

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

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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

*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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Table 1: Selection into the experiment

	Admin Data	Sample	<i>p</i>
Reading score (z-score)	0.000	0.264	0.000
Math score (z-score)	0.000	0.295	0.000
GPA (z-score)	0.000	0.156	0.000
Low-SES	0.343	0.410	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, 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. GPA and test scores are standardized to have mean zero and standard deviation one in the administrative sample.

Table 2: Balance between treatments

	Baseline	Bonus	<i>p</i>
Reading score (z-score)	0.212	0.320	0.116
Math score (z-score)	0.285	0.307	0.753
GPA (z-score)	0.126	0.187	0.393
# connections	346.80	353.75	0.574
Tie strength	3.665	3.565	0.798
Low-SES	0.419	0.401	0.615
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. GPA and test scores are standardized to have mean zero and standard deviation one in the administrative sample. 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 is a binary variable indicating the share of participants in estrato 1 or 2.

Table 3: Summary statistics for referred and not referred

	Verbal		Math	
	Not Referred	Referred	Not Referred	Referred
Reading score (z-score)	0.165 (0.003)	0.547 (0.034)	0.164 (0.003)	0.501 (0.035)
Math score (z-score)	0.201 (0.002)	0.513 (0.035)	0.204 (0.002)	0.624 (0.036)
GPA (z-score)	-0.144 (0.003)	0.579 (0.038)	-0.151 (0.003)	0.580 (0.039)
Tie strength	3.163 (0.013)	14.467 (0.362)	3.161 (0.013)	13.822 (0.359)
Low-SES	0.334 (0.001)	0.374 (0.019)	0.338 (0.001)	0.384 (0.019)
Female	0.524 (0.001)	0.562 (0.019)	0.520 (0.001)	0.428 (0.019)
Age	20.945 (0.006)	20.501 (0.104)	20.961 (0.006)	20.490 (0.099)
Observations	128,174	673	127,481	669

Note: Standard errors in parentheses. All scores are standardized (z-scores). Tie strength measures the number of courses taken together. Low-SES indicates the share of participants in estrato 1 or 2. # connections represents the size of the choice set.

Table 4: Math Referrals by own SES and Treatment

	Baseline		Bonus	
	Choice Set	Nominated	Choice Set	Nominated
Low-SES	0.358	0.483	0.368	0.508
Middle-SES	0.527	0.595	0.517	0.527
High-SES	0.202	0.161	0.196	0.259
Observations	65,103	348	62,378	321

Table 5: Verbal Referrals by own SES and Treatment

	Baseline		Bonus	
	Choice Set	Nominated	Choice Set	Nominated
Low-SES	0.365	0.464	0.370	0.554
Middle-SES	0.527	0.570	0.513	0.512
High-SES	0.199	0.200	0.192	0.310
Observations	66,674	351	61,500	322

14 **References**

14

- 15 Beaman, L., Keleher, N., & Magruder, J. (2018). Do Job Networks Disadvantage 15
16 Women? Evidence from a Recruitment Experiment in Malawi. *Journal of Labor* 16
17 *Economics*, 36(1), 121–157. doi: 10.1086/693869 17

18 **A Additional Figures and Tables**

18

19 **A.1 Additional Figures**

19

20 B Experiment 20

21 *We include the English version of the instructions used in Qualtrics. Participansts saw* 21
22 *the Spanish version. Horizontal lines in the text indicate page breaks and clarifying* 22
23 *comments are inside brackets.* 23

24 Consent 24

25 You have been invited to participate in this decision-making study. This study is directed 25
26 by [omitted for anonymous review] and organized with the support of the Social Bee Lab 26
27 (Social Behavior and Experimental Economics Laboratory) at UNAB. 27

28 In this study, we will pay **one (1)** out of every **ten (10)** participants, who will be 28
29 randomly selected. Each selected person will receive a fixed payment of **70,000** (seventy 29
30 thousand pesos) for completing the study. Additionally, they can earn up to **270,000** 30
31 (two hundred and seventy thousand pesos), depending on their decisions. So, in total, 31
32 if you are selected to receive payment, you can earn up to **340,000** (three hundred and 32
33 forty thousand pesos) for completing this study. 33

34 If you are selected, you can claim your payment at any Banco de Bogotá office by 34
35 presenting your ID. Your participation in this study is voluntary and you can leave the 35
36 study at any time. If you withdraw before completing the study, you will not receive 36
37 any payment. 37

38 The estimated duration of this study is 20 minutes. 38

39 The purpose of this study is to understand how people make decisions. For this, we will 39
40 use administrative information from the university such as the SABER 11 test scores of 40
41 various students (including you). Your responses will not be shared with anyone and your 41
42 participation will not affect your academic records. To maintain strict confidentiality, the 42
43 research results will not be associated at any time with information that could personally 43

44 identify you. 44

45 There are no risks associated with your participation in this study beyond everyday risks. 45

46 However, if you wish to report any problems, you can contact Professor [omitted for 46

47 anonymous review]. For questions related to your rights as a research study participant, 47

48 you can contact the IRB office of [omitted for anonymous review]. 48

49 By selecting the option “I want to participate in the study” below, you give your con- 49

50 sent to participate in this study and allow us to compare your responses with some 50

51 administrative records from the university. 51

52 • I want to participate in the study [advances to next page] 52

53 • I do not want to participate in the study 53

54

 54

55 **Student Information** 55

56 Please write your student code. In case you are enrolled in more than one program 56

57 simultaneously, write the code of the first program you entered: 57

58 [Student ID code] 58

59 What semester are you currently in? 59

60 [Slider ranging from 1 to 11] 60

61

 61

62 [Random assignment to treatment or control] 62

63	Instructions	63
64	The instructions for this study are presented in the following video. Please watch it	64
65	carefully. We will explain your participation and how earnings are determined if you are	65
66	selected to receive payment.	66
67	[Treatment-specific instructions in video format]	67
68	If you want to read the text of the instructions narrated in the video, press the “Read	68
69	instruction text” button. Also know that in each question, there will be a button with	69
70	information that will remind you if that question has earnings and how it is calculated,	70
71	in case you have any doubts.	71
72	<ul style="list-style-type: none"> • I want to read the instructions text [text version below] 	72
73	<hr/>	73
74	In this study, you will respond to three types of questions. First, are the belief questions.	74
75	For belief questions, we will use as reference the results of the SABER 11 test that you	75
76	and other students took to enter the university, focused on three areas of the exam:	76
77	mathematics, reading, and English.	77
78	For each area, we will take the scores of all university students and order them from	78
79	lowest to highest. We will then group them into 100 percentiles. The percentile is a	79
80	position measure that indicates the percentage of students with an exam score that is	80
81	above or below a value.	81
82	For example, if your score in mathematics is in the 20th percentile, it means that 20	82
83	percent of university students have a score lower than yours and the remaining 80 percent	83
84	have a higher score. A sample belief question is: “compared to university students, in	84
85	what percentile is your score for mathematics?”	85
86	If your answer is correct, you can earn 20 thousand pesos. We say your answer is correct	86

87 if the difference between the percentile you suggest and the actual percentile of your 87
88 score is not greater than 7 units. For example, if you have a score that is in the 33rd 88
89 percentile and you say it is in the 38th, the answer is correct because the difference is 89
90 less than 7. But if you answer that it is in the 41st, the difference is greater than 7 and 90
91 the answer is incorrect. 91

92 The second type of questions are recommendation questions and are also based on the 92
93 mathematics, reading, and English areas of the SABER 11 test. We will ask you to think 93
94 about the students with whom you have taken or are taking classes, to recommend from 94
95 among them the person you consider best at solving problems similar to those on the 95
96 SABER 11 test. 96

97 When you start typing the name of your recommended person, the computer will show 97
98 suggestions with the full name, program, and university entry year of different students. 98
99 Choose the person you want to recommend. If the name doesn't appear, check that you 99
100 are writing it correctly. Do not use accents and use 'n' instead of 'ñ'. If it still doesn't 100
101 appear, it may be because that person is not enrolled this semester or because they did 101
102 not take the SABER 11 test. In that case, recommend someone else. 102

103 You can earn up to 250,000 pesos for your recommendation. We will multiply your 103
104 recommended person's score by 100 pesos if they are in the first 50 percentiles. We will 104
105 multiply it by 500 pesos if your recommended person's score is between the 51st and 105
106 65th percentile. If it is between the 66th and 80th percentile, we will multiply your 106
107 recommended person's score by 1000 pesos. If the score is between the 81st and 90th 107
108 percentile, you earn 1500 pesos multiplied by your recommended person's score. And if 108
109 the score is between the 91st and 100th percentile, we will multiply your recommended 109
110 person's score by 2500 pesos to determine the earnings. 110

111 The third type of questions are information questions and focus on aspects of your 111
112 personal life or your relationship with the people you have recommended. 112

113	Earnings	113
114	Now we will explain who gets paid for participating and how the earnings for this study	114
115	are assigned. The computer will randomly select one out of every 10 participants to pay	115
116	for their responses. For selected individuals, the computer will randomly choose one of	116
117	the three areas, and from that chosen area, it will pay for one of the belief questions.	117
118	Similarly, the computer will randomly select one of the three areas to pay for one of the	118
119	recommendation questions.	119
120	Additionally, if you are selected to receive payment, your recommended per-	120
121	son in the chosen area will receive a fixed payment of 100 thousand pesos.	121
122	[Only seen if assigned to the treatment]	122
123	Each person selected to receive payment for this study can earn: up to 20 thousand pesos	123
124	for one of the belief questions, up to 250 thousand pesos for one of the recommendation	124
125	questions, and a fixed payment of 70 thousand pesos for completing the study.	125
126	Selected individuals can earn up to 340 thousand pesos.	126
127	<hr/>	127
128	[Participants go through all three Subject Areas in randomized order]	128
129	Subject Areas	129
130	Critical Reading	130
131	For this section, we will use as reference the Critical Reading test from SABER 11, which	131
132	evaluates the necessary competencies to understand, interpret, and evaluate texts that	132
133	can be found in everyday life and in non-specialized academic fields.	133
134	[Clicking shows the example question from SABER 11 below]	134

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

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.

159	• Incorrect. The exact value of the investment should be known.	159
160	• Correct. 3% is a fixed proportion in either currency.	160
161	• Incorrect. 3% is a larger increase in Colombian pesos.	161
162	<hr/>	162
163	English	163
164	This section uses the English test from SABER 11 as a reference, which evaluates that	164
165	the person demonstrates their communicative abilities in reading and language use in	165
166	this language.	166
167	[Clicking shows the example question from SABER 11 below]	167
168	Complete the conversations by marking the correct option.	168
169	• Conversation 1: I can't eat a cold sandwich. It is horrible!	169
170	– I hope so.	170
171	– I agree.	171
172	– I am not.	172
173	• Conversation 2: It rained a lot last night!	173
174	– Did you accept?	174
175	– Did you understand?	175
176	– Did you sleep?	176
177	<hr/>	177
178	[Following parts are identical for all Subject Areas and are not repeated here for brevity]	178

179	Your Score	179
180	Compared to university students, in which percentile do you think your [Subject Area]	180
181	test score falls (1 is the lowest percentile and 100 the highest)?	181
182	[Clicking shows the explanations below]	182
183	How is a percentile calculated?	183
184	A percentile is a position measurement. To calculate it, we take the test scores for all	184
185	students currently enrolled in the university and order them from lowest to highest. The	185
186	percentile value you choose refers to the percentage of students whose score is below	186
187	yours. For example, if you choose the 20th percentile, you're indicating that 20% of	187
188	students have a score lower than yours and the remaining 80% have a score higher than	188
189	yours.	189
190	What can I earn for this question?	190
191	For your answer, you can earn 20,000 (twenty thousand) PESOS , but only if the	191
192	difference between your response and the correct percentile is less than 7. For example, if	192
193	the percentile where your score falls is 33 and you respond with 38 (or 28), the difference	193
194	is 5 and the answer is considered correct. But if you respond with 41 or more (or 25 or	194
195	less), for example, the difference would be greater than 7 and the answer is incorrect.	195
196	Please move the sphere to indicate which percentile you think your score falls in:	196
197	[Slider with values from 0 to 100]	197
198	<hr/>	198

199 **Recommendation** 199

200 Among the people with whom you have taken any class at the university, who is your 200
 201 recommendation for the [Subject Area] test? Please write that person's name in the 201
 202 box below: 202

203 **Important:** You will not be considered for payment unless the recommended 203
 204 person is someone with whom you have taken at least one class during your 204
 205 studies. 205

206 Your response is only a recommendation for the purposes of this study and we will **not** 206
 207 contact your recommended person at any time. 207

208 [Clicking shows the explanations below] 208

209 Who can I recommend? 209

210 Your recommendation **must** be someone with whom you have taken (or are taking) a 210
 211 class. If not, your answer will not be considered for payment. The person you recommend 211
 212 will not be contacted or receive any benefit from your recommendation. 212

213 As you write, you will see up to 7 suggested student names containing the letters you 213
 214 have entered. The more you write, the more accurate the suggestions will be. Please 214
 215 write **without** accents and use the letter 'n' instead of 'ñ'. If the name of the person 215
 216 you're writing doesn't appear, it could be because you made an error while writing the 216
 217 name. 217

218 If the name is correct and still doesn't appear, it could be because the student is not en- 218
 219 rolled this semester or didn't take the SABER 11 test. In that case, you must recommend 219
 220 someone else. 220

221 My earnings for this question? 221

222 For your recommendation, you could receive earnings of up to 250,000 (two hundred and 222
223 fifty thousand) PESOS. The earnings are calculated based on your recommendation's 223
224 score and the percentile of that score compared to other UNAB students, as follows: 224

- 225 • We will multiply your recommendation's score by \$100 (one hundred) pesos if it's 225
226 between the 1st and 50th percentiles 226
- 227 • We will multiply your recommendation's score by \$500 (five hundred) pesos if it's 227
228 between the 51st and 65th percentiles 228
- 229 • We will multiply your recommendation's score by \$1000 (one thousand) pesos if 229
230 it's between the 66th and 80th percentiles 230
- 231 • We will multiply your recommendation's score by \$1500 (one thousand five hun- 231
232 dred) pesos if it's between the 81st and 90th percentiles 232
- 233 • We will multiply your recommendation's score by \$2500 (two thousand five hun- 233
234 dred) pesos if it's between the 91st and 100th percentiles 234

235 This is illustrated in the image below: 235

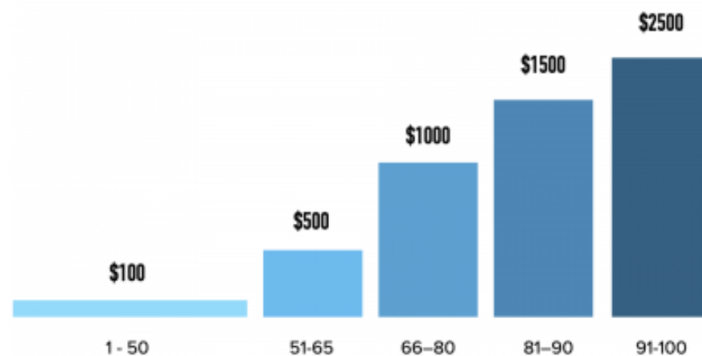


Figure B.1: Earnings for recommendation questions

236 For example, if your recommendation got 54 points and the score is in the 48th percentile, 236

237 you could earn $54 \times 100 = 5400$ PESOS. But, if the same score of 54 points were in the 237
238 98th percentile, you could earn $54 \times 2500 = 135,000$ PESOS. 238

239 [Text field with student name suggestions popping up as participant types] 239

240

 240

241 **Relationship with your recommendation** 241

242 How close is your relationship with your recommendedation: “[Name of the student 242
243 selected from earlier]”? (0 indicates you are barely acquaintances and 10 means you are 243
244 very close) 244

245 [Slider with values from 0 to 10] 245

246

 246

247 **Your recommendation’s score** 247

248 Compared to university students, in which percentile do you think [Name of the student 248
249 selected from earlier]’s score falls in the [Subject Area] test (1 is the lowest percentile 249
250 and 100 the highest)? 250

251 [Clicking shows the explanations below] 251

252 How is a percentile calculated? 252

253 A percentile is a position measurement. To calculate it, we take the test scores for all 253
254 students currently enrolled in the university and order them from lowest to highest. The 254
255 percentile value you choose refers to the percentage of students whose score is below 255
256 yours. For example, if you choose the 20th percentile, you’re indicating that 20% of 256
257 students have a score lower than yours and the remaining 80% have a score higher than 257
258 yours. 258

259 What can I earn for this question? 259

260 For your answer, you can earn **20,000 (twenty thousand) PESOS**, but only if the 260
261 difference between your response and the correct percentile is less than 7. For example, 261
262 if the percentile where your recommended person's score falls is 33 and you respond with 262
263 38 (or 28), the difference is 5 and the answer is considered correct. But if you respond 263
264 with 41 or more (or 25 or less), for example, the difference would be greater than 7 and 264
265 the answer is incorrect. 265

266 Please move the sphere to indicate which percentile you think your recommended per- 266
267 son's score falls in: 267

268 [Slider with values from 0 to 100] 268

269 _____ 269

270 Demographic Information 270

271 What is the highest level of education achieved by your father? 271

272 [Primary, High School, University, Graduate Studies, Not Applicable] 272

273 What is the highest level of education achieved by your mother? 273

274 [Primary, High School, University, Graduate Studies, Not Applicable] 274

275 Please indicate the socio-economic group to which your family belongs: 275

276 [Group A (Strata 1 or 2), Group B (Strata 3 or 4), Group C (Strata 5 or 6)] 276

277 _____ 277

278	UNAB Students Distribution	278
279	Thinking about UNAB students, in your opinion, what percentage belongs to each socio-	279
280	economic group? The total must sum to 100%:	280
281	[Group A (Strata 1 or 2) percentage input area]	281
282	[Group B (Strata 3 or 4) percentage input area]	282
283	[Group C (Strata 5 or 6) percentage input area]	283
284	[Shows sum of above percentages]	284
285	<hr/>	285
286	End of the Experiment	286
287	Thank you for participating in this study.	287
288	If you are chosen to receive payment for your participation, you will receive a confirma-	288
289	tion to your UNAB email and a link to fill out a form with your information. The process	289
290	of processing payments is done through Nequi and takes approximately 15 business days,	290
291	counted from the day of your participation.	291
292	[Clicking shows the explanations below]	292
293	Who gets paid and how is it decided?	293
294	The computer will randomly select one out of every ten participants in this study to be	294
295	paid for their decisions.	295
296	For selected individuals, the computer will randomly select one area: mathematics,	296
297	reading, or English, and from that area will select one of the belief questions. If the	297
298	answer to that question is correct, the participant will receive 20,000 pesos.	298

299 The computer will randomly select an area (mathematics, critical reading, or English) to 299
300 pay for one of the recommendation questions. The area chosen for the recommendation 300
301 question is independent of the area chosen for the belief question. The computer will 301
302 take one of the two recommendations you have made for the chosen area. Depending on 302
303 your recommendation's score, you could win up to 250,000 pesos. 303

304 Additionally, people selected to receive payment for their participation will have a fixed 304
305 earnings of 70,000 pesos for completing the study. 305

306

 306

307 **Participation** 307

308 In the future, we will conduct studies similar to this one where people can earn money 308
309 for their participation. The participation in these studies is by invitation only. Please 309
310 indicate if you are interested in being invited to other studies similar to this one: 310

311 [Yes, No] 311