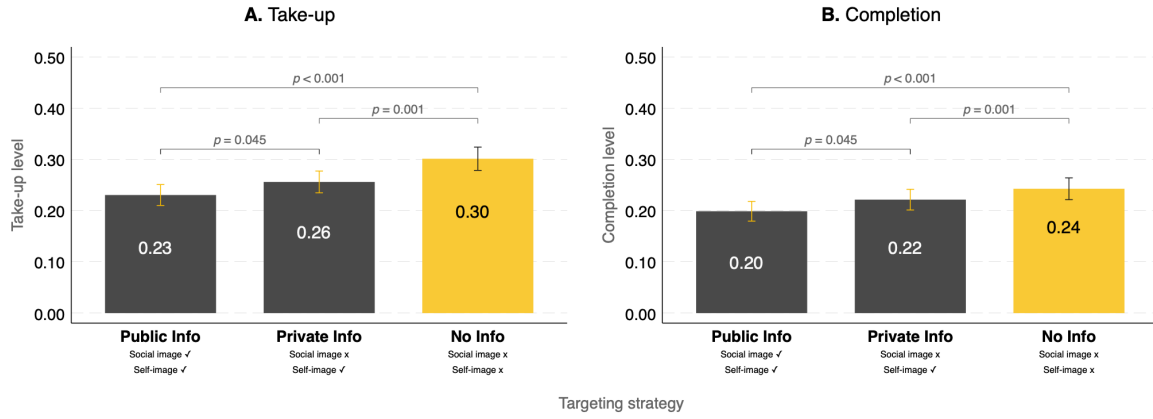


Figure 2 Take-up/completion levels by targeting strategy.

The figure pools together high and low performance groups to illustrate the main effects of the targeting strategies on take-up (Panel A) and completion (Panel B). Values inside the bars display average levels of take-up/completion. The p-values report the significance of one-sided proportion tests comparing targeting strategies. Labels under each bar display on top the targeting strategy, and below whether social image and/or self-image concerns were triggers (✓) or turned off (x).

I summarize the main finding in Result 1 below:

**Result 1** *Explicit targeting (PUBLIC INFO and PRIVATE INFO) negatively affects take-up/completion because it triggers social image and self-image concerns. These negative effects are cancelled with NO INFO, which significantly increases take-up/completion by eliminating any emphasis on identities.*

The evidence from result 1 gives support to both Hypothesis 1 and Hypothesis 2. Thus suggesting that using administrative data to personalize targeting, without revealing this process to potential participants, can allow program providers to promote equity and inclusion by reaching populations of interest (e.g., disadvantaged groups) without reducing their willingness to accept of the offered opportunity.<sup>16</sup> Next, I test Hypothesis 3 on the effects of performance on program participation.

<sup>16</sup> In Appendix D, I report results evaluating the impact on take-up of having peers invited to the program. For this, I construct a co-enrollment network between students, where a connection between two individuals means they have taken a course together. I find there is no effect of having peers invited to the program, irrespective of the information received.

## 3.2 The role of academic performance

The second experimental variation of my study focuses on differences between targets holding social categories that are, on average, disadvantaged in terms of academic performance. By looking at high and low performers (in terms of their gpa), I can evaluate how effective it may be to target individuals who conform or elude the negative stereotypes associated with their group identities.

### Academic performance and program participation

Program take-up and completion, pooling targeting strategies

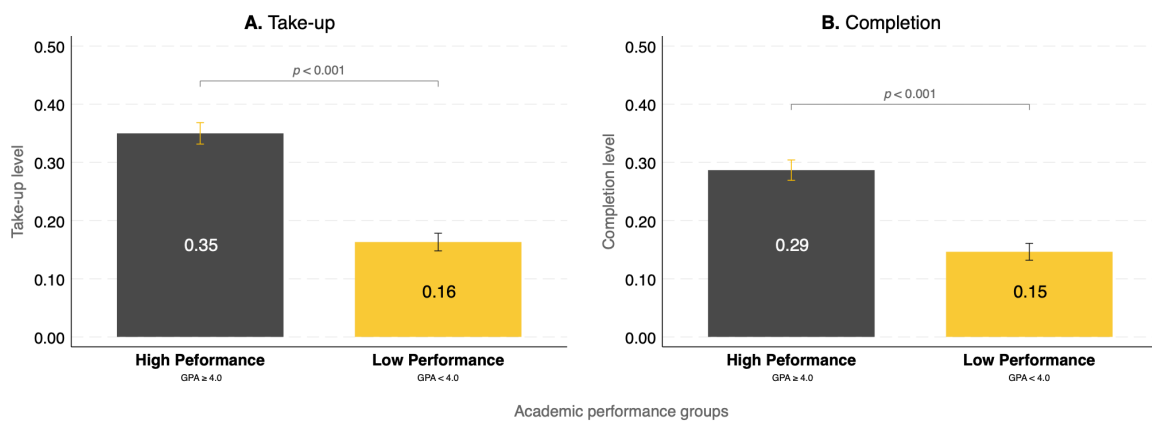


Figure 3 Take-up/completion levels by academic performance.

The figure pools together the targeting strategies (public info, private info, and no info) to illustrate the main effects of performance on program take-up (Panel A) and completion (Panel B). Values inside the bars display average levels of take-up/completion. The p-values report the significance of one-sided proportion tests comparing performance groups. Labels under each bar display on top the performance group and below the gpa cutoff in each case.

Figure 3.A reports the average levels of program take-up for targeted individuals in the low and high performance groups. While about 16% of low performers take up the educational program, the level more than doubles to 35% for the high performers ( $p = 0.001$ ). This stark difference, also observed for completion (see Figure 3.B), gives strong support to the conjecture in Hypothesis 3.

**Result 2** *The high performance group is twice as likely to take-up/complete the educational program than the low performance group.*



### 3.3 The effects of targeting on different performance groups

So far, the results show that explicitly informing individuals that they are targeted because of their group identities (PUBLIC INFO or PRIVATE INFO) prevents take-up and completion of the educational program, compared to NO INFO. This because explicit targeting triggers social image and self-image concerns. The results show that low performer are half as likely than high performers to take advantage of such beneficial opportunities. In what follows, I assess what is the effect of the targeting strategies separately for the *high* and *low* performance groups. This distinction is important to see if the negative effects of explicit targeting are driven by the specific targeted population, and how they interact with the fact that individuals elude or conform to stereotypes that may be associated to their group identities.

Figure 4.A illustrates the effects of the different targeting strategies separately for the high (Panel A.1) and low (Panel A.2) performance groups. For high performers, NO INFO increased take-up by 7 percentage points compared to PUBLIC INFO (39% vs. 32%,  $p = 0.007$ ) and by 5 p.p. compared to PRIVATE INFO (39% vs. 34%,  $p = 0.044$ ). Similarly, for the low performance group, NO INFO increased take-up by 7 p.p. compared to PUBLIC INFO (20% vs. 13%,  $p < 0.001$ ) and by 4 p.p. compared to PRIVATE INFO (20% vs. 16%,  $p = 0.034$ ). This shows that the detrimental effects of explicit targeting are robust across performance groups.

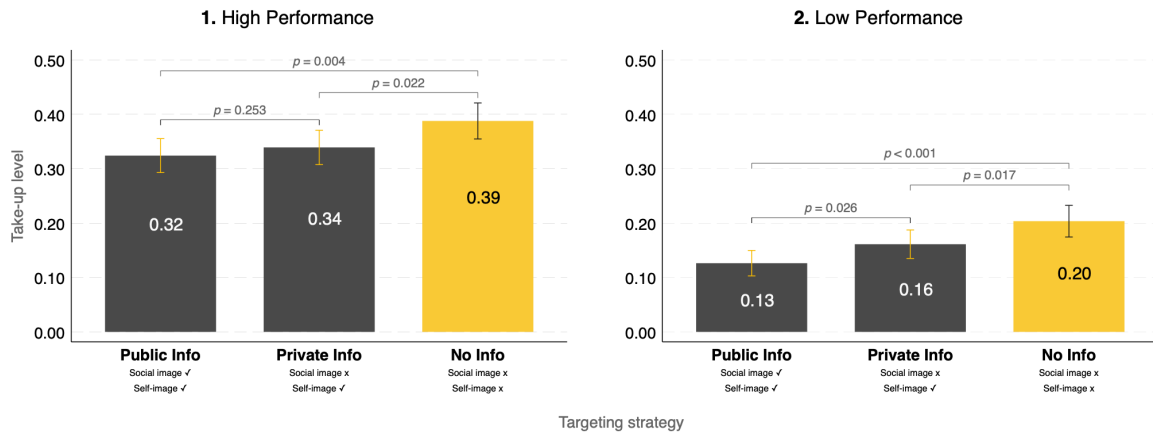
As the average levels of take-up are significantly larger for high performers than for low performers,  $33\% > 16\%$  ( $p < 0.001$ ), it is key to move beyond the absolute to the relative effects of targeting. That is, although the increase in percentage points with NO INFO is very close across groups, the relative effect of NO INFO is more pronounced for the low performing group. Specifically, take-up increases with NO INFO in the low performance group by 53% compared to PUBLIC INFO, and by 25% compared to PRIVATE INFO. The increase in the high performing group is more modest: 22% with respect to PUBLIC INFO and 15% with respect to PRIVATE INFO. This indicates that explicit forms of targeting (PUBLIC INFO or PRIVATE INFO) can be worse for the groups of people that could need the opportunity the most; those who hold disadvantaged identities and conform to the negative stereotypes that may be linked to their social groups. The results on completion rates are consistent with this, as completion increases by almost 50% between PUBLIC INFO and NO INFO for low performers. The effect is more attenuated and only marginally significant for high performers (from 27% to 30%;  $p = 0.061$ ). This is summarized in Result 3 below:

**Result 3** *Compared to NO INFO, explicit targeting (PUBLIC INFO and PRIVATE INFO) negatively affects take-up/completion for both low and high performance targets. The negative effect is most detrimental for those who need the opportunity the most; the low performers.*

In conclusion, I find a very strong negative effect of explicit targeting strategies on program take-up and completion, as they trigger both social image and self-image concerns. Moreover, the effect is present for both high and low performance groups, although the negative impact is much stronger for low performers. In the next section, I present complementary results showing how robust these detrimental effects are, for different sub-samples of the population.

## A. Targeting and performance: **Take-up**

Program take-up, separate for High and Low performance groups



## B. Targeting and performance: **Completion**

Program completion, separate for High and Low performance groups

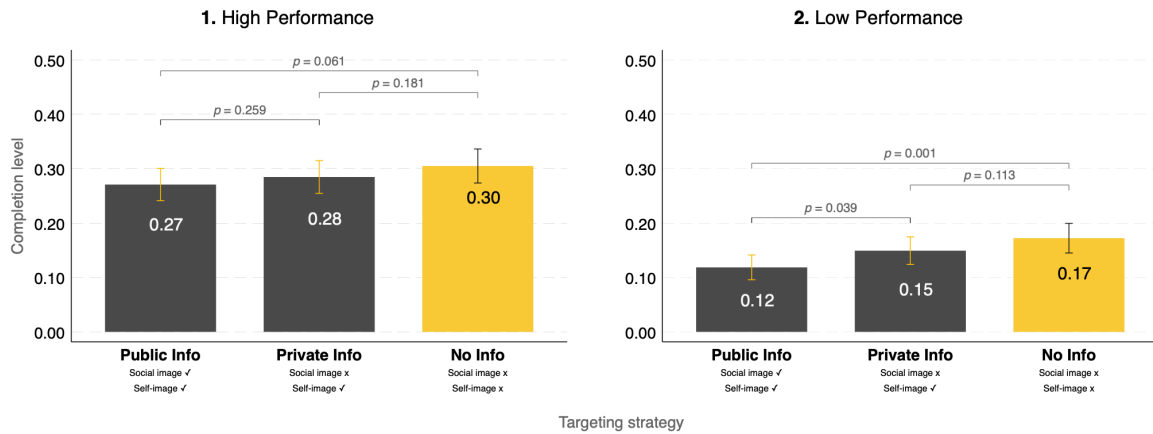


Figure 4 Take-up/completion levels for high and low performance groups. The figure illustrates the effects of the targeting strategies on take-up (4.A) and completion (4.B), separately for each performance group. Values inside the bars display average levels of take-up/completion. The p-values report the significance of one-sided proportion tests comparing targeting strategies. Labels under each bar display on top the targeting strategy, and below whether social image and/or self-image concerns were triggers (✓) or turned off (x).

## 4 Complementary results: Heterogeneity analysis

In what follows, I replicate the analysis on how the targeting strategies impact take-up and completion, for different subsets of the population. This allows me to show the robustness of the main results. It also provides insights on additional effects that the different targeting strategies may have on specific subgroups.

### 4.1 The effect of targeting on the best performers

One recurrent question that comes up when looking at interventions that aim to *level the playing field* for disadvantaged groups, is whether they attract average members of the targeted group or if they can draw in the most capable ones (REFS). In general, this is hard to assess. Usually, data on the performance of individuals that do not apply for the offered opportunity is not available. In my case, however, I have performance measures (i.e., gpa) for all targets, irrespective of their take-up choices. This allows me to test how informing targets that selection is identity-based, affects the very best performers. To explore this, I focus on targets in the high performance group. I rank the cumulative gpa of all 2,561 high performing individuals that were invited to the educational program. I divide them into top 10% performers (those in the 90<sup>th</sup> percentile or above), and the rest (everyone below the 90<sup>th</sup> percentile).

Figure 5.A, illustrates the level of program take-up for those in the top 10% (solid line connecting circles) and those in the remaining 90% (dashed line connecting triangles), and shows that results across performance groups are somewhat consistent with what was reported in the main analysis. For the top 10%, take-up significantly increases from PUBLIC INFO to NO INFO (29% to 48%,  $p = 0.005$ ), also from PUBLIC INFO to PRIVATE INFO (29% to 50%,  $p = 0.003$ ), while there is no difference between PRIVATE INFO and NO INFO (50% vs. 48%,  $p = 0.586$ ). For the rest of the targets whose performance is below the 90<sup>th</sup> percentile, NO INFO out-performs both PUBLIC INFO (38% vs. 32%,  $p = 0.024$ ) and PRIVATE INFO (38% vs. 32%,  $p = 0.013$ ), and there is no difference between PUBLIC INFO and PRIVATE INFO (32% for both,  $p = 0.606$ ). While the drop in take-up for the best performers appears to be driven by social image concerns and for the rest by self-image concerns, these results show that the negative effects of explicit targeting on take-up are once again observed. In addition, they show that the magnitude of the drop in take-up when social image and self-image concerns are triggered, is much larger for the top performers than for the rest: 19% compared to 5%. A similar effect is illustrated in Figure 5.B, with respect to completion. The gap in the level of completion between PUBLIC INFO and NO INFO is much larger for the top 10% performers than for the rest: 15% compared to 2%. This is summarized in Result 4:

## Targeting and top performers

Program take-up and completion by top 10% and remaining 90% performers

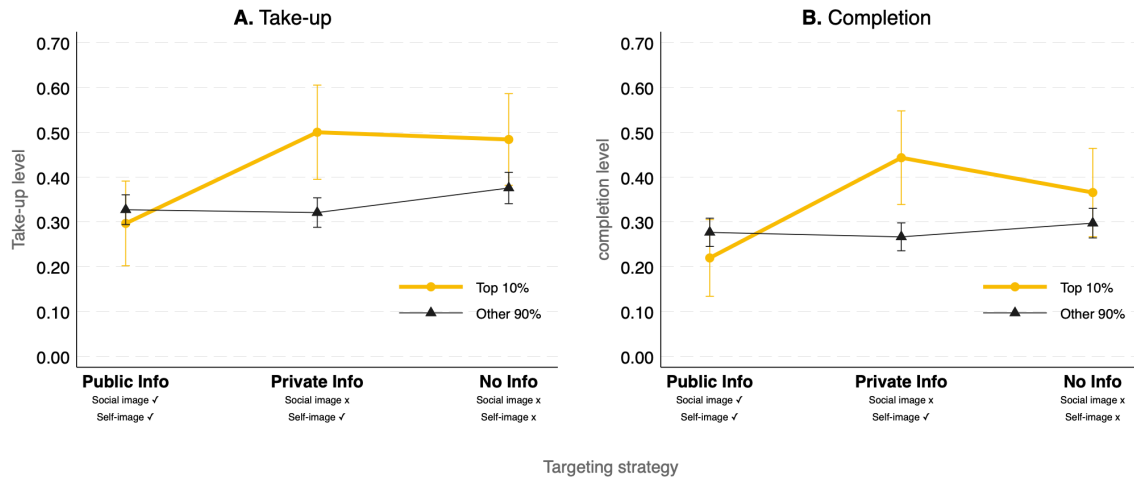


Figure 5 Take-up/completion levels for top performers.

The figure illustrate take-up (Panel A) and completion (Panel B) levels across targeting strategies, for the top 10% performers (thick line connecting circles) and for the other 90% (thin line connecting triangles). Labels under each bar display on top the targeting strategy, and below whether social image and/or self-image concerns were triggers (✓) or turned off (×).

**Result 4** *There is a strong negative impact of explicit targeting in deterring the best performers (top 10%) from taking up and completing the program, but this can be mitigated with a NO INFO targeting strategy.*

### 4.2 The effect of targeting on the number of identities

Students holding *at least one* of the social categories identified as being in academic disadvantage were invited to the educational program, in a message that pooled all five targeted categories together (see invitation in Section 2.4). About one-third of the targets held one single category (34.2%), while the other two-thirds held two or more (65.8%). Arguably, the more of these social categories a person holds, the more likely she is to feel disadvantaged or stereotyped. This could imply that individuals belonging to multiple groups may feel threatened when their different identities are made salient, and react more negatively to the triggers from explicit targeting than individuals belonging to fewer disadvantaged groups.

In this section, I report results from the assessment of whether the pooling of different social categories in the invitation messages triggered a negative reaction on those who hold multiple

identities.<sup>17</sup> Figure 6.A illustrate take-up levels across targeting strategies for individuals holding a single identity (dashed line connecting circles) and those holding two or more identities (solid line connecting triangles), pooled across performance groups. Irrespective of the number of identities, the trend of take-up is increasing as social image and self-image concerns are turned off. That is the case for those holding a single identity (18% – 20% – 26%) as well as for those holding multiple identities (25% – 28% – 32%).

## Targeting and number of identities

Program take-up and completion when holding a single or multiple identities

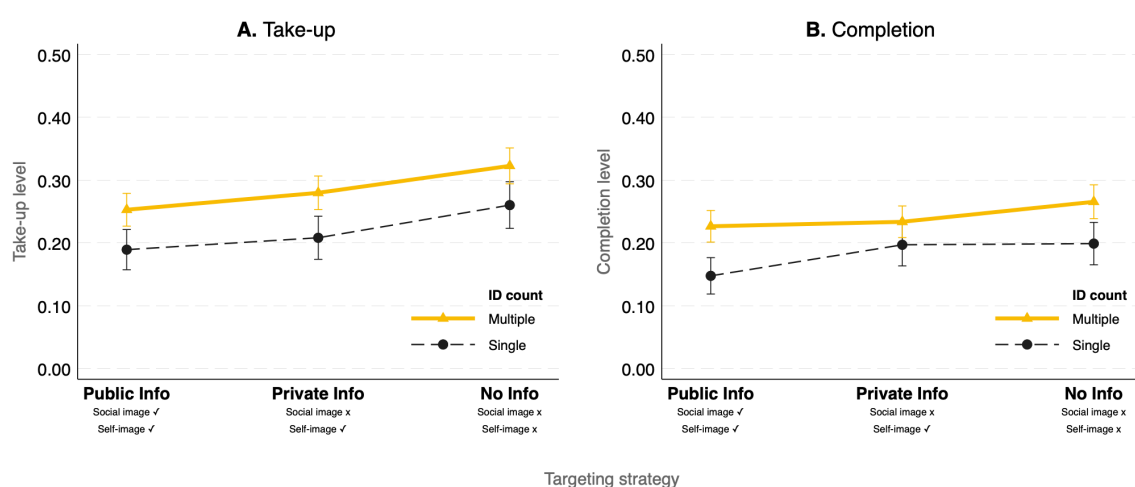


Figure 6 Take-up/completion levels for different number of identities.

The figure illustrate take-up (Panel A) and completion (Panel B) levels across strategies for targets holding a single (dashed line connecting circles) or multiple identities (solid line connecting triangles), pooled across performance groups. Labels under each bar display on top the targeting strategy, and below whether social image and/or self-image concerns were triggers (✓) or turned off (×).

The main effects of the targeting strategies on program take-up/completion appears to be robust to the different identity profiles. Moreover, instead of lower levels, targets holding multiple identities display higher levels of take-up than those holding a single one, and the difference is statistically significant even in NO INFO (26% vs. 30%,  $p = 0.005$ ). This can be interpreted as some suggestive evidence that targeting different identities at the same time may be an inclusive way of reaching targets with identity profiles that belong to more than a single disadvantage social group. The more targeted categories a person holds the more included she feels and thus the higher the take-up. Also, that individuals with more disadvantaged identity profiles are very

<sup>17</sup> For ease of exposition, I illustrate results pooling individuals holding 2 or more categories together. But, the results are consistent when separating into those holding, 1, 2 or at least 3 (only 3.8% of the sample hold more than 3 categories).

responsive to opportunities, possibly because these are less frequent for them. The effects for completion rates are consistent with those for program take-up, as illustrated in Figure 6.B. This is summarized in Result 5 below:

*Result 5 There is a strong negative impact of explicit targeting in deterring take-up and completion, so that across identity profiles take-up/completion is higher in NO INFO. Moreover, the levels of take-up/completion are higher when targets hold more than a single identity.*

### 4.3 The effect of targeting on specific identities: gender and social class

To conclude, I look at the disaggregate case and explore the impact of the targeting strategies on holding specific identities. I focus on female and low social class students, as these were identified as the most disadvantaged categories (see Appendix A).<sup>18</sup> By focusing on specific group identities, I am able to assess the interaction between holding a category that is stereotypically disadvantaged in academic terms *versus* actually conforming to or eluding the stereotype: being either high or low performance.

Figure 7.A summarizes take-up rates for female targets, showing that these students increase program take-up as social image and self-image concerns are turned off. Take-up goes up by 10 p.p. in NO INFO compared to PUBLIC INFO, irrespective of them being high performers (35% to 45%,  $p < 0.001$ ) or low performers (14% to 24%,  $p = 0.001$ ). In contrast, Figure 7.A (Panel 2) shows that for low social class students triggering social-image and self-image impacts take-up in a positive (although not statistically significant) way if their performance is high (from 30% to 37%,  $p = 0.279$ ), but the impact is negative if their performance is low (from 26% to 16%,  $p = 0.047$ ). That is, *females* are more likely to be deterred from taking up the program if their identity is emphasized as a selection criterion, irrespective of their performance level, while *low social class* students respond positively to explicit targeting if they are identified as high performers, but negatively when they are low performers.

The results on completion are in line with those of take-up. A negative effect on females as social image and self-image concerns are triggered, irrespective of performance. While two opposing effects for low class. More completion if information on identities is concealed and they are low performers, but less completion when they actually overcome the stereotype but this is not explicitly highlighted (see Figure 7.B).

<sup>18</sup> A detailed analysis of all possible identity profiles is out of the scope of this project. Five social categories were targeted: female, mid/low social class, rural, first generation, and ethnic minorities. This results in 120 identity profiles. Instead, I look at individuals holding each of these categories, irrespective of whether they hold none or some others. I focus on females and low social class targets in the main text, and report results on all five identities in the Appendix.

The evaluation done to identify which social categories to target for the program, showed that these categories are in academic disadvantage when contrasted with their relevant comparison group: females vs. males, as well as low social class vs. middle social class or vs. high social class. However, it does not follow directly that because this is true in the data, individuals actually believe this is the case and hold negative stereotypes towards these social categories (see e.g., [Bohren et al. 2019](#), for a discussion on inaccurate beliefs). If this were not the case and individuals from a given social category do not perceive themselves as disadvantaged, they would react negatively when their identity is signaled as part of the selection criteria. This would be a consequence of some form of entitlement, such that individuals from groups that are expected to do well are negatively affected if their group identity is emphasized as a *complement* to their high performance. However, if those from a given social category perform worse than their counterparts, on average, and the beliefs about their group are in line with the truth, then they would be positively affected if their identities are highlighted together with a recognition of high performance, as they elude the stereotype. They would nonetheless respond negatively if they confirm the stereotype with their low performance.

To explore this mechanism further, I conducted an online experiment with 245 students from the same university. Participants were asked to report the average scores they believed students got in their national exam depending on specific demographic characteristics. Scores in the exam range between 0 and 100, and payments for this experiments were contingent on accuracy (matching the predicted score and the actual average score for each subgroup). Figure 8 (dashed lines) illustrates the results of the experiment and shows that females are expected to perform slightly better than males ( $61.7 > 60.7, p < 0.001$ ), while low social class students are expected to underperform compared to middle class peers ( $57.9 < 60.8, p = < 0.001$ ) as well as compared to high class peers ( $57.9 < 62.1, p = < 0.001$ ). This provides support to the entitlement conjecture and would help explain why females react negatively to explicit targeting in both high and low performance groups, while low class students would react positively when their performance is high (as they elude the stereotype), and react negatively otherwise.

Targeted individuals are invited to an educational program on goal pursuit (i.e., setting and attaining goals) and not specifically on academic performance (see Section 2.3). Although it is arguable that being good at attaining goals should be correlated with academic performance, I complemented the results of the online experiment by conducting an online survey specifically asking for beliefs on goal attainment. This to reinforce the elucidation of the mechanism explaining why social image and self-image trigger positive effects on take-up for those eluding the stereotype, but not for the rest. The survey asked 1,200 respondents to report, out of a 100 individuals from a specific social category, how many attained the goals they set for their personal or professional life (see details in Appendix F). Figure 8 (solid lines) illustrates the results of the survey, which are consistent with those of the online experiment. Females are

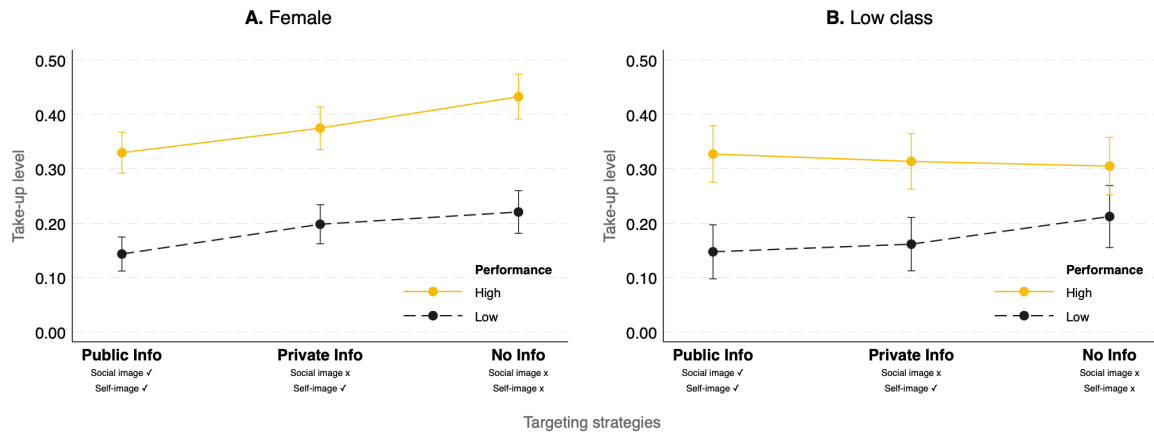


not expected to attain goals in a lower rate than males (73% vs. 73.5%,  $p = 0.116$ ), while low social class students are expected to attain goals at a significantly lower rate than middle class ( $52.1 < 69.9, p = < 0.001$ ) or high class peers ( $52.1 < 77.7, p = < 0.001$ ). This evidences that highlighting how a person eludes the stereotypes associated to her identity can have a positive impact on their choice to take up a beneficial opportunity, when it is offered because of their social categories. I summarize this finding in Result 6 below:

*Result 6 For social groups expected to underperform, explicit targeting (PUBLIC INFO and PRIVATE INFO) can have a positive effect on take-up/completion if it highlights that such individuals elude the stereotypes associated to their identities (e.g., low-class high-performing students). In all other cases, explicit targeting negatively affects program take-up and completion.*

## A. Targeting and specific identities: **Take-up**

Program take-up by females and low class, by performance group



## B. Targeting and specific identities: **Completion**

Program completion by females and low class, by performance group

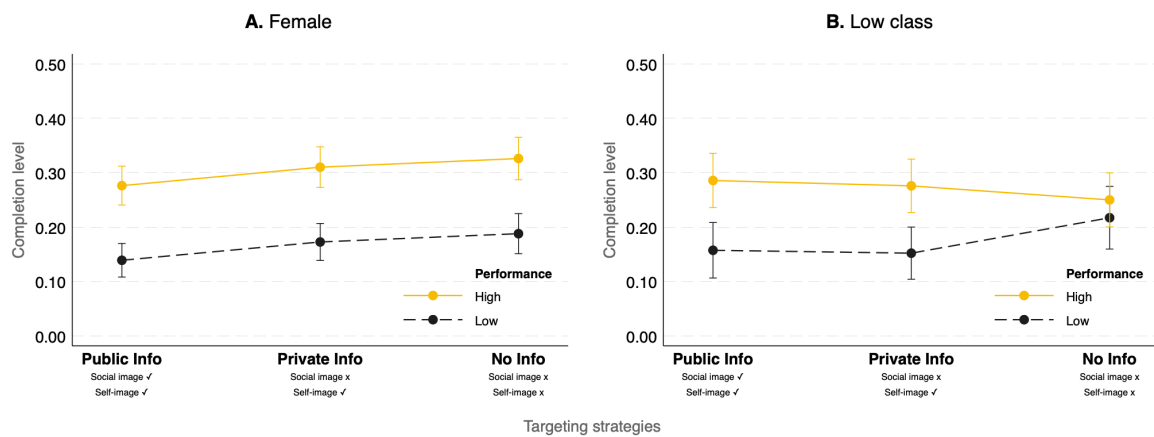


Figure 7 Take-up/completion levels for female and low class targets.

The figure illustrates take-up (Panel A) and completion (Panel B) levels across targeting strategies for female and low social class targets, separately for high and low performance groups.

## Reported beliefs on gender and social class

For experiment on exam scores and for survey on goal attainment

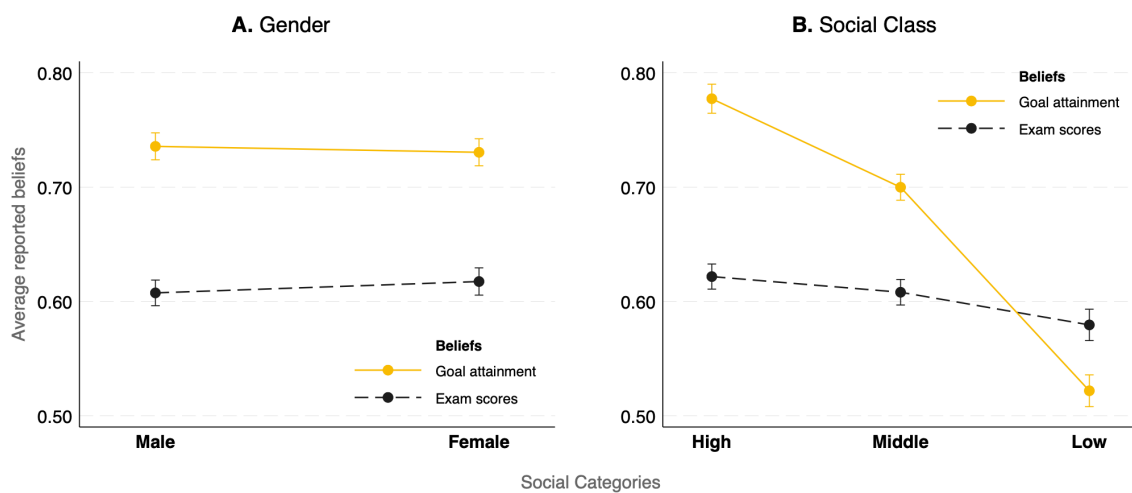


Figure 8 Reported beliefs towards females and low social class students.

The figure illustrates the reported beliefs on scores in the national exam elicited in the online experiment (dashed lines) and on the levels of goal attainment elicited in the online survey (solid line), by gender (Panel A) and social class (Panel B).

## 5 Conclusions

In this paper, I report the results of a field experiment that evaluates how informing individuals that they are invited to an educational program because of the group identities they hold, impacts their take-up and completion of the program. This is motivated by how institutions and organizations make salient the identities of their targeted populations when offering these types of opportunities, as a way to signal their commitment to equity and inclusion. I argue that this well-intended strategy may have the opposite results, as this could trigger social image and self-image concerns. To test how different targeting strategies impact targeted populations, I run a field experiment with almost five thousand college students, invite them to take part in an educational program, and experimentally vary how much is disclosed to them (or others) about selection being based on their group identities.

The main result of this study confirms the conjecture that explicitly targeting members of disadvantaged groups, by emphasizing that an opportunity is offered to them because of who they are, prevents their take-up of such opportunity. This is because individuals experience social image concerns when others know they are accepting an opportunity offered to them because of their demographics, and to reduce the negative social cost they pass on the opportunity. Similarly, individuals experience self-image concerns as they perceive themselves negatively for the same reasons, also preventing take-up.

The main result is very strong and persistent across different groups. For example, it both affects individuals with high or low academic performance, although it affects low performers to a larger extent. It also affects the very best performers, who are dissuaded to a larger extent than average performers. Explicit targeting also affects individuals irrespective of the number of targeted groups they belong to. And, to a large extent, it deters program take-up irrespective of which specific identities people hold. Because of this, the policy implications of this study are very clear: if the strategies being used to invite disadvantaged groups to take up a beneficial opportunity deter a significant fraction of them, institutions and organizations need to re-think their strategies.

I test a potential avenue for improvement through a *no-information* condition. The strategy relies on the use of existing administrative data to identify which individuals to target. So that it becomes unnecessary to explicitly emphasize to individuals that they are being targeted because of their group identities to attract them into taking up the offered opportunity. The evidence from this work show that such a strategy significantly increases take-up and completion, because it turns off social image and self-image concerns. By avoiding any reference to the disadvantaged groups people belong to, they are less likely to feel triggered by the invitation and more likely to see how beneficial the opportunity is.

In fact, there is evidence that such a strategy can be put in place and effectively promote take-up. For instance, [Dynarski et al. \(2021\)](#) reports how high-performing low-class students were targeted by an elite university and offered free tuition if they applied and were accepted to an undergraduate program. However, the authors did not use the standard approach of open calls that put the cost on the candidates, who must prove they hold the targeted identities (e.g., prove they are from low income families). Instead, they used administrative data on who applied for free lunch at school, which highly correlates with being from low social class, to identify which students to target. This allowed them to reach their intended population without explicitly emphasizing their disadvantaged group identities. Thus, providing supportive evidence that the policy implication of my study can be used to improve how to reach people who can really benefit from the opportunities offered to them.

An exception to this is presented, in my study, for the low-income high-performing students. These individuals, unlike everyone else invited to the program, responded positively to explicit targeting. To understand why this was the case, I conducted additional online surveys and experiments. The findings showed that for such individuals the negative stereotype was real and strong, most people thought they were academically disadvantaged, but they themselves had overcome the stereotype. As such, emphasizing on their disadvantaged identities and their achievements motivated them to take-up the program. This exception, however, must be taken with caution. For explicit targeting to work in a positive way, as in this case, the data suggests that it must be clear that beliefs on the disadvantaged condition of a certain social group are strong and widely held. Also, that the targeted individuals have indeed eluded the negative stereotype. How to leverage this is an important avenue of future research to further our understanding of how to target and benefit members of different social groups.

In summary, while highlighting identities can be an effective approach in certain contexts to demonstrate an organization's commitment to equity, it may not always be the best approach when offering opportunities to disadvantaged groups. The social and personal burdens placed on disadvantaged individuals when they are explicitly singled out for an opportunity, can be significant enough to dissuade many from pursuing it. Instead, the evidence suggests that organizations and institutions can still support disadvantaged and underrepresented groups without causing negative effects, by employing a strategy that does not disclose identity-related criteria during the selection process. To achieve this, institutions can utilize administrative data to identify individuals from the relevant social groups they are interested in reaching, and directly target them without emphasizing their group identities.

## References

- Alan, S., Boneva, T., and Ertac, S. (2019). Ever failed, try again, succeed better: Results from a randomized education intervention on grit. Quarterly Journal of Economics, 134:1121–1162.
- Alan, S. and Ertac, S. (2018). Fostering patience in the classroom: Results from randomized educational intervention. Journal of Political Economy, 126:1865–1911.
- Ashraf, N., Bandiera, O., Davenport, E., and Lee, S. S. (2020). Loosing prosociality in the quest for talent? sorting, selection and productivity in the delivery of public services. American Economic Review, 110:1355–1394.
- Benabou, R. and Tirole, J. (2006). Incentives and prosocial behavior. American Economic Review, 96:1652–1678.
- Bertrand, M. and Duflo, E. (2017). Field experiments on discrimination. In Banerjee, A. V. and Duflo, E., editors, Handbook of Economic Field Experiments, Volume 1, pages 309–393.
- Bogliacino, F., Jiménez Lozano, L., and Reyes, D. (2018). Socioeconomic stratification and stereotyping: lab-in-the-field evidence from colombia. International Review of Economics, 65:77–118.
- Bohren, J. A., Imas, A., and Rosenberg, M. (2019). The dynamics of discrimination: Theory and evidence. American Economic Review, 109:3395–3436.
- Bordalo, P., Coffman, K., Gennaioli, N., and Shleifer, A. (2016). Stereotypes. Quarterly Journal of Economics, 131:1753–1794.
- Bursztyn, L. and Jensen, R. (2015). How does peer pressure affect educational investments. The Quarterly Journal of the Economics, 130:1329–1367.
- Cardenas, J. C., Fergusson, L., and Garcia Villegas, M. (2021). La quinta puerta: De cómo la educación en Colombia agudiza las desigualdades en lugar de remediarlas. Ariel Colombia.
- Carlana, M., La Ferrara, E., and Pinotti, P. (2022). Goals and gaps: Educational careers of immigrant children. Econometrica, 90:1–29.
- Delavande, A. and Zafar, B. (2016). University choice: The role of expected earnings, nonpecuniary outcomes, and financial constraints. Journal of Political Economy, 127:2343–2393.
- Dynarski, S., Libassi, C., Micheltore, K., and Owen, S. (2021). Closing the gap: The effect of reducing complexity and uncertainty in college pricing on the choices of low-income students. American Economic Review, 111:1721–1756.

Genicot, G. and Ray, D. (2020). Aspirations and economic behavior. Annual Review of Economics, 12:715–746.

Milkman, K. (2021). How to change: The Science of Getting from Where You Are to Where You Want to Be. Penguin Random House LLC, New York.

Usmani, F., Jeuland, M., and Pattanayak, S. (2023). Ngos and the effectiveness of interventions. Review of Economics and Statistics, xx:1–45.

Online Appendix:

Explicitly targeting disadvantaged groups prevents  
take-up of an educational program

Manuel Muñoz-Herrera<sup>19</sup>

---

<sup>19</sup> Luxembourg Institute of Socio-Economic Research (LISER), Esch-sur-Alzette, Luxembourg (e-mail: [manuel.munoz@liser.lu](mailto:manuel.munoz@liser.lu)).



## A Selected identities

I combine two separate strategies to identify which groups of people are at a disadvantage and could benefit from the up-skilling program. I look at the academic performance of individuals at the moment of starting college (national entry exam) and at the economic expectations they have for their life after graduation.

### A.1 College Entry Exam

First, I look at differences in academic performance in the national exam all high-school students must take to apply for college. The exam covers five areas: mathematics and logic, critical reading skills, natural sciences, social sciences, and English as a second language. Scores for each area are between 0 and 100. I focus on the average total score and look at the trends on the periods between 2016 and 2021, which comprises 12 semesters. This because at the moment of launching the program, all registered students at the university had started between those periods.

I have data on the entry exam for a total of 10,604 students. However, not all administrative profiles were complete. This means that there are missing observations on at least one of the main demographic variables of interest. To complement the analysis, I imputed the data replacing missing observations with the average value for each variable.

Table A-1 reports OLS regressions where the dependent variable is the score in the national exam, with the raw data in column I ( $n = 3,343$ ; 31% of the sample) and with the imputed data in column II ( $n = 8,339$ ; 78% of the sample). The independent variables are different social categories such as gender (female vs. male), social class (low vs. middle vs. high), parental education (first generation vs. continuous education), origin (rural or urban), ethnic minority (afro-descending or indigenous vs. not), scholarship holder (holds a scholarship from the national government or not). I also include as controls the semester in which the student started college as well as the academic program he/she chooses.

The results show that individuals from some social categories are clearly disadvantaged against their comparison groups. For instance, females significantly underperform compared to males ( $p < 0.001$ ), even when controlling for chosen major. Similarly, students from low social class ( $p < 0.001$ ) and middle class ( $p < 0.001$ ) underperformed when compared to those of high class. In the same direction, the exam scores for first generation students ( $p < 0.001$ ), those who come from rural areas ( $p < 0.001$ ), as well as ethnic minorities ( $p < 0.001$ ) are not up to par with their counterparts.

Table A-1 Academic performance on entry exam

OLS regressions with robust standard errors (in parenthesis). The dependent variable is the score in the national entry exam in columns I-III and the score on economic expectations after graduation in columns IV-V. In all regressions, I control for the effect of different social categories such as gender, social class, parental education, origin, ethnic minority and scholarship holder. For the regression in column II, missing data on the different social categories was imputed as the average value for each variable. All regressions include academic major and starting semester as controls, except for column IV. \*\*\*, \*\* and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels.

	Exam score			Expectations score	
	I	II	III	IV	V
Female	-1.407** (0.282)	-1.623** (0.196)	-1.191** (0.373)	-0.017* (0.007)	-0.020** (0.007)
Low SES	-2.795** (0.352)	-3.865** (0.230)	-2.035** (0.493)	-0.016+ (0.009)	-0.020* (0.009)
High SES	2.878** (0.453)	3.057** (0.315)	3.777** (0.580)	0.031** (0.009)	0.037** (0.009)
First gen.	-2.945** (0.315)	-2.716** (0.311)	-2.282** (0.433)	-0.026** (0.008)	-0.021** (0.008)
Rural	-1.417* (0.311)	-2.272** (0.223)	-1.378** (0.439)	0.003 (0.008)	0.000 (0.008)
Ethnic	-3.143 (1.166)	-2.866** (0.678)	-3.523* (1.515)	0.032 (0.046)	0.017 (0.046)
Scholarship	11.325** (0.315)	12.840** (0.262)	9.725** (0.408)	0.011 (0.010)	0.018+ (0.010)
Constant	66.807** (0.493)	68.787** (0.296)	63.261** (0.632)	0.413** (0.007)	0.429** (0.011)
Controls	Yes	Yes	Yes	No	Yes
# Obs.	3343	8339	1636	1868	1865
R <sup>2</sup>	0.237	0.250	0.220	0.025	0.061

## A.2 Economic expectations after graduation

To complement the data on academic performance, and to assess another dimension in which these students may be behind their counterparts, I conducted a survey on the expectations students have for their future after graduation in the fall of 2021 (see survey questions below). I invited 6,421 students to take a 5 minutes survey, out of which 1,924 completed it (30% response rate.)

First, for comparability with the previous analysis on academic performance, I run the same model looking at differences in the scores on the entry exam (Table A-1 column III). I include exclusively those students who completed the expectations survey, and find consistent results showing that the same social categories underperform.

Next, I use the responses students gave to the survey to create an expectations score for each individual. For this, I combine the following indicators: (i) whether the student plans to continue studying after graduation (even if they also choose to work), (ii) how long do they

expect to be unemployed after graduation, (iii) the expected salary for their first job, (iv) the belief about the number of students (between 0 and 100) who graduate from their major and find a job in less than 6 months, and (v) the belief about the number of students (between 0 and 100) who graduate from their major and find a job through a social connection (referral). The expectation score ranges between 0 and 1, where 1 means students have high economic expectations. For instance, they plan to go to gradschool, they do not expect to be unemployed for too long, they expect a good salary, and also they expect people from their major to do well in finding a job (which can be a proxy for their views on their labor market and the value of social capital).

Table A-1 (columns IV and V) reports regressions on the expectations score and shows that most of the social categories displaying low academic performance also display lower levels of economic expectations for the future after graduation. For instance, when compared to their male counterparts, female students are less likely to have a job or be in an internship during their studies, expect to be unemployed for much longer after graduation and to earn less. Also, they believe this is somewhat generalized and expect graduates from their major to be less likely to find a job in the first 6 months after graduation. A similar thing happens with low and middle class students when compared to high class. An exception in terms of expectations is for students coming from rural areas of belonging to ethnic minorities, who do not differ significantly to their counterparts in their expectations.

Based on the results from the assessment of academic performance at the time of entering university and on the assessment of economic expectations after graduation from university, I chose females, low and middle social class, first generation, rural origins, and ethnic minorities as the social categories that would be targeted and offered the educational program.

**Questionnaire on economic expectations.** Below, I include the questions from the survey on economic expectations. In addition to these questions, I also collected data on socio-demographics (e.g., gender, social class).

- What is your work status? [Do not work (only study); Work independently (entrepreneur); Work in business/company of family; Work in business/company (non-family)]
- What are your plans after graduation? [Continue studying; Work in my field of study; Work out of my field of study; Entrepreneur; Continue in my current job; Other]
- Independently of your previous answer, consider the case in which you decided work after graduation in a job in your field of study. In which sector do you expect you can find that job? [Private; Public]
- How long do you expect it would take you to find that job? [Less than 6 months; Between 6 months and 1 year; Between 1 and 2 years; More than 2 years]

- How many minimum wages do you expect to earn as your salary for that job? (The minimum wage in 2021 is 908, 526 Pesos) [0-20]
- For every 100 students that graduate from your program, how many do you expect to find a job in less than 6 months? [0-100]
- For every 100 students that graduate from your program, how many do you expect to find a job through someone they met at university? (for instance a classmate or a friend) [0-100]
- How competitive are you? (Please choose a value, where 0 means *Not competitive at all* and 10 means *Very competitive*) [0-10]

## B Invitation Emails

The invitation message below was sent to pre-selected students. The original email was sent in Spanish, I include below the English translation. To maintain anonymity on the involved institutions, I replace names and identifiable information in the emails with placeholders. Experimental variations in the content of the email are indicated with the label of each treatment: NO INFO, PRIVATE INFO, and PUBLIC INFO.

### Message to students

Dear [Student Name],

The [Local University] has a collaboration agreement with the [International University], a global university of re-known quality. As part of the agreement, professors from the [International University] will teach a workshop to help students at [Local University] acquire the necessary tools to achieve their goals and increase their chances of personal and professional success (you can see details of the workshop at the end of this message).

This great opportunity provides multiple benefits. First, being able to learn from excellent professors. Second, by completing the workshop participants will receive an attendance certificate from the [International University]. These types of certificates can have a very large impact in your CV and open doors for future jobs or scholarships. In addition, at the end of the workshop there will be a lottery of various iPads among those who complete the program, with the aim of giving students a tool that may help them in their academic endeavors.

- NO INFO: The workshop has a limited number of slots and you have been chosen among all students at the university because you have the [merit/potential] to benefit from this program, as your cumulative GPA is [Student's GPA].
- PRIVATE INFO OR PUBLIC INFO: The workshop has a limited number of slots and you have been chosen among all students at the university because you have the [merit/potential] to benefit from this program, as your cumulative GPA is [Student's GPA], and also because you fulfill one of the following requirements: being a woman, being of middle-low social class, belonging to an ethnic minority (indigenous or afro-descendant), being a first-generation student (neither of your parents has a college degree), or coming from a rural area (or not coming from any of the main cities in the country).

As slots are limited, in order to register for the workshop and indicate you are interested in benefiting from this great opportunity, you will need to follow two very simple steps:

1. Pre-registration: Respond to this message indicating your interest in taking part of the workshop. This will count as a pre-registration.
2. Endorsement from a faculty member at [Local University]: Send an email message to a faculty member including this email address [Program's Email Address] in copy (cc), asking him/her to reply with the following message:
  - NO INFO or PRIVATE INFO: I, [Professor's name] recommend student [YourName] to take part in the workshop "How to change: scientific tools to achieve the goals in your personal and professional life", because he/she has the academic merit/potential to benefit from this program, as his/her cumulative GPA is [Student's GPA].
  - PUBLIC INFO: I, [Professor's name] recommend student [YourName] to take part in the workshop "How to change: scientific tools to achieve the goals in your personal and professional life", because he/she has the academic merit/potential to benefit from this program, as his/her cumulative GPA is [Student's GPA], and also because he/she fulfills at least one of the following requirements: being a woman, being of middle-low social class, belonging to an ethnic minority (indigenous or afro-descendant), being a first-generation student (neither of his/her parents has a college degree), or coming from a rural area (or not coming from any of the main cities in the country).

Once the professor has replied, you will be officially registered. It is indispensable that both you and the professor include this email address in copy for all communication.

All professors at the [Local University] have been informed about this great opportunity, so they will be willing to help you with the required endorsement.

Additional information about the workshop:

- Name: "How to change: scientific tools to achieve the goals in your personal and professional life".
- Instructor(s): The workshop will be taught by professors of high international standing from the [International University].
- Language: Spanish.
- Duration: 9 online sessions, half an hour each. All sessions are independent and you will be able to complete them at your own pace. So, you will not have any conflicts of scheduling with other academic activities.
- Start: The workshop will start on [Start date].

- Costs: Free course.
- Requirements: To be pre-selected and to be endorsed by a faculty member from the [Local University].
- Benefits: An international certificate of attendance. Also, you will participate in the lottery of various iPads.
- Registration deadline: Please pre-register before [Deadline date].

We await for your positive response so you can benefit from the opportunities in this workshop.

Sincerely,

[Signature Person - 1]

Head / Office of International Relations

[Signature Person - 2]

Director Social Bee Lab

## C Course evaluations

In this section, I present suggestive evidence that the program offered was considered valuable by both faculty and students. For this, I follow two strategies: (i) indications of value from faculty in their email responses to the nomination experiment, and (ii) course evaluations by students that completed the program in both the high and low gpa groups.

### C.1 Faculty perceptions

All faculty members were informed about the program and their role in endorsing students. So any faculty member considering this was a beneficial opportunity could endorse those students who asked them to. Among those who made an endorsement, 27 (9.5%) also included in their response emails positive messages about the program offered. Below, I include some samples (translated from Spanish to English by the author):

- What a great opportunity for the students!
- Thank you for including us in these important processes for our students with academic merit.
- To the team of the Office of International Relations, I want to thank you for the opportunities you provide to our students.
- Thank you for the possibility you give for students to strengthen their competencies.
- I find the topic of the workshop very relevant, especially for those who are concluding their academic program or beginning their professional lives, as well as for everyone else.
- For me as a faculty member, it is very gratifying to learn about such opportunities to benefit students. Initiatives like this strengthen the value of academic research.
- Thank you for the opportunity offered to the students, I am sure they will take advantage of it to the fullest.
- Thank you for such wonderful opportunity for our students.
- I think this workshop is fantastic and a great opportunity of growth for students.
- I greatly value these spaces of development for our students.



## C.2 Course evaluations

The course evaluation was completed by 1,135 students, 795 from the high performance group and 340 from the low performance group. The evaluation included a set of questions and here I report the results on the two most relevant for understanding the value students assigned to the program. First, “General evaluation of the course”, for which answers ranged from 1 “Very deficient”, 2 “Deficient”, 3 “Adequate”, 4 “Good” and 5 “Excellent”. The second item is “The course helped my way of thinking”, for which answers ranged from 1 “Completely disagree”, 2 “Disagree”, 3 “Neutral”, 4 “Agree” and 5 “Completely agree”. In both cases, I combine answers 1 and 2 into a “Negative” category, 3 I relabel as “Neutral”, and 4 and 5 I combine into a “Positive” category. Figure 9 summarizes the responses for these items in the course evaluation.

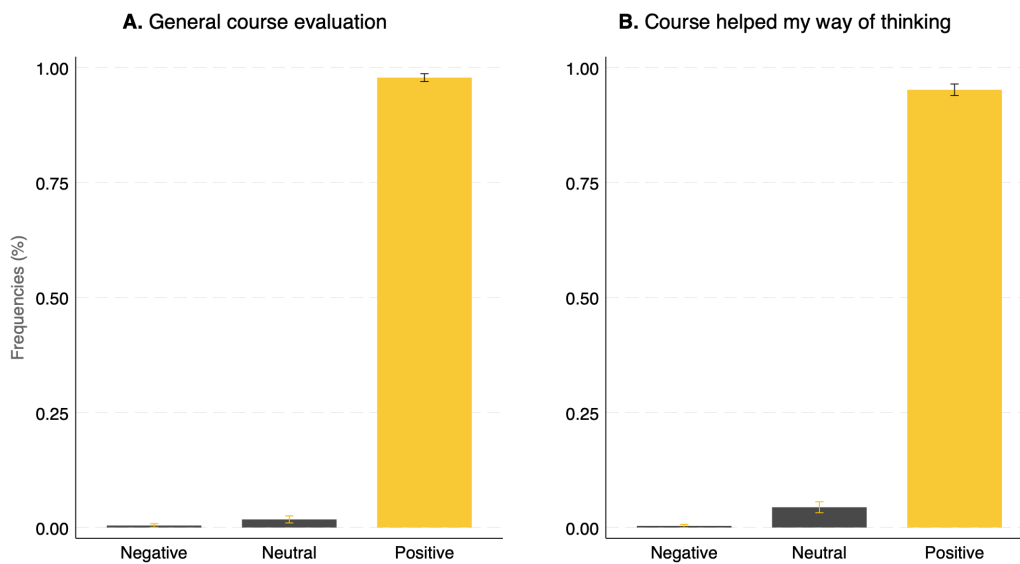


Figure 9

In the first case 97.8% of responses evaluated the course as positive (69.5% *Excellent* and 28.3% *Good*). Similarly, 95.2% agreed that the course impacted their way of thinking (59.5% *Completely agree* and 35.7% *Agree*). Thus, indicating that in line with comments from faculty endorsers, students are very positive about the program. Note that these course evaluations are measured ex-post, only for those who completed the program, which limits the extent to which I can state that all students valued the course in the same way despite the information they received about targeting. But, if I test how course evaluations vary depending on the performance group or the way they were targeted, I find no effect of treatment variations on the way students evaluated the course. This is reported in Table C-1 below.

Table C-1 The effect of targeting on course evaluations.

OLS regressions with robust standard errors (in parenthesis). The dependent variable is the item evaluated" general course evaluation in column I, "the course helped my way of thinking" in column II, "the course was intellectually stimulating" in column III, and "general evaluation of the instructor" in columns IV. In all regressions, targeting is a categorical variable for which *Public* is the omitted category. Similarly, performance is a categorical variable for which *Low gpa* is the omitted category. \*\*\*, \*\* and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels.

	Course I	Think II	Stimulate III	Instructor IV
PRIVATE INFO	0.014 (0.041)	-0.057 (0.044)	0.014 (0.047)	-0.015 (0.042)
NO INFO	0.004 (0.040)	-0.058 (0.044)	0.042 (0.046)	-0.005 (0.039)
High gpa	-0.005 (0.035)	-0.026 (0.039)	-0.007 (0.041)	-0.019 (0.036)
Constant	4.664** (0.040)	4.602** (0.043)	4.543** (0.046)	4.722** (0.040)
# Obs.	1135	1134	1134	1135

Table C-1 includes regressions for the two items illustrated in Figure 9: general course evaluation (column I) and a statement that the "course helped my way of thinking" (column II). Also, for the following two other statements: "The course was intellectually stimulating" (column III) and "General evaluation of the instructor" (column IV). All items are evaluated above 4 (in a 1 to 5 scale) and there is no effect of targeting on any of the items evaluated.

## D Peer effects

In this section, I evaluate the impact on take-up of having peers invited to the program. This is a way to assess potential spillover effects between treatments, if an individual decreases take-up when becoming aware that her peers have received a different invitation message (see Section B). But also, to measure peer influence, if an individual's willingness to take-up increases the more of her peers have received the same message.

To evaluate peer effects, I construct a network of relations between students using administrative data on each course taught across all academic programs. This dataset can be understood as a bipartite network that connects students to courses. The projection of this network results in a co-enrollment network of students connected to students. There is a connection between two individuals if they have attended to a course together, where the weight of a connection is the number of courses two students have co-attended. For each group, I use data on all courses up to the point where the experiment was launched: fall (spring) term of 2022-2023 for the high (low) gpa cohort. In each case, I maintain in the network only students who have been invited to the program, separate for each cohort. I am able to trace 2,193 of the 2,626 students invited for the high gpa cohort (83.5%) and 2,233 of the 2,270 students from the low gpa cohort (98.37%). The missing observations are due to errors in the academic database of the university, which prevents matching between student ids in the administrative data and the course enrollment data. This results in 2,616 (2,677) courses connecting all students invited in the high (low) gpa group. The average student is connected to 76 other students invited to the program, out of which about 25 are invited to the same treatment as herself (33%).

Table D-1 summarizes the main regressions testing for the effects of peers on take-up.

Table D-1 The effect of peers on take-up choices

OLS regressions with robust standard errors (in parenthesis). The dependent variable is the level of take-up of the up-skilling program. In all regressions, targeting is a categorical variable for which *Public* is the omitted category. Column I does not include peer effects. Column II looks at the absolute effect of the number of peers invited to the program. Column III looks at the effect of peers invited to the program using the same targeting message. Finally, column IV looks at the effect of peers invited to the program using a different targeting message. \*\*\*, \*\* and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels.

	I	II	III	IV
PRIVATE INFO	0.024 <sup>+</sup> (0.015)	0.026 <sup>+</sup> (0.015)	0.026 <sup>+</sup> (0.015)	0.026 <sup>+</sup> (0.015)
NO INFO	0.069** (0.015)	0.071** (0.016)	0.072** (0.016)	0.071** (0.016)
High gpa	0.186** (0.012)	0.191 (0.013)	0.190** (0.0413)	0.191** (0.013)
Degree		0.000 <sup>+</sup> (0.000)		
Degree same			0.001 (0.000)	
Degree different				0.000 <sup>+</sup> (0.000)
Constant	0.133** (0.011)	0.115** (0.0415)	0.117** (0.015)	0.115** (0.015)
# Obs.	4896	4426	4426	4426
R <sup>2</sup>	0.049	0.050	0.050	0.050

## E Online experiment - beliefs on performance by social group

I conducted an incentivized experiment with 245 students from the same university. The task is to report their beliefs on the average score of different social groups as well as the share of different social groups on the top 25% for two areas of the national exam: mathematics and reading comprehension (see details of the questionnaire below). For easy in exposition, in the main text, I report the aggregate belief for mathematics and reading. Here, I summarize the disaggregated results, reporting *p*-values from t-tests.

Respondents believe that males outperform females in mathematics (62.17 vs. 61.37, *p* = ??), while females outperform males in reading (62.75 vs. 59.20, *p* = ??). Thus, indicating there is no clear ranking between males and females. Unlike gender, the ranking on social class is consistent across areas of the exam. Students believe that in mathematics low class students underperform compared to middle class (58.83 vs. 61.62, *p* = ??) and to high class (58.83 vs. 62.61, *p* = ??), and middle class underperforms compared to high class (61.62 vs. 62.61, *p* = ??). Similarly, for reading low class students rank in the bottom compared to middle (57.96 vs. 59.72, *p* = ??) and high class (57.96 vs. 61.27, *p* = ??), and middle ranks below high class (59.72 vs. 61.27, *p* = ??).

## E.1 The questionnaire

*Below I include the main text and items of the questionnaire translated to English (by the author), as the original survey was conducted in Spanish.*

You have been invited to participate in this survey, with an estimated duration of 10 minutes.

Among all participants, we will randomly choose **1** out of every **10** to get paid. The chosen participants will receive a fixed payment of 50,000 pesos for completing the study, and an additional payment of 50,000 pesos, depending on their decisions. That is, in total, if you are chosen to receive payment, you could earn up to 100,000 pesos for completing this study. You will be paid online using Nequi.

[Page break]

### Instructions

We will ask you to report your belief about the average score that the students at [Local University] got in different areas of the Saber 11 exam. The two areas of interest are **Mathematics** and **Critical reading comprehension**.

In each area we will present to you cases where we vary the characteristics of the students.

In case you are chosen to receive payment, one of your responses will be randomly selected to calculate your earnings. In that case, if the score that you reported is less than 1.5 points away from the real score, you will receive a bonus payment of 50 thousand pesos.

[Page break]

### Math

In the **area of MATHEMATICS** of the Saber 11 exam, the average score of all students at the university was **63.77** points.

Report what was the average score in **MATHEMATICS** for students according to the following characteristics.

Remember you can earn a bonus of 50 thousand pesos if the score you report is less than 1.5 points away from the true value for that group of students.

[**Choices:** Male students; Female students; Strata 1 or 2 students; Strata 3 or 4 students; Strata 5 or 6 students]

[Page break]

### Reading

In the **area of CRITICAL READING** of the Saber 11 exam, the average score of all students at

the university was **62.49** points.

Report what was the average score in **CRITICAL READING** for students according to the following characteristics.

Remember you can earn a bonus of 50 thousand pesos if the score you report is less than 1.5 points away from the true value for that group of students.

[**Choices:** Male students; Female students; Strata 1 or 2 students; Strata 3 or 4 students; Strata 5 or 6 students]

[Page break]

## Instructions 2

Think about the students from [Local University] that are ranked in the **top 25%** of the scores in **Mathematics** and **Critical reading**.

Next we will ask you to estimate the percentage of students with different characteristics in this group of the top 25%.

In case you are chosen to receive payment, one of your responses will be randomly selected to calculate your earnings. In that case, if the score that you reported is less than 1.5 points away from the real score, you will receive a bonus payment of 50 thousand pesos.

[Page break]

Of all students of Local University], 34.11% are from strata 1 or 2, 50.56% are from strata 3 or 4, and 15.33% are from strata 5 or 6.

Now think in the students whose score in the **Critical reading** area is on the top 25% of all scores, what fraction of these students are:

[**Choices:** Strata 1 or 2 students; Strata 3 or 4 students; Strata 5 or 6 students]

[Page break]

Of all students of Local University], 34.11% are from strata 1 or 2, 50.56% are from strata 3 or 4, and 15.33% are from strata 5 or 6.

Now think in the students whose score in the **Mathematics** area is on the top 25% of all scores, what fraction of these students are:

[**Choices:** Strata 1 or 2 students; Strata 3 or 4 students; Strata 5 or 6 students]

[Page break]

Of all students of Local University], 56.75% are female and 43.25% are male.

Now think in the students whose score in the **Critical reading** area is on the top 25% of all

scores, what fraction of these students are:

[**Choices:** Male students; Female students]

[Page break]

Of all students of Local University], 56.75% are female and 43.25% are male.

Now think in the students whose score in the **Mathematics** area is on the top 25% of all scores, what fraction of these students are:

[**Choices:** Male students; Female students]

## F Online survey - Beliefs on goal attainment by social group

### F.1 The questionnaire

*Below I include the main text and items of the questionnaire translated to English (by the author), as the original survey was conducted in Spanish.*

Welcome. Next you will answer a short questionnaire.

We will ask you to indicate, in your opinion, what is the probability (between 0 and 100) that different groups of people attain the goals they set for themselves.

For example, if we asked you for **the probability that astronauts attain the goals they set for themselves** and you answer 0, you are indicating that in this group no one even attains the goals they set. On the other extreme, if you answer 100, you are indicating that everyone in this group always attains the goals they set.

What is the probability that each group of people, in general, attain the goals they set?

*\*The different options were displayed in random order.*

- Males
- Females
- People from strata 1 or 2
- People from strata 3 or 4
- People from strata 5 or 6
- People who left their city to go to college
- People who attended college in their city
- People whose parents went to college
- People whose parents did not go to college