

1 Project ICFES: Evidence from a referral field experiment\* 1

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3 May 20, 2025 3

4 **Abstract** 4

5 Lorem Ipsum ([Beaman, Keleher, & Magruder, 2018](#)) 5

6 **JEL Classification:** C93, D03, D83, J24 6

7 **Keywords:** productivity beliefs, referrals, field experiment, skill identification, social 7  
8 class 8

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\*We obtained Institutional Review Board approvals from NYU Abu Dhabi (HRPP 2024-50) and the University of Luxembourg (ERP 24-028). The study design was preregistered in the OSF Registries prior to data collection (see <https://doi.org/10.17605/OSF.IO/V9T3W>).

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# 1 Introduction

Equally qualified individuals in the labor market may face very different outcomes depending on their socioeconomic status (SES). A key driver of inequality according to sociologists is due to differences in social capital (e.g., Bourdieu). A lack of social capital means a lack of access to individuals with influential (higher paid) jobs and job opportunities. In economic terms, it implies having worse outcomes when using one's network to find jobs conditional on the capacity on leveraging one's social network.<sup>1</sup>.

Referral hiring, the formal or informal process where firms ask workers to recommend qualified candidates for job opportunities, is a vivid labor market application where the role of differences in social capital becomes evident. As referrals must originate from the networks of referrers, the composition of referrer networks becomes a crucial channel that may propagate inequality: Similar individuals across socio-demographic characteristics tend to form connections at higher rates (McPherson, Smith-Lovin, & Cook, 2001), making across SES (low-to-high) connections less likely than same-SES connections (Chetty et al., 2022).<sup>2</sup> This implies referrals will reflect differences in network structures even in the absence of biases in the referral procedure, i.e., referring at random from one's network according to some productivity criteria.

Yet, in case of gender, evidence shows referrals may be biased under substantial pay-for-performance incentives beyond what is attributable to differences in network compositions (Beaman et al., 2018; Hederos, Sandberg, Kvissberg, & Polano, 2025). A similar bias against low-SES may further exacerbate outcomes of low-SES individuals in the labor market: If job information are in the hands of a select few high-SES which low-SES have already limited network access to (social capital hypothesis), and high-SES referrers are biased against low-SES, referring other high-SES at higher rates than their network composition, we can be confident that referral hiring disadvantages low-SES. The empirical question we answer is whether there is a bias against low-SES once we

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<sup>1</sup>fill in citation sociology reading from slides

<sup>2</sup>Chetty and colleagues suggests the share of high-SES connections among low-SES networks as the definition of social capital, as it correlates so strongly with labor market income.

35 account for the network SES composition in a controlled setting. 35

36 In this study, we focus on the role of SES in referrals by investigating whether in- 36

37 dividuals who are asked to refer someone tend to refer a candidate of their own SES. 37

38 We also explore potential mechanisms behind referral patterns under different incen- 38

39 tives. To this end, we conducted a lab-in-the-field experiment with 734 participants 39

40 in a Colombian university where different SES groups mix together. Participants were 40

41 instructed to refer a qualified student for tasks similar to the Math and Reading parts 41

42 of the national university entry exam (akin to SAT). To incentivize participants to refer 42

43 qualified candidates, we set earnings dependent on referred candidates' actual university 43

44 entry exam scores. 44

45 Referral hiring in the labor market range from formal referral program at firm asking 45

46 employees to refer to simply passing on job opportunities between network members 46

47 ([Topa, 2019](#)). As participants in our study are students at the university referring 47

48 based on exam scores, we abstract away from formal referral programs with defined job 48

49 openings. Our setting instead resembles situations where contacts share opportunities 49

50 with each other. This also eliminates reputational concerns as there is no firm, which 50

51 play a larger role in the labor market compared to our setting. At the same time, 51

52 national university entry exam scores are objective, widely accepted measures of ability, 52

53 and referrers in our setting possess accurate information about these signals. 53

|    |                                 |    |
|----|---------------------------------|----|
| 54 | <b>2 Background and Setting</b> | 54 |
| 55 | <b>3 Design</b>                 | 55 |
| 56 | <b>4 Results</b>                | 56 |
| 57 | <b>4.1 Descriptives</b>         | 57 |

Table 1: Selection into the experiment

|               | <b>Admin Data</b> | <b>Sample</b> | <b><i>p</i></b> |
|---------------|-------------------|---------------|-----------------|
| Reading score | 62.651            | 65.183        | 0.000           |
| Math score    | 63.973            | 67.477        | 0.000           |
| GPA           | 3.958             | 4.012         | 0.000           |
| Low-SES       | 0.343             | 0.410         | 0.000           |
| Med-SES       | 0.505             | 0.499         | 0.763           |
| High-SES      | 0.153             | 0.091         | 0.000           |
| Female        | 0.567             | 0.530         | 0.060           |
| Age           | 21.154            | 20.651        | 0.000           |
| Observations  | 4,417             | 734           | 5,151           |

*Note:* This table compares characteristics between the full administrative sample and the experimental sample. *p*-values for binary outcomes (Low-SES, Med-SES, High-SES, Female) are from two-sample tests of proportions; for continuous variables, from two-sample *t*-tests with unequal variances. All reported *p*-values are two-tailed.

Table 2: Balance between treatments

|               | <b>Baseline</b> | <b>Bonus</b> | <b><i>p</i></b> |
|---------------|-----------------|--------------|-----------------|
| Reading score | 64.712          | 65.693       | 0.134           |
| Math score    | 67.366          | 67.597       | 0.780           |
| GPA           | 4.003           | 4.021        | 0.445           |
| # connections | 173.40          | 176.88       | 0.574           |
| Tie strength  | 3.939           | 3.719        | 0.443           |
| Low-SES       | 0.419           | 0.401        | 0.615           |
| Med-SES       | 0.492           | 0.506        | 0.714           |
| High-SES      | 0.089           | 0.094        | 0.824           |
| Female        | 0.529           | 0.531        | 0.947           |
| Age           | 20.576          | 20.733       | 0.380           |
| Observations  | 382             | 352          | 734             |

*Note:* This table presents balance tests between **Baseline** and **Bonus** conditions.  $p$ -values for binary outcomes are from two-sample tests of proportions; for continuous variables, from two-sample  $t$ -tests with unequal variances. All reported  $p$ -values are two-tailed. Tie strength refers to the number of classes taken together. # connections refers to the number of individuals in referrer choice sets, otherwise called the “network degree”. Low-SES, Med-SES, and High-SES are binary variables indicating the share of participants in estrato 1 and 2, 3 and 4, or 5 and 6, respectively.

Table 3: Distribution of referrals by area

| Area   | Only one referral | Both areas | Total |
|--------|-------------------|------------|-------|
| Verbal | 65                | 608        | 673   |
| Math   | 61                | 608        | 669   |
| Total  | 126               | 1,216      | 1,342 |

*Note:* The table shows how many referrers made referrals in only one area versus both areas. “Only one referral” indicates individuals who made referrals exclusively in that area. “Both areas” shows individuals who made referrals in both verbal and math areas. The majority of referrers (608) made referrals in both areas.

Table 4: Summary statistics for network members by nomination status

|                      | Verbal            |                  | Math              |                  |
|----------------------|-------------------|------------------|-------------------|------------------|
|                      | Not Referred      | Referred         | Not Referred      | Referred         |
| Reading z-score      | 0.070<br>(0.003)  | 0.509<br>(0.039) | 0.079<br>(0.003)  | 0.465<br>(0.040) |
| Math z-score         | 0.079<br>(0.003)  | 0.452<br>(0.042) | 0.087<br>(0.003)  | 0.590<br>(0.043) |
| GPA z-score          | -0.066<br>(0.003) | 0.705<br>(0.041) | -0.069<br>(0.003) | 0.711<br>(0.041) |
| Tie strength z-score | -0.153<br>(0.003) | 2.690<br>(0.091) | -0.184<br>(0.003) | 2.488<br>(0.090) |
| Low-SES              | 0.334<br>(0.001)  | 0.374<br>(0.019) | 0.338<br>(0.001)  | 0.384<br>(0.019) |
| Med-SES              | 0.515<br>(0.001)  | 0.513<br>(0.019) | 0.513<br>(0.001)  | 0.507<br>(0.019) |
| High-SES             | 0.151<br>(0.001)  | 0.113<br>(0.012) | 0.149<br>(0.001)  | 0.109<br>(0.012) |
| Observations         | 128,174           | 673              | 127,481           | 669              |

*Note:* Standard errors in parentheses. GPA, test scores, and tie strength are standardized at the network level. For each referrer’s network, we first calculated the mean and standard deviation of each measure. We then computed the average of these means and standard deviations across all referrers. Each individual’s score was standardized using these network-level statistics. The standardization formula is  $z = (x - \bar{x}_{network}) / \sigma_{network}$ , where  $\bar{x}_{network}$  and  $\sigma_{network}$  are the average of network means and standard deviations, respectively. Low-SES, Med-SES, and High-SES are binary variables indicating the share of participants in estrato 1 and 2, 3 and 4, or 5 and 6, respectively. Tie strength measures the number of connections between individuals.

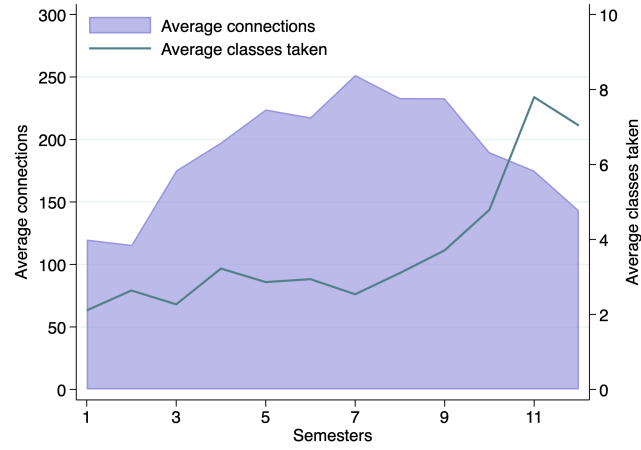
Table 5: Comparison of math and verbal scores by SES group and data source

|              | Math              |                   |                   | Verbal            |                   |                   |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|              | Network           | Admin             | Sample            | Network           | Admin             | Sample            |
| Low-SES      | 66.976<br>(0.052) | 61.653<br>(0.346) | 67.813<br>(0.694) | 64.738<br>(0.043) | 60.974<br>(0.274) | 66.058<br>(0.574) |
| Mid-SES      | 65.627<br>(0.039) | 64.531<br>(0.224) | 66.859<br>(0.580) | 63.685<br>(0.032) | 63.154<br>(0.183) | 64.779<br>(0.436) |
| High-SES     | 67.781<br>(0.077) | 67.330<br>(0.416) | 70.610<br>(1.295) | 64.966<br>(0.063) | 64.892<br>(0.341) | 66.397<br>(1.214) |
| Observations | 128,150           | 4,415             | 669               | 128,847           | 4,403             | 673               |

*Note:* Standard errors in parentheses. The table presents mean scores with standard errors for math and verbal tests across the entire network, the admin data, and the sample. Admin data consistently shows lower scores than both network and the sample across all SES groups consistent with selection, with the largest gaps occurring for the Low-SES. Differences between network and sample scores are generally smaller than those between either and the admin data.

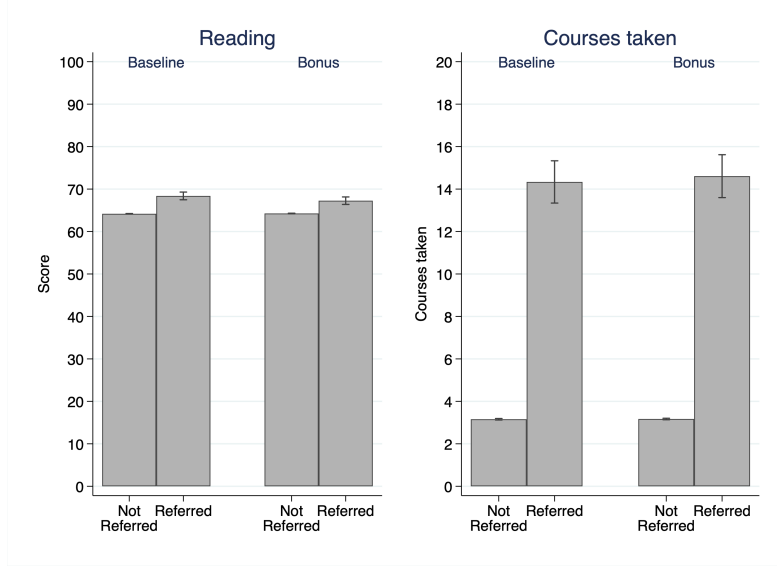


Figure 1: Participant network size and tie strength by time spent at UNAB

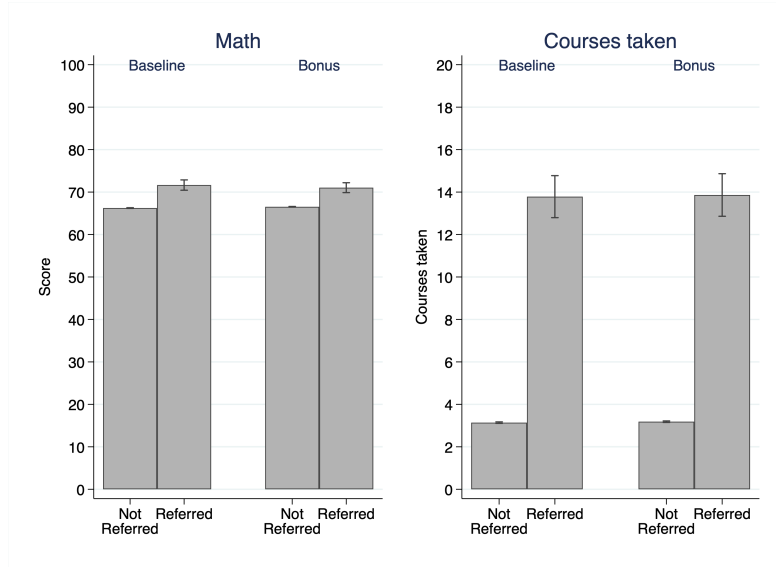


*Note:* This figure displays the average number of connections for referrers in blue and the average number of classes they have taken together with their connections in green across semesters spent at UNAB. The data shows an increase in the number of classes taken together as students progress in their programs, with the connections peaking around 7 semesters and dropping as certain students finish their bachelor's.

Figure 2: Effect of the Bonus on Referrals



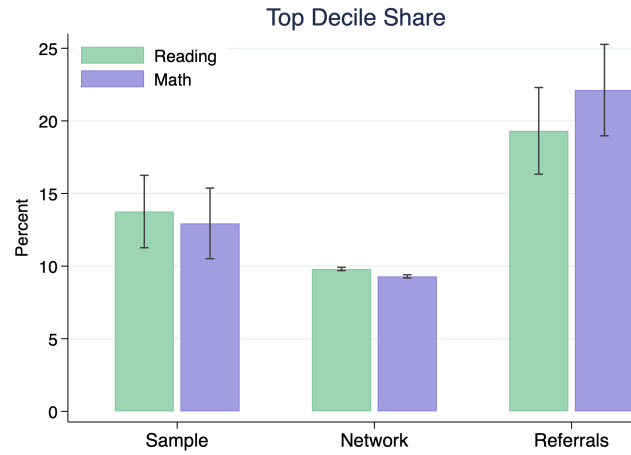
(a) Reading



(b) Math

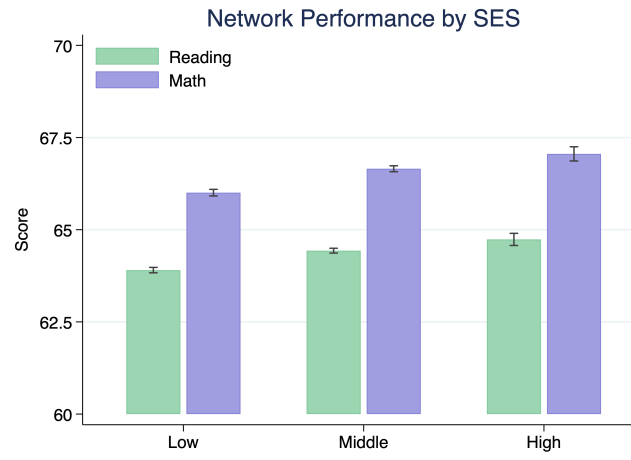
*Note:* The top panel compares the reading scores and tie strength of referrals across conditions. The bottom panel shows the average standardized math and tie strength of referrals across conditions. We test differences in across conditions using two-sample  $t$ -tests and find no meaningful differences. For both math and reading, treatment causes no significant changes in referral performance or tie strength.

Figure 3: Top decile performer share across the sample, network and referrals



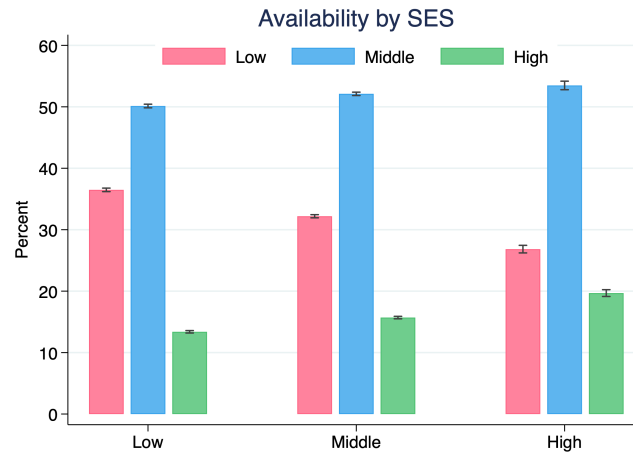
*Note:* This figure displays the percentage share of top decile individuals according to the admin data across three dimensions. First bar shows referrers in the sample of participants. Second bar is the share of top decile individuals in their networks. Third column shows the share of top decile among the referrals made. We test differences between proportions across these three groups using two-sample tests of proportions. For both math and reading scores, the differences between Sample and Network ( $p < 0.001$ ), Sample and Referrals ( $p < 0.005$ ), and Network and Referrals ( $p < 0.001$ ) are all statistically significant.

Figure 4: Participant network performance by subject and SES



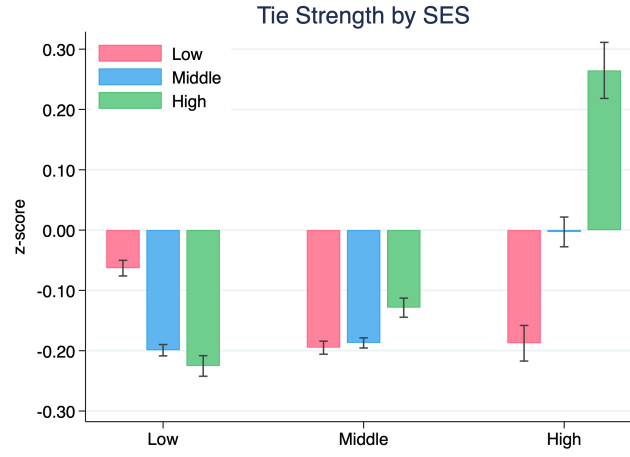
*Note:* This figure displays the network average math and reading z-scores across referrer SES. We test differences between scores across SES using paired  $t$ -tests. For both math and reading scores, all differences between SES groups are statistically significant (all  $p \leq 0.001$ ).

Figure 5: Participant network composition by SES



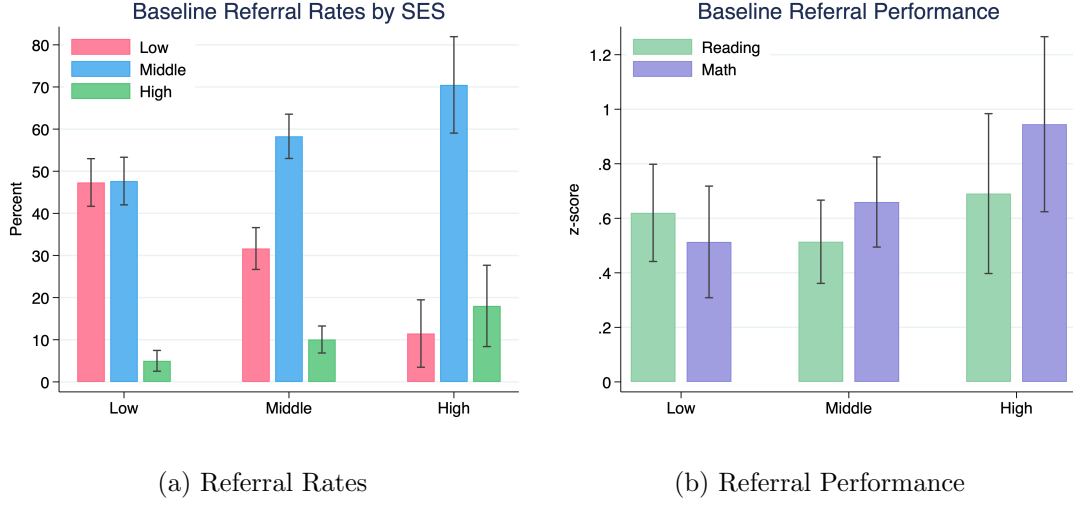
*Note:* This figure displays the composition of networks by SES. We test differences in proportions of peer connections across SES groups using two-sample tests of proportions. All differences are statistically significant ( $p < 0.001$ ): Low SES students are more likely to connect with Low SES peers than Middle or High SES students; Middle SES students form more connections with Middle SES peers than Low SES students; and High SES students have the highest proportion of High SES connections.

Figure 6: Participant network composition by SES



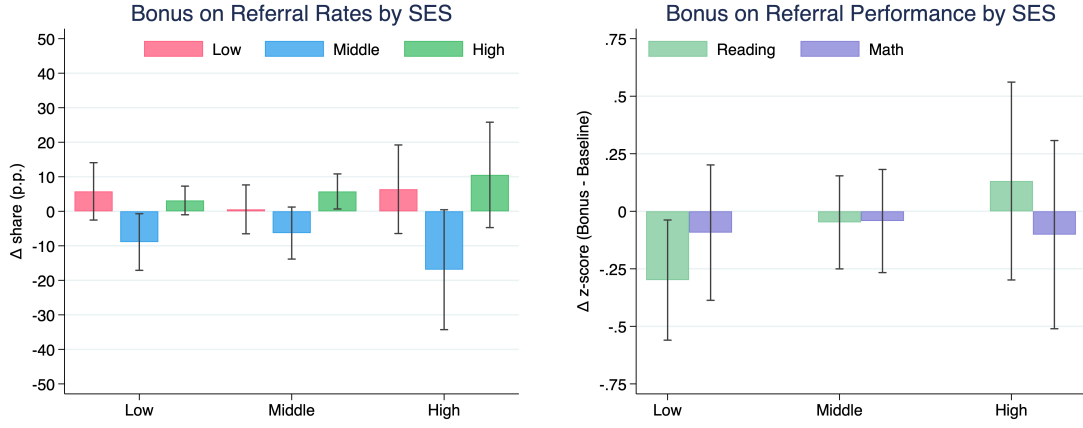
*Note:* This figure displays the standardized tie strength by SES. We test differences in standardized tie strength across SES groups using two-sample  $t$ -tests. All differences are statistically significant ( $p < 0.001$ ) except for the comparison between Middle and High SES students' connections to Low SES peers ( $p = 0.65$ ). The standardized tie strength for High SES students with other High SES students is substantially positive (0.26), while all other tie strengths are negative or near zero.

Figure 7: Baseline Referral Patterns by SES



*Note:* The left panel shows the distribution of referrals across SES in the baseline condition. We test differences in SES shares across SES groups using two-sample tests of proportions. All differences are statistically significant ( $p < 0.1$ ). The right panel shows the average standardized math and reading scores of referred students by referrer's SES. We test differences in z-scores across SES groups using two-sample  $t$ -tests and find no statistically significant differences in reading scores across SES groups (all  $p > 0.36$ ). For math scores, we observe marginally significant differences between Low and High SES students ( $p = 0.08$ ) and between Middle and High SES students ( $p = 0.18$ ), with High SES referring peers with higher math performance.

Figure 8: Effect of the Bonus



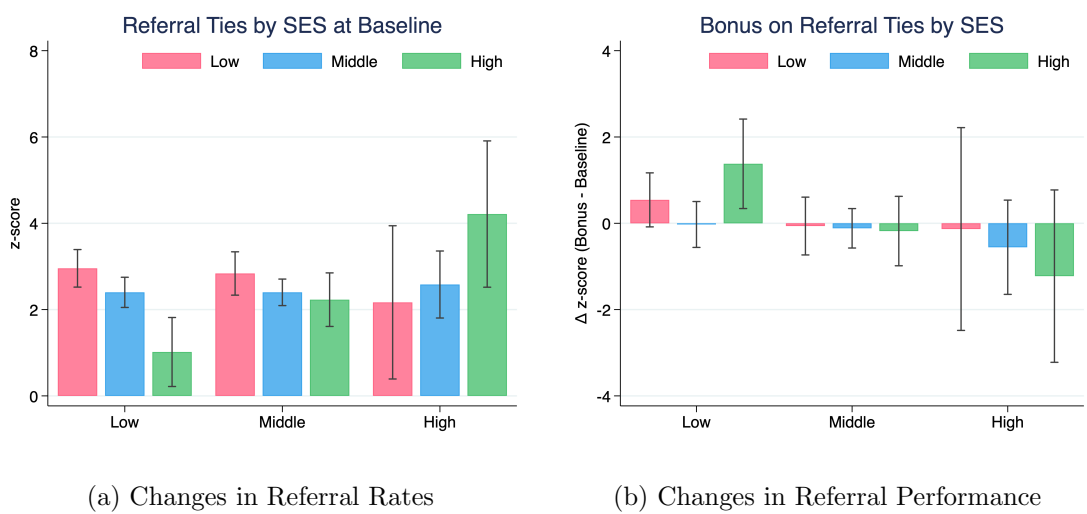
(a) Changes in Referral Rates

(b) Changes in Referral Performance

*Note:* The left panel shows the changes in referral rates across SES. We test differences in SES shares across conditions using two-sample tests of proportions. For Low-SES, only the change in referral share of Middle-SES is statistically significant ( $p = 0.034$ ). For Middle-SES, only the change in referral share of High-SES is statistically significant ( $p = 0.027$ ). For High-SES, only the change in referral share of Middle-SES is statistically significant ( $p = 0.059$ ). The right panel shows the differences in math and reading z-scores across SES. We test differences in SES shares across conditions using two-sample  $t$ -tests. For both reading and math scores, the only statistically significant difference is in the reading scores for Low-SES ( $p = 0.026$ ).

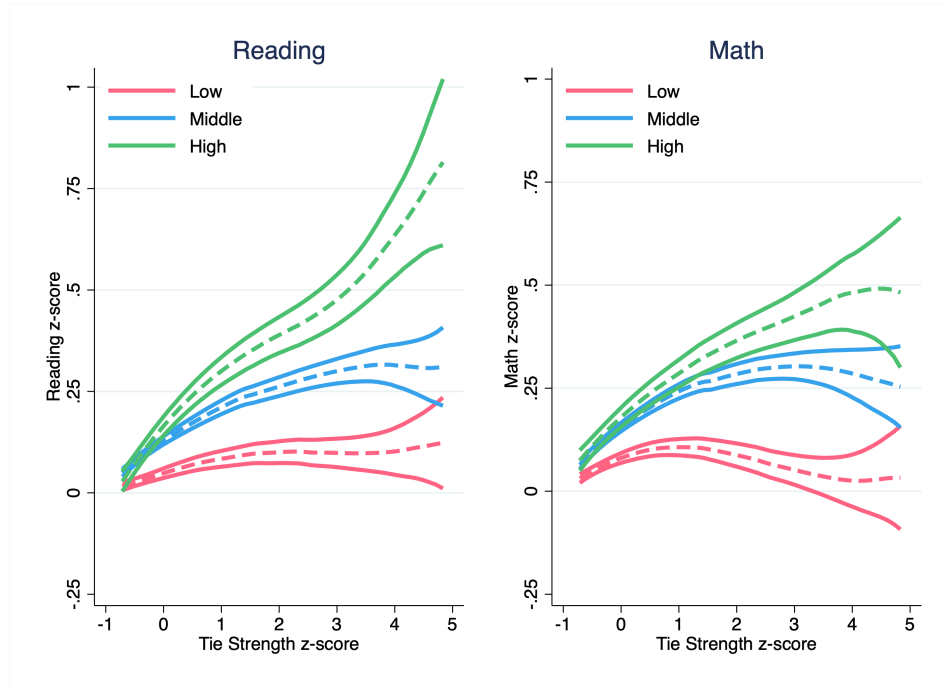


Figure 9: Effect of the Bonus on Tie Strength



*Note:* The left panel shows the changes in referral rates across socioeconomic strata (bonus minus baseline). The right panel shows the differences in average standardized math and reading scores of referred students by referrer's SES.

Figure 10: Performance by Tie Strength and SES



*Note:* This figure shows local polynomial regressions of network math and reading z-scores by social tie strength across socioeconomic status groups with 95% confidence intervals. Higher SES have steeper positive relationships between tie strength and the average performance those in their network across reading and math scores.

## References

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|    |          |                                      |    |
|----|----------|--------------------------------------|----|
| 73 | <b>A</b> | <b>Additional Figures and Tables</b> | 73 |
|----|----------|--------------------------------------|----|

|    |            |                           |    |
|----|------------|---------------------------|----|
| 74 | <b>A.1</b> | <b>Additional Figures</b> | 74 |
|----|------------|---------------------------|----|

|    |  |    |
|----|--|----|
| 75 | <b>B Experiment</b>  | 75 |
| 76 | <i>We include the English version of the instructions used in Qualtrics. Participansts saw</i>   | 76 |
| 77 | <i>the Spanish version. Horizontal lines in the text indicate page breaks and clarifying</i>     | 77 |
| 78 | <i>comments are inside brackets.</i>   | 78 |
| 79 | <b>Consent</b>   | 79 |
| 80 | You have been invited to participate in this decision-making study. This study is directed       | 80 |
| 81 | by [omitted for anonymous review] and organized with the support of the Social Bee Lab           | 81 |
| 82 | (Social Behavior and Experimental Economics Laboratory) at UNAB.                                 | 82 |
| 83 | In this study, we will pay <b>one (1)</b> out of every <b>ten (10)</b> participants, who will be | 83 |
| 84 | randomly selected. Each selected person will receive a fixed payment of <b>70,000</b> (seventy   | 84 |
| 85 | thousand pesos) for completing the study. Additionally, they can earn up to <b>270,000</b>       | 85 |
| 86 | (two hundred and seventy thousand pesos), depending on their decisions. So, in total,            | 86 |
| 87 | if you are selected to receive payment, you can earn up to <b>340,000</b> (three hundred and     | 87 |
| 88 | forty thousand pesos) for completing this study.   | 88 |
| 89 | If you are selected, you can claim your payment at any Banco de Bogotá office by                 | 89 |
| 90 | presenting your ID. Your participation in this study is voluntary and you can leave the          | 90 |
| 91 | study at any time. If you withdraw before completing the study, you will not receive             | 91 |
| 92 | any payment.   | 92 |
| 93 | The estimated duration of this study is 20 minutes.  | 93 |
| 94 | The purpose of this study is to understand how people make decisions. For this, we will          | 94 |
| 95 | use administrative information from the university such as the SABER 11 test scores of           | 95 |
| 96 | various students (including you). Your responses will not be shared with anyone and your         | 96 |
| 97 | participation will not affect your academic records. To maintain strict confidentiality, the     | 97 |
| 98 | research results will not be associated at any time with information that could personally       | 98 |

99 identify you. 99

100 There are no risks associated with your participation in this study beyond everyday risks. 100  
101 However, if you wish to report any problems, you can contact Professor [omitted for 101  
102 anonymous review]. For questions related to your rights as a research study participant, 102  
103 you can contact the IRB office of [omitted for anonymous review]. 103

104 By selecting the option “I want to participate in the study” below, you give your con- 104  
105 sent to participate in this study and allow us to compare your responses with some 105  
106 administrative records from the university. 106

107 • I want to participate in the study [advances to next page] 107

108 • I do not want to participate in the study 108

109 \_\_\_\_\_ 109

## 110 **Student Information** 110

111 Please write your student code. In case you are enrolled in more than one program 111  
112 simultaneously, write the code of the first program you entered: 112

113 [Student ID code] 113

114 What semester are you currently in? 114

115 [Slider ranging from 1 to 11] 115

116 \_\_\_\_\_ 116

117 [Random assignment to treatment or control] 117

|     |   |     |
|-----|---|-----|
| 118 | <b>Instructions</b>   | 118 |
| 119 | The instructions for this study are presented in the following video. Please watch it                         | 119 |
| 120 | carefully. We will explain your participation and how earnings are determined if you are                      | 120 |
| 121 | selected to receive payment.  | 121 |
| 122 | [Treatment-specific instructions in video format]   | 122 |
| 123 | If you want to read the text of the instructions narrated in the video, press the “Read                       | 123 |
| 124 | instruction text” button. Also know that in each question, there will be a button with                        | 124 |
| 125 | information that will remind you if that question has earnings and how it is calculated,                      | 125 |
| 126 | in case you have any doubts.  | 126 |
| 127 | <ul style="list-style-type: none"> <li>• I want to read the instructions text [text version below]</li> </ul> | 127 |
| 128 | <hr/>   | 128 |
| 129 | In this study, you will respond to three types of questions. First, are the belief questions.                 | 129 |
| 130 | For belief questions, we will use as reference the results of the SABER 11 test that you                      | 130 |
| 131 | and other students took to enter the university, focused on three areas of the exam:                          | 131 |
| 132 | mathematics, reading, and English.  | 132 |
| 133 | For each area, we will take the scores of all university students and order them from                         | 133 |
| 134 | lowest to highest. We will then group them into 100 percentiles. The percentile is a                          | 134 |
| 135 | position measure that indicates the percentage of students with an exam score that is                         | 135 |
| 136 | above or below a value.   | 136 |
| 137 | For example, if your score in mathematics is in the 20th percentile, it means that 20                         | 137 |
| 138 | percent of university students have a score lower than yours and the remaining 80 percent                     | 138 |
| 139 | have a higher score. A sample belief question is: “compared to university students, in                        | 139 |
| 140 | what percentile is your score for mathematics?”   | 140 |
| 141 | If your answer is correct, you can earn 20 thousand pesos. We say your answer is correct                      | 141 |

142 if the difference between the percentile you suggest and the actual percentile of your 142  
143 score is not greater than 7 units. For example, if you have a score that is in the 33rd 143  
144 percentile and you say it is in the 38th, the answer is correct because the difference is 144  
145 less than 7. But if you answer that it is in the 41st, the difference is greater than 7 and 145  
146 the answer is incorrect. 146

147 The second type of questions are recommendation questions and are also based on the 147  
148 mathematics, reading, and English areas of the SABER 11 test. We will ask you to think 148  
149 about the students with whom you have taken or are taking classes, to recommend from 149  
150 among them the person you consider best at solving problems similar to those on the 150  
151 SABER 11 test. 151

152 When you start typing the name of your recommended person, the computer will show 152  
153 suggestions with the full name, program, and university entry year of different students. 153  
154 Choose the person you want to recommend. If the name doesn't appear, check that you 154  
155 are writing it correctly. Do not use accents and use 'n' instead of 'ñ'. If it still doesn't 155  
156 appear, it may be because that person is not enrolled this semester or because they did 156  
157 not take the SABER 11 test. In that case, recommend someone else. 157

158 You can earn up to 250,000 pesos for your recommendation. We will multiply your 158  
159 recommended person's score by 100 pesos if they are in the first 50 percentiles. We will 159  
160 multiply it by 500 pesos if your recommended person's score is between the 51st and 160  
161 65th percentile. If it is between the 66th and 80th percentile, we will multiply your 161  
162 recommended person's score by 1000 pesos. If the score is between the 81st and 90th 162  
163 percentile, you earn 1500 pesos multiplied by your recommended person's score. And if 163  
164 the score is between the 91st and 100th percentile, we will multiply your recommended 164  
165 person's score by 2500 pesos to determine the earnings. 165

166 The third type of questions are information questions and focus on aspects of your 166  
167 personal life or your relationship with the people you have recommended. 167



|     |   |     |
|-----|---|-----|
| 168 | <b>Earnings</b>   | 168 |
| 169 | Now we will explain who gets paid for participating and how the earnings for this study   | 169 |
| 170 | are assigned. The computer will randomly select one out of every 10 participants to pay   | 170 |
| 171 | for their responses. For selected individuals, the computer will randomly choose one of   | 171 |
| 172 | the three areas, and from that chosen area, it will pay for one of the belief questions.  | 172 |
| 173 | Similarly, the computer will randomly select one of the three areas to pay for one of the | 173 |
| 174 | recommendation questions.   | 174 |
| 175 | <b>Additionally, if you are selected to receive payment, your recommended per-</b>        | 175 |
| 176 | <b>son in the chosen area will receive a fixed payment of 100 thousand pesos.</b>         | 176 |
| 177 | [Only seen if assigned to the treatment]  | 177 |
| 178 | Each person selected to receive payment for this study can earn: up to 20 thousand pesos  | 178 |
| 179 | for one of the belief questions, up to 250 thousand pesos for one of the recommendation   | 179 |
| 180 | questions, and a fixed payment of 70 thousand pesos for completing the study.             | 180 |
| 181 | Selected individuals can earn up to 340 thousand pesos.                                   | 181 |
| 182 | <hr/>   | 182 |
| 183 | [Participants go through all three Subject Areas in randomized order]                     | 183 |
| 184 | <b>Subject Areas</b>  | 184 |
| 185 | <b>Critical Reading</b>   | 185 |
| 186 | For this section, we will use as reference the Critical Reading test from SABER 11, which | 186 |
| 187 | evaluates the necessary competencies to understand, interpret, and evaluate texts that    | 187 |
| 188 | can be found in everyday life and in non-specialized academic fields.                     | 188 |
| 189 | [Clicking shows the example question from SABER 11 below]                                 | 189 |

Although the democratic political tradition dates back to ancient Greece, political thinkers did not address the democratic cause until the 19th century. Until then, democracy had been rejected as the government of the ignorant and unenlightened masses. Today it seems that we have all become democrats without having solid arguments in favor. Liberals, conservatives, socialists, communists, anarchists, and even fascists have rushed to proclaim the virtues of democracy and to show their democratic credentials (Andrew Heywood). According to the text, which political positions identify themselves as democratic?

- Only political positions that are not extremist
- The most recent political positions historically
- The majority of existing political positions
- The totality of possible political currents

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## Mathematics

This section references the Mathematics test from SABER 11, which evaluates people's competencies to face situations that can be resolved using certain mathematical tools.

[Clicking shows the example question from SABER 11 below]

A person living in Colombia has investments in dollars in the United States and knows that the exchange rate of the dollar against the Colombian peso will remain constant this month, with 1 dollar equivalent to 2,000 Colombian pesos. Their investment, in dollars, will yield profits of 3% in the same period. A friend assures them that their profits in pesos will also be 3%. Their friend's statement is:

- Correct. The proportion in which the investment increases in dollars is the same as in pesos.

|     |   |     |
|-----|---|-----|
| 214 | • Incorrect. The exact value of the investment should be known.                             | 214 |
| 215 | • Correct. 3% is a fixed proportion in either currency.                                     | 215 |
| 216 | • Incorrect. 3% is a larger increase in Colombian pesos.                                    | 216 |
| 217 | <hr/>   | 217 |
| 218 | <b>English</b>  | 218 |
| 219 | This section uses the English test from SABER 11 as a reference, which evaluates that       | 219 |
| 220 | the person demonstrates their communicative abilities in reading and language use in        | 220 |
| 221 | this language.  | 221 |
| 222 | [Clicking shows the example question from SABER 11 below]                                   | 222 |
| 223 | Complete the conversations by marking the correct option.                                   | 223 |
| 224 | • Conversation 1: I can't eat a cold sandwich. It is horrible!                              | 224 |
| 225 | – I hope so.  | 225 |
| 226 | – I agree.  | 226 |
| 227 | – I am not.   | 227 |
| 228 | • Conversation 2: It rained a lot last night!   | 228 |
| 229 | – Did you accept?   | 229 |
| 230 | – Did you understand?   | 230 |
| 231 | – Did you sleep?  | 231 |
| 232 | <hr/>   | 232 |
| 233 | [Following parts are identical for all Subject Areas and are not repeated here for brevity] | 233 |

|     |  |     |
|-----|--|-----|
| 234 | <b>Your Score</b>  | 234 |
| 235 | Compared to university students, in which percentile do you think your <b>[Subject Area]</b> | 235 |
| 236 | test score falls (1 is the lowest percentile and 100 the highest)?                           | 236 |
| 237 | [Clicking shows the explanations below]  | 237 |
| 238 | How is a percentile calculated?  | 238 |
| 239 | A percentile is a position measurement. To calculate it, we take the test scores for all     | 239 |
| 240 | students currently enrolled in the university and order them from lowest to highest. The     | 240 |
| 241 | percentile value you choose refers to the percentage of students whose score is below        | 241 |
| 242 | yours. For example, if you choose the 20th percentile, you're indicating that 20% of         | 242 |
| 243 | students have a score lower than yours and the remaining 80% have a score higher than        | 243 |
| 244 | yours.   | 244 |
| 245 | What can I earn for this question?   | 245 |
| 246 | For your answer, you can earn <b>20,000 (twenty thousand) PESOS</b> , but only if the        | 246 |
| 247 | difference between your response and the correct percentile is less than 7. For example, if  | 247 |
| 248 | the percentile where your score falls is 33 and you respond with 38 (or 28), the difference  | 248 |
| 249 | is 5 and the answer is considered correct. But if you respond with 41 or more (or 25 or      | 249 |
| 250 | less), for example, the difference would be greater than 7 and the answer is incorrect.      | 250 |
| 251 | Please move the sphere to indicate which percentile you think your score falls in:           | 251 |
| 252 | [Slider with values from 0 to 100]   | 252 |
| 253 | <hr/>  | 253 |

254 **Recommendation** 254

255 Among the people with whom you have taken any class at the university, who is your 255  
 256 recommendation for the [Subject Area] test? Please write that person's name in the 256  
 257 box below: 257

258 **Important:** You will not be considered for payment unless the recommended 258  
 259 person is someone with whom you have taken at least one class during your 259  
 260 studies. 260

261 Your response is only a recommendation for the purposes of this study and we will **not** 261  
 262 contact your recommended person at any time. 262

263 [Clicking shows the explanations below] 263

264 Who can I recommend? 264

265 Your recommendation **must** be someone with whom you have taken (or are taking) a 265  
 266 class. If not, your answer will not be considered for payment. The person you recommend 266  
 267 will not be contacted or receive any benefit from your recommendation. 267

268 As you write, you will see up to 7 suggested student names containing the letters you 268  
 269 have entered. The more you write, the more accurate the suggestions will be. Please 269  
 270 write **without** accents and use the letter 'n' instead of 'ñ'. If the name of the person 270  
 271 you're writing doesn't appear, it could be because you made an error while writing the 271  
 272 name. 272

273 If the name is correct and still doesn't appear, it could be because the student is not en- 273  
 274 rolled this semester or didn't take the SABER 11 test. In that case, you must recommend 274  
 275 someone else. 275

276 My earnings for this question? 276

For your recommendation, you could receive earnings of up to 250,000 (two hundred and fifty thousand) PESOS. The earnings are calculated based on your recommendation's score and the percentile of that score compared to other UNAB students, as follows:

- We will multiply your recommendation's score by \$100 (one hundred) pesos if it's between the 1st and 50th percentiles
- We will multiply your recommendation's score by \$500 (five hundred) pesos if it's between the 51st and 65th percentiles
- We will multiply your recommendation's score by \$1000 (one thousand) pesos if it's between the 66th and 80th percentiles
- We will multiply your recommendation's score by \$1500 (one thousand five hundred) pesos if it's between the 81st and 90th percentiles
- We will multiply your recommendation's score by \$2500 (two thousand five hundred) pesos if it's between the 91st and 100th percentiles

This is illustrated in the image below:

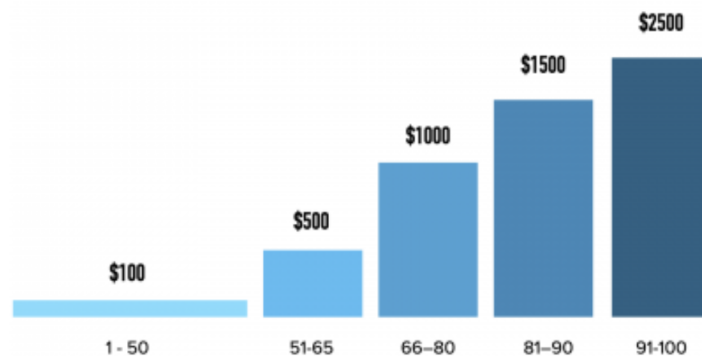


Figure B.1: Earnings for recommendation questions

For example, if your recommendation got 54 points and the score is in the 48th percentile,

292 you could earn  $54 \times 100 = 5400$  PESOS. But, if the same score of 54 points were in the 292  
293 98th percentile, you could earn  $54 \times 2500 = 135,000$  PESOS. 293

294 [Text field with student name suggestions popping up as participant types] 294

295 

---

 295

## 296 **Relationship with your recommendation** 296

297 How close is your relationship with your recommendedation: “[Name of the student 297  
298 selected from earlier]”? (0 indicates you are barely acquaintances and 10 means you are 298  
299 very close) 299

300 [Slider with values from 0 to 10] 300

301 

---

 301

## 302 **Your recommendation’s score** 302

303 Compared to university students, in which percentile do you think [Name of the student 303  
304 selected from earlier]’s score falls in the [Subject Area] test (1 is the lowest percentile 304  
305 and 100 the highest)? 305

306 [Clicking shows the explanations below] 306

307 How is a percentile calculated? 307

308 A percentile is a position measurement. To calculate it, we take the test scores for all 308  
309 students currently enrolled in the university and order them from lowest to highest. The 309  
310 percentile value you choose refers to the percentage of students whose score is below 310  
311 yours. For example, if you choose the 20th percentile, you’re indicating that 20% of 311  
312 students have a score lower than yours and the remaining 80% have a score higher than 312  
313 yours. 313

314 What can I earn for this question? 314

315 For your answer, you can earn **20,000 (twenty thousand) PESOS**, but only if the 315  
316 difference between your response and the correct percentile is less than 7. For example, 316  
317 if the percentile where your recommended person's score falls is 33 and you respond with 317  
318 38 (or 28), the difference is 5 and the answer is considered correct. But if you respond 318  
319 with 41 or more (or 25 or less), for example, the difference would be greater than 7 and 319  
320 the answer is incorrect. 320

321 Please move the sphere to indicate which percentile you think your recommended per- 321  
322 son's score falls in: 322

323 [Slider with values from 0 to 100] 323

324 \_\_\_\_\_ 324

## 325 Demographic Information 325

326 What is the highest level of education achieved by your father? 326

327 [Primary, High School, University, Graduate Studies, Not Applicable] 327

328 What is the highest level of education achieved by your mother? 328

329 [Primary, High School, University, Graduate Studies, Not Applicable] 329

330 Please indicate the socio-economic group to which your family belongs: 330

331 [Group A (Strata 1 or 2), Group B (Strata 3 or 4), Group C (Strata 5 or 6)] 331

332 \_\_\_\_\_ 332



|     |   |     |
|-----|---|-----|
| 333 | <b>UNAB Students Distribution</b>   | 333 |
| 334 | Thinking about UNAB students, in your opinion, what percentage belongs to each socio-     | 334 |
| 335 | economic group? The total must sum to 100%:   | 335 |
| 336 | [Group A (Strata 1 or 2) percentage input area]   | 336 |
| 337 | [Group B (Strata 3 or 4) percentage input area]   | 337 |
| 338 | [Group C (Strata 5 or 6) percentage input area]   | 338 |
| 339 | [Shows sum of above percentages]  | 339 |
| 340 | <hr/>   | 340 |
| 341 | <b>End of the Experiment</b>  | 341 |
| 342 | Thank you for participating in this study.  | 342 |
| 343 | If you are chosen to receive payment for your participation, you will receive a confirma- | 343 |
| 344 | tion to your UNAB email and a link to fill out a form with your information. The process  | 344 |
| 345 | of processing payments is done through Nequi and takes approximately 15 business days,    | 345 |
| 346 | counted from the day of your participation.   | 346 |
| 347 | [Clicking shows the explanations below]   | 347 |
| 348 | Who gets paid and how is it decided?  | 348 |
| 349 | The computer will randomly select one out of every ten participants in this study to be   | 349 |
| 350 | paid for their decisions.   | 350 |
| 351 | For selected individuals, the computer will randomly select one area: mathematics,        | 351 |
| 352 | reading, or English, and from that area will select one of the belief questions. If the   | 352 |
| 353 | answer to that question is correct, the participant will receive 20,000 pesos.            | 353 |

354 The computer will randomly select an area (mathematics, critical reading, or English) to 354  
355 pay for one of the recommendation questions. The area chosen for the recommendation 355  
356 question is independent of the area chosen for the belief question. The computer will 356  
357 take one of the two recommendations you have made for the chosen area. Depending on 357  
358 your recommendation's score, you could win up to 250,000 pesos. 358

359 Additionally, people selected to receive payment for their participation will have a fixed 359  
360 earnings of 70,000 pesos for completing the study. 360

361 \_\_\_\_\_ 361

## 362 **Participation** 362

363 In the future, we will conduct studies similar to this one where people can earn money 363  
364 for their participation. The participation in these studies is by invitation only. Please 364  
365 indicate if you are interested in being invited to other studies similar to this one: 365

366 [Yes, No] 366