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Gender differences in willingness to compete: The role of public observability

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Appendix A: Power and PSP (for Online Publication)

A1. Power Calculations

Our key hypothesis is that making choices publicly observable increases the gender difference in willingness to compete. Since this hypothesis involves an interaction effect, we compute power $P(p < 0.05|H_1)$ using simulations. For this purpose, we take the fraction of men and women that choose the tournament in an earlier study run at the same laboratory (Van Veldhuizen 2018) as the benchmark for willingness to compete in the control condition (men=58.6%, women=27.1%). We then specify several different alternative hypotheses H_1 that increase male and decrease female willingness to compete by a similar amount (e.g., men=68.6% and women=17.1% for a 20pp increase in the gender gap). For each H_1 we then simulate 1000 samples by drawing sample sizes equal to the ones observed in the Control (116 men and 107 women) and Public Choice condition (109 men and 115 women) using a binomial distribution with probability equal to the relevant fraction (e.g., $p=0.586$ for men in the Control condition). The power $P(p < 0.05|H_1)$ is then equal to the fraction of simulated samples in which we obtained a significantly larger gender gap in the Public Choice condition using a two-sided p-value smaller than 0.05. Table A1 presents the results for four different assumed effect sizes (H_1).

Table A1: Power calculations

Effect Size (H_1)	Power
15pp	0.417
20pp	0.662
25pp	0.861
30pp	0.960

As expected, power depends on the assumed effect size. To identify an appropriate effect size, Table A2 presents the effect sizes as well as sample sizes and ex-post power in a number of previous studies that also investigate whether the gender gap in willingness to compete changes across conditions. There are several things to note. First, our sample size (111 people per cell on average) is larger than all but one of the studies summarized in Table A2 (an online experiment conducted on Amazon's Mechanical Turk). Second, the average effect size reported in previous work is fairly large (28pp). While these studies used different manipulations, it is nevertheless instructive to see that

given our large sample we are highly powered to detect effect sizes that are typical in previous work. All in all, we have obtained one of the largest samples of tournament entry decisions in the literature, and therefore have good power to detect even moderately large effects.

Table A2: Sample size and effect size in previous work

Study	Sample Size		Fraction Competes		Test Used			Effect Size	
	Control	Treatment	Control	Treatment	Type	B/W	DiD	Men	Women
ADM2017Lab	50M,50W	52M,52W	0.58M,0.38W	0.55M,0.42W	DiD	Between	0.07	-0.03	0.04
ADM2017Online	129M,129W	112M,112W	0.40M,0.28W	0.31M,0.36W	DiD	Between	0.17	-0.09	0.08
BGR2015	56M,56W	56M,56W	0.59M,0.30W	0.59M,0.38W	DiD	Between	0.08	0.00	0.08
BS2012Quota	36M,36W	36M,36W	0.64M,0.31W	0.62M,0.53W	Women	Between	0.24	-0.02	0.22
BS2012REP	36M,36W	36M,36W	0.64M,0.31W	0.67M,0.39W	Women	Between	0.05	0.03	0.08
BS2012PT1	36M,36W	36M,36W	0.64M,0.31W	0.55M,0.58W	Women	Between	0.36	-0.09	0.27
BS2012PT2	36M,36W	36M,36W	0.64M,0.31W	0.50M,0.69W	Women	Between	0.53	-0.14	0.39
D2012	78M,74W	78M,74W	0.85M,0.51W	0.59M,0.62W	All	Within	0.37	-0.26	0.11
DER2014	108M,109W	108M,109W	0.36M,0.17W	0.33M,0.28W	M+W	Within	0.14	-0.03	0.11
GLL2009	34M,40W	52M,28W	0.50M,0.26W	0.39M,0.54W	DiD	Between	0.39	-0.11	0.28
HP2011	32M,32W	64M,62W	0.81M,0.28W	0.67M,0.45W	DiD	Between	0.31	-0.14	0.17
NSV2013	84M,84W	84M,84W	0.74M,0.31W	0.45M,0.83W	All	Within	0.81	-0.29	0.52
S2012Math	36M,36W	36M,36W	0.44M,0.19W	0.44M,0.36W	Women	Within	0.17	0.00	0.17
S2012Verbal	45M,45W	45M,45W	0.39M,0.30W	0.43M,0.57W	Women	Within	0.21	0.06	0.27
Average:	57M,57W	59M,57W	0.59M,0.30W	0.51M,0.50W			0.28	-0.08	0.20

Notes: The table reports the results of fourteen separate experiments from nine published papers. For each experiment, the first two columns ('Sample Size') display the number of men (M) and women (W) in the control and treatment condition respectively. The next two columns ('Fraction Competes') display the fraction of men and women in the respective conditions who choose to compete. 'Test Used' displays both the 'Type' of test reported in the paper, either for a change in the gender gap (difference-in-difference, DID) or for a change in the fraction of men or women who compete, and whether the study used a between-subject or within-subject design ('B/W'). The three 'Effect Size' columns report the gender gap, the fraction of men and the fraction of women competing in the treatment condition minus the corresponding fraction in the control condition. 'ADM2017' is Apicella, Dreber and Mollerstrom (2017), 'BS2012' is Balafoutas and Sutter (2012), 'BGR2015' is Brandts, Groener and Rott (2015), 'D2012' is Dargnies (2012), 'DER2014' is Dreber, von Essen and Ranehill (2014), 'GLL2009' is Gneezy, Leonard and List (2009), 'HP2011' is Healy and Pate (2011), 'NSV2013' is Niederle, Segal and Vesterlund (2013), and 'S2012' is Shurchkov (2012). The control condition in all experiments is a variation of the Niederle and Vesterlund (2007) design. In the treatment conditions, participants compete against their own past performance (ADM2017), participants are advised whether or not to compete (BGR2015), there is a minimum number of female winners (BS2012, Quota; NSV2013), tournaments are repeated if there are too few female winners (BS2012, REP), or female performance is artificially boosted by one or two unites (BS2012, PT1 and PT2 respectively). In D2012, treated participants choose whether to enter as a team, in DER2014 treated participants face a verbal task, in GLL2009 the treated group consists of a different population (Khasi) than the control (Maasai), in HP2011 treated participants choose whether to compete based on the combined performance of themselves and a team mate and in S2012 treated participants are under time

pressure. ADM2017 includes both a laboratory and online (MTurk) experiment. BS2012 includes four different affirmative action conditions that are all compared to the same control condition. S2012 includes separate sessions with verbal and mathematical tasks. 'Average' is the unweighted average of the respective column across all reported experiments.

A2. Post-Study-Probability

Our main result is that making choices publicly observable does not significantly increase the gender gap in willingness to compete. In this section, we analyze what this result tells us about the probability that public observability truly does not affect the gender difference in willingness to compete. Our main intuition is that a null result can be observed for two reasons: a true null effect and a false negative (i.e., a type II error). Hence we ask ourselves here what our data tell us about the probability that public observability truly does not affect the gender gap in willingness to compete in our setting (i.e., the null hypothesis is indeed true), or that our results rather reflect a false negative.

We formalize this question using the framework proposed by Maniadis, Tufano and List (2014). Specifically, we ask ourselves what the posterior probability is that the null hypothesis (H_0) holds, given a prior $\pi(H_0)$ that the null hypothesis is true, and given the p-value p^* observed in our study:

$$P(H_0|p \geq p^*) = \frac{P(p \geq p^*|H_0)\pi(H_0)}{P(p \geq p^*|H_0)\pi(H_0) + P(p \geq p^*|H_1)(1 - \pi(H_0))} \quad (1)$$

Equation (1) reflects the two mutually exclusive reasons for observing a null result: a true null effect (which happens with probability $P(p \geq p^*|H_0) = (1 - p^*)$), and a false negative, which happens with probability $P(p \geq p^*|H_1)$ (where H_1 is the alternative hypothesis). Equation (1) then follows from applying Bayes' rule. Following Maniadis et al. (2014), we will refer to $P(H_0|p \geq p^*)$ as the post-study-probability (or PSP).¹

The PSP provides a way to differentiate between informative null results (that is, high-powered precisely estimated zero effects) and less informative null results (underpowered imprecisely estimated effects), similar to a power analysis. It also takes into account the observed p-value, which captures the intuition that (for a given power) high p-values are more likely to be the result of a true null effect than a false negative. Indeed, a key advantage of the PSP is that it combines both information on the sample size and power of the study (as reflected by $P(p \geq p^*|H_1)$) and the observed p-value, allowing us to compute how informative our results are, i.e., how much they shift our posterior. The main assumption for the PSP to be accurate is that both the p-value and statistical power are correct.

¹ In contrast to us, Maniadis et al. (2014) derive the post-study-probability that an observed significant effect reflects a true underlying effect i.e., $P(H_1|p < \alpha)$.

To obtain the PSP, note that our hypothesis here relates to a difference-in-difference test: do we observe a larger gender gap in willingness to compete when choices are publicly observable? We present this test in Table 3, where we investigate whether the Public Choice coefficient is significantly larger for men (columns 4, 6 and 8) than for women (columns 5, 7 and 9). The relevant two-sided p-values are 0.34, 0.40 and 0.57, which implies that $P(p \geq p^* | H_0) \approx 0.54$. To see this, note that all p-values are equally likely under the null hypothesis. $P(p \geq p^* | H_0)$ is then simply equal to one minus the one-sided p-value, which in our case on average is approximately 0.46.

The next step is to compute $P(p \geq p^* | H_1)$, that is, the probability that a (one-sided) p-value larger than p^* (i.e., 0.46) is observed in our experiment given our alternative hypothesis H_1 . Since we are dealing with an interaction effect, we compute $P(p \geq p^* | H_1)$ using simulations. For this purpose, we take the fraction of competitive men and women in the ‘Control’ condition as the benchmark for willingness to compete absent in absence of public information (men=49.1%, women=19.6%). We then specify several different alternative hypotheses H_1 that increase male and decrease female willingness to compete by a similar amount (e.g., men=59.1% and women=9.6% for a 20pp increase in the gender gap). For each H_1 we then simulate 1000 samples with sample sizes equal to the ones observed in the Control (116 men and 107 women) and Public Choice condition (109 men and 115 women) using a binomial distribution with probability equal to the relevant fraction (e.g., $p=0.491$ for men in the control condition). $P(p \geq p^* | H_1)$ is then equal to the fraction of simulated samples in which we obtained a one-sided p-value larger than p^* .

Table A3 presents the resulting PSPs for various possible priors and effect sizes. Let us first consider the case where H_1 postulates a large effect size (the final column). In this case, our results appear to almost rule out the possibility that H_1 is true for any value of the prior. Intuitively, the (fairly large) p-value we obtain is extremely unlikely given a large effect size ($P(p \geq p^* | H_1) < 0.001$). As a result, any null result almost certainly reflects a true null. For intermediate effect sizes (15-25pp) we still observe a substantial shift in the probability that the null hypothesis holds (e.g., by 56.7 percentage points for a prior of 0.2 and an effect size of 20pp). For the smallest effect size we considered (a mere 10pp increase in the gender gap), our null result only has a modest impact on the posterior probability that the null hypothesis is true.

Table A3: Post-Study-Probability (PSP)

	Effect Size (H_1)				
	10pp	15pp	20pp	25pp	30pp
$P(p \geq p^* H_0)$	0.54	0.54	0.54	0.54	0.54
$P(p \geq p^* H_1)$	0.333	0.134	0.041	0.010	<0.001
PSP ($\pi(H_0)=0.9$)	0.936	0.973	0.992	0.998	1.000

PSP ($\pi(H_0)=0.8$)	0.866	0.942	0.981	0.995	1.000
PSP ($\pi(H_0)=0.5$)	0.619	0.801	0.929	0.982	0.998
PSP ($\pi(H_0)=0.2$)	0.288	0.502	0.767	0.931	0.993
PSP ($\pi(H_0)=0.1$)	0.153	0.309	0.594	0.857	0.984

Notes: the first and second row report the probability of observing a p-value larger than the observed p-value p^* given the null and alternative hypothesis respectively. The remaining rows report the post-study-probabilities (PSPs) for different values of the prior $\pi(H_0)$. Each column corresponds to a different alternative hypothesis, as discussed above.

Overall, we feel that these results provide a useful way to quantify what we learn from our null result. They reveal that our data increase the posterior likelihood that public observability does not affect the gender gap in willingness to compete, in particular for a low prior (i.e., optimism about the alternative hypothesis being true) and a moderate or large hypothesized effect size. More generally, our results also illustrate that the PSP might serve as a useful framework to interpret the informativeness of null results such as ours.

Appendix B: Additional tables

Table B1: Descriptive statistics by condition

	(1) Control:	(2) Public choice	(3) Public outcome	(4) Dif (1) vs (2)	(5) Dif (2) vs (3)
Score round 1 (Piece Rate)	7.238 (3.201)	7.138 (2.770)	7.330 (3.053)	0.099 (0.283)	-0.192 (0.276)
Score round 2 (Tournament)	8.242 (3.494)	8.201 (3.027)	8.588 (3.369)	0.041 (0.309)	-0.387 (0.304)
Guessed chance of winning	0.565 (0.244)	0.585 (0.242)	0.587 (0.252)	-0.020 (0.023)	-0.002 (0.023)
Investment (risk)	12.278 (5.870)	11.955 (6.183)	12.122 (5.966)	0.323 (0.570)	-0.167 (0.576)
Age	23.682 (4.194)	24.326 (4.999)	23.624 (4.552)	-0.644 (0.437)	0.701 (0.453)
Female	0.480 (0.501)	0.513 (0.501)	0.493 (0.501)	-0.034 (0.047)	0.020 (0.048)
Observations	223	224	221	447	445

Notes: Columns 1, 2 and 3 show averages in each of the three main conditions (standard deviations in parentheses). Column 4 shows the difference between the control and public choice conditions (standard errors in parentheses). Column 5 shows the difference between the public choice and public outcome conditions (standard errors in parentheses). Investment is the amount invested in the part 1 investment task in ECU. Guessed chance of winning is equal to $(N - \text{Guessed rank}) / (N - 1)$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ significance levels and standard errors for the differences are from t-tests.

Table B2: Descriptive statistics by wave

	(1) Wave 1	(2) Wave 2	(3) Difference:
Competing	0.372 (0.484)	0.390 (0.488)	-0.018 (0.038)
Score round 1 (Piece Rate)	7.411 (3.091)	7.035 (2.906)	0.376 (0.233)
Score round 2 (Tournament)	8.524 (3.470)	8.137 (3.093)	0.387 (0.256)
Guessed chance of winning	0.572 (0.252)	0.587 (0.239)	-0.015 (0.019)
Investment (risk)	12.087 (5.901)	12.153 (6.121)	-0.066 (0.466)
Age	23.946 (4.581)	23.802 (4.624)	0.145 (0.357)
Female	0.515 (0.500)	0.473 (0.500)	0.043 (0.039)
Observations	355	313	668

Notes: Columns 1 and 2 averages in each of the two data collection waves (standard deviations in parentheses). Column 3 shows the difference between two waves (standard errors in parentheses). Investment is the amount invested in the part 1 investment task in ECU. Guessed chance of winning is equal to $(N - \text{Guessed rank}) / (N - 1)$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; significance levels and standard errors for the difference are from t-tests.

Table B3: Regression results (bottom 50 percent performers)

	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.198*** (0.044)	-0.148** (0.041)	-0.110* (0.042)	-0.101 (0.075)	-0.051 (0.070)	-0.006 (0.082)
Public Choice (T1)				0.164* (0.077)	0.160* (0.076)	0.152* (0.072)
Public Outcome (T2)				0.158 (0.087)	0.164* (0.072)	0.176* (0.069)
Public Choice (T1) * Female				-0.190 (0.098)	-0.183 (0.101)	-0.182 (0.104)
Public Outcome (T2)*Female				-0.120 (0.099)	-0.127 (0.089)	-0.146 (0.095)
Investment (risk)		0.012** (0.003)	0.012*** (0.003)		0.012** (0.004)	0.012** (0.003)
Guessed chance of winning			0.550*** (0.110)			0.553*** (0.110)
Round 2 score	✓	✓	✓	✓	✓	✓
Age, major, year		✓	✓		✓	✓
T1-T2 (men)				0.006	-0.004	-0.024
P-val.(T1-T2) (men)				0.936	0.951	0.701
T1-T2 (women)				-0.064	-0.061	-0.060
P-val.(T1-T2) (women)				0.317	0.256	0.249
R-squared	0.054	0.111	0.183	0.071	0.128	0.200
N	324	324	324	324	324	324

Notes: The table reports results from OLS regressions of a dummy for choosing the competitive payment scheme on gender and condition dummies. Round 2 score is the number of solved exercises in Round 2, Lottery is the chosen investment level in the investment task. Age is measured in years, and study major is a set of dummy variables for 8 different fields of study. Confidence is the guessed performance rank in Round 2. Standard errors in parentheses are clustered at the session level. T1-T2 is the difference between the coefficients for the Public Choice and Public Outcome conditions, the p-value tests whether this difference is significantly different from zero.

*p<0.05, **p<0.01, ***p<0.001

Table B4: Regression results (top 50 percent performers)

	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.384*** (0.052)	-0.325*** (0.056)	-0.230*** (0.056)	-0.471*** (0.069)	-0.399*** (0.071)	-0.309*** (0.073)
Public Choice (T1)				0.018 (0.065)	0.027 (0.073)	0.013 (0.070)
Public Outcome (T2)				-0.119 (0.095)	-0.115 (0.094)	-0.142 (0.091)
Public Choice (T1) * Female				0.123 (0.086)	0.064 (0.090)	0.050 (0.090)
Public Outcome (T2)*Female				0.157 (0.146)	0.168 (0.140)	0.200 (0.142)
Investment (risk)		0.012** (0.003)	0.012*** (0.003)		0.012** (0.004)	0.012** (0.003)
Guessed chance of winning			0.550*** (0.110)			0.553*** (0.110)
Round 2 score	✓	✓	✓	✓	✓	✓
Age, major, year		✓	✓		✓	✓
T1-T2 (men)				0.137	0.142	0.155
P-val.(T1-T2) (men)				0.145	0.147	0.102
T1-T2 (women)				0.104	0.038	0.005
P-val.(T1-T2) (women)				0.242	0.654	0.959
R-squared	0.161	0.212	0.286	0.176	0.223	0.298
N	344	344	344	344	344	344

Notes: The table reports results from OLS regressions of a dummy for choosing the competitive payment scheme on gender and condition dummies. Round 2 score is the number of solved exercises in Round 2, Lottery is the chosen investment level in the investment task. Age is measured in years, and study major is a set of dummy variables for 8 different fields of study. Confidence is the guessed performance rank in Round 2. Standard errors in parentheses are clustered at the session level. T1-T2 is the difference between the coefficients for the Public Choice and Public Outcome conditions, the p-value tests whether this difference is significantly different from zero.
*p<0.05, **p<0.01, ***p<0.001

Appendix C: Experimental Materials (for Online Publication)

This document contains the original English instructions used in the experiment. We read out all the instructions, except where otherwise indicated. The horizontal lines indicate page breaks.

Experimental Instructions

Thank you for participating in today's experiment. During the experiment it is not allowed to use electronic devices or to communicate with other participants. Do not try to exit the experimental program.

If you have any questions, please raise your hand. We will come to your desk to answer your question in private. Please do not ask your questions in public. If your question is relevant for all participants, we will repeat it publicly and answer your question to everyone.

If you fail to comply with these regulations, you will be excluded from the experiment without payment.

In a few moments, the experimenter will read instructions that will explain the nature of this experiment. The instructions will also be available on your screen.

In this experiment, we ask you not to click the "Next" button on your screen until asked to do so by the experimenter.

[But please click the 'Next' button now.]²

Initial Instructions

Today's experiment has three parts. In addition to the 5 Euro payment that you receive for your participation, you will be paid an additional amount of money that you accumulate from decision tasks in the three parts of the study. The exact amount you receive will be determined during the experiment, and will depend on your decisions, and the decisions of others.

We will give you further information about parts two and three of the experiment once we get there.

² Unless otherwise indicated, text in square brackets was read by the experimenter, but did not appear on participants' screens.

All monetary amounts you will see in this experiment will be expressed in experimental currency units (ECU). At the end of the experiment, your earnings in ECU will be exchanged into Euro at a rate of

10 ECU = 1 Euro

If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk or try to communicate with other participants, unless asked to do so.

[Does anyone have any questions so far?]

[If not, please click “Next” now to see the instructions for the first part of the study.]

Part 1

This is the start of Part 1 of the experiment.

In Part 1, you will make a simple economic decision. You will receive detailed instructions before you make the decision.

Please note that the decision you make in this part does not influence the future course of the study. You will be informed about the outcome of your decision, and the earnings you received, at the end of the study.

[Does anyone have any questions so far?]

[If not, please click “Next” to continue.]

Investment Decision

The decision we ask you to make is an investment decision. This decision is for real money; the result of your decision will be added to your account and paid to you at the end of the experiment.

You start the investment task with a balance of 20 ECU. You choose how much of this amount (from 0 ECU to 20 ECU) you wish to allocate to the investment.

The ECU that you choose *not to invest* will be saved in your account and cannot be lost. You will receive these ECU at the end of the experiment.

The value of the ECU you choose *to invest* depends on the success or failure of the investment.

The success or failure of the investment will be determined by a computerized random draw, similar to a coin flip. There are two possible outcomes:

- With 50% probability the investment fails and you lose the amount invested.
- With 50% probability the investment succeeds and you receive 2.5 times the amount invested.

So, for any amount X that you invest, you will keep $20 - X$, regardless of what happens with the investment. If the investment fails, which happens with 50% probability, your total earnings from this decision will be $20 - X$, since you lose the amount that you invested. If the investment succeeds, which also happens with 50% probability, your earnings from the decision will be $20 - X + 2.5 \cdot X = 20 + 1.5 \cdot X$

When you are ready, please enter the amount you wish to invest on your screen. If you have any questions in the meantime, please raise your hand and an experimenter will come to you.

[After you have made your decision, please click "OK" to continue.]

[For screen only:]

Your Decision:

Please enter the amount of money (from ECU 0 to ECU 20) you wish to invest:

ECU _____

[Wait Screen]

This is the start of Part 2 of the experiment.

In Part 2 of the experiment, you will earn money for your performance in a task. Part 2 has 3 rounds and the task is the same in all rounds. However, the way you are paid for your performance will vary from round to round. We will explain how you will be paid at the beginning of each round.

At the end of the experiment, the computer will randomly pick one of the three rounds of Part 2 for your payment. Only that round will be paid out.

[Does anyone have any questions?]

[If not, please click “Next” to continue to the description of the task.]

Part 2 – Round 1

Task

The task in each round of Part 2 consists of calculating the sum of five randomly chosen two-digit numbers.

Example: $24+56+97+71+45=?$

In each round, you have 4 minutes to complete as many sums as you can. You cannot use a calculator or phone to determine the sums, however, you are welcome to write the numbers down and make use of the provided scratch paper.

[Does anyone have any questions so far?]

[If not, please click “Next” to continue.]

This is the beginning of Round 1.

Remember that Part 2 consists of three rounds. In each round you will solve sums for 4 minutes. After the three rounds the computer will randomly select one round for payment. If the current round, Round 1, is selected for payment, you will be paid as follows: you will receive 10 ECU for each correctly solved sum.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to start the task.]

[Wait Screen, followed by four minutes of solving addition problems.]

Your score is <score>.

Part 2 – Round 2

This is the start of Round 2. The task is exactly the same as before but the way you are paid for your performance is different.

In this round, you will compete against another participant. This participant is chosen randomly among all other participants who are in the lab with you today.

If this round is selected for payment, you will be paid as follows: You receive 20 ECU for each correctly solved sum if you solve more sums than your opponent. You receive no payment if you perform worse than your opponent. In case of a tie, the computer will randomly determine whether you win or lose.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to start the task.]

[Wait Screen, followed by four minutes of solving addition problems.]

Your score is <score>.

Part 2 – Round 3

This is the start of Round 3.

The task is the same as in the previous rounds. However you will now get to choose which of the two previous payment schemes you prefer to apply to your performance in the third round. You can choose between **Piece Rate** (same as in Round 1) and **Competition** (same as in Round 2).

If Round 3 is the one randomly selected for your payment, then your payment is determined as follows:

- If you choose Piece Rate, you receive 10 ECU per sum that you solve correctly
- If you choose Competition, your performance will be compared to a randomly selected opponent (as in Round 2). This opponent will be randomly selected among all other participants present here today, regardless of which payment scheme they choose. If you solve more sums than your opponent, you receive 20 ECU per correct answer. If you perform worse than your opponent, you receive nothing. In case of a tie, the computer will randomly determine whether you win or lose.

If you choose Competition, you will be informed about the outcome of the competition when you have finished solving sums.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to go to the next screen.]

[CONTROL CONDITION ONLY]

After you have made your decision and entered your choice on the screen, but before you start solving sums, we will ask each of you to stand up next to your desk. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your name. Specifically, we will ask you to say “Hi, my name is (your name)”. Please use this exact sentence when you stand up.

You will be called forward one by one in the order of your computer number. Please remain standing, pay attention to the other participants and wait for your turn.

After everybody has introduced themselves, the third round will proceed.

In short, Round 3 thus proceeds as follows:

1. All participants choose their preferred payment for Round 3.
2. All participants stand up and introduce themselves.
3. All participants solve sums.

The next screen will ask you to choose whether you want the Piece Rate or the Competition applied to your performance in Round 3.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to start the task.]

[PUBLIC CHOICE CONDITION ONLY]

After you have made your decision and entered your choice on the screen, but before you start solving sums, we will ask each of you to stand up next to your desk. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your name and what payment method you chose for the third round. Specifically, we will ask you to say “Hi, my name is (your name) and I chose the piece rate” or “Hi, my name is (your name) and I chose to compete”. Please use this exact sentence when you stand up.

You will be called forward one by one in the order of your computer number. Please remain standing, pay attention to the other participants and wait for your turn.

After everybody has introduced themselves, the third round will proceed.

In short, Round 3 thus proceeds as follows:

1. All participants choose their preferred payment for Round 3.
2. All participants stand up, introduce themselves and announce their choice of payment method.
3. All participants solve sums.

The next screen will ask you to choose whether you want the Piece Rate or the Competition applied to your performance in Round 3.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to start the task.]

[PUBLIC OUTCOME CONDITION ONLY]

After you have made your decision and entered your choice on the screen, but before you start solving sums, we will ask each of you to stand up next to your desk. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your

name and what payment method you chose for the third round. Specifically, we will ask you to say “Hi, my name is (your name) and I chose the piece rate” or “Hi, my name is (your name) and I chose to compete”. Please use this exact sentence when you stand up.

You will be called forward one by one in the order of your computer number. Please remain standing, pay attention to the other participants and wait for your turn.

After everybody has introduced themselves the third round will proceed, and all participants solve sums. When all participants have finished solving sums, we will ask all of you to stand up again. This time we will ask you to, one by one, walk to the front and state whether you chose competition, and if yes, what the outcome was. That is, we will ask you to say “I chose the piece rate”, or “I chose to compete, and I won/lost the competition”. When you stand up, please use this exact sentence.

In short, Round 3 thus proceeds as follows:

1. All participants choose their preferred payment for Round 3.
2. All participants stand up, introduce themselves and announce their choice of payment method.
3. All participants solve sums.
4. All participants stand up and announce their choice of payment method. Those who chose the competitive payment also announce whether they won or lost the competition.

The next screen will ask you to choose whether you want the Piece Rate or the Competition applied to your performance in Round 3.

[Please raise your hand if you have any questions.]

If you do not have any questions, please click “OK” to start the task.]

[Wait Screen]

[ALL CONDITIONS]

Which compensation scheme do you choose?

- Piece-rate pay (10 ECU per correct answer)
- Competition pay (20 ECU per correct answer if you win, nothing if you lose)

Please click OK when you're ready to continue.

[Wait Screen]

[CONTROL CONDITION ONLY]

We will now start with the introductions. Remember that we ask each of you to stand up next to your desk. [Please do so now.]. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your name. Specifically, we ask you to say **"Hi, my name is (your name)"**. Please use this exact sentence when you stand up.

Please listen to the experimenter who will call out your computer numbers one by one. Please remain standing, pay attention to the other participants and wait for your turn.

Please do not click the "Continue" button on your screen until prompted by the experimenter.

[Please click the "Continue" button to start the task.]

[[participants need to click the ok button when they are done with the task]]

[PUBLIC CHOICE AND OUTCOME CONDITIONS]

We will now start with the introductions. Remember that we ask each of you to stand up next to your desk. [Please do so now.]. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your name and what payment method you chose for the third round. Specifically, we ask you to say **"Hi, my name is (your name) and I chose the piece**

rate”, or “Hi, my name is (your name) and I chose to compete”. Please use this exact sentence when you stand up.

Please listen to the experimenter who will call out your computer numbers one by one. Please remain standing, pay attention to the other participants and wait for your turn.

Please do not click the “Continue” button on your screen until prompted by the experimenter.

[Please click the “Continue” button to start the task.]

[[participants need to click the ok button when they are done with the task]]

[If Piece Rate]: Your score is <score>.

[If Tournament]: Your score is <score>. You won/lost against your opponent.

[PUBLIC OUTCOME CONDITION: PIECE RATE]

We will now start with the outcomes. Remember that we ask each of you to stand up next to your desk. [Please do so now.] We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your choice of payment. Specifically, we ask you to say **“I chose the piece rate”** Please use this exact sentence when you stand up.

Please listen to the experimenter who will call out your computer numbers one by one. Please remain standing, pay attention to the other participants and wait for your turn.

Please do not click the “Continue” button on your screen until prompted by the experimenter.

[Please click the “Continue” button to start the task.]

[Wait Screen, followed by four minutes of solving addition problems.]

[PUBLIC OUTCOME CONDITION: COMPETITION]

We will now start with the outcomes. Remember that we ask each of you to stand up next to your desk. [Please do so now.]. We will then, one by one, ask you to walk to the front of the lab [where I am standing now], and tell the other participants your choice of payment and the outcome of the competition. Specifically, we ask you to say “**I chose the competition and I won/lost.**” Please use this exact sentence when you stand up.

Please listen to the experimenter who will call out your computer numbers one by one. Please remain standing, pay attention to the other participants and wait for your turn.

Please do not click the “Continue” button on your screen until prompted by the experimenter.

[Wait Screen, followed by four minutes of solving addition problems.]

[Please click the “Continue” button to go to the third part.]

Before we move to Part 3 of the experiment, we would like you to guess how well you performed at the task in **Round 2** of Part 2, compared to the other people who are present in the lab with you. (In Round 2, you and the other participants all competed against a random opponent.)

We ask you to guess your rank among all participants in Round 2. You will receive a bonus of 10 ECU if your guessed rank is correct. There are NN people in the lab today including yourself.

What was your rank in Round 2? Please choose a value between 1 (best) and NN (worst).

[After you have made your decision, please click "OK" to continue.]

[Wait Screen]

This is the start of Part 3 of the experiment.

In this part we ask you to read the instructions on your own, and work through a questionnaire independently. In the questionnaire, you should take the perspective of a manager and evaluate a candidate for an internship in your organization. Please read the Background Information below and then follow the Assessment Instructions. Don't forget to click the continue button on your screen to move ahead and fill out the whole questionnaire.

Background Information

Imagine you are a manager in one of the branch offices in Berlin of a large commercial bank based in Geneva. The head of the branch office (your boss) has authorized you to hire a few interns to work for you over the summer.

Each year, the headquarters in Geneva pays for summer interns to help out in the various branch offices. The internship program runs for 8 weeks, from mid-June to mid-August. Different branches have different needs, so interns might work on anything from new program planning to accounting or administrative duties. The interns usually work together and collaborate in groups consisting of two or three interns. The main purpose of the internship program is recruitment. The internship program provides an opportunity for the bank to identify and attract talented college students to careers in commercial banking and to your bank in particular.

You are very glad to be in charge of the selection process because you really want good interns this year. A capable team of interns could be of great assistance to you and your team.

The HR department has already identified a couple of candidates, and asks that you evaluate one of them. On the next screen you will see a few notes from the interview. Please review this material together with the candidate's resume, which is handed out by the experimenter.

Please click "Next" on your screen to see the interview notes.

Please read the interview notes below together with the resume.³

When you are ready for the assessment, please click the “Next” button on your screen to get to the assessment material. The interview notes will remain accessible as you make your assessment of the candidate.

Interview Notes for Riley Watkins:

- Riley is an articulate and intelligent young (wo)man.
- Very energetic and outgoing.
- He(She) has terrific and directly relevant work experience from another bank. He(She) could definitely hit the ground running.
- He(She) seems genuinely enthusiastic about the position, and is interested in continuing his(her) employment at the bank after the internship program ends.
- [Competitive Vignettes Only:] He(She) also said that he(she) found competitive environments stimulating, and asked if the bank provides a ranking of the interns hired for the year's summer internship program, after the program is completed.

Step 1. Please rate on a scale of 1 – 7 (1 = not at all, 7 = perfectly) how much each of the following words characterizes **YOUR IMPRESSION of the candidate** based on the resume and interview notes.

	<i>Not at all</i>			Somewhat		Perfectly	
Aggressive	1	2	3	4	5	6	7
Ambitious	1	2	3	4	5	6	7
Analytical	1	2	3	4	5	6	7
Arrogant	1	2	3	4	5	6	7
Assertive	1	2	3	4	5	6	7
Competent	1	2	3	4	5	6	7
Competitive	1	2	3	4	5	6	7
Confident	1	2	3	4	5	6	7

³ The interview notes varied the gender of the applicant, and the inclusion of the last bullet point. The resume can be found below.

Determined	1	2	3	4	5	6	7
Dominating	1	2	3	4	5	6	7
Friendly	1	2	3	4	5	6	7
Good listener	1	2	3	4	5	6	7
Helpful	1	2	3	4	5	6	7
Independent	1	2	3	4	5	6	7
Kind	1	2	3	4	5	6	7
Likeable	1	2	3	4	5	6	7
Over-bearing	1	2	3	4	5	6	7
Popular	1	2	3	4	5	6	7
Sensitive to needs of others	1	2	3	4	5	6	7
Sincere	1	2	3	4	5	6	7
Supportive	1	2	3	4	5	6	7
Warm	1	2	3	4	5	6	7
Works well under pressure	1	2	3	4	5	6	7

To confirm your entries and get to the second step, please click the “Continue” button.

Step 2. Please answer the following questions about the candidate on a scale of 1-7.

1. How likely is it that the candidate has the skills for the job? (Scale: not at all likely-extremely likely)	1	2	3	4	5	6	7

2. How beneficial would it be to have this candidate working for you? (Scale: not at all beneficial-extremely beneficial)	1	2	3	4	5	6	7
3. How much would you enjoy having this candidate working for you? (Scale: not at all enjoyable-extremely enjoyable)	1	2	3	4	5	6	7
4. How likely is it that <u>you</u> would hire this candidate for the position? (Scale: not at all likely-extremely likely)	1	2	3	4	5	6	7

To confirm your entries and get to the third step, please click the “Continue” button.

Step 3

In Step 3 we ask you to answer the same questions as in Step 2 a second time. However, we ask you to answer them in a different way.

In Step 3, everybody present in the laboratory will answer the same questions, which you see on your screen below, once again. Now we ask you to think about how the other participants present here today rate the internship candidate on the four questions, and try to guess what the most common answer will be. That is, we ask you to tick, for each of the questions, the button that corresponds to what you think will be the most frequent rating chosen by the other participants in the room when they answer the questions this second time.

Please think carefully about your answer. For each response that you provide that is the same as the most common response in today’s session, you will earn an additional 10 ECU. For example, if most people answer the first question "How likely is it that the candidate has the skills for the job?" with a 4, meaning “somewhat” then you would receive 10 ECU if you chose 4 as well. Otherwise you receive no additional payment from that question. You will be informed about your earnings from this step at the end of the study.

If you have any questions, please raise your hand and wait for the experimenter to come to you.

Please indicate how you think most other persons present here today answered the questions about the candidate on a scale of 1-7.

Riley Watkins⁴

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13189 Berlin

Mobile + 49 1573 3029742
Email riley.watkins@gmail.com
Birthday 17/11/1991

Academic Career

10/2013 – 09/2015 **Humboldt University of Berlin**, Berlin
Master of Science in Economics and Management Science (M. Sc.)
09/2010 – 06/2013 **Ludwig Maximilian University of Munich**, Munich
Bachelor of Science in Business Administration (B. Sc.)
09/2001 – 07/2010 **Hegau - Gymnasium**, Singen
Higher education entrance qualification

Professional Experience

10/2015 – 04/2016 **TFC Bank**, Berlin
Mortgages and Loans
Internship

- Advising clients on mortgages
- Examining past data on mortgages
- Analyzing and summarizing financial reports

Presenting financial reports to the team
07/2013 – 09/2013 **Smith Management Consultants**, London (UK)
Customer Management and Service
Internship

- Support in administration
- Preparation of company presentations for clients

07/2011 – 05/2013 **Adam's Book Shop**, Munich
Administration and Accounting
Student assistance

- Support in administration and accounting

Skills

EDP MS Office (Word, PowerPoint, Outlook and Excel)

Languages

German:	Native speaker
English:	Native speaker
French:	Fluently, written and spoken
Spanish:	Basic communication skills

Personal Interests: Traveling, diving and skiing

References: Upon request

⁴ A printed version of this resume was distributed to all participants at the start of part 3 of the experiment. For the sessions run in 2018 all dates were moved forward by two years to be closer to the date of the sessions.