

Credit Attribution to Joint Production

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- **Recent observational study: in academia, women penalized for co-authorship** in a way that men are not (Sarsons, 2017 and 2019)

"While the results presented in this paper are correlations, they provide suggestive evidence that gender plays a role in promotion decisions. The probability that a woman receives tenure is significantly lower when she coauthors unless she works with other women. Men, on the other hand, have an equal probability of receiving tenure when they coauthor and solo author, conditional on the quality of the paper."

- **Discrimination (often) mentioned, but hard to empirically establish: the usual issues**
 - **We study this in controlled environment**
1. **Laboratory experiments** in Bologna & Abu Dhabi
 2. **Field experiment** (Qualtrics) amongst HR workers in US and India

Both:

- test whether contribution of men & women to ‘joint work’ is **evaluated differently**
- distinguish between **statistical discrimination** –based on facts or beliefs- and **taste** discrimination
- **male- and female oriented** task

2x2 between-subject design

		Information	
		Individual	Aggregate
Task	Female-biased		
	Male-biased		

- **two types of participants**, A ('worker') and B ('employer')
- **Bologna**: each session **10 As and 20 Bs**; **groups** consist of 2 As and 4 Bs
- **Abu Dhabi**: players play both roles; ex post random assignment of role (strategy method)

- **Stage 0:** Each participant fills out background info, including gender. Depending on gender, subject chooses a **nickname** “to be identified in remainder of the experiment”
- **Stage 1:** Each participant conducts a **real effort task** for 15 minutes. Earnings are individual, determined by performance
- **Stage 2:** Each B participant makes **hiring decision** between two type A
- **Stage 3:** The chosen A does the same real effort task again, and earns in the same way as in stage 1. Each B player that chose this A earns the same amount as the A

- Each type B chooses between two types A
- The information she receives about candidates is treatment variable:
 - **Individual performance** treatment: B is told the individual score of each A candidate
 - **Aggregate performance** treatment: B is told the sum of the scores of the two A candidates
- In addition, in both treatments the B is told the **(chosen) name** of each A, **reflecting gender**

- **Female-oriented task:** Word-in-a-Word puzzle (Shurchkov 2012) –henceforth ‘Words’
- **Male-oriented task:** adding up highest numbers in pairs of 10x10 matrices (Weber and Schram 2017) – henceforth ‘Numbers’
- **Why?** gender performances may be **task-dependent** (e.g. Günther et al. 2010)

Problemi svolti:	4	Numero del problema:	
Punti ottenuti nei problemi precedenti:	-2	Inserisci una parola:	<input type="text"/>
	8		
Tempo:	01:00	<input type="button" value="invio"/>	

Problema: **TURISMO**

Parole Inserite	Punti
MISTURO	3
TRUISMO	3
SMUORI	2
MORTI	1
IUSTO	1
OSITIO	-2

Rules

- five letters or more
- each letter of given word used once
- only alpha-numeric letters
- proper nouns not allowed
- plurals, verb conjugations allowed
- words without accent

Find as many 'sub-words' as you can that can be formed out of the letters of the given word

Numero delle somme corrette fino a qui: 1
Numero delle somme scorrette fino a qui: 1
Numero di problemi che possono ancora essere risolti: 28

25	23	19	18	34	18	76	70	59	58
12	76	54	45	18	47	58	25	38	25
86	62	79	55	79	10	82	60	11	45
36	44	53	63	84	55	23	63	61	52
41	43	38	71	20	50	20	41	55	55
84	41	39	21	32	51	25	88	88	83
86	56	39	70	13	45	46	15	80	76
79	77	32	58	55	40	85	58	84	29
64	85	51	86	27	54	21	21	27	66
31	35	13	50	32	86	43	17	82	36

33	66	56	39	51	72	45	60	39	42
57	56	22	73	25	29	50	56	29	53
29	59	36	41	20	68	62	39	15	18
68	69	50	67	65	66	24	12	24	42
43	29	13	33	23	39	70	52	14	42
19	16	13	10	52	53	69	44	57	17
36	15	72	69	30	71	63	62	23	20
32	13	62	27	43	43	71	29	32	72
53	18	10	35	61	15	35	37	57	60
15	22	68	72	57	71	67	70	13	17

Il numero più grande della matrice sinistra più il numero più grande della matrice destra:

1. find highest number on the left
2. find highest number on the right
3. add them up, enter and confirm
4. if correct, earnings increase by 50 cents
5. correct or incorrect: new matrices appear

- Test whether two tasks are indeed **perceived to be female- or male-biased**
- **No hiring** in stage 2
- Instead, everyone asked to **bet** whether men or women scored better in stage 1. Correct bet gives 5 euro
- One session for ‘female’ task and one for ‘male’
- Only in **Bologna**

Beliefs: Bets (Only Bologna)

	Fraction of men that think women are better	Fraction of women that think women are better	Total fraction that think women are better
Numbers	0.47 ($p>0.99$)	0.67 ($p=0.30$)	0.57 ($p=0.58$)
Words	0.73 ($p=0.12$)	0.60 ($p=0.61$)	0.67 ($p=0.10$)

- Little evidence that men or women are **perceived** to differ in their ability on these tasks (but $N=30$)
- Similar evidence for Numbers task in other project

Gender Differences in Performance

Bologna		Women	Men
All sessions (score in stage 1)	Numbers (#correct sums)	9.3	10.8
	Words (#points)	34.1	38.2

Abu Dhabi		Women	Men
All sessions (score in stage 1)	Numbers (#correct sums)	10.9	11.6
	Words (#points)	23.3	28.1

- Only significant difference between men and women: male task in Bologna ($p=0.01$)

Hiring Decisions: Individualized information

Fraction of time higher score was selected	Bologna	Abu Dhabi
Numbers	0.90	0.92
Words	0.95	0.95

- Without uncertainty, candidate with highest performance is chosen => **no gender discrimination**

Hiring Decisions: Aggregate information

Focus: choices woman/man: fraction of women chosen

Bologna	Men choosing	Women choosing	All
Numbers	0.70, $p=0.05$, N=27	0.44, $p=0.69$, N=25	0.58, $p=0.33$, N=52
Words	0.68, $p=0.11$, N=25	0.53, $p>0.99$, N=15	0.63, $p=0.16$, N=40

Abu Dhabi	Men choosing	Women choosing	All
Numbers	0.50, $p>0.99$, N=8	0.58, $p=0.59$, N=12	0.55, $p=0.66$, N=20
Words	0.80, $p=0.05$, N=10	0.57, $p=0.61$, n=14	0.67, $p=0.10$, N=24

➤ If anything, men discriminate **in favor of women**

- **Men discriminate in favor of women (perhaps)**
- **No evidence of statistical discrimination:**
 - **Beliefs:** men do not believe that women are better at numbers task in Bologna
 - **Facts:** if anything, men are better (average scores in stage 1)
- **Taste-based discrimination, but **opposite to what we expected****
 - **NB.** This is not due to rational expectations about round 2: men and women both improve after being hired

- These results raise question in **comparison to observational field data**
- First obvious explanation: **subject pools**
- We take the **lab to the field**
- People working in **Human Resources** face similar choices
- Compare **US and India**
 - Both in English
 - Distinct cultures w.r.t. gender inequality
- Platform: **Qualtrics**

- We have data from Bologna and AD of subjects who **did a task (only consider first time)**
- We make a **set of profiles** with type of degree, field of study, age, gender, region of nationality, and some information on score in task
- Respondent's task is to choose a candidate (**individual choice experiment**)
- Paid according to this candidates score
- **Treatments:** between-subject 2 x 2 x 2
 - Task:** Numbers or Words
 - Information:** Individualized (control) or paired
 - Country:** Respondent in US or India

Example of Individualized Info in Control (Numbers)

	Student 1	Student 2	Student 3	Student 4
Type of degree	5-year degree	4-year degree	4-year degree	5-year degree
Field of study	Humanities	Social sciences	Law studies	Engineering
Age	22	25	18	21
Gender	Male	Male	Female	Male
Region of nationality	North America	Sub Saharan Africa	South Asia	European Union
Score in addition task	2 additions	20 additions	14 additions	8 additions



“dominant choice”

Example of Aggregate Info in Control (Numbers)

	Student 1	Student 2	Student 3	Student 4
Type of degree	4-year degree	4-year degree	4-year degree	5-year degree
Field of study	Social sciences	Social sciences	Engineering	Law studies
Age	19	19	Kept constant in dominant choices	
Gender	Male	Female		
Region of nationality	North America	North America	South Asia	European Union
Score in word task	Student 1 + Student 2 = 40 points		Student 3 + Student 4 = 14 points	

“dominant choice”

- Respondents (HR workers) approached by Qualtrics to **log in**. Do the task (dependent on treatment) for **5 minutes** (rerouted to our server)
 - **Male task: 6x6** matrix instead of 10x10
 - **Female task: four-letter words** instead of five
- Incentivized earn \$0.15 for each correct summation or \$0.06 per point in words task
- Then asked to make **three times choice** out of four candidates
- Incentivized earn \$0.15 for each correct summation or \$0.06 per point in words task **by the chosen students**

➤ Respondents asked if they believe men or women are better: **correct answer pays \$1.50**
 (“we calculated the average score of all female students and the average score of all male students who participated in the task across all the regions of the world”)

- Female students are much better (the average score of female students is 4 more than that of male students)
- Female students are slightly better (the average score of female students is between 1 and 3.99 more than that of male students)
- Male and female students are about the same (the average score of male and female students differs by less than 1)
- Male students are slightly better (the average score of male students is between 1 and 3.99 more than that of female students)
- Male students are much better (the average score of male students is 4 more than that of female students)

- Qualtrics approached **HR workers in US and India**
- **Randomly assigned to Numbers or Words (50%-50%)**
- **Randomly assigned to control or paired info (10%-90%)**
- **Implemented attention checks**
 - ❑ (understood instructions & read carefully)
- Qualtrics pays respondents in **points to be redeemed** for Amazon vouchers, frequent flyer miles, etc.
- **Number of respondents: 350 in India, 259 in the US**
- **We only consider respondents involved in hiring: 335 in India, 225 in US; those that pass attention checks: 281 in India, 217 in US**

Numbers of Observations			
India		US	
Control	Treatment	Control	Treatment
19	262	20	197

Fraction Dominated Choices			
India		US	
Control	Treatment	Control	Treatment
0.32	0.24	0.18	0.18

No difference across tasks

dominated choices **not randomly distributed** across respondents (χ^2 , $p = 0.001$)

⇒ Some respondents understand this better than others

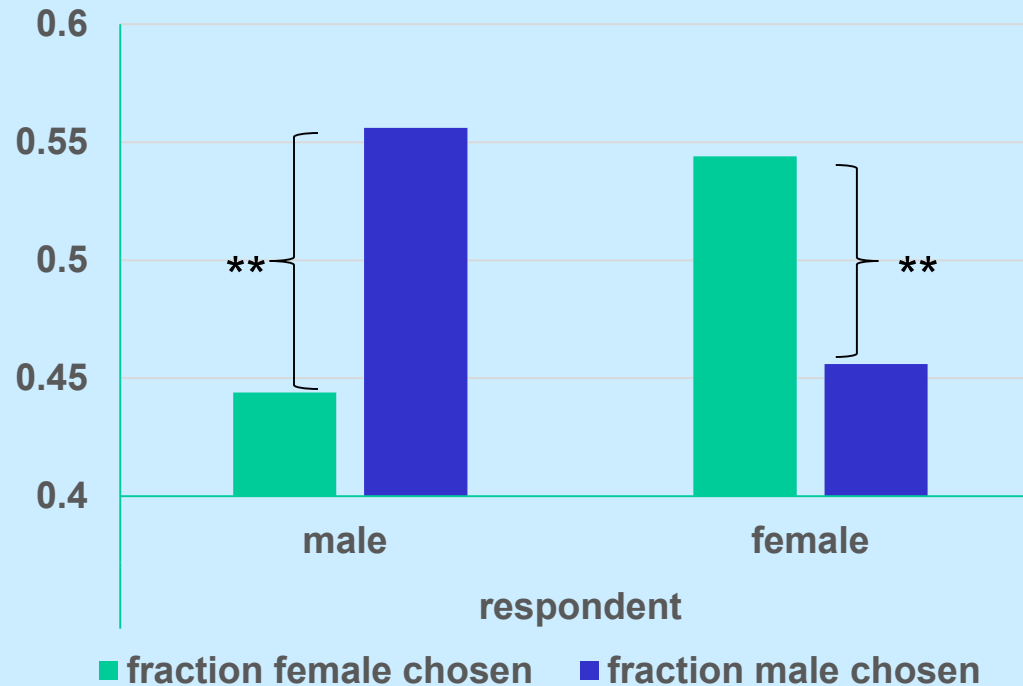
⇒ Logit of dominant choice on background variables: **no effects found**

From here on we consider

- **Joint information treatment**
- **Only dominant choices**
- **(involved in hiring and passed attention checks)**
- **two-sided tests**

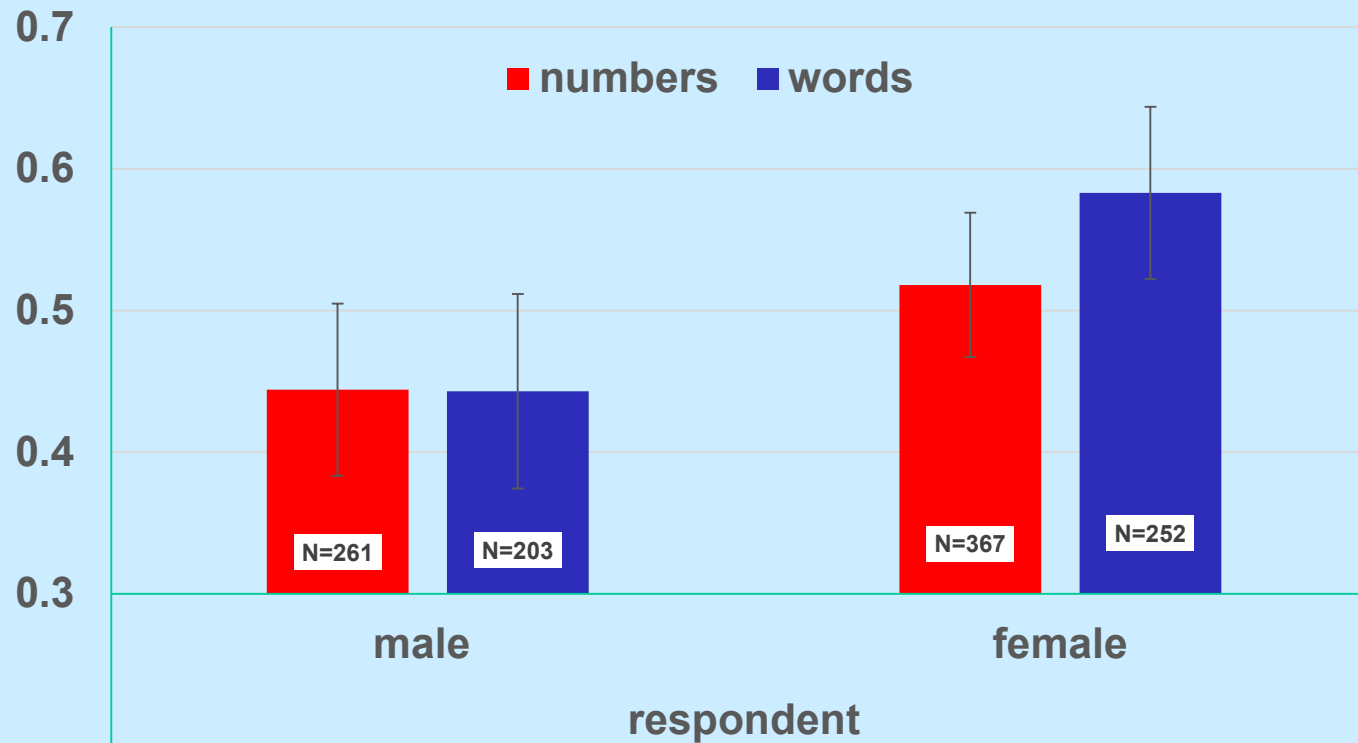
N = 1083 choices, made by **443** individuals

Fraction of time the woman is chosen



Consequence:

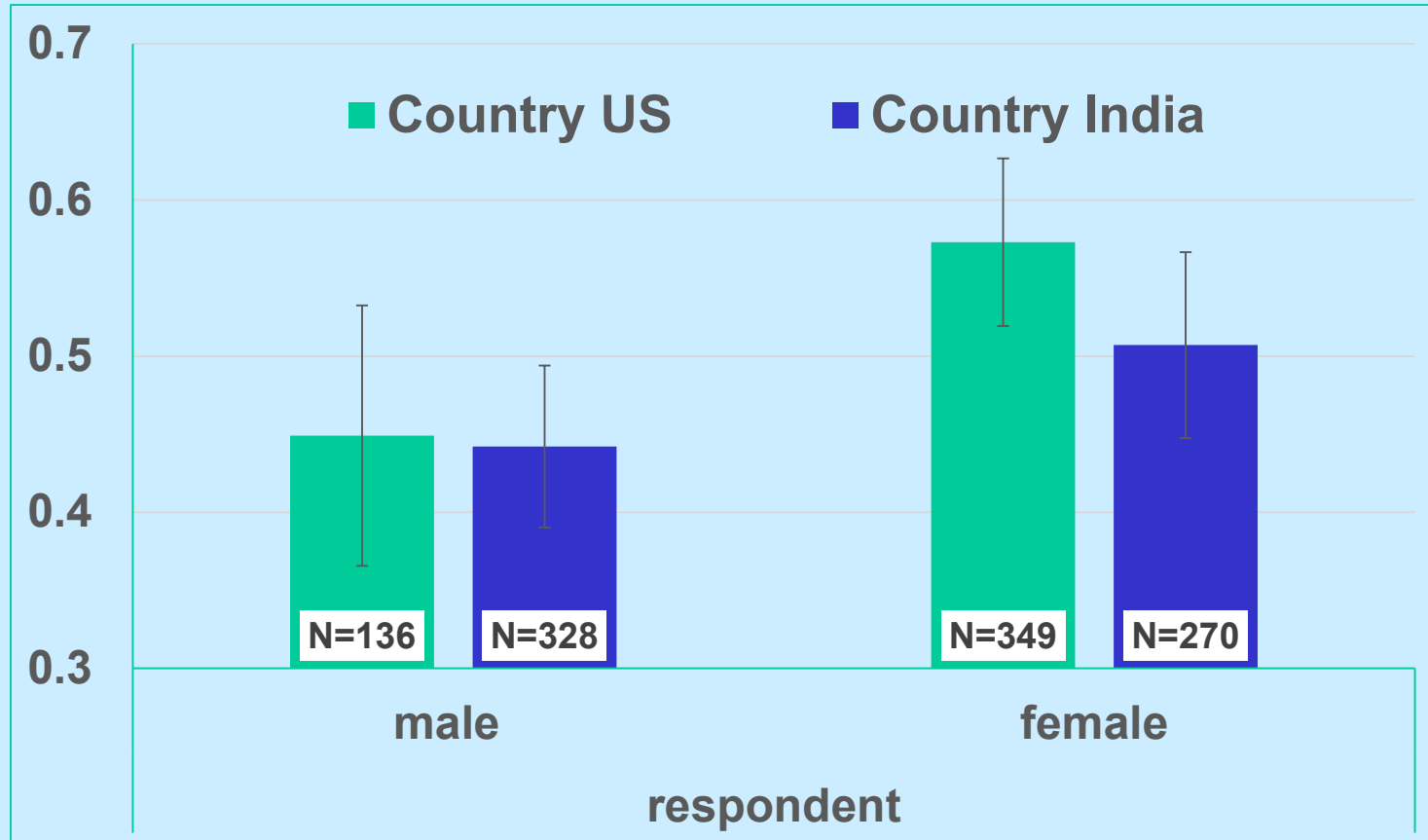
fraction of men choosing female candidate < fraction women choosing female candidate
(prop. test, $p = 0.001$, $N = 1083$)



Prop. tests for difference between tasks:

Men: $p = 0.981$, $N = 464$ **insignificant**

Women: $p = 0.107$, $N = 619$ **insignificant**



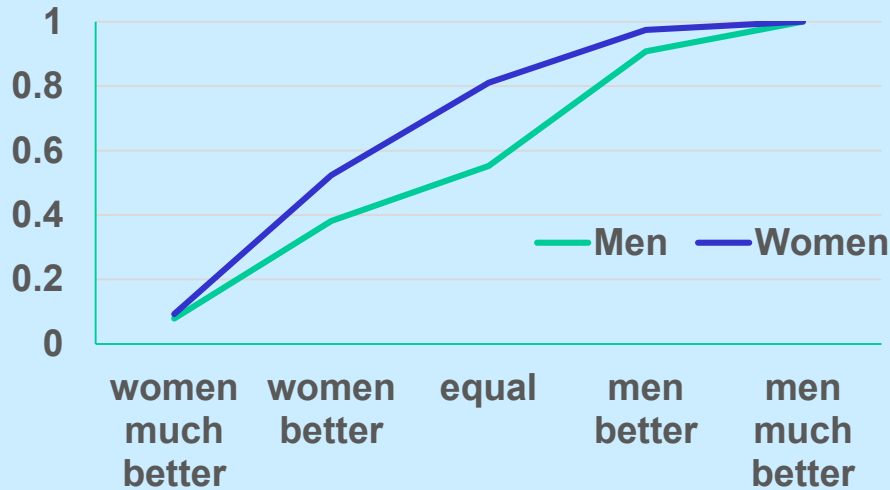
Prop. tests for difference between tasks:

Men: $p = 0.899$, $N = 464$ **insignificant**

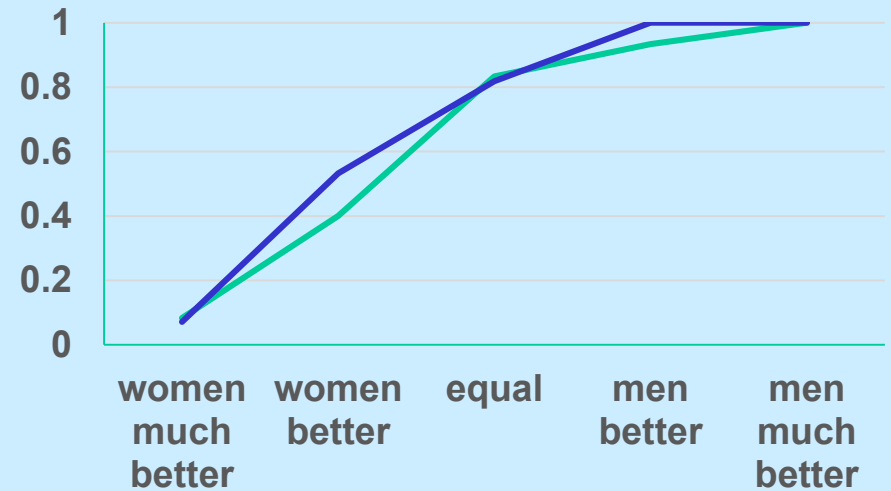
Women: $p = 0.104$, $N = 619$ **insignificant**

- 1. Men choose the female candidate significantly less often than women do**
 - Men choose female significantly less often than 50%
 - Women choose female significantly more often than 50%
- 2. Men's choices are not affected by task
Women's choices are not affected by task**
- 3. Men's choices are not affected by country
Women's choices are not affected by country**

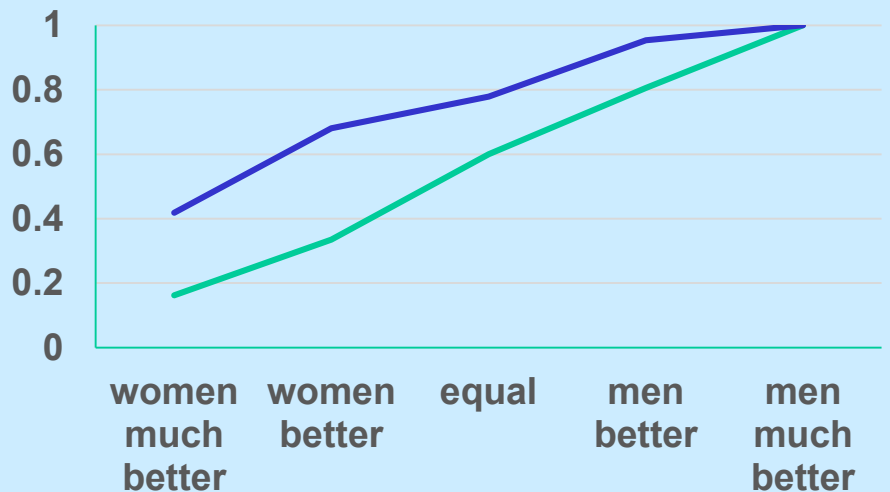
US – Numbers



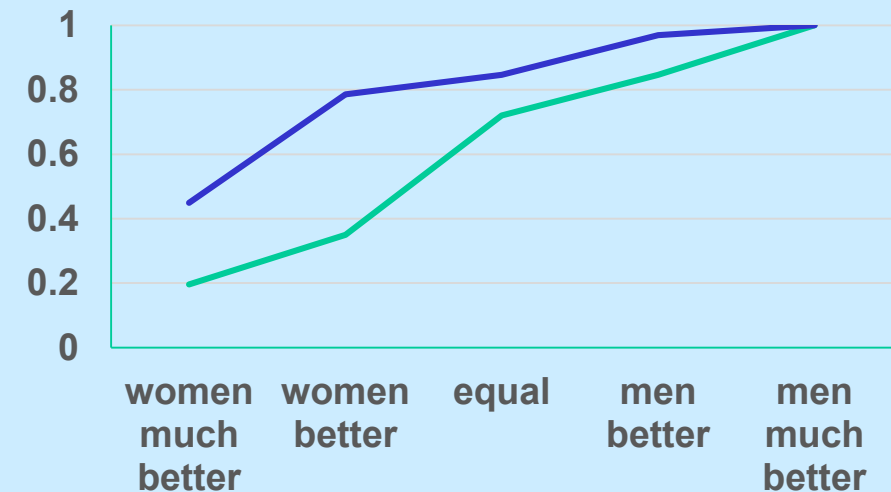
US – Words



India – Numbers



India – Words



Conclusion: 4. women have more faith in women than men do

Logit: choosing female candidate on beliefs (robust standard error clustered by id) and dummy for India; beliefs: -2, -1, 0, 1, 2.

task	respondent	Mean Belief	Marginal Effect
Numbers	Male	0.092	-0.113***
	Female	-0.602***	-0.058**
Words	Male	-0.153	-0.080***
	Female	-0.667***	-0.064**

**Conclusion 5: Women are more biased;
men respond more strongly to beliefs**

(doesn't explain why men show gender bias in hiring)

NB: there are no significant gender differences in actual performance in any task-country combination

Logit regression of Choosing Female Candidate (marginal effects; clustered at individual)

	Choose Female	Choose Female	Choose Female
Female	0.102***	0.104***	0.053
Word task	0.037	0.081*	0.069
Belief			-0.076***
Age		0.003*	0.003
India		-0.025	-0.052
Higher Education		0.072	0.074
Distance to CEO		-0.020	-0.032
Candidate's Age		-0.041***	-0.041***
Joint Score		-0.003***	-0.002***
N	1083	1083	1083

6. **The effect of gender on the choice of a female candidate is mediated by beliefs**
7. **The candidate's age correlates negatively with the likelihood of choosing the female candidate**
Why? – seems unrelated to age distribution of male and female candidates
8. **The higher is the joint score, the less likely it is that the female candidate will be chosen**

This is preliminary analysis of data. **Suggestive** of:

- **Male bias against women** in credit attribution to joint work (like Sarsons, unlike lab);
- Also **female bias against men** in credit attribution to joint work (Sarsons for Sociology?)
- These biases are **robust** across countries and tasks
- We need to explain **beliefs** (choices are rationalizable with beliefs)
- Interesting phenomenon: **bias increases with quality** of the joint production