Are Men Less Generous to a Smarter Woman? Evidence from a Dictator Game Experiment

Yuki Takahashi*

August 22, 2024

Abstract

Although evidence suggests men are more generous to women than to men, it may stem from paternalism and could reverse when women excel in important skills for one's career success, such as cognitive skills. Using a dictator game, this paper studies whether male dictators allocate less to female receivers than to male receivers when these receivers have higher IQs than dictators. By exogenously varying the receivers' IQ relative to the dictators', I do not find evidence consistent with this hypothesis; if anything, male dictators allocate slightly more to female receivers with higher IQs than to male receivers with equivalent IQs. The results hold both in mean and distribution and are robust to the so-called "beauty premium." Also, female dictators' allocations are qualitatively similar to male dictators. These findings suggest that women who excel in cognitive skills may not receive less favorable treatment than equally intelligent men in the labor market.

JEL Classification: D91, C91, J16

Keywords: Gender, IQ, dictator game, laboratory experiment

*Department of Economics, Tilburg University. Warandelaan 2, Koopmans Building K333, 5037AB Tilburg, The Netherlands. Email: y.takahashi@uvt.nl. I am grateful to Maria Bigoni, Boon Han Koh, Boris van Leeuwen, Natalia Montinari, and Bertil Tungodden, whose feedback was essential for this project, and to the participants of the experiments. This paper also benefited from comments at the Applied Young Economist Webinar, the BEEN Meeting, and seminars at Ca' Foscari University, the NHH, and the University of Bologna. Lorenzo Golinelli provided excellent technical and administrative assistance. This study was pre-registered with the OSF registry (https://osf.io/r6d8f/files); Online Appendix A explains deviations from the pre-analysis plan. The main experiment was conducted in compliance with the University of Bologna's standardized ethics protocol and the personal data protection policy, and the follow-up experiment was approved by the Institutional Review Board of the Tilburg School of Economics and Management (approval no. IRB EXE 2023-044).

"All through my life, culturally reinforced signals cautioned me against being branded as too smart or too successful."

— Sheryl Sandberg *Lean In: Women, Work, and the Will to Lead*

1 Introduction

Cognitive skills are important personal attributes that affect one's career success (Herrnstein and Murray 1996). However, individual skills are not the only determinant of one's success: a positive and welcoming environment is also important, especially for jobs based on teamwork. Yet, colleagues' support may also be affected by gender norms, which makes the role of cognitive skills and its interplay with gender possibly more nuanced (Eagly and Karau 2002; Heilman 2001; Ridgeway 2001; Rudman and Phelan 2008). Although the literature finds that men are more generous to women than to men (Dufwenberg and Muren 2006; List 2004), few studies examine its interaction with cognitive skills.

One manifestation of gender norms is paternalism towards women, which may motivate men to be more generous to them. For example, many men (and women) in the US believe that women who fall behind deserve more support than men in similar situations because they attribute women's setbacks to bad luck rather than a lack of effort (Cappelen, Falch, and Tungodden 2023). Similarly, men (and women) are more likely to attribute female leaders' bad outcomes to bad luck rather than poor decisions, compared to how they attribute male leaders' bad outcomes (Erkal, Gangadharan, and Koh 2023). Furthermore, many countries prohibit women from engaging in certain activities, such as close military combat (Fitriani, Cooper, and Matthews 2016).[1]

The main research question addressed in this paper is whether men are less generous to women who have higher cognitive skills than they do. I hypothesize that this is indeed the case because if the paternalism derived from gender norms drives men's higher generosity towards women, their generosity may disappear or even reverse when women violate these norms by excelling in critical skills for their career success. I test this hypothesis via a laboratory experiment.

In the experiment, participants first work on an incentivized IQ test (Raven matrices) that measures their cognitive skills. After the test, participants are randomly assigned to a group of six and receive an IQ rank relative to other group members. Then three of the six members are randomly chosen to be dictators and play three rounds of dictator game with the other three members chosen to be receivers, observing the receivers' facial photos and first names – both of which convey information about their gender – and the relative IQ ranks. I use the dictators' allocation as the measure of generosity, a widely used tool in experimental economics and shown to predict one's generosity outside the laboratory (Franzen and Pointner 2013). The use of photos allows me to inform the dictators of the receivers' gender with minimum experimenter demand

1. In fact, most countries exhibit protective attitudes toward women (Glick et al. 2000) and such attitudes are more pronounced in low-income countries. For example, Buchmann, Sullivan, and Meyer (2024) show that men prohibit women from taking risky jobs against their will.

effects.[2] I use dictator IQ fixed effects in the analysis to compare allocations of dictators with the same IQ but assigned different relative IQ ranks due to random group formation to cut the correlation between IQ and baseline generosity.[3,4]

I first confirm that male and female dictators' behaviors are consistent with the literature: their allocation amount is close to a previous study with a similar level of social distance with receivers, male dictators allocate more to female receivers than to male receivers (albeit statistically insignificant), and that female dictators allocate more than male dictators. Yet, I do not find male dictators are not less generous to a female receiver with a higher IQ: the point estimate is quantitatively negligible and statistically indistinguishable from 0, and the confidence interval is tight. If anything, male dictators are slightly more generous to a female receiver with a higher IQ. These results are robust to the so-called "beauty premium" and hold across the whole distribution of the male dictator allocations. The female dictators' allocation patterns are qualitatively similar to those of male dictators. Taken together, contrary to what is hypothesized, men (and women) are no less generous to women even when women excel in cognitive skills, and thus, the results suggest that women who excel in cognitive skills may not receive less favorable treatment than equally intelligent men in the labor market.[5]

This paper contributes to the literature about people's differential attitudes towards competent women and men. Social psychology and sociology literature find that people perceive and evaluate competent women more negatively than competent men (Heilman et al. 2004; Phelan, Moss-Racusin, and Rudman 2008; Rudman 1998; Rudman and Fairchild 2004; Rudman et al. 2012). Also, Quadlin (2018) finds female college students with a very high grade point average (GPA) receive fewer callbacks in hiring than male students with a similar GPA. However, there are studies that find the opposite: Ceci and Williams (2015) and Williams and Ceci (2015) find well-qualified female candidates for assistant professor positions receive equal or more favorable treatment than equally qualified male candidates in hiring. I show that although intelligence is an important factor of career success and one of the attributes men (and women) care most about (Castagnetti and Schmacker 2022; Eil and Rao 2011; Zimmermann 2020), excelling in intelligence is not a sufficient condition for women to receive less favorable treatments than equally intelligent men, consistent with the latter line of studies.

My paper also contributes to the literature on the role of gender in dictator games. The literature finds that female dictators allocate more than male dictators, but the difference is quantitatively modest at best (Bilén, Dreber, and Johannesson 2021). The difference is also context-dependent (Croson and Gneezy 2009; Doñate-Buendía, García-Gallego, and Petrović 2022) and possibly driven

2. For example, Babcock et al. (2017), Coffman (2014), and Isaksson (2018) use photos to inform experimental participants of the other participants' gender. Yet, I show the robustness of the results to the concern that facial photos may be subject to the so-called "beauty premium."

3. IQ fixed effects were used by Zimmermann (2020), among others.

4. For example, Falk et al. (2021) show that children from families with higher socioeconomic status tend to have higher IQ and are more altruistic than children from families with lower socioeconomic status.

5. A caveat is that the size of the standard error is not very small; thus, the results should be interpreted with caution.

by non-monetary motives (Klinowski 2018). Regarding the gender of the receivers, the literature finds that dictators allocate more to female receivers than to male receivers (Engel 2011), and male dictators may do so more (Dufwenberg and Muren 2006; List 2004). My paper adds to the latter evidence by introducing IQ as an additional dimension to gender and shows that male dictators' allocation patterns are largely unchanged when female receivers have higher IQs than male dictators.

The remainder of the paper proceeds as follows. Section 2 describes the experimental design, procedure, implementation, and data. Section 3 discusses the empirical strategy. Section 4 presents the results. Section 5 concludes.

2 Experiment

I conduct two experiments: the main and the follow-up. The main experiment collects data on dictator game allocation, and the follow-up experiment collects data on the receivers' attractiveness and other facial characteristics. I describe each of them in detail below.

2.1 Main Experiment

The main experiment consists of two parts, and participants receive instructions at the beginning of each part.

Pre-Experiment: Random Desk Assignment & Photo-Taking

Participants are randomly assigned to a partitioned computer desk. Afterward, they have their facial photos taken at a photo booth and enter their first names on their computers. The experimenters then go to each participant's desk to check that their photo and first name are correct, to assure other participants that the checked participants' photos and first names are real, following Isaksson (2018).

Part 1: IQ Test

In Part 1, participants work on nine incentivized IQ questions for nine minutes to measure their IQ. I use Bilker et al. (2012)'s "form A 9-item Raven test," which measures one's IQ 90% as accurately as the full-length Raven test but with fewer questions. Participants receive 0.5€ for each correctly solved IQ test question, but they do not receive information about how many questions they have solved correctly until the end of the experiment.

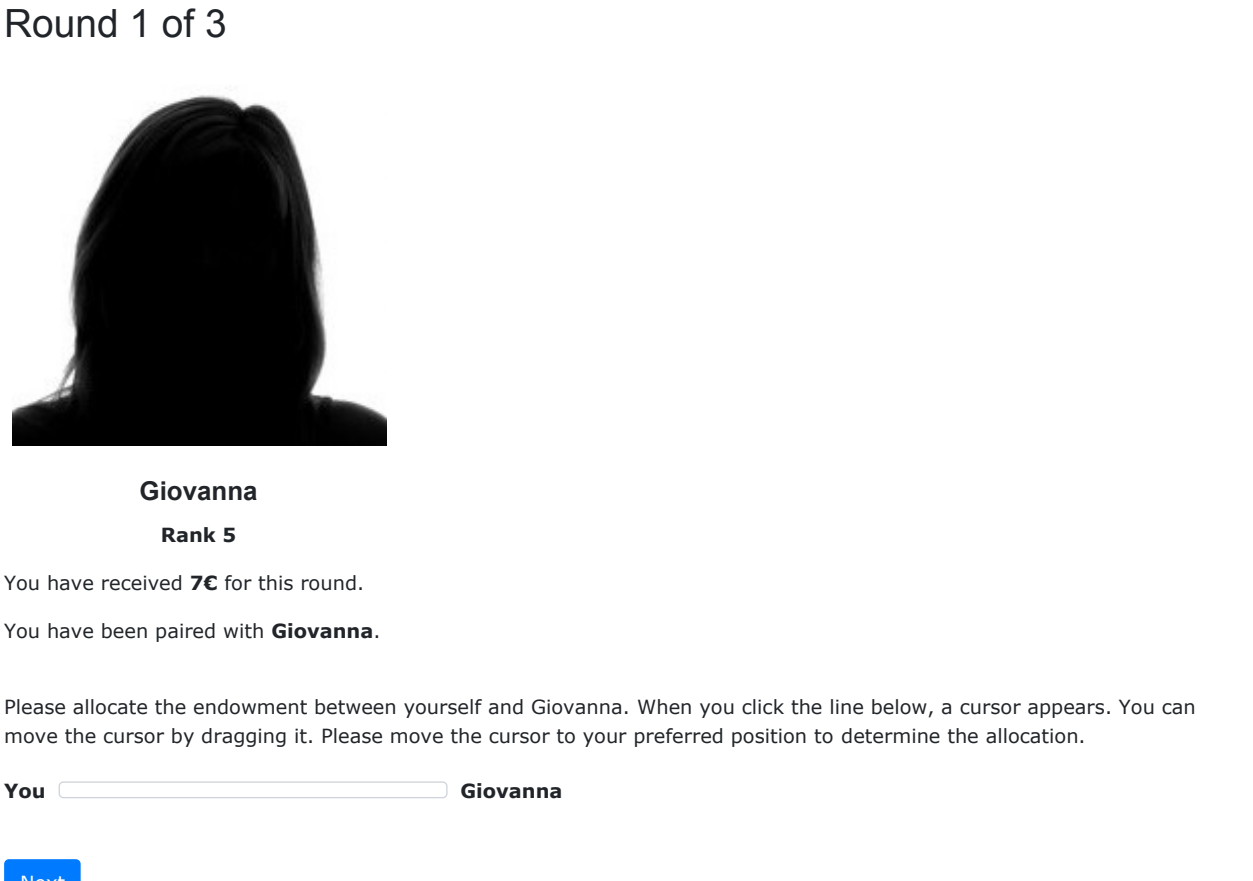
After the IQ test, participants make an incentivized guess on the number of IQ test questions they have solved correctly, which I use as a measure of their over-confidence level. They receive 0.5€ for a correct guess. They do not receive feedback on their guess accuracy until the end of the experiment.

Following Eil and Rao (2011), six participants are randomly grouped and privately informed about their IQ rank relative to the other five participants in the group. Ties are broken randomly.

They then answer a set of comprehension questions about their IQ rank. They cannot proceed to the next part until they answer the comprehension questions correctly.

Part 2a: Dictator Game (Dictators Only)

Figure 1: Dictator's allocation screen



Notes: This figure shows an example of a dictator's allocation screen. In this example, the dictator is playing the first round and paired with a receiver whose first name is Giovanna (a female name) and whose IQ rank is 5. In the experiment, dictators see Giovanna's facial photo instead of the silhouette.

In Part 2, three participants in each group are randomly assigned the role of dictators (which I call "active participant"), and the other three participants are randomly assigned the role of receivers (which I call "passive participant"). Dictators then play dictator games with windfall money three times, each time with a different receiver from their group, one by one, using a perfect stranger-matching protocol. During the dictator game, dictators observe the receivers' facial photos, first names, and IQ ranks; see Figure 1 for an example of a dictator's decision screen. The use of photos follows gender economics literature (Babcock et al. 2017; Coffman 2014; Isaksson 2018) to minimize the experimenter demand effects.

Dictators are told that their decisions are anonymous to the receivers and that their allocation will be paid as a "top-up" to the receivers' earnings. Dictators decide allocations by moving a cursor

on a slider where the cursor is initially hidden to prevent anchoring. I vary the endowment across rounds to make each dictator game less repetitive: 7€ for the 1st and the 3rd rounds, and 5€ for the 2nd round. At the end of the experiment, one of the three allocations is randomly chosen for each participant as earnings for Part 2.[6,7]

Part 2b: Belief Elicitation (Receivers Only)

I also collect a proxy of dictators' beliefs on how many IQ test questions the matched receivers have solved correctly. To prevent the belief elicitation from affecting/being affected by the dictator game, I exploit the random role assignment, and use the receivers' beliefs. This is a valid proxy because both dictators and receivers are exactly in the same experimental environment up to the role assignment and the role assignment is random. Specifically, while dictators are playing the dictator game, receivers are matched with the other two receivers in the same group one by one with a perfect stranger-matching protocol, and they make incentivized guesses on how many IQ test questions they have solved correctly, observing the receivers' facial photo, first name, and IQ rank, just as dictators do. They receive 0.5€ for each correct guess.

To address the non-anonymity of showing facial photos and first names, I ask both dictators and receivers how well they know the paired participants on a scale of 4, from "Did not know at all" to "Knew very well."[8] I ask this question twice to make sure they do not answer randomly: right after the three dictator games (for dictators) or two guesses (for receivers) and in the post-experimental questionnaire.

Post-Experiment: Questionnaire

After the dictator game and the belief elicitation, participants are told their earnings from the IQ test, the dictator game, and the belief elicitation in private. Before receiving their earnings, participants answer a short questionnaire about their demographics. In addition, receivers are asked whether I could use their photos in another experiment with a gratuity of 1.5€ (only for receivers who agreed; 162 receivers out of 193, or 84% of receivers, agreed).

Implementation

The main experiment was programmed with oTree (Chen, Schonger, and Wickens 2016) and conducted in English in November-December 2019 at the Bologna Laboratory for Experiments in Social Science (BLESS). I recruited 390 students (195 female and 195 male) of the University

6. For each dictator and in each round, one of the three receivers in the same group is randomly chosen *without replacement* and the dictator allocates the endowment between themselves and the receiver. Thus, it is possible for two dictators to play the dictator game with the same receiver in the same round. At the end of the dictator games, each participant has three allocations, one of which is randomly chosen for payment.

7. Note that, as with other information provision experiments, the results I show later are intention-to-treat effects because some dictators may not have taken into account the receivers' IQ rank when deciding the allocation. Yet, dictators solved the comprehension questions about their IQ rank relative to other group members, as in Appendix Figure D1.

8. See the experimental instructions in Appendix E for the exact wording.

of Bologna via ORSEE (Greiner 2015) who (i) were born in Italy, (ii) had not participated in gender-related experiments in the past (as far as I could trace), and (iii) were available to participate in experiments in English. The first condition was to reduce the chance that receivers' photos and first names would signal ethnicity, race, or cultural background. The second condition was to minimize the experimenter demand effects. The third condition was to run the experiment in English. As a further attempt to make the data cleaner, I excluded receivers with non-Italian-sounding names and allocations in which the dictators answered at least once that they knew the paired receivers "very well."[9] These data screenings leave me with 388 participants, 195 dictators, and 558 dictator allocations.

The number of participants is based on the power simulation in the pre-analysis plan to achieve 80% power.[10] The experiment is pre-registered with the OSF.[11] Appendix A explains deviations from the pre-analysis plan.

I ran 24 sessions in total, and the number of participants in each session was a multiple of 6 (12 to 30). The average session length was 70 minutes, including registration and payment. The average payment per participant was about 10€ including the participation fee of 2.5€ and a gratuity of 1.5€ for photo use in another experiment (only for receivers who agreed).

2.2 Follow-Up Experiment

I conduct a follow-up experiment to collect a measure of the attractiveness and other facial characteristics of the receivers in the main experiment. It consists of one part, and participants earn a flat fee of 10€.

Participants are randomly assigned to a partitioned computer desk. Afterward, participants see photos of 100 receivers in the main experiment one by one and rate the attractiveness of each of the photos on a 5-point Likert scale. I also ask them to rate the photos in terms of how kind they look (on a 5-point Likert scale), to which extent they look Italian (on a 3-point Likert scale), and whether they know the person (yes or no) – all in one screen for each photo. The photos are randomly drawn from the pool of all receivers who agreed to show their photos in another experiment, and the order of the photos is randomized. After rating all the 100 photos, participants provide their gender and age.

The follow-up experiment was programmed with oTree and conducted in Italian in October 2023 at the Bologna Laboratory for Experiments in Social Science (BLESS). I recruited 28 students (14 female and 14 male) who (i) were born in Italy and (ii) were available to participate in experiments in English to make the subject pool as close as possible to that of the main experiment. I also

9. Although it is easy to distinguish Italian and non-Italian-sounding names, to make sure not to misclassify I asked the laboratory manager, who was a native Italian, to check the participants' first names after each session.

10. I exclude the first-session data because of the problem discussed in Appendix A.

11. The pre-analysis plan and the R code for power calculation are available at the OSF registry: https://osf.io/r6d8f/files.

restricted participants to those who had not participated in the main experiment.[12,13,14]

2.3 Data

Appendix B describes the data in detail; I briefly summarize its key aspects here. First, most male dictators (95%) do not know the receiver at all, so it is unlikely that the relationship outside the laboratory affects dictator allocation. Second, consistent with the literature, male dictators allocate less (6.3 percentage points less, the p-value < 0.05 with a two-sided t-test) to receivers than female dictators do. Third, again somewhat consistent with the literature, dictators, especially male dictators, allocate slightly more (2.4 percentage points more; male dictators allocate 3.1 percentage points more) to female receivers than to male receivers, although the difference is statistically insignificant. Fourth, both men and women consider women to look more attractive than men, regardless of their IQ level.

3 Empirical Strategy

A naive way to test whether male dictators allocate less to higher-IQ female receivers than to higher-IQ male receivers is to compare male dictators' allocations to those receivers. However, this simple difference may be biased upward because male dictators may allocate more to more attractive receivers (Rosenblat 2008), and men rate women more highly than men on attractiveness (see the discussion in Section 2.3). In fact, male dictators allocate more to more attractive receivers (see Appendix Figure D2, Panels A and B).[15]

A difference-in-differences would eliminate the bias from the attractiveness differences, using the difference between male dictators' allocations to lower-IQ female receivers and to lower-IQ male receivers as a comparison group. However, it introduces two other biases because low-IQ dictators are more likely to face higher-IQ receivers. First, because low-IQ dictators earned less on the IQ test than high-IQ dictators, higher-IQ receivers and dictators' earnings are negatively correlated, potentially biasing the dictators' allocation to higher-IQ receivers due to the wealth effects. Also, if low-IQ dictators think the differences between their earnings and the higher-IQ receivers' earnings are larger than high-IQ dictators think, it also induces inequality aversion (Fehr and Schmidt 1999). Second, because one's IQ is positively associated with one's socioeconomic background, and one's socioeconomic background influences one's social preferences (Falk et al. 2021), the dictators' allocation to higher-IQ receivers may be biased upward or downward. In my sample, male dictators' IQs (or their earnings on the IQ test) and allocations are negatively correlated, and male dictators'

12. Participants know the people in the photos in 10 out of 2800, or 0.4% of total ratings.

13. Although I recruited participants born in Italy, 5 people in the photos were considered completely non-Italian (4 by male raters and 4 by female raters with overlaps of 3 receivers).

14. I use ratings by male raters for male dictators and by female raters for female dictators. For female and male raters, the median ratings per receiver is 9, the mean is 8.81, the minimum is 4, the maximum is 14, and the standard deviation is 1.77.

15. Interestingly, female dictators do not allocate more to more attractive receivers (see Appendix Figure D2, Panels C and D).

IQ ranks and allocations are positively correlated (see Appendix Figure D2, Panels A and B), both of which bias the allocations to higher-IQ receivers upwards.[16]

To address these concerns, I estimate the following difference-in-differences equation via OLS using male dictators' allocation data:

$$\begin{aligned} Allocate_{ij} =& \beta_1 HigherIQReceiver_{ij} \times FemaleReceiver_j \\ &+ \beta_2 HigherIQReceiver_{ij} + \beta_3 FemaleReceiver_j + X'_{ij}\gamma + \mu_i^{IQ} + \epsilon_{ij} \end{aligned} \tag{1}$$

where each variable is defined as follows:

- $Allocate_{ij} \in [0, 1]$: dictator i's allocation to receiver j as a fraction of endowment.
- $HigherIQReceiver_{ij} \in \{0, 1\}$: an indicator variable equals 1 if receiver j's IQ is higher than that of dictator i.
- $FemaleReceiver_j \in \{0, 1\}$: an indicator variable equals 1 if receiver j is female.
- X_{ij}: a set of additional covariates to increase statistical power. Appendix C provides a full description of the covariates.
- ϵ_{ij}: the error term.

and $\mu_i^{IQ} \equiv \sum_{k=1}^{9} \theta_k^{IQ} \mathbb{1}[\text{i's IQ} = k]$ is fixed effects for the dictators' IQ (the number of IQ test questions they have solved correctly), where $\mathbb{1}$ is the indicator function. Standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment. The IQ fixed effects are included following Zimmermann (2020), so that the coefficients in equation 1 capture allocation differences due to the receivers' IQ, not that of the dictators. As discussed above, without the IQ fixed effects, the coefficients related to higher-IQ receiver can capture the wealth effects, inequality aversion, and the difference in the preference for allocation between high IQ and low IQ dictators.

The coefficient of interest is β_1, which captures the difference between the dictator allocations to higher-IQ female receivers and higher-IQ male receivers relative to the difference between the dictator allocations to lower-IQ female receivers and lower-IQ male receivers. As discussed above, because men rate women more highly than men on attractiveness, the estimates related to the female receiver can capture the effects of attractiveness differences without taking the double differences. On the other hand, as discussed in Section 2.3, men's ratings on high-IQ women's attractiveness and low-IQ women's attractiveness are very similar. Also, men's rating on high-IQ men's attractiveness and low-IQ men's attractiveness is very similar, justifying the difference-in-differences.

4 Results

4.1 Regression Results

Table 1 presents the regression results of equation 1 with data for male dictators. Column 1 shows that the coefficient estimate on higher-IQ receivers (β_2) is 0.093 and statistically marginally

16. We do not observe this correlation patterns for female dictators (see Appendix Figure D2, Panels C and D).

Table 1: Dictator allocations to higher-IQ female receivers – OLS, male dictators

Outcome:	Dictator's allocation (fraction of endowment)			
Sample:	Male dictators			
	(1)	(2)	(3)	(4)
Higher IQ receiver x Female receiver (β_1)	0.018	0.017	0.031	0.047
	(0.060)	(0.060)	(0.061)	(0.075)
	[-0.101, 0.136]	[-0.101, 0.134]	[-0.089, 0.151]	[-0.101, 0.195]
Higher IQ receiver (β_2)	0.093*	0.054	0.048	0.007
	(0.048)	(0.053)	(0.055)	(0.059)
	[-0.001, 0.188]	[-0.050, 0.159]	[-0.060, 0.156]	[-0.109, 0.124]
Female receiver (β_3)	0.038	0.031	0.014	-0.021
	(0.035)	(0.035)	(0.034)	(0.044)
	[-0.031, 0.107]	[-0.038, 0.100]	[-0.053, 0.081]	[-0.108, 0.066]
Dictator IQ FE	-	✓	✓	✓
Round FE	-	-	✓	✓
Social distance FE	-	-	✓	✓
Dictator demographics	-	-	✓	✓
Receiver demographics	-	-	✓	✓
Receiver attractiveness FE	-	-	-	✓
Higher IQ receiver x Female receiver	0.111**	0.071	0.079	0.054
+Higher IQ receiver ($\beta_1 + \beta_2$)	(0.055)	(0.048)	(0.052)	(0.070)
	[0.004, 0.219]	[-0.024, 0.166]	[-0.023, 0.181]	[-0.084, 0.193]
Higher IQ receiver x Female receiver	0.056	0.048	0.045	0.026
+Female receiver ($\beta_1 + \beta_3$)	(0.049)	(0.046)	(0.047)	(0.061)
	[-0.040, 0.151]	[-0.043, 0.139]	[-0.048, 0.138]	[-0.094, 0.146]
Baseline Mean	0.305	0.305	0.305	0.327
Baseline SD	0.269	0.269	0.269	0.270
Adj. R-squared	0.032	0.052	0.080	0.088
Observations	260	260	260	211
Clusters	91	91	91	91

Notes: This table presents the regression results of equation 1. The standard error (in parenthesis) and the 95% confidence interval (in bracket) are reported below each coefficient estimate. The standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment. Baseline mean and standard deviation are that of lower-IQ male receivers. Significance levels: * 10%, ** 5%, and *** 1%.

significant at 10%, suggesting that male dictators allocate 9.3 percentage points more to higher-IQ male receivers than to lower-IQ male receivers. Also, the sum of the coefficient estimates on the interaction term between higher-IQ receivers and the female receivers, and on the higher-IQ receivers ($\beta_1 + \beta_2$) is 0.111 and statistically significant at 5%, suggesting that male dictators allocate 11.1 percentage points more to higher-IQ female receivers than to lower-IQ female receivers. However, as discussed in Section 3, the coefficient estimates related to higher-IQ receivers are biased because low-IQ dictators are more likely to face higher-IQ receivers. Hence, we move to Column 2, which includes dictator IQ fixed effects. Comparing the coefficient estimates of Columns 1 and 2, the only difference is the coefficient estimate on higher-IQ receivers (β_2), which is in line with the discussion in Section 3. Indeed, the dictator IQ fixed effects in Column 2 are jointly statistically significant with a p-value of 0.07.

Column 2 shows that the coefficient estimate on female receivers (β_3) is 0.031, suggesting that male dictators may allocate slightly more to lower-IQ female receivers than to lower-IQ male receivers, albeit the difference is statistically insignificant. Also, the coefficient estimate on higher-IQ receivers (β_2) is 0.054, suggesting that male dictators may allocate more higher-IQ male receivers than to lower-IQ male receivers, albeit the difference is statistically insignificant. The sum of the coefficient estimates on the interaction term between higher-IQ receivers and female receivers, and on higher-IQ receivers ($\beta_1 + \beta_2$) is 0.071, suggesting that male dictators may allocate slightly more to higher-IQ female receivers than to lower-IQ female receivers, albeit the difference is statistically insignificant. The sum of the coefficient estimates on the interaction term between higher-IQ receivers and female receivers, and on female receivers ($\beta_1 + \beta_3$) is 0.048, albeit statistically insignificant, suggesting that male dictators may allocate more to higher-IQ female receivers than to higher-IQ male receivers.

However, as discussed in Section 3, the comparison between allocations to higher-IQ female receivers and allocations to lower-IQ female receivers is confounded because higher-IQ receivers earn more in the IQ test than lower-IQ receivers, which may induce dictators' inequality aversion. Also, the comparison between allocations to higher-IQ female receivers and allocations to higher-IQ male receivers is confounded because men consider women to be more attractive than men and thus may allocate more to female receivers than to male receivers.

To address these concerns, we turn to our coefficient of interest: The coefficient estimate on the interaction between higher-IQ receivers and female receivers (β_1), which is 0.017 and statistically insignificant, suggesting that male dictators' allocation differences towards higher-IQ female and male receivers and towards lower-IQ female and male receivers are statistically indistinguishable. Column 3, which controls for dictator and receiver demographics, as well as for round and dictator-receiver social distance to increase statistical power, presents quantitatively similar empirical patterns to Column 2.[17,18,19] Thus, the results are inconsistent with the hypothesis that men are less generous

17. Appendix Table D1 presents results where I gradually add controls and show that the main results are not driven by specific controls.

18. Appendix Table D2 presents results where the standard errors are neither cluster-robust nor heteroskedasticity-robust to see how the standard errors change by clustering and making it robust to heteroskedasticity.

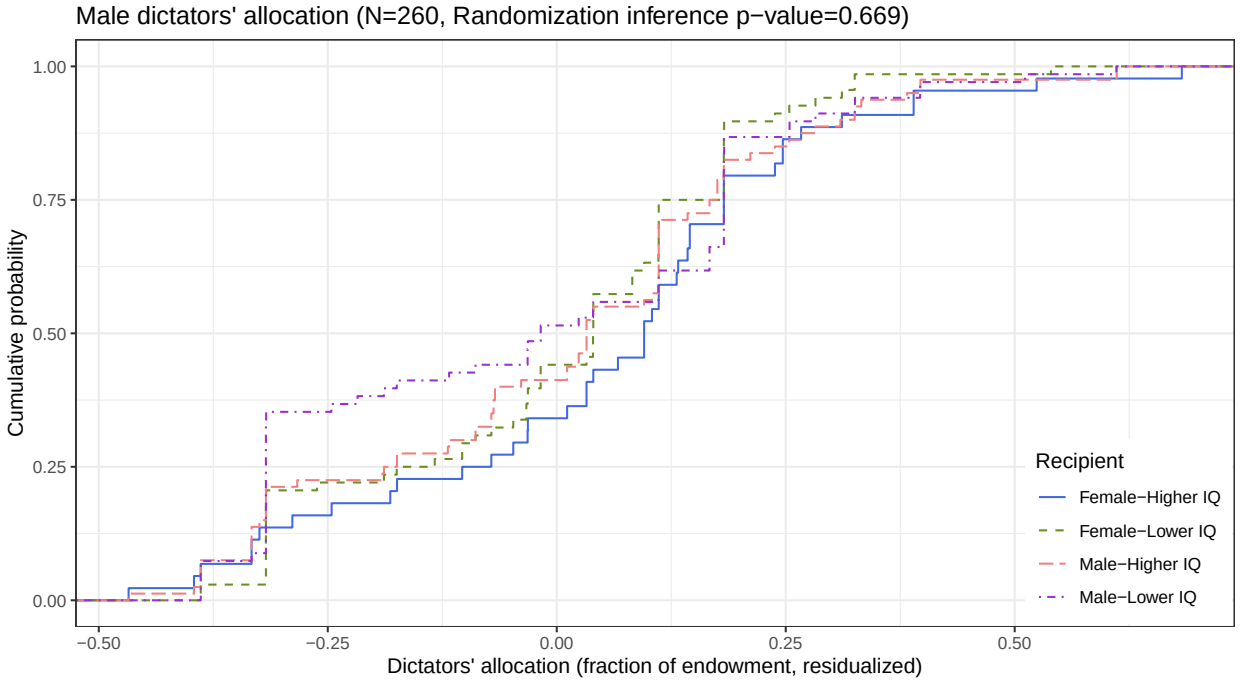
19. Appendix Table D3 presents the same results as Table 1 but with female dictators. While the coefficient estimates on higher-IQ receivers and on female receivers are slightly negative albeit statistically insignificant, the coefficient

to higher-IQ women.

A caveat is that the confidence interval is not very tight. Looking at the 95% confidence intervals of the interaction between higher-IQ receivers and female receivers (β_1), our coefficient of interest, we can reject at the 5% significance level that the effect size is no smaller than -8.9 to -10.1 percentage points and no larger than 13.4 to 15.1 percentage points. As references, Engel (2011) finds via meta-analysis that male dictators allocate 14.3 percentage points more to female receivers than to male receivers, and Dufwenberg and Muren (2006) find using a university-student sample that male dictators allocate 7.6 to 8.9 percentage points more to female receivers than to male receivers. To halve the confidence intervals, we need approximately 1560 participants (=390*4).[20]

4.2 Distribution Results

Figure 2: Dictator allocations to higher-IQ female receivers – Distribution, male dictators



Notes: The figure presents the empirical CDF of dictator allocations by receiver types, residualized with the dictator-IQ fixed effects, to give a causal interpretation to the differences. The randomization inference p-value (Young 2019) is calculated with the Kruskal-Wallis test with 2000 random draws. I use randomization inference to address arbitrary dependency among allocations. The null hypothesis is that all CDFs coincide.

Although we did not find support for the hypothesis in mean, we may find support in distribution. To see this, Figure 2 presents the empirical CDF of dictator allocations by receiver types, residualized with the dictator-IQ fixed effects to give a causal interpretation to the differences,[21] and shows that

estimate of the interaction between higher-IQ receivers and female receivers remains positive, albeit statistically insignificant.

20. The number is based on the OLS standard error formula.

21. Residualized allocation is residual from a regression of dictator allocations on dictator-IQ fixed effects.

the results in Section 4.1 also hold in distribution. It shows that across almost the whole dictators' allocations, male dictators allocate slightly more to higher-IQ female receivers than to lower-IQ male receivers, higher-IQ male receivers, and lower-IQ female receivers, albeit the differences are statistically insignificant (the randomization inference p-value is 0.669, which is robust to arbitrary dependency among allocations, calculated with the Kruskal-Wallis test with 2,000 random draws).[22]

Thus, the results are inconsistent with the hypothesis that men are less generous to higher-IQ women even in distribution; rather, if anything, men are slightly more generous to higher-IQ women than to higher-IQ men.

4.3 Robustness Check

"Beauty Premium"

In the main results, I control for the possibility that dictators allocate more to more attractive receivers – the so-called "beauty premium" (Rosenblat 2008) – by taking double differences. Yet, I further address this concern in Column 4 of Table 1. In addition to all the controls in Column 3, Column 4 controls for the receivers' attractiveness via fixed effects (adding dummies for each level of attractiveness ratings, which are jointly significant with a p-value of 0.002), and shows that the magnitude of the coefficient of interest, the interaction term between higher-IQ receivers and female receivers (β_1), remains essentially the same as in Column 3, albeit the standard errors are larger due to a drop in the sample size by 16%.[23]

Inequality Aversion due to Differential Earnings in the IQ Test

I control for dictators' inequality aversion (Fehr and Schmidt 1999) due to the differential earnings in the IQ test between higher-IQ receivers and dictators via IQ fixed effects. Yet, it assumes that male dictators believe higher-IQ female and male receivers solved the same number of IQ test questions. Thus, I examine the validity of this assumption in Column 5 of Appendix Table D1. Instead of allocation data for male dictators, Column 5 uses data for male receivers' beliefs on the IQ levels of the other receivers.[24] It shows that male receivers believe that higher-IQ female receivers solve about 0.82 more IQ test questions (=1.109-0.291) or earn about 0.41€ more (about 6.5% of the dictator endowment) than higher-IQ male receivers. Thus, if anything, the main results are underestimated in the absence of inequality aversion.

IQ Rank Differences

Dictators see the difference between the receivers' and their own IQ rank. Yet, in the main results, I only consider whether the receivers' IQ rank is higher than the dictators' IQ rank. To investigate

22. Appendix Figure D3 presents the same results as Figure 2, but with female dictators and shows essentially the same empirical patterns.

23. 31 out of 193 receivers, or 16% of all receivers, refused to show their photos in the follow-up experiment.

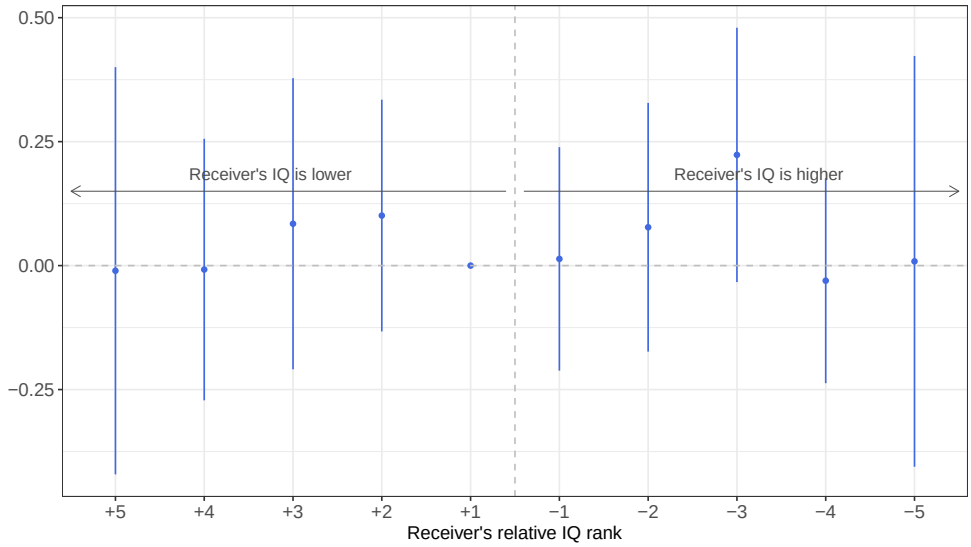
24. See Section 2 for the justification that it is a valid proxy of the male dictators' beliefs about the receivers' IQ level.

the heterogeneity by the difference in the IQ rank, I estimate the following equation:

$$\begin{aligned} Allocate_{ij} = & \sum_{k=-3,\neq 1}^{3} \beta_1^k \mathbb{1}[ReceiverIQRank_j - DictatorIQRank_i = k] \times FemaleReceiver_j \\ & + \sum_{k=-3,\neq 1}^{3} \beta_2^k \mathbb{1}[ReceiverIQRank_j - DictatorIQRank_i = k] + \beta_3 FemaleReceiver_j \\ & + X'_{ij}\gamma + \mu_i^{IQ} + \epsilon_{ij} \end{aligned} \tag{2}$$

where $ReceiverIQRank_j$ is receiver j's IQ rank, $DictatorIQRank_i$ is dictator i's IQ rank, and other variables are as defined in equation 1. In the main specification, $HigherIQReceiver_{ij}$ is equal to $\sum_{k=-3}^{-1} \mathbb{1}[ReceiverIQRank_j - DictatorIQRank_i = k]$ and the omitted category is $\sum_{k=2}^{3} \mathbb{1}[ReceiverIQRank_j - DictatorIQRank_i = k]$.

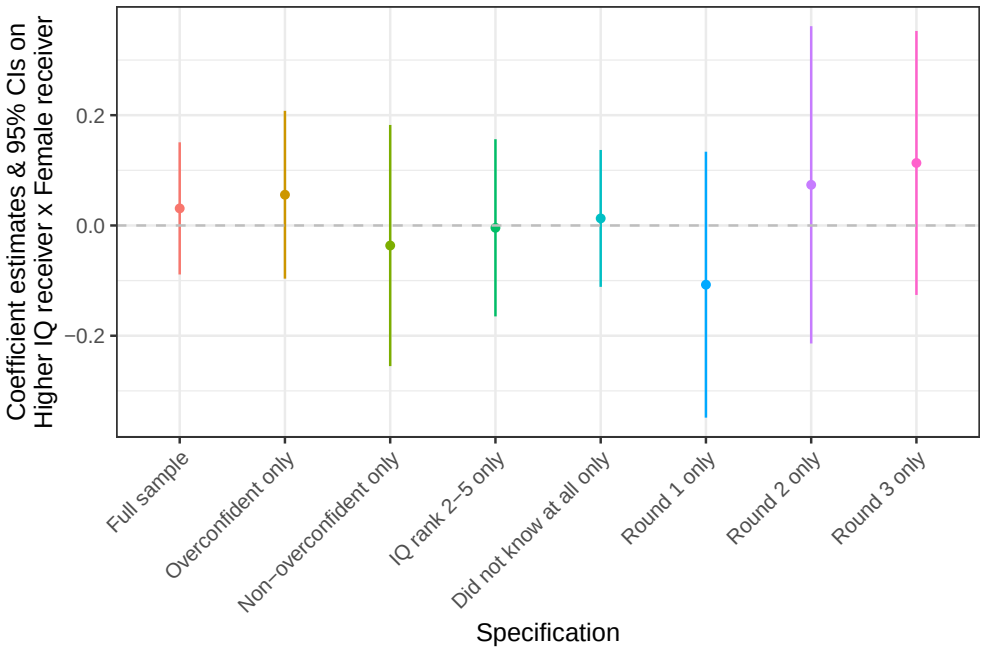
Figure 3: Dictator allocations to higher-IQ female receivers – IQ rank differences, male dictators



Notes: This figure plots the OLS estimates of β_1s in equation 2, along with the 95% confidence intervals. The omitted category is the receiver's relative IQ rank is 1. The standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment.

Figure 3 plots the OLS estimates of β_1s of equation 2, along with the 95% confidence intervals. We do not see any statistically or quantitatively significant heterogeneity due to the IQ rank differences – all $\hat{\beta}_1$s are close to each other. While the estimate of β_1^{-3} is larger than the other estimates, it is not statistically significantly different from the omitted category, and there is no consistent pattern when the receiver's IQ is higher than that of the dictator's as the estimates of β_1^{-4} and β_1^{-5} are very small.

Figure 4: Dictator allocations to higher-IQ female receivers – Sub-sample analysis, male dictators



Notes: This figure presents the OLS estimates of β_1 and their 95% confidence intervals of equation 1 with the same controls in Column 3 of Table 1 but with sub-samples of male dictators. "Full sample" is the same estimate as in Column 3 of Table 1, provided as a reference. The standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment for specifications from "Full sample" to "Did not know at all only" and heteroskedasticity-robust with Bell and McCaffrey (2002)'s small sample bias adjustment for specifications "Round 1 only," "Round 2 only," and "Round 3 only."

Other Concerns

Figure 4 presents the OLS estimates of β_1 and their 95% confidence intervals of equation 1 with the same controls in Column 3 of Table 1 but with sub-samples of male dictators. "Full sample" is the same estimate as in Column 3 of Table 1, provided as a reference. As we see, the point estimates are quantitatively very close to those of the full sample, although the confidence intervals are wider due to a drop in the sample size. One noticeable heterogeneity is round effects, where male dictators allocate less in round 1 and more in rounds 2 and 3. This heterogeneity could possibly be due to the experimenter demand effect, as dictators may have realized that the experiment was about gender and IQ.

5 Conclusions

The literature finds that men are more generous to women than to men. Still, there is scarce evidence about how men's higher generosity towards women interacts with skills important for one's career success, such as cognitive skills. The literature suggests that men's higher generosity towards women may be due to paternalism and thus be reversed if women excel in those skills. To fill the

gap in the literature, this paper uses a dictator game to examine whether men are less generous to women when those women excel in cognitive skills. Although male dictators allocate more to attractive receivers, consistent with the so-called "beauty premium," and male dictators with high IQs (or those who earn more on the IQ test) allocate less, I exogenously vary the receivers' IQ relative to that of the dictators and use difference-in-differences to control for these associations. The results, however, are inconsistent with the hypothesis; if anything, male dictators give more to higher-IQ female receivers than to higher-IQ male receivers. The results hold both in mean and distribution, and female dictators' allocation patterns are qualitatively similar to male dictators. The caveat is that the confidence intervals are not very tightly estimated. Taken together, men are no less generous to women even when women excel in cognitive skills, and thus, women who excel in cognitive skills may not receive less favorable treatment than equally intelligent men in the labor market.

One possible explanation of the results would be that the gender norm violations are offset by something else; for example, it is possible that women are more likely to appreciate other people's work, women with high IQs do so more effectively, and men (and women) reciprocate it. Indeed, Folke and Rickne (2023) show that workplaces with a higher female-worker ratio have a higher incidence of appreciation for others' work. Another potential explanation is that gendered attitudes develop as people get older, and university students – my sample – have not formed gendered attitudes yet. If this is the case, intelligent women may still receive less favorable treatment than equally intelligent men in the labor market. These two explanations are not mutually exclusive, but testing these explanations is beyond the scope of this paper. Nevertheless, my paper showed that, at least among the university student population in Italy, intelligent women would not receive less favorable treatment than equally intelligent men.

References

Almås, Ingvild, Alexander W. Cappelen, Kjell G. Salvanes, Erik Ø Sørensen, and Bertil Tungodden. 2016. "What Explains the Gender Gap in College Track Dropout? Experimental and Administrative Evidence." *American Economic Review: Papers & Proceedings* 106 (5): 296–302.

Autor, David, and Melanie Wasserman. 2013. *Wayward Sons: The Emerging Gender Gap in Labor Markets and Education.* Report. Washington, DC: Third Way.

Babcock, Linda, María P. Recalde, Lise Vesterlund, and Laurie Weingart. 2017. "Gender Differences in Accepting and Receiving Requests for Tasks with Low Promotability." *American Economic Review* 107 (3): 714–747.

Bell, Robert M., and Daniel F. McCaffrey. 2002. "Bias Reduction in Standard Errors for Linear Regression with Multi-Stage Samples." *Survey Methodology* 28 (2): 169–181.

Bertrand, Marianne. 2011. "New Perspectives on Gender." In *Handbook of Labor Economics,* edited by David Card and Orley Ashenfelter, 4:1543–1590. Amsterdam, Netherlands: Elsevier.

Bilén, David, Anna Dreber, and Magnus Johannesson. 2021. "Are Women More Generous than Men? A Meta-Analysis." *Journal of the Economic Science Association* 7 (1): 1–18.

Bilker, Warren B., John A. Hansen, Colleen M. Brensinger, Jan Richard, Raquel E. Gur, and Ruben C. Gur. 2012. "Development of Abbreviated Nine-Item Forms of the Raven's Standard Progressive Matrices Test." *Assessment* 19 (3): 354–369.

Bohnet, Iris, and Bruno S. Frey. 1999. "Social Distance and Other-Regarding Behavior in Dictator Games: Comment." *American Economic Review* 89 (1): 335–339.

Buchmann, Nina, Colin D. Sullivan, and Carl Meyer. 2024. *Paternalistic Discrimination.* Working Paper.

Cappelen, Alexander W., Ranveig Falch, and Bertil Tungodden. 2023. *Experimental Evidence on the Acceptance of Males Falling Behind.* Working Paper 4474442.

Carrell, Scott E., Marianne E. Page, and James E. West. 2010. "Sex and Science: How Professor Gender Perpetuates the Gender Gap." *The Quarterly Journal of Economics* 125 (3): 1101–1144.

Castagnetti, Alessandro, and Renke Schmacker. 2022. "Protecting the Ego: Motivated Information Selection and Updating." *European Economic Review* 142:104007.

Ceci, Stephen J., and Wendy M. Williams. 2015. "Women Have Substantial Advantage in STEM Faculty Hiring, except When Competing against More-Accomplished Men." *Frontiers in Psychology* 6:1532.

Chen, Daniel L., Martin Schonger, and Chris Wickens. 2016. "oTree–An Open-Source Platform for Laboratory, Online, and Field Experiments." *Journal of Behavioral and Experimental Finance* 9:88–97.

Coffman, Katherine Baldiga. 2014. "Evidence on Self-Stereotyping and the Contribution of Ideas." *The Quarterly Journal of Economics* 129 (4): 1625–1660.

Croson, Rachel, and Uri Gneezy. 2009. "Gender Differences in Preferences." *Journal of Economic Literature* 47 (2): 448–474.

Doñate-Buendía, Anabel, Aurora García-Gallego, and Marko Petrović. 2022. "Gender and Other Moderators of Giving in the Dictator Game: A Meta-Analysis." *Journal of Economic Behavior & Organization* 198:280–301.

Dufwenberg, Martin, and Astri Muren. 2006. "Generosity, Anonymity, Gender." *Journal of Economic Behavior & Organization* 61 (1): 42–49.

Eagly, Alice H., and Steven J. Karau. 2002. "Role Congruity Theory of Prejudice toward Female Leaders." *Psychological Review* 109 (3): 573–598.

Eil, David, and Justin M. Rao. 2011. "The Good News-Bad News Effect: Asymmetric Processing of Objective Information about Yourself." *American Economic Journal: Microeconomics* 3 (2): 114–138.

Engel, Christoph. 2011. "Dictator Games: A Meta Study." *Experimental Economics* 14 (4): 583–610.

Erkal, Nisvan, Lata Gangadharan, and Boon Han Koh. 2023. "Do Women Receive Less Blame than Men? Attribution of Outcomes in a Prosocial Setting." *Journal of Economic Behavior & Organization* 210:441–452.

Falk, Armin, Fabian Kosse, Pia Pinger, Hannah Schildberg-Hörisch, and Thomas Deckers. 2021. "Socioeconomic Status and Inequalities in Children's IQ and Economic Preferences." *Journal of Political Economy* 129 (9): 2504–2545.

Fehr, Ernst, and Klaus M. Schmidt. 1999. "A Theory of Fairness, Competition, and Cooperation." *The Quarterly Journal of Economics* 114 (3): 817–868.

Fitriani, Randolf G. S. Cooper, and Ron Matthews. 2016. "Women in Ground Close Combat." *The RUSI Journal* 161 (1): 14–24.

Folke, Olle, and Johanna Rickne. 2023. *Workplace Sex Composition and Appreciation at Work.* Working Paper.

Franzen, Axel, and Sonja Pointner. 2013. "The External Validity of Giving in the Dictator Game." *Experimental Economics* 16 (2): 155–169.

Glick, Peter, Susan T. Fiske, Antonio Mladinic, José L. Saiz, Dominic Abrams, Barbara Masser, Bolanle Adetoun, et al. 2000. "Beyond Prejudice as Simple Antipathy: Hostile and Benevolent Sexism across Cultures." *Journal of Personality and Social Psychology* (US) 79 (5): 763–775.

Greiner, Ben. 2015. "Subject Pool Recruitment Procedures: Organizing Experiments with ORSEE." *Journal of the Economic Science Association* 1 (1): 114–125.

Heilman, Madeline E. 2001. "Description and Prescription: How Gender Stereotypes Prevent Women's Ascent Up the Organizational Ladder." *Journal of Social Issues* 57 (4): 657–674.

Heilman, Madeline E., Aaron S. Wallen, Daniella Fuchs, and Melinda M. Tamkins. 2004. "Penalties for Success: Reactions to Women Who Succeed at Male Gender-Typed Tasks." *The Journal of Applied Psychology* 89 (3): 416–427.

Herrnstein, Richard J., and Charles Murray. 1996. *The Bell Curve: Intelligence and Class Structure in American Life.* New York, NY: Free Press.

Isaksson, Siri. 2018. *It Takes Two: Gender Differences in Group Work.* Working Paper.

Klinowski, David. 2018. "Gender Differences in Giving in the Dictator Game: The Role of Reluctant Altruism." *Journal of the Economic Science Association* 4 (2): 110–122.

List, John A. 2004. "The Nature and Extent of Discrimination in the Marketplace: Evidence from the Field." *The Quarterly Journal of Economics* 119 (1): 49–89.

Niederle, Muriel, and Lise Vesterlund. 2011. "Gender and Competition." *Annual Review of Economics* 3 (1): 601–630.

Phelan, Julie E., Corinne A. Moss-Racusin, and Laurie A. Rudman. 2008. "Competent yet Out in the Cold: Shifting Criteria for Hiring Reflect Backlash Toward Agentic Women." *Psychology of Women Quarterly* 32 (4): 406–413.

Pustejovsky, James E., and Elizabeth Tipton. 2018. "Small-Sample Methods for Cluster-Robust Variance Estimation and Hypothesis Testing in Fixed Effects Models." *Journal of Business & Economic Statistics* 36 (4): 672–683.

Quadlin, Natasha. 2018. "The Mark of a Woman's Record: Gender and Academic Performance in Hiring." *American Sociological Review* 83 (2): 331–360.

Ridgeway, Cecilia L. 2001. "Gender, Status, and Leadership." *Journal of Social Issues* 57 (4): 637–655.

Rosenblat, Tanya S. 2008. "The Beauty Premium: Physical Attractiveness and Gender in Dictator Games." *Negotiation Journal* 24 (4): 465–481.

Rudman, Laurie A. 1998. "Self-Promotion as a Risk Factor for Women: The Costs and Benefits of Counterstereotypical Impression Management." *Journal of Personality and Social Psychology* 74 (3): 629–645.

Rudman, Laurie A., and Kimberly Fairchild. 2004. "Reactions to Counterstereotypic Behavior: The Role of Backlash in Cultural Stereotype Maintenance." *Journal of Personality and Social Psychology* 87 (2): 157–176. pmid: 15301625.

Rudman, Laurie A., Corinne A. Moss-Racusin, Julie E. Phelan, and Sanne Nauts. 2012. "Status Incongruity and Backlash Effects: Defending the Gender Hierarchy Motivates Prejudice against Female Leaders." *Journal of Experimental Social Psychology* 48 (1): 165–179.

Rudman, Laurie A., and Julie E. Phelan. 2008. "Backlash Effects for Disconfirming Gender Stereotypes in Organizations." *Research in Organizational Behavior* 28:61–79.

Williams, Wendy M., and Stephen J. Ceci. 2015. "National Hiring Experiments Reveal 2:1 Faculty Preference for Women on STEM Tenure Track." *Proceedings of the National Academy of Sciences* 112 (17): 5360–5365. pmid: 25870272.

Young, Alwyn. 2019. "Channeling Fisher: Randomization Tests and the Statistical Insignificance of Seemingly Significant Experimental Results." *The Quarterly Journal of Economics* 134 (2): 557–598.

Zimmermann, Florian. 2020. "The Dynamics of Motivated Beliefs." *American Economic Review* 110 (2): 337–361.

Online Appendix

A Deviations from the Pre-Analysis Plan

A.1 Implementation

In the initial design, receivers finished all the tasks except the post-questionnaire and left the laboratory before dictators received their IQ rank so that dictators could play the dictator game without receivers in the same room. The allocation to the receivers was paid electronically as a "participation fee" for the online post-questionnaire, which was sent to receivers via email after the session was over. However, as I ran the 1st session with this initial design with 24 participants, dictators had to wait idly for about 20-30 minutes until receivers left the laboratory, and dictators seemed to have lost concentration during this waiting time: about half of the dictators could not answer the comprehension questions about their IQ rank. Thus, I changed the design and let receivers stay in the laboratory while dictators played the dictator game. I looked at the 1st session data before making this change. I exclude the 1st session data in the analysis, but results are robust to including the 1st session data. The oTree code and instructions used for the 1st session are available upon request.

I also made the following changes after the 1st session:

1. I reduced participation fee from 3€ to 2.5€ because participants earned more than I expected in the IQ test.
2. I added more explanation to the instructions on how the IQ rank was assigned and how to allocate endowment in the dictator game.
3. I asked participants' major by simply choosing among the choices from humanities, social sciences, natural sciences/mathematics, medicine, and engineering and letting them type in their degree program name for a check, instead of letting them access to the University of Bologna's degree program website. This is because the computers in the laboratory sometimes did not accept `iframe` or prevented a pop-up to another website due to the security setting.

A.2 Other Changes

1. I mainly discussed results for question 3.
2. I corrected the definition of $Lower_{ij}$. Consequently, I renamed it as $IQHigher_{ij}$ to make the meaning clearer.
3. I added distributional analysis (in Figure 2) to examine whether the results hold also in distribution.
4. I added round-by-round analysis in Figure 4.
5. I used `lm_robust` instead of `vcovCR` to apply Pustejovsky and Tipton (2018)'s small cluster bias adjustment because `vcovCR` did not make degrees of freedom adjustment.

6. I included in female and male dictator regressions STEM major dummy and Emilia-Romagna dummy because excluding them in regressions where the sample is conditioned by gender made little sense. The results are invariant to the exclusion of these covariates.
7. I divided dictator allocations by dictator endowment to facilitate the interpretation of the regression results (this does not affect my results because of the round fixed effects).

A.3 Follow-Up Experiment

The follow up experiment was not pre-registered. Thus, the robustness check where I control for the receivers' attractiveness was not pre-registered either.

B Data Description

Table B1 describes dictators' own (panel A) and paired receivers' characteristics (panel B) as well as dictators' social distance with paired receivers (panel C) and dictator game allocation (panel D), separately for male and female dictators.

Panel A shows that male dictators solve 0.37 more IQ questions (out of 9) than female dictators, but the difference is quantitatively insignificant. Also, male dictators are less likely to major in humanities and more likely to major in science, technology, engineering, and mathematics (STEM), consistent with the pattern observed in most OECD countries (see, for example, Carrell, Page, and West 2010). In addition, male dictators are more overconfident than female dictators, consistent with other studies (Bertrand 2011; Croson and Gneezy 2009; Niederle and Vesterlund 2011). Further, male dictators are less likely to have completed undergraduate studies than female dictators, consistent with that women are more educated than men in OECD countries (see, for example, Almås et al. 2016; Autor and Wasserman 2013).

Panel B shows that paired receivers' characteristics are roughly balanced, except that male dictators are 10% less likely to be paired with receivers from the Emilia-Romagna region where the experiment was conducted. I control this imbalance in the analysis. The attractiveness/kindness is a median of the attractiveness/kindness ratings by male participants in the followup experiment for male dictators and by female participants for female dictators (the median ratings per receiver is 9, the minimum is 4, the maximum is 14, the mean is 8.81, and the standard deviation is 1.77). There are some differences in men's and women's perception of attractiveness and kind-lookingness of the receivers, although the differences are not quantitatively significant.

Panel C shows that dictators do not know 95-98% of the paired receivers at all, addressing the concern that dictator game allocation is driven by relationships outside the laboratory. Panel D shows that male dictators allocate six percentage points less than female dictators.

Finally, the standard deviation of the residualized allocation in Panel D shows that there is enough variation in the dictator game allocation after adding dictator-IQ fixed effects, which I exploit in the analysis.[25]

25. The residualized allocation is the residual from regressing the dictator game allocation on dictator-IQ fixed

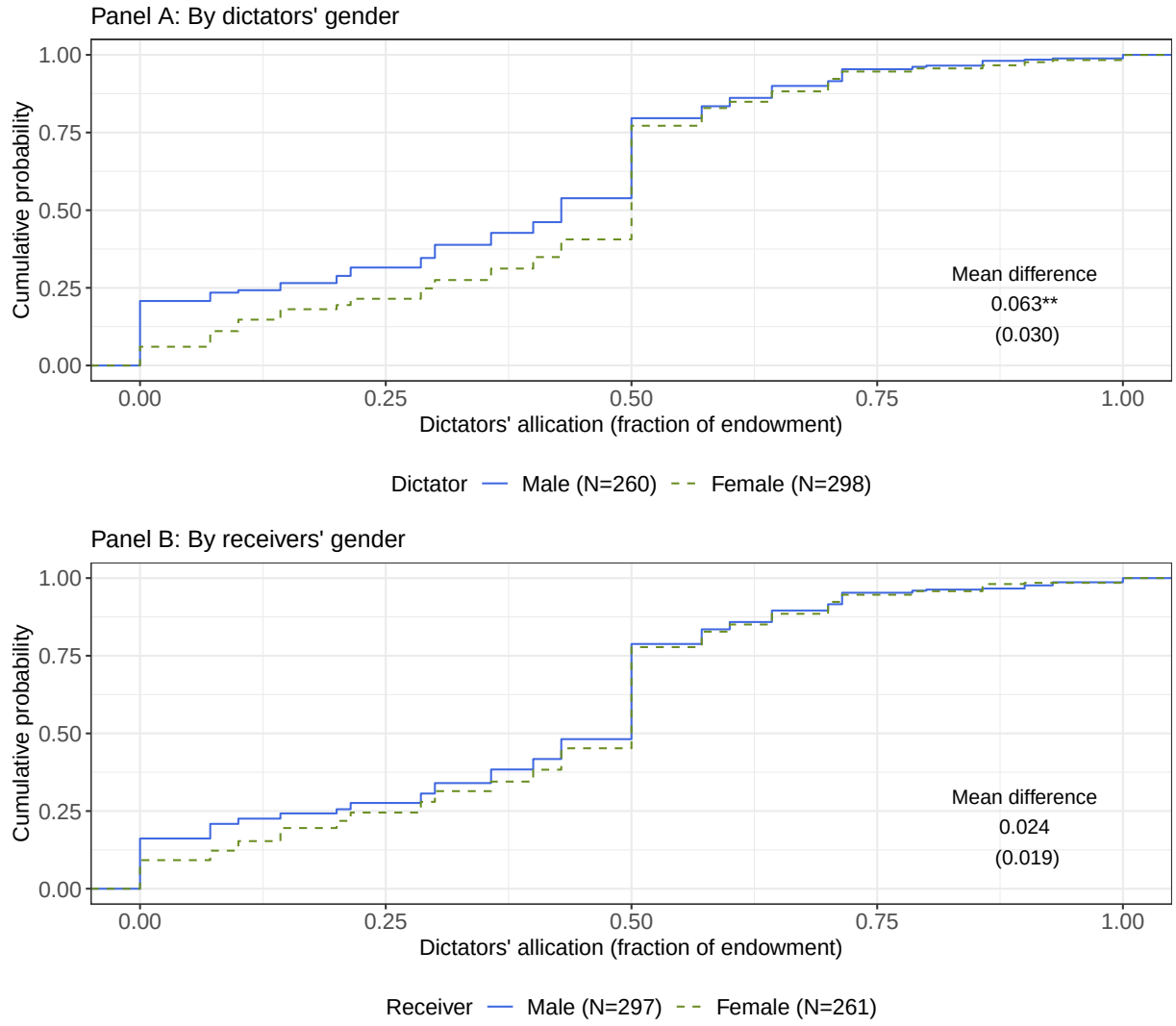
Table B1: Dictators' and paired receivers' characteristics, proximity between dictators and paired receivers, and dictator game allocation

	Male dictators		Female dictators		Difference (Male – Female)		
	Mean	SD	Mean	SD	Mean	SE	P-value
Panel A: Own characteristics							
IQ level	6.89	1.24	6.52	1.20	0.37	0.18	0.04
IQ rank	3.31	1.73	3.83	1.59	-0.52	0.24	0.03
Age	23.23	2.81	23.68	2.62	-0.45	0.39	0.25
From Emilia-Romagna	0.19	0.39	0.18	0.39	0.00	0.06	0.94
Humanities	0.32	0.47	0.58	0.50	-0.26	0.07	0.00
Social sciences	0.24	0.43	0.15	0.36	0.09	0.06	0.13
STEM	0.44	0.50	0.27	0.45	0.17	0.07	0.01
Post bachelor	0.37	0.49	0.53	0.50	-0.16	0.07	0.03
Overconfidence	0.56	0.72	0.31	0.78	0.25	0.11	0.02
Time on feedback (sec.)	107.52	102.26	107.67	89.88	-0.16	13.88	0.99
Observations	91		104				
Panel B: Paired receivers' characteristics							
IQ level	6.91	1.12	6.77	1.19	0.14	0.09	0.11
IQ rank	3.45	1.74	3.39	1.75	0.05	0.10	0.61
Higher IQ	0.48	0.50	0.57	0.50	-0.09	0.05	0.08
Age	23.55	2.98	23.17	2.57	0.37	0.24	0.12
Female	0.43	0.50	0.50	0.50	-0.07	0.04	0.06
From Emilia-Romagna	0.25	0.43	0.15	0.36	0.09	0.04	0.01
Attractiveness (1-5)	2.62	0.73	2.37	0.74	0.25	0.07	0.00
Kind-lookingness (1-5)	3.14	0.57	3.27	0.50	-0.13	0.05	0.01
Observations	260		298				
Panel C: Social distance with paired receivers							
Did not know at all	0.95	0.23	0.98	0.15	-0.03	0.02	0.14
Knew but not well	0.03	0.18	0.02	0.15	0.01	0.02	0.48
Saw before	0.02	0.14	0.00	0.00	0.02	0.01	0.06
Observations	260		298				
Panel D: Dictator game allocation (fraction of endowment)							
Allocation	0.37	0.25	0.43	0.22	-0.06	0.03	0.04
Allocation (residualized)	-0.03	0.25	0.03	0.22	-0.06	0.03	0.06
Observations	260		298				

Notes: This table shows dictators' own (panel A) and paired receivers' characteristics (panel B) as well as dictators' social distance with paired receivers (panel C) and dictator game allocation (panel D), separately for male and female dictators. Residualized allocation is residual from the regression of the dictator game allocation as a fraction of endowment on IQ fixed effects and shows within dictator IQ variation. P-values for the difference between male and female dictators are calculated with heteroskedasticity-robust standard errors with Bell and McCaffrey (2002)'s small sample bias adjustment for Panel A and with Pustejovsky and Tipton (2018)'s small cluster bias adjustment for Panels B-D. Attractiveness and kindness are the medians of the attractiveness/kindness ratings by male participants in the followup experiment for male dictators and by female participants for female dictators.

effects.

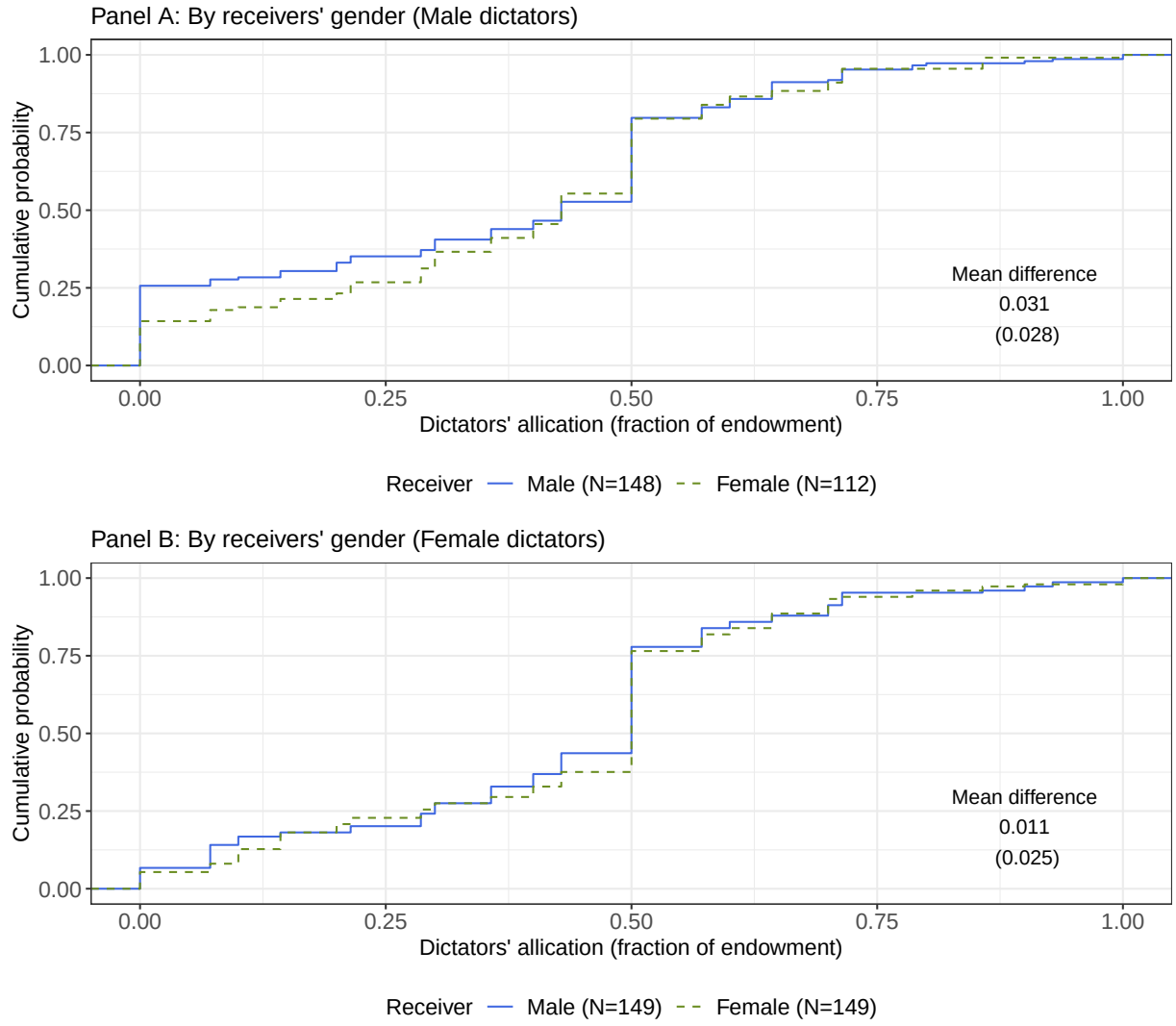
Figure B1: Distribution of the dictator allocations by dictators' and receivers' gender



Notes: Panel A plots empirical cumulative distribution functions (CDFs) of dictator allocations separately for male (blue, solid line) and female (green, dashed line) dictators. Panel B plots empirical CDFs of dictator allocations separately for male (blue, solid line) and female (green, dashed line) receivers. Significance levels: * 10%, ** 5%, and *** 1%. The significance level of the mean difference is calculated with standard errors with with Pustejovsky and Tipton (2018)'s small cluster bias adjustment.

Figures B1 and B2 elaborate Panel D of Table B1. Panel A of Figure B1 plots empirical cumulative distribution functions (CDFs) of dictator allocations separately for male (blue, solid line) and female (green, dashed line) dictators. Consistent with the literature, male dictators allocate less than female dictators up to the 50% split, but after that, there is no noticeable differences between them, consistent with Bilén, Dreber, and Johannesson (2021). Also, the mean effect size is moderate, about 6.3 percentage points, again consistent with Bilén, Dreber, and Johannesson. The overall pattern is similar to that of Bohnet and Frey (1999)'s one-way identification with information treatment where the social distance between dictators and receivers is the closest to my setting.

Figure B2: Distribution of the dictator allocations by dictators' and receivers' gender

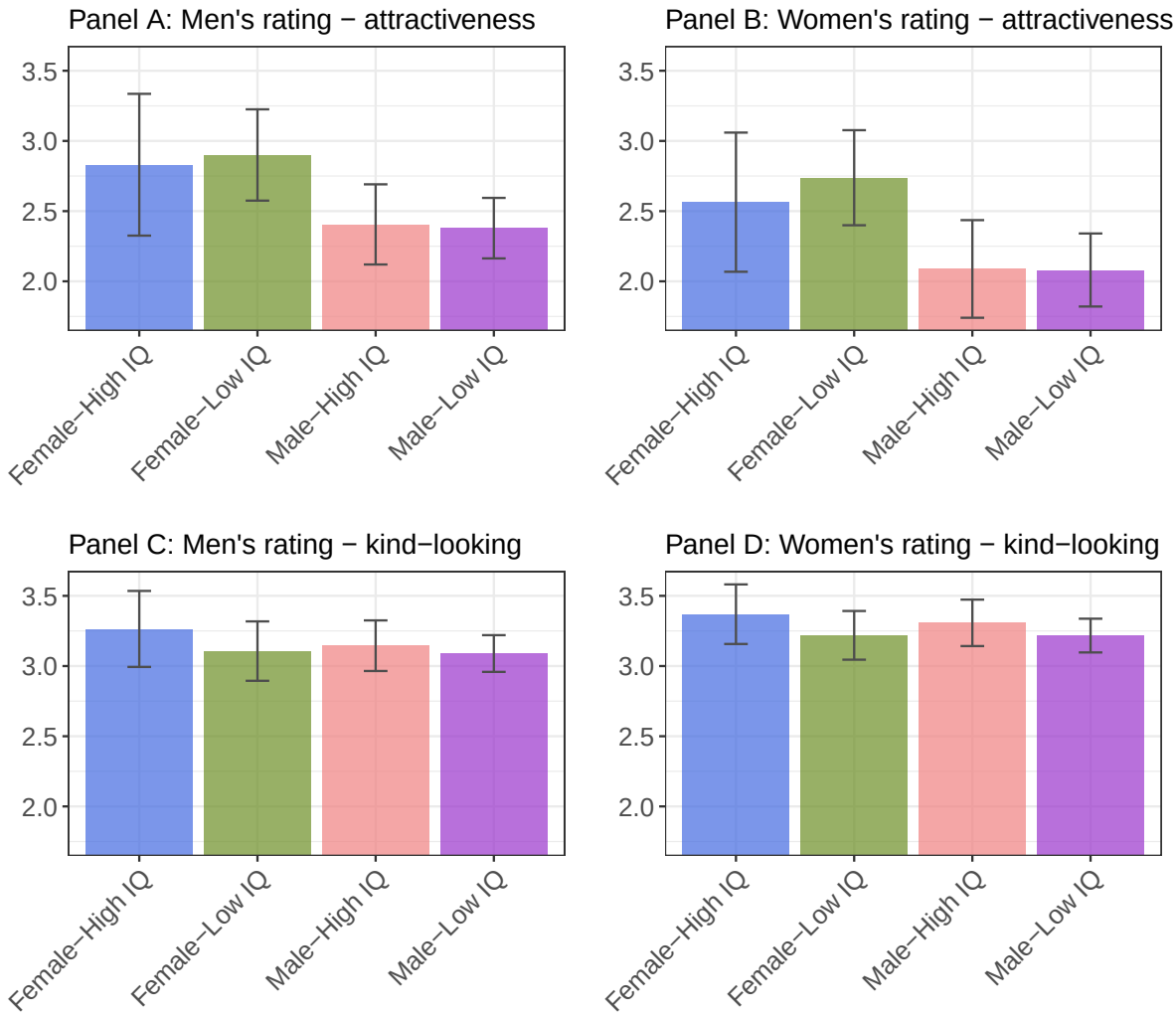


Notes: Panel A plots empirical CDFs of male-dictator allocations separately for male (blue, solid line) and female (green, dashed line) receivers. Panel B plots empirical CDFs of female-dictator allocations separately for male (blue, solid line) and female (green, dashed line) receivers. Significance levels: * 10%, ** 5%, and *** 1%. The significance level of the mean difference is calculated with standard errors with with Pustejovsky and Tipton (2018)'s small cluster bias adjustment.

Panel B of Figure B1 plots empirical CDFs of dictator allocations separately for male (blue, solid line) and female (green, dashed line) receivers. Dictators allocate more to female receivers than to male receivers, consistent with the literature, but the difference is modest (2.4 percentage points). Figure B2 plots the same empirical CDFs separately for male (Panel A) and female (Panel B) dictators and shows that male dictators allocate more to female receivers than to male receivers than female dictators do, consistent with the literature.

Figure B3 elaborate Panel B of Table B1. Panel A plots median attractiveness ratings by male participants by receivers' gender and IQ and Panel B plots the same but by female participants.

Figure B3: Attractiveness and Kind-lookingness rating by receivers' gender and IQ



Notes: Panel A plots attractiveness ratings by male participants by receivers' gender and IQ and Panel B plots the same but by female participants, along with the 95% confidence intervals. Panel A plots kind-lookingness ratings by male participants by receivers' gender and IQ and Panel B plots the same but by female participants, along with the 95% confidence intervals. Confidence intervals are calculated with standard errors with with Bell and McCaffrey (2002)'s small sample bias adjustment. Receivers are high IQ if their IQ level is above median in the sample, and are low IQ otherwise.

Panels A and B show that both men and women consider that women look more attractive than men, regardless of their IQ level. On the other hand, Panels C and D show that whether a given person look more kind than other people does not depend on their gender or IQ level.

C Description of Covariates

X_{ij} in equation 1 includes the following variables:

Dictator characteristics

- $Age_i \in \mathbb{N}$: dictator i's age.
- $FromEmiliaRomagna_i \in \{0,1\}$: an indicator variable equals 1 if dictator i is from the Emilia-Romagna region where the experiment was conducted, 0 otherwise.
- $SocialSciences_i \in \{0,1\}$: an indicator variable equals 1 if dictator i majors in social sciences, 0 otherwise.
- $STEM_i \in \{0,1\}$: an indicator variable equals 1 if dictator i majors in natural sciences/mathematics, engineering, or medicine; 0 otherwise.
- $PostBachelor_i \in \{0,1\}$: an indicator variable equals 1 if dictator i is either a master or post-bachelor student, a student in the 4th year or beyond in a bachelor-master combined program (bachelor is a 3 year program in Italy), or PhD student, 0 otherwise.
- $OverConfidence_i \in \{-1,0,1\}$: degree of dictator i's overconfidence. It is equal to -1 if dictator i's guess about the number of IQ test questions they have solved correctly is lower than the actual number, 0 if equal to the actual number, and 1 if higher than the actual number.

receiver characteristics

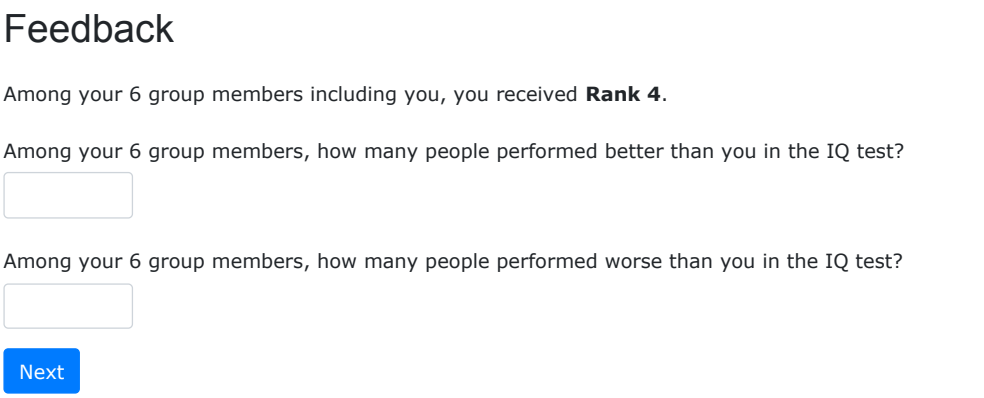
- $Age_j \in \mathbb{N}$: receiver j's age.
- $FromEmiliaRomagna_j \in \{0,1\}$: an indicator variable equals 1 if receiver j is from the Emilia-Romagna region where the experiment was conducted, 0 otherwise.

Fixed effects

- $\sum_{k=2}^{3} \theta_k^{round} \mathbb{1}[\text{round}_{ij} = k]$: fixed effects for dictator game or belief elicitation round. $\mathbb{1}$ is the indicator variable.
- $\sum_{k=2}^{3} \theta_k^{social\ distance} \mathbb{1}[\text{social distance}_{ij} = k]$: fixed effects for social distance between dictator i and receiver j. social distance$_{ij} = 1$ means dictator i did not know receiver j at all, $= 2$ knew but not well, and $= 3$ saw before. $\mathbb{1}$ is the indicator variable.

D Additional Figures and Tables

Figure D1: IQ rank comprehension questions screen



Notes: This figure shows an example of an IQ rank comprehension questions screen participants solve at the end of Part 1. In this example, the participant's IQ rank is 4.

Table D1: Dictator allocations to higher-IQ female receivers – OLS, male dictators (robustness)

Outcome:	Dictator's allocation (fraction of endowment)				Belief on IQ level
Sample:	Male dictators				Male receivers
	(1)	(2)	(3)	(4)	(5)
Higher IQ receiver x Female receiver (β_1)	0.008	0.035	0.044	0.035	0.818
	(0.062)	(0.060)	(0.075)	(0.077)	(0.522)
	[-0.113, 0.130]	[-0.083, 0.154]	[-0.103, 0.191]	[-0.117, 0.187]	[-0.212, 1.847]
Higher IQ receiver (β_2)	0.056	0.042	0.019	0.010	0.291
	(0.053)	(0.054)	(0.059)	(0.056)	(0.426)
	[-0.049, 0.161]	[-0.064, 0.147]	[-0.097, 0.135]	[-0.101, 0.121]	[-0.549, 1.132]
Female receiver (β_3)	0.031	0.014	-0.011	-0.009	-0.253
	(0.035)	(0.034)	(0.043)	(0.046)	(0.362)
	[-0.037, 0.100]	[-0.052, 0.081]	[-0.095, 0.073]	[-0.099, 0.082]	[-0.968, 0.463]
Dictator IQ FE	✓	✓	✓	✓	✓
Round FE	✓	✓	✓	✓	✓
Social distance FE	✓	✓	✓	✓	✓
Dictator demographics	-	✓	✓	✓	✓
Receiver demographics	-	-	✓	✓	✓
Receiver attractiveness FE	-	-	-	✓	-
Receiver kind-lookingness FE	-	-	✓	✓	-
Higher IQ receiver x Female receiver	0.064	0.077	0.063	0.045	1.109***
+Higher IQ receiver ($\beta_1 + \beta_2$)	(0.050)	(0.052)	(0.072)	(0.075)	(0.403)
	[-0.034, 0.163]	[-0.025, 0.179]	[-0.079, 0.204]	[-0.102, 0.193]	[0.314, 1.904]
Higher IQ receiver x Female receiver	0.040	0.050	0.033	0.027	0.565
+Female receiver ($\beta_1 + \beta_3$)	(0.048)	(0.047)	(0.060)	(0.063)	(0.354)
	[-0.056, 0.135]	[-0.042, 0.142]	[-0.085, 0.150]	[-0.097, 0.151]	[-0.134, 1.264]
Baseline Mean	0.305	0.305	0.327	0.327	6.489
Baseline SD	0.269	0.269	0.270	0.270	1.842
Adj. R-squared	0.051	0.083	0.079	0.103	0.047
Observations	260	260	211	211	197
Clusters	91	91	91	91	104

Notes: This table presents the same regression results as Table 1 but with different controls. The standard error (in parenthesis) and the 95% confidence interval (in bracket) are reported below each coefficient estimate. The standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment. Baseline mean and standard deviation are that of lower-IQ male receivers. Significance levels: * 10%, ** 5%, and *** 1%.

Table D2: Dictator allocations to higher-IQ female receivers – OLS, male dictators, No standard error clustering

Outcome:	Dictator's allocation (fraction of endowment)			
Sample:	Male dictators			
	(1)	(2)	(3)	(4)
Higher IQ receiver x Female receiver (β_1)	0.018	0.017	0.031	0.047
	(0.063)	(0.063)	(0.064)	(0.074)
	[-0.107, 0.142]	[-0.107, 0.140]	[-0.096, 0.158]	[-0.098, 0.192]
Higher IQ receiver (β_2)	0.093**	0.054	0.048	0.007
	(0.041)	(0.045)	(0.046)	(0.053)
	[0.013, 0.174]	[-0.034, 0.143]	[-0.043, 0.139]	[-0.098, 0.113]
Female receiver (β_3)	0.038	0.031	0.014	-0.021
	(0.043)	(0.042)	(0.043)	(0.052)
	[-0.046, 0.122]	[-0.052, 0.115]	[-0.070, 0.098]	[-0.124, 0.081]
Dictator IQ FE	-	✓	✓	✓
Round FE	-	-	✓	✓
Social distance FE	-	-	✓	✓
Dictator demographics	-	-	✓	✓
Receiver demographics	-	-	✓	✓
Receiver attractiveness FE	-	-	-	✓
Higher IQ receiver x Female receiver	0.111**	0.071	0.079	0.054
+Higher IQ receiver ($\beta_1 + \beta_2$)	(0.048)	(0.052)	(0.053)	(0.063)
	[0.017, 0.206]	[-0.032, 0.174]	[-0.025, 0.182]	[-0.069, 0.178]
Higher IQ receiver x Female receiver	0.056	0.048	0.045	0.026
+Female receiver ($\beta_1 + \beta_3$)	(0.047)	(0.047)	(0.048)	(0.058)
	[-0.036, 0.148]	[-0.044, 0.140]	[-0.048, 0.139]	[-0.088, 0.139]
Baseline Mean	0.305	0.305	0.305	0.327
Baseline SD	0.269	0.269	0.269	0.270
Adj. R-squared	0.032	0.052	0.080	0.088
Observations	260	260	260	211
Clusters	91	91	91	91

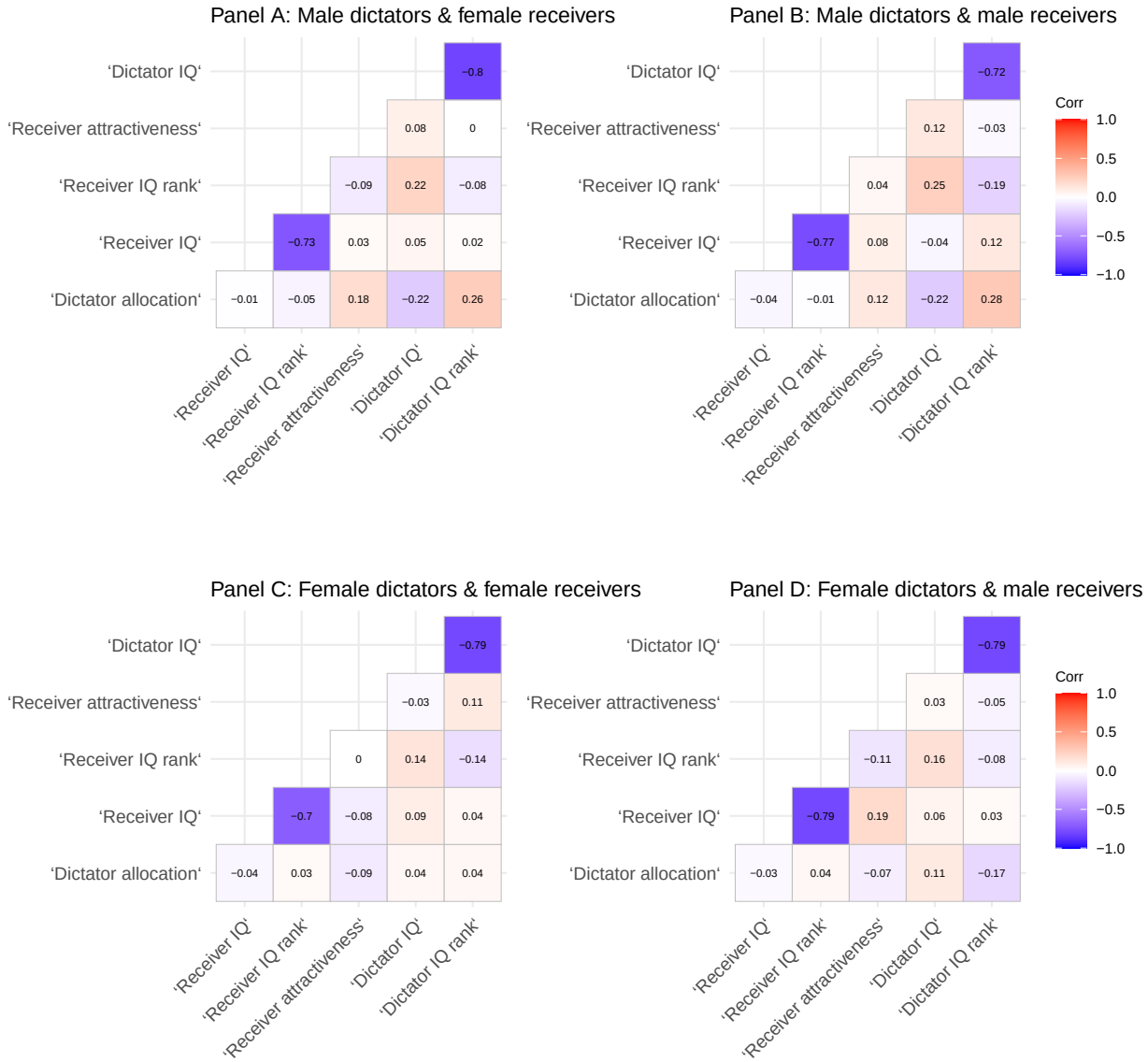
Notes: This table presents the regression results of equation 1. The standard error (in parenthesis) and the 95% confidence interval (in bracket) are reported below each coefficient estimate. The standard errors are neither cluster-robust nor heteroskedasticity-robust. Baseline mean and standard deviation are that of lower-IQ male receivers. Significance levels: * 10%, ** 5%, and *** 1%.

Table D3: Dictator allocations to higher-IQ female receivers – OLS, female dictators

Outcome:	Dictator's allocation (fraction of endowment)			
Sample:	Female dictators			
	(1)	(2)	(3)	(4)
Higher IQ receiver x Female receiver (β_1)	0.057	0.060	0.057	0.035
	(0.045)	(0.047)	(0.046)	(0.063)
	[-0.033, 0.146]	[-0.032, 0.152]	[-0.034, 0.147]	[-0.089, 0.160]
Higher IQ receiver (β_2)	-0.049	-0.051	-0.049	-0.020
	(0.035)	(0.037)	(0.042)	(0.063)
	[-0.119, 0.021]	[-0.123, 0.021]	[-0.131, 0.033]	[-0.144, 0.105]
Female receiver (β_3)	-0.024	-0.027	-0.014	-0.009
	(0.037)	(0.038)	(0.037)	(0.043)
	[-0.098, 0.049]	[-0.101, 0.048]	[-0.088, 0.059]	[-0.094, 0.077]
Dictator IQ FE	-	✓	✓	✓
Round FE	-	-	✓	✓
Social distance FE	-	-	✓	✓
Dictator demographics	-	-	✓	✓
Receiver demographics	-	-	✓	✓
Receiver attractiveness FE	-	-	-	✓
Higher IQ receiver x Female receiver	0.008	0.009	0.007	0.016
+Higher IQ receiver ($\beta_1 + \beta_2$)	(0.036)	(0.036)	(0.037)	(0.057)
	[-0.064, 0.079]	[-0.061, 0.080]	[-0.065, 0.080]	[-0.097, 0.128]
Higher IQ receiver x Female receiver	0.032	0.033	0.042	0.026
+Female receiver ($\beta_1 + \beta_3$)	(0.030)	(0.031)	(0.029)	(0.045)
	[-0.027, 0.092]	[-0.027, 0.094]	[-0.015, 0.100]	[-0.062, 0.115]
Baseline Mean	0.458	0.458	0.458	0.466
Baseline SD	0.225	0.225	0.225	0.222
Adj. R-squared	-0.004	-0.008	0.021	-0.014
Observations	298	298	298	223
Clusters	104	104	104	103

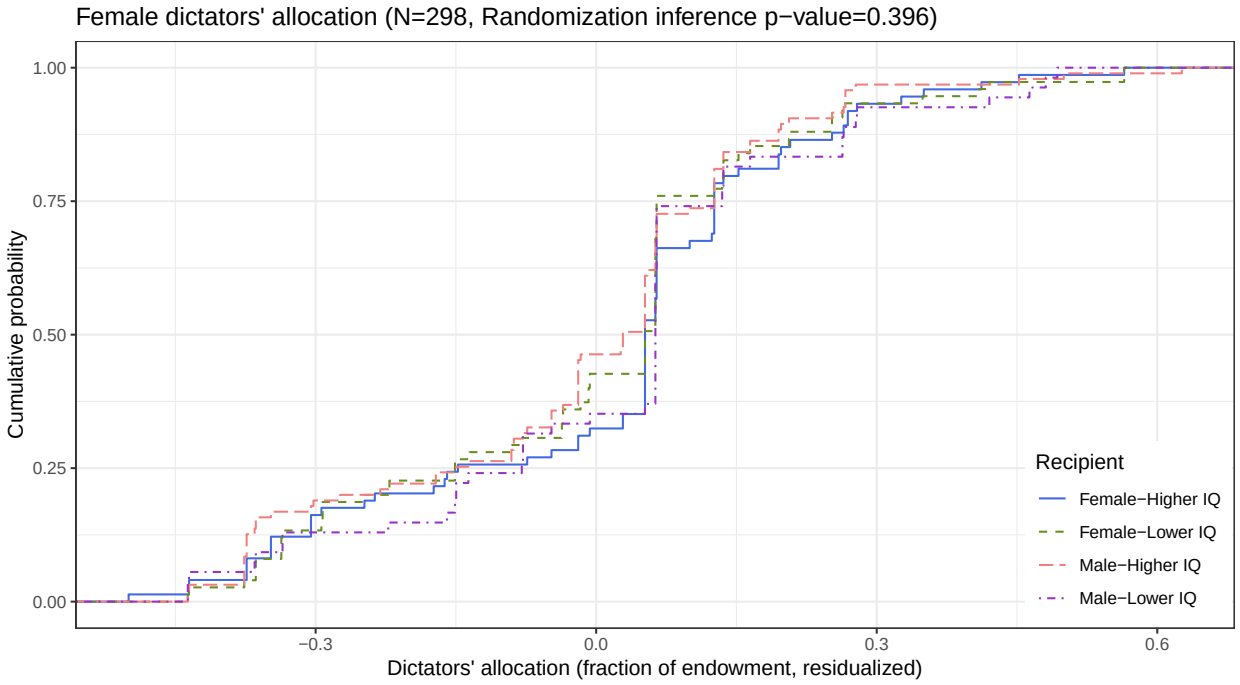
Notes: This table presents the regression results of equation 1. The standard error (in parenthesis) and the 95% confidence interval (in bracket) are reported below each coefficient estimate. The standard errors are clustered at the dictator level with Pustejovsky and Tipton (2018)'s small cluster bias adjustment. Baseline mean and standard deviation are that of lower-IQ male receivers. Significance levels: * 10%, ** 5%, and *** 1%.

Figure D2: Correlation between dictator allocation and key variables



Notes: This figure plots correlations between dictators' allocation and key variables of dictators' and receivers' key variables. Panel A restricts the sample to male dictators' allocations to female receivers, Panel B to male dictators' allocations to male receivers, Panel B to female dictators' allocations to female receivers, and Panel D to female dictators' allocations to male receivers.

Figure D3: Dictator allocations to higher-IQ female receivers – Distribution, female dictators



Notes: The figure presents the empirical CDF of dictator allocations by receiver types, residualized with the dictator-IQ fixed effects to give a causal interpretation to the differences. The randomization inference p-value (Young 2019) is calculated with the Kruskal-Wallis test with 2000 random draws. I use randomization inference to address arbitrary dependency among allocations. The null hypothesis is that all CDFs coincide.

E Experimental Instructions

To the experimenter:

- *Before subjects arrive:*
- *Clear image cache from the browser.*
- *Put on each desk (i) a scratch paper and (ii) a pencil.*
- *Have a printed instructions ready.*
- *Set up photo booth. The brightness of the camera should be 172 and resolution 0.7 mb with 4:3 aspect ratio.*
- *Leave a paper in which participants write down their desk number on the photo booth.*
- *After registration:*
- *Give them photo taking instructions.*
- *Ask them to take photo at the photo booth, then take seat.*
- *After subjects took photo:*
- *Check that all the participants' photos are neutral: they must not signal nothing other than their gender.*
- *Make sure that the photos are saved as Pxx.jpg where xx is participant's desk number.*
- *After reserve participants left the room:*
- *Rename the photo name to the new desk number's for those who moved to new desks.*
- *Store photos in _static/photo folder.*
- *Startup Chrome & oTree*

App: personal_info

Page: DeskNumber

Please enter your desk number and click "Next"

[Your desk number:]

Page: PersonalInfo

Please check that the photo is yours

[Participant's photo]

The photo you took is displayed above. Please check that the photo is yours. Please also enter your first name. We will come to each desk and check the photo and the first name.

[Your first name:]

[Digital signature (please wait for us to sign you in):]

To the experimenter: before type in the password, do the followings:

- *Check that the photo and the first name correspond to the participant.*

Then click "Next" to let participants to proceed.

Page: Introduction

To the experimenter: read the instructions aloud.

Welcome!

You are participating in a study of the BLESS. For your participation, you will receive a fixed amount of [Participation fee]€. There are 2 parts in which you can earn additional earnings. The expected length is 1 hour.

During the study, we use your photo and first name to identify you. Your photo and the first name will only be used in this session and deleted immediately afterwards. However, we may ask some of you to allow us to use their photo in another study, which you can opt out.

The study is computerized, meaning that the computer program will give you precise instructions in each task. In the following you will find general instructions of the study, which you can always find in the bottom of the screen.

General instructions

- Please turn off your mobile phone.
- Please do not communicate with other participants.
- Please only use paper and pencil.
- Once you understand the instructions or enter your decisions, please click "Next" to proceed unless instructed otherwise.
- If you have any questions, please raise your hand at any time.

If there is no question, we will start the study.

To the experimenter:

- *Confirm that everyone turned off their mobile phone.*
- *Then, if there is no question, click "Advance slowest user(s)."*

After that, just sit in the experimenter area unless someone raises her or his hand. Do not read instructions aloud unless this document says to do so.

App: iqtest

Page: Introduction

Part 1: Instructions

In part 1, you will work on an IQ test, which is frequently used to measure intelligence. The IQ test you will work on is the Raven's Standardized Progressive Matrices Test.

You will solve the IQ test as follows: for each question, you will see an image in which a piece is missing. Below the image there will be several options. Choose the correct option among them to complete the image. There will be only one correct option.

An example is provided below. In the image, there are 9 large white squares each containing a small black square. In the first column, the small black square is located on the left; in the second column, in the middle; in the third column, on the right. In the first row, it is located on the top; in the second row, in the middle; in the third row, in the bottom. Thus, in the third

column of the third row, the small black square must be located in the right bottom, thus the correct option is 5.

[Raven matrix no. 31 here]

There are 9 questions in total and you have 9 minutes. Once the time is over, you will automatically be directed to the next page. You will earn [Payoff per IQ test]€ for each correct answer. There is no penalty for wrong answers. You can use paper and pencil on your desk.

Page: IQTest (9 minutes)

Please complete the image by choosing the correct option

[Raven IQ test]

Page: Guess

Guess the number of questions you solved

The IQ test is over.

We have randomly formed a group of 6 participants including you in this room and constructed a ranking among the 6 group members based on their IQ test performance.

A group member with rank 1 performed the best in the IQ test, followed by a group member with rank 2, 3, 4, 5, and 6. In case of a tie between group members, the computer randomly decided who receives the higher rank.

How many questions do you think you have solved correctly? If your guess is correct, you will additionally earn [Earnings from guess]€.

[Guess]

[Dictator] ***Page: Feedback***

Feedback

Among your 6 group members including you, you received **Rank [Participant's rank]**.

[Among your 6 group members, how many people performed better than you in the IQ test?:]

[Among your 6 group members, how many people performed worse than you in the IQ test?:]

App: dictator

[Dictator] ***Page: IntroductionDict***

Part 2: Instructions

In this part, half of you will be active participants who will work on the task described in the next page, and the remaining half will be passive participants who will NOT work on the task described in the next page.

[Dictator] ***Page: IntroductionDictCont***

Part 2: Instructions

You are assigned to a role of **active participant**.

Part 2 consist of 3 rounds. In each round, you will first receive an endowment (money). After that, you will be paired with a passive participant in your group.

Your task in this part is to allocate the endowment to yourself and the paired passive participant. The passive participants, other active participants, or anyone else other than us will never know who allocated how much.

At the end of the study, the computer will randomly select 1 out of 3 rounds and the amount you allocated to you in that round will be your earnings in this part.

The computer will also randomly select 1 out of 3 rounds for the paired passive participants and the amount you allocated to him or her in that round will be his or her earnings in this part.

[Recipient] ***Page: IntroductionRecip***

Part 2: Instructions

In part 2 consists of 2 rounds. In each round, you will be paired with another participant in your group.

Your task in this part is to guess how many questions the paired participant has solved correctly in the IQ test. For each correct guess, you will earn [Earning from guess other]€.

[Dictator] ***Page: PrepEndow***

Round [Round number] of 3

Please wait.

[Dictator] ***Page: OfferDict1-3***

Round [Round number] of 3

[Paired participant's photo]

[Paired participant's first name]

Rank [Paired participant's rank]

You have received **[7/5/7]€** for this round.

You have been paired with **[Paired participant's first name].**

Please allocate the endowment between yourself and [Paired participant's first name]. When you click the line below, a cursor appears. You can move the cursor by dragging it. Please move the cursor to your preferred position to determine the allocation.

[Slider from 0 to endowment that moves with increment of 0.5]

[Recipient] ***Page: GuessOther1-3***

Round [Round number] of 2

[Paired participant's photo]

[Paired participant's first name]

Rank [Paired participant's rank]

You have been paired with **[Paired participant's first name].**

How many questions do you think [Paired participant's first name] has solved correctly?

[Guess]

[Dictator] **Page: AnonymityCheckDict**

Round 3 of 3

Below we display the participants whom you were paired with. How well did you know him/her before participating in this study?

[Paired participant 1's photo]	[Paired participant 2's photo]	[Paired participant 3's photo]
[Paired participant 1's first name]	[Paired participant 2's first name]	[Paired participant 3's first name]
[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]

[Recip] **Page: AnonymityCheckRecip**

Round 2 of 2

Below we display the participants whom you were paired with. How well did you know him/her before participating in this study?

[Paired participant 1's photo]	[Paired participant 2's photo]
[Paired participant 1's first name]	[Paired participant 2's first name]
[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]

Page: ShowResults

Results

The study is over. The results are provided below.

- In part 1, you solved [**Number of IQ test questions solved**] questions and earned [**Earnings from IQ test]€.** [If guess is correct] You have additionally earned **[Earnings from guess]€** because your guess about the number of questions solved was correct.
- [Dictator] In part 2, computer selected **round [1/2/3]** in which you allocated **[Allocation to self]€** to yourself.
- [Recipient] In part 2, you made **[Number of correct guesses on others]** guesses correct. So you earned **[Earnings from guesses other]€**.
- [Recipient] You additionally earned a top-up of **[Allocation from dictator]€**.

So, your total earnings are **[Participant's earnings]€** including [Participation fee]€ of participation fee.

Thank you for participating in this study! We will prepare your payment soon. Meanwhile, please answer a short questionnaire by clicking "Next." Your answer will be kept anonymous and will not affect your payment.

Page: Questionnaire1

Questionnaire 1 of 3

[Your study program: Agricultural and Food Sciences; Economics and Management; Education; Engineering and Architecture; Humanities; Languages and Literatures, Interpreting and Translation; Law; Medicine; Pharmacy and Biotechnology; Political Sciences; Psychology; Sciences; Sociology; Sport Sciences; Statistics; Veterinary Medicine]

[Please also type your full study program name in Italian:]

If you are enrolled in a specialized or professional program, please choose the closest study program. If you are enrolled in a post-bachelor vocational program, please choose the study program of your bachelor's degree. If you are an exchange student, please choose the study field closest to the one in your home university.

[Your degree program: Bachelor, Master/Post-bachelor, Bachelor-master combined (ciclo unico), Doctor]

[Your year in the degree program: 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th]

[Your age:]

[Your gender: Male, Female]

[Are you from Emilia-Romagna region?: Yes, No]

[Recipient] In another study, we'd like to use your photo. We will show your photo to some people in the University of Bologna only in this room, but no other people except us will see

your photo. Your photo will be deleted immediately after we finish another study. For your cooperation, we will pay you gratuity of [Gratuity for photo use]€. May we use your photo in another study?

[Yes, I allow the researcher to use my photo in another study; No, I do NOT allow the researcher to use my photo in another study]

[What do you think the study you participated was about?]

[Was there anything unclear or confusing about the study you participated?]

[Do you have any other comments? (optional)]

Page: Questionnaire2

To the experimenter:

- *Prepare payment.*

Questionnaire 2 of 3

Below we display the participants whom you were paired with. How well did you know him/her before participating in this study?

[Dictator]

[Paired participant 3's photo]	[Paired participant 1's photo]	[Paired participant 2's photo]
[Paired participant 3's first name]	[Paired participant 1's first name]	[Paired participant 2's first name]
[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]

[Recipient]

[Paired participant 2's photo]	[Paired participant 1's photo]
[Paired participant 2's first name]	[Paired participant 1's first name]
[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]	[I didn't know him/her at all, I saw him/her before, I knew him/her but not very well, I knew him/her very well]

Page: Questionnaire3

Questionnaire 3 of 3

[What do you think this study was about?]

[Was there anything unclear or confusing about this study?]

[Do you have any other comments? (optional)]

[Participants with payment less than 5€] ***Page: ExtraTask***

Extra task

Please solve the additions below and click next to earn [5€ – Participant's earnings]€.

84	33	64

[Sum of the above numbers:]

19	65	97

[Sum of the above numbers:]

[English translation – Original in Italian]

Welcome!

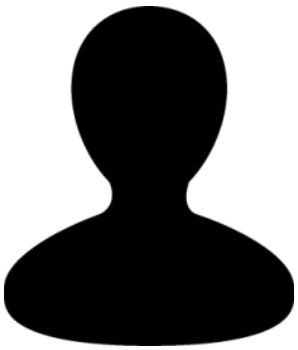
Thank you for participating in this study, which should take around 30 minutes of your time.

In this study, we will show you 100 facial photos of participants in another study conducted in BLESS. For each photo, we will ask you to evaluate some aspects of the photos.

Please click Next to continue.

[Next]

Photo 1/100



- How attractive do you think this person is? [Not attractive at all, Not attractive, Neither not attractive nor attractive, Attractive, Very attractive]
- How kind do you think this person is? [Not kind at all, Not kind, Neither not kind nor kind, Kind, Very kind]
- Do you think this person is Italian? [Italian, Maybe Italian, Foreigner]
- Do you know this person? [Yes, No]

[Next]

Thank you!

Thank you for your participation. Before you leave, could you please tell us about yourself?

- Your gender: [Male, Female, Other]
- Your age: [Under 25, 25 or above]

[Next]

End of the study

The study is over. We will pay you 10€ for your participation via PayPal in 2 weeks. Please remain seated until the experimenter calls you.