

# Whose Job Is it? Measuring Implicit Gender Bias Toward Occupations in Uganda and India

Christian Castaño Bonilla (World Bank)  
Aletheia Donald (World Bank)  
Anita Raj (Tulane University)

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# MAGNET Initiative

- World Bank (Africa GIL and LSMS), IFPRI, IRC partnership w/researchers at Oxford, Tufts, Brookings, Makerere, ADB and CUNEF
- Aims to broaden and deepen the measurement of gender equality & women's agency and promote the adoption of new measures at scale
- Developed 24 new measurement tools
- Validated through 75 data collection rounds across Sub-Saharan Africa, Latin America, Central & Western Asia and South Asia



# This paper: Motivation

Implicit attitudes matter for understanding behavior

- Occupational bias can create labor market inefficiencies

**Challenge:** Implicit attitudes suffer from measurement error

**Our Approach:** capture automatic cognition using Affect Misattribution Procedure (AMP)

- Fast, effortless cognition with little conscious awareness

# Contribution

**AMP:** Implemented in high-income countries (Payne et al. 2005, 2014)

- Topics: racial attitudes, political preferences, consumer evaluations
- Few gender applications (Vuletic et al. 2020)
- Rarely used outside labs (Seel & Teige-Mocigemba 2014)

**Lower-income countries:** IAT, list experiments, audit studies used to capture bias

- Few measure occupational gender bias specifically (Jain et al. 2022)

**Our Contribution:**

- Validate AMP in two LMICs with text + visual primes
- Expand evidence on implicit occupational bias

# Experimental Design

- Respondents are shown primes (professions with gender congruent or incongruent subjects) and neutral images in quick succession
  - 3 blocks, each with 11 randomly selected primes
  - Text or image version randomly assigned (balanced)



氏

In your opinion, is this Chinese character more pleasant or less pleasant than the average Chinese character?

- More pleasant
- Less pleasant

Click this button to continue

# Respondent Characteristics

Variable	India	Uganda
Is female	0.50	0.53
Average age	42.04	41.91
Completed secondary	0.25	0.18
Is working	0.70	0.92
HH size	4.47	6.33
Is married	0.84	0.89
<b>Sample size</b>	<b>1,556</b>	<b>1,941</b>

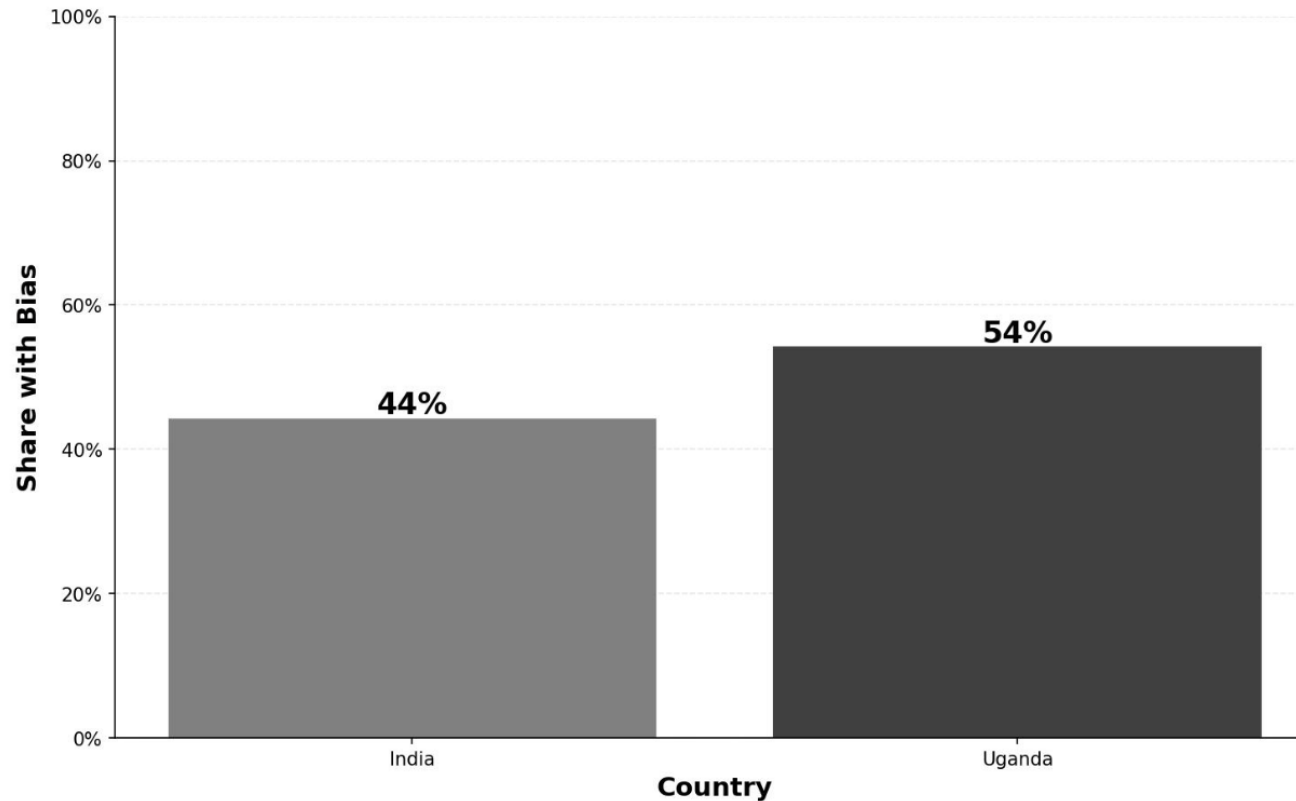
- Randomly sampled men and women (mostly couples) within villages of diverse districts
- (Fairly) representative
- Female LFP in India < half that of men's

# Validation: Implementation Quality

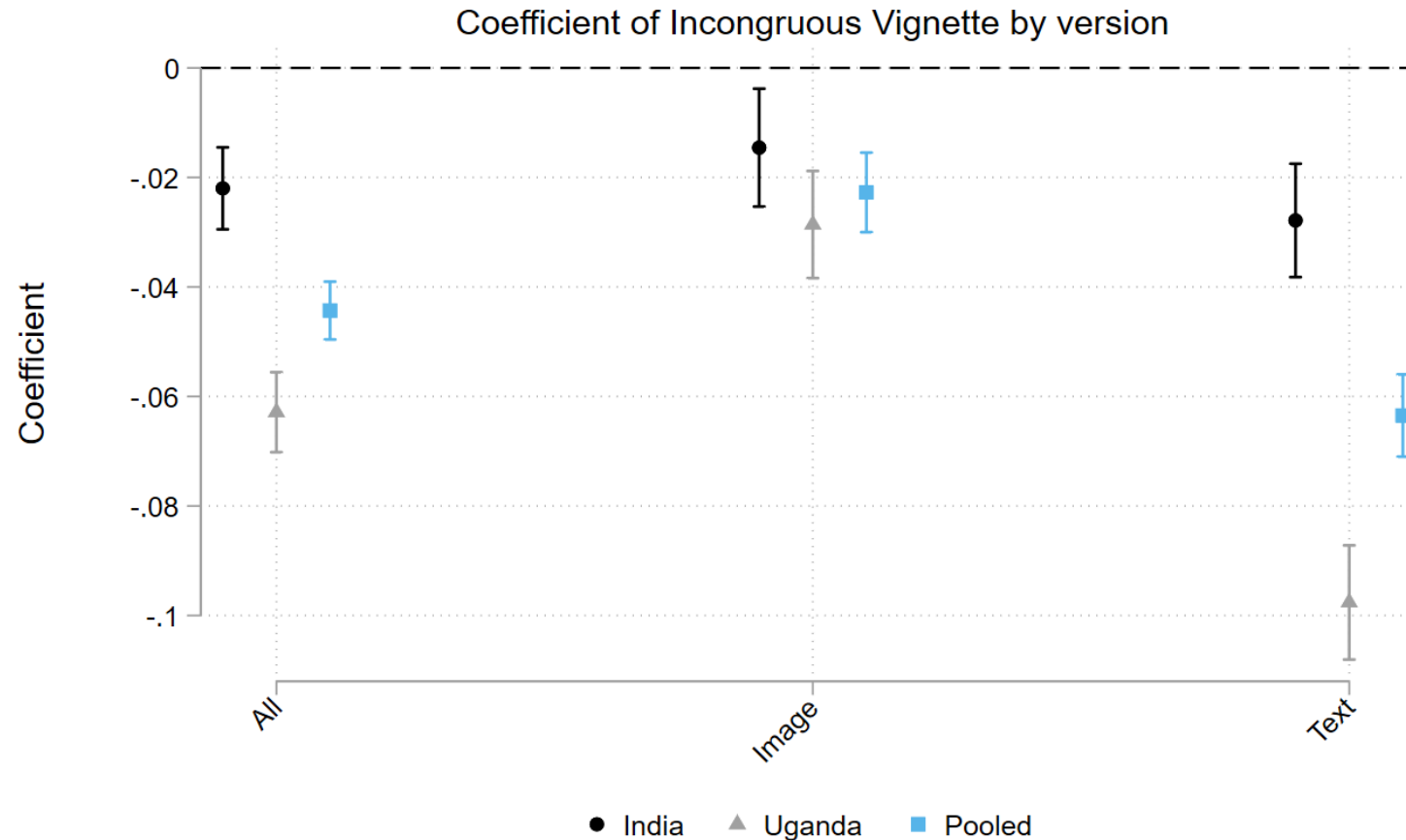
- Respondents had access to a practice round (not included in our analysis)
- Response time per prime: 1 second (median).
- The tool received good feedback from respondents:
  - Found it different and novel
  - Described as fully clear and simple to answer: 74% of respondents

# Overall Results

What share of respondents rate neutral image as more pleasant after congruous primes on average?



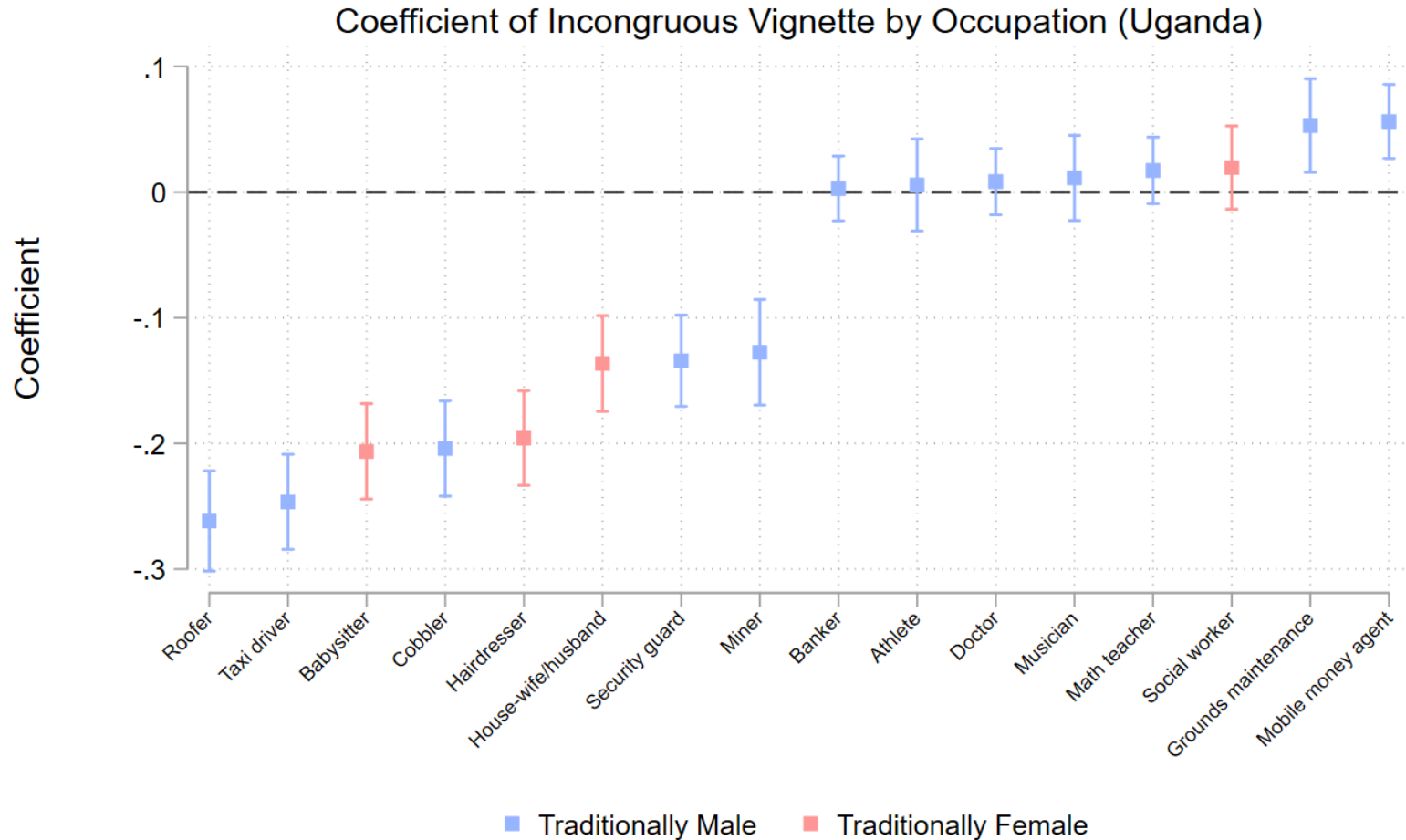
# Overall Results



Note: Coefficients show effect of incongruent gender-occupation pairing on pleasantness ratings. SEs are clustered at the respondent-level. Error bars represent 95% confidence intervals.

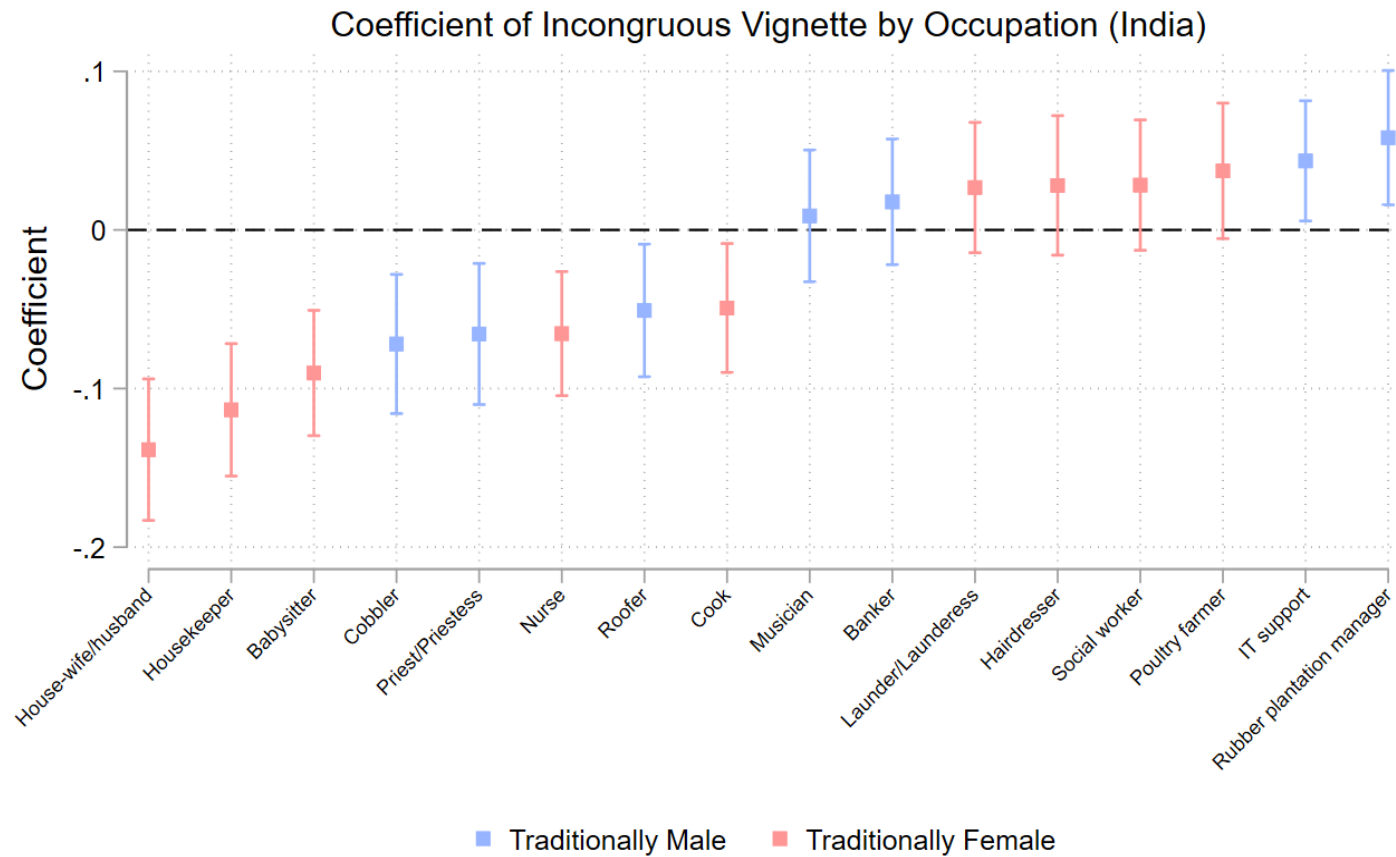
- Statistically significant bias across the board (overall effect: 4.4 pp or 6%)
- Larger in Uganda (6.3 pp or 8.4%)
- Limited survey mode effects in India, strong effects in Uganda

# Effect by Occupation: Uganda



Note: Coefficients show effect of incongruent gender-occupation pairing on pleasantness ratings. SEs are clustered at the respondent-level. Error bars represent 95% confidence intervals.

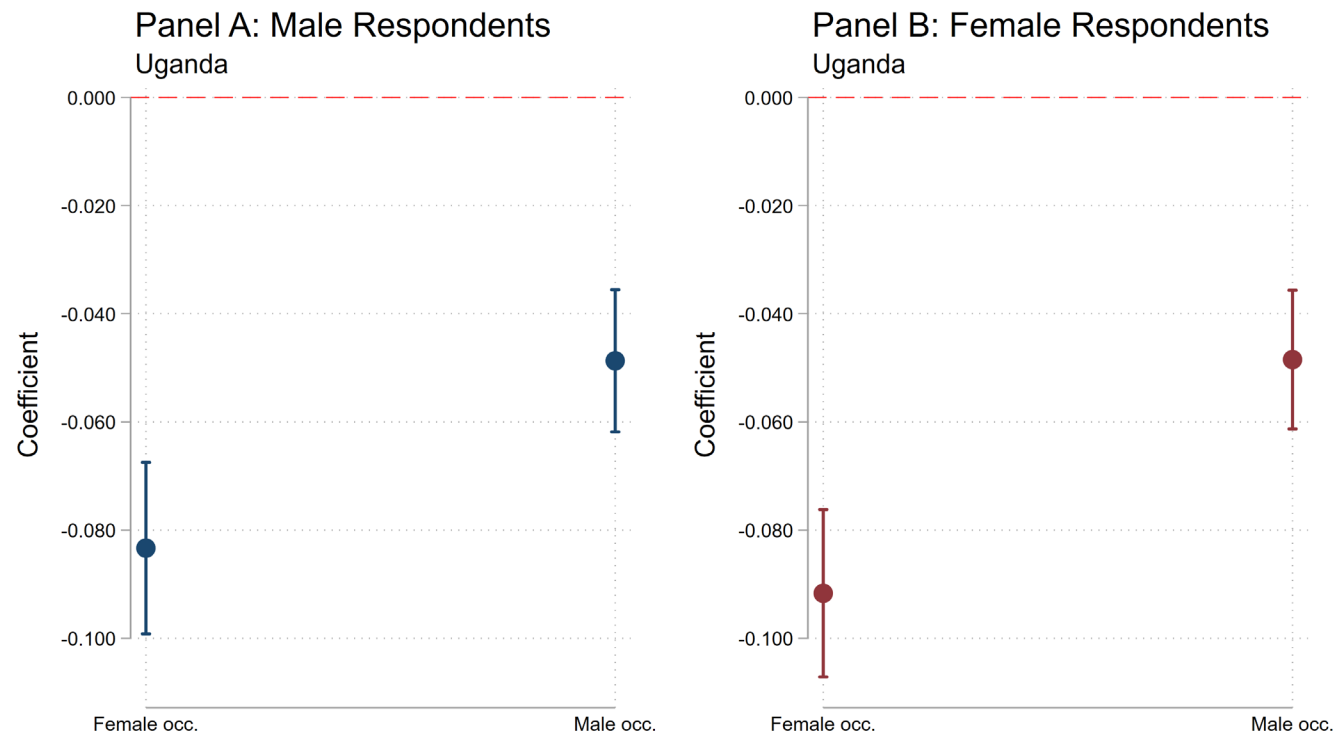
# Effect by Occupation: India



Note: Coefficients show effect of incongruent gender-occupation pairing on pleasantness ratings. SEs are clustered at the respondent-level. Error bars represent 95% confidence intervals.

# Results by Gender of Prime Occupation and Respondent: Uganda

## Effect of Incongruence on Pleasantness by Occupation Type

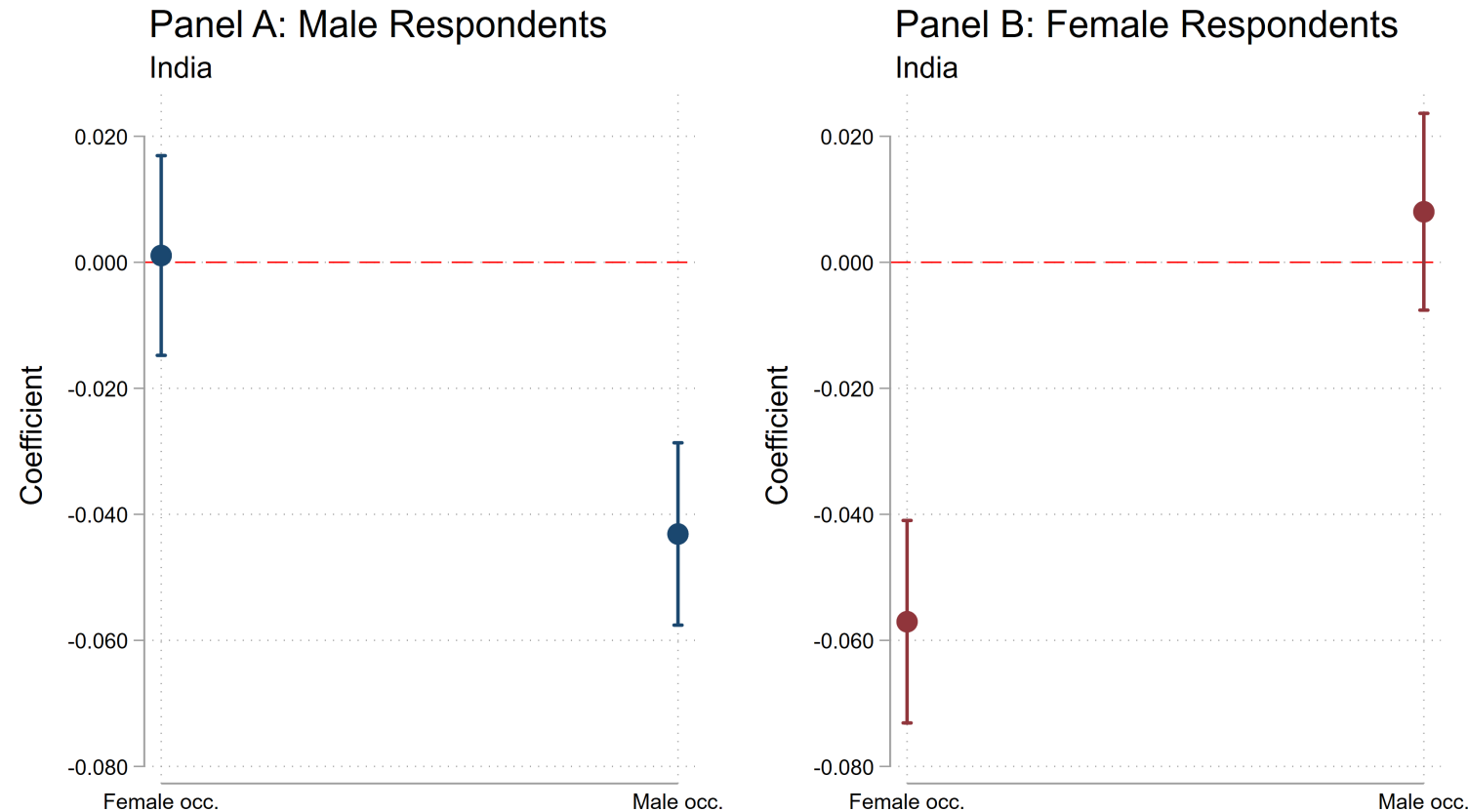


Note: Coefficients show effect of incongruent gender-occupation pairing on pleasantness ratings. SEs are clustered at the respondent-level. Error bars represent 95% confidence intervals.

- Bias against men in female occupations is close to twice as large as bias against women in male occupations (8.8 pp less pleasant vs 4.9 pp)
- This holds regardless of gender of the respondent

# Results by Gender of Prime Occupation and Respondent: India

## Effect of Incongruence on Pleasantness by Occupation Type



- No significant difference by traditional gender of occupation in India
- BUT large differences by gender of respondent:
  - Indian men are ONLY biased towards women in traditionally male occupations
  - Indian women are ONLY biased towards men in traditionally female occupations

Note: Coefficients show effect of incongruent gender-occupation pairing on pleasantness ratings. SEs are clustered at the respondent-level. Error bars represent 95% confidence intervals.

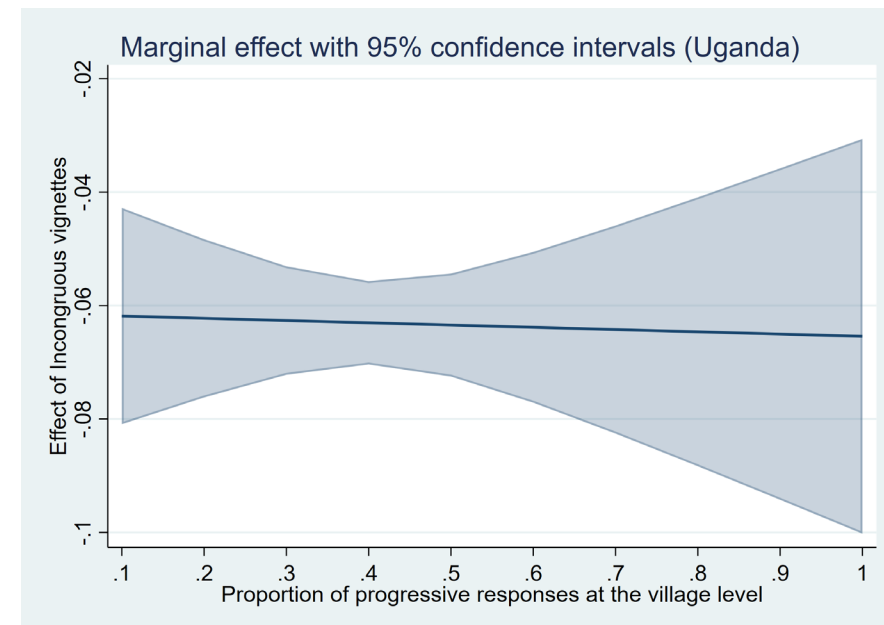
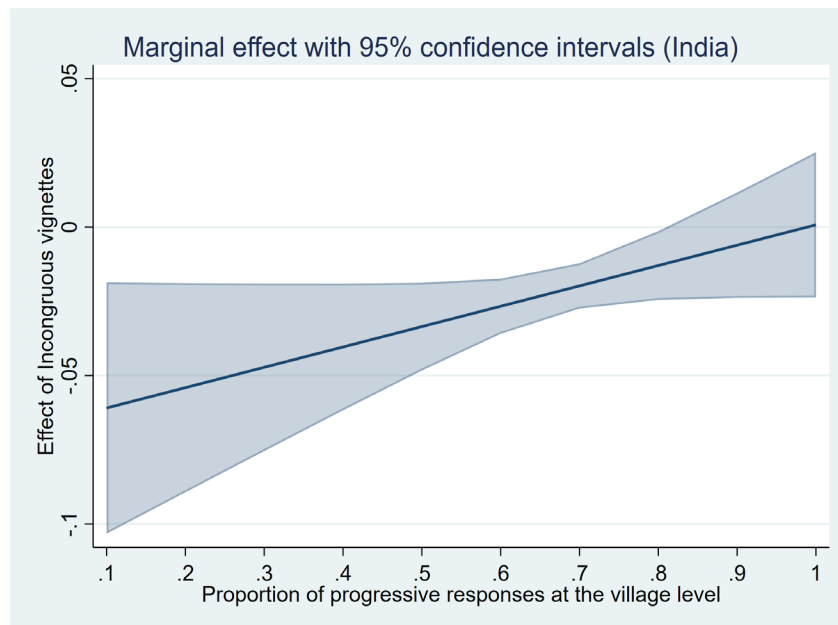
# Robustness Checks

- Results robust to controlling for image vs. text and response time
- Results robust to enumerator fixed effects
- Results robust to couple fixed effects

# Relationship w/ norms

**Employment norms:** Share of women in village with gender-progressive responses regarding work (5 questions)

- ‘Women should be free to choose the type of job they want to do’
- In India (low women’s LFP) implicit bias much more responsive to village norms



# Relationship w/ attitudes

- **For all respondents:**
  - General gender measure (IPV is unacceptable)
  - Occupation-related gender measure (inclusion of traditionally male profession in aspirations for daughter)
- Significant relationship only in Uganda
  - But there is 'pass-through' b/w implicit bias and attitudes only for occupation-related/specific beliefs

# Does implicit bias matter for respondents' own occupational choices?

- Categorize respondents by whether they themselves work in a congruous sector (one where most workers belong to same gender).
- We do this classification ex-ante, BEFORE looking at the data, based on input from the research team and local partners.
- To account for varying levels of unemployment across contexts and genders, additional specification with unemployed respondents ('nw'):
  - Stay-at-home/unemployed women were counted as having congruous jobs.
  - Unemployed men were counted as having incongruous jobs.

# Does Bias Predict Respondent Occupational Choice?

- In India: respondents not biased towards own gender in incongruent occupations—so own bias should have less impact on occupational choice
- In Uganda: more bias against men in female occupations—bias should be more predictive of men's occupational choices
- Mostly in line with what we find

# Does Bias Predict Respondent Occupational Choice?

## India

### India - congruous jobs (ex-ante)

	Women						Men					
	(1) Congruous	(2) Congruous	(3) Congruous	(4) Congruous(nw)	(5) Congruous(nw)	(6) Congruous(nw)	(7) Congruous	(8) Congruous	(9) Congruous	(10) Congruous(nw)	(11) Congruous(nw)	(12) Congruous(nw)
Bias	0.038 (0.028)	0.036 (0.028)	0.035 (0.027)	0.020 (0.015)	0.021 (0.015)	0.022 (0.015)	-0.014 (0.012)	-0.015 (0.012)	-0.016 (0.012)	-0.015 (0.013)	-0.015 (0.013)	-0.019 (0.012)
Observations	266	266	266	703	703	703	662	662	662	696	696	696
R-squared	0.007	0.031	0.080	0.002	0.010	0.057	0.002	0.016	0.031	0.001	0.016	0.063
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Socio-Dem controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses. Tool controls include tool version and duration, and socio-demographic controls include age, marital status, and educational attainment for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Does Bias Predict Respondent Occupational Choice?

## Uganda

### Uganda - congruous jobs (ex-ante)

	Women						Men					
	(1) Congruous	(2) Congruous	(3) Congruous	(4) Congruous(nw)	(5) Congruous(nw)	(6) Congruous(nw)	(7) Congruous	(8) Congruous	(9) Congruous	(10) Congruous(nw)	(11) Congruous(nw)	(12) Congruous(nw)
Bias	-0.009 (0.012)	0.002 (0.012)	0.003 (0.011)	-0.028** (0.013)	-0.018 (0.013)	-0.016 (0.013)	0.018 (0.012)	0.015 (0.012)	0.017 (0.012)	0.034*** (0.013)	0.033** (0.013)	0.033** (0.013)
Observations	934	934	934	1,025	1,025	1,025	879	879	879	914	914	914
R-squared	0.001	0.056	0.081	0.004	0.049	0.090	0.003	0.041	0.067	0.009	0.038	0.060
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Socio-Dem controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses. Tool controls include tool version and duration, and socio-demographic controls include age, marital status, and educational attainment for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

- Most robust result: men with more bias tend to work in congruous sectors

# Conclusion

- Novel application of AMP tool to field settings
- Tool works well and is able to pick up implicit bias even in rural areas
  - And uncover important differences across professions and contexts

## Application in India and Uganda:

- In settings where economic behavior (e.g., women's labor market participation) is rarer, norms have more explanatory power
- In settings where more prevalent, (specific) individual attitudes may be relevant margin
- Features of bias matter for explaining relationship to labor market outcomes

# Thank you!



Public Disclosure Authorized

## Measuring Women's Sense of Control and Efficacy

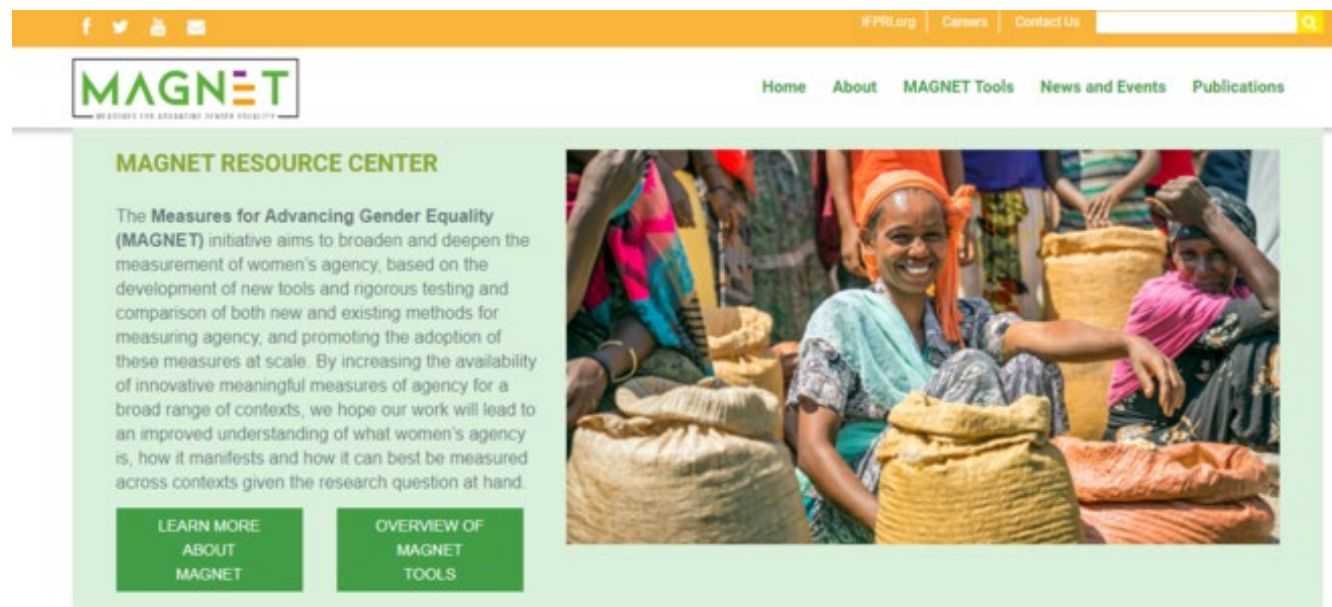
### MOTIVATION AND POLICY RELEVANCE

Increasing women's sense of control over their lives is key to reducing gender inequalities and improving development outcomes (Wuepper and Lybbert 2017; Donald et al. 2020). Research suggests women tend to believe less in their abilities to act effectively towards their goals and they provide more importance than men to external factors determining their life events (Sherman, Higgs, and Williams 1997; Dercon, and Singh 2013). An individual's sense of control over their life is also inexorably linked to the control over their time. However, gender inequalities in time allocations are pervasive. On average, women spend about three times as many hours as

Public Disclosure Authorized

### Measures for Advancing Gender Equality (MAGNET)

The Measures for Advancing Gender Equality (MAGNET) initiative aims to broaden and deepen the measurement of women's agency, based on the development of new tools and rigorous testing and comparison of both new and existing methods for measuring agency, and promoting the adoption of these measures at scale. By increasing the availability of innovative meaningful measures of agency for a broad range of contexts, we hope our work will lead to an improved understanding of what women's agency is, how it manifests and how it can best be measured across contexts given the research question at hand.



<https://magnet.ifpri.info>

# Experiment Data

Rubber Plantation Manager	Civil Servant	Launderer/Laundress
House Husband/Wife	Seamster/Seamstress	IT Support
Hairdresser	Miner	Cook
Roofer	Healer	Entrepreneur
Cashier	Babysitter	Nurse
Math Teacher	Security Guard	Banker
Taxi Driver	Scientist	Agro-processing Worker
Social Worker	Poultry Farmer	Mobile Money Agent
Athlete	Doctor	Housekeeper
Lawyer	Grounds Maintenance Worker	Cobbler
Musician	Priest/Priestess	Village Chief

- Text or image version randomly assigned (balanced)
- Image versions generated by giving Chat-GPT the following prompt: "Create a cartoon of {male/female} {occupation} in {country}"
- Each respondent completed 3 blocks, each with 11 randomly selected primes

# Sampling Strategy

## **District selection:**

- 2 districts in Uganda, 4 in India
- Urban/rural mix with diverse livelihoods (agriculture & business)

## **Within districts:**

- **Uganda:** communities with diverse ethnic backgrounds, active women's groups
- **India:** Urban wards with higher English literacy (NFHS-5); rural areas for variation

## **Within villages:**

- Random sampling of men and women (mostly couples)

## **Sample representativeness:**

- Representative of individuals with slightly above-average employment levels

# Main Empirical Strategy

$$\text{Pleasant}_{vi} = \beta_0 + \beta_1 \text{Incongruous}_{vi} + \beta_2 \mathbf{X} + \beta_3 \text{Incongruous}_{vi} \mathbf{X} + \varepsilon_{vi}$$

- Pleasant = 1 when the response to Chinese character after a prime was “More pleasant”
- Incongruous = 1 if prime showed non-stereotypical gender for profession
- $\mathbf{X}$  is vector capturing variables of interest (e.g., prime mode or respondent gender)
- Errors are clustered at the respondent level

# Empirical Strategy Extension

$$\text{Congruous}_i = \beta_0 + \beta_1 \text{Bias}_i + \varepsilon_i$$

- Congruous is whether the respondent has a gender-congruous job
- Bias is the standardized difference in means of pleasantness ratings across congruous and incongruous vignettes
- Use robust standard errors

→ Augment both specifications with additional controls (response time, survey mode and respondent characteristics).

# Appendix: Balance table (assigned text or image)

## India Balance table

Variable	Image version		Text version		Pairwise t-test	
	N	Mean/(SE)	N	Mean/(SE)	N	P-value
Woman	670	0.501 (0.019)	886	0.500 (0.017)	1556	0.954
Age	670	42.385 (0.427)	886	41.782 (0.370)	1556	0.285
Secondary	667	0.235 (0.016)	885	0.261 (0.015)	1552	0.249
Work	670	0.679 (0.018)	886	0.711 (0.015)	1556	0.174
Household Size	670	4.416 (0.064)	886	4.518 (0.057)	1556	0.236
Married	670	0.861 (0.013)	886	0.827 (0.013)	1556	0.070*

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

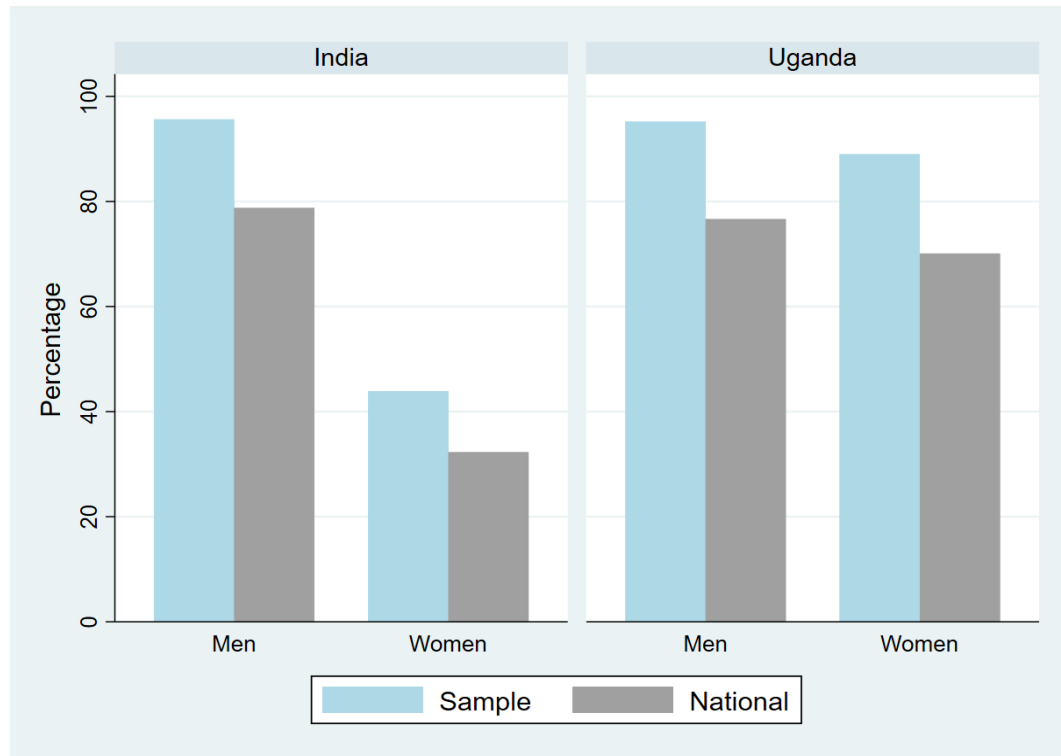
# Appendix: Balance table (assigned text or image)

## Uganda Balance table

Variable	Image version		Text version		Pairwise t-test	
	N	Mean/(SE)	N	Mean/(SE)	N	P-value
Woman	966	0.533 (0.016)	975	0.525 (0.016)	1941	0.724
Age	966	41.955 (0.395)	973	41.860 (0.401)	1939	0.866
Secondary	964	0.164 (0.012)	972	0.188 (0.013)	1936	0.159
Work	965	0.916 (0.009)	975	0.922 (0.009)	1940	0.629
Household Size	922	6.338 (0.089)	929	6.319 (0.091)	1851	0.877
Married	966	0.883 (0.010)	975	0.898 (0.010)	1941	0.276

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

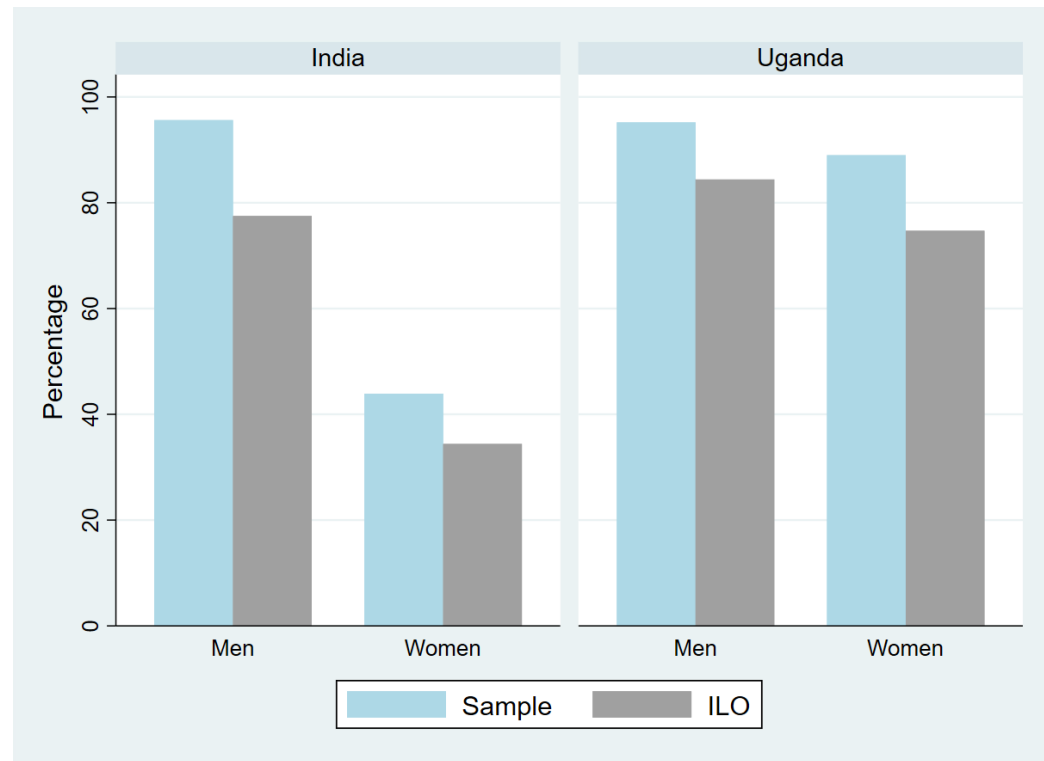
# Alignment with labor force characteristics



Much lower women's labor force participation in India → only setting where men exclusively biased towards women working incongruous jobs

Uganda: National Panel Survey 2019-2020  
India: Periodic Labour Force Survey 2024

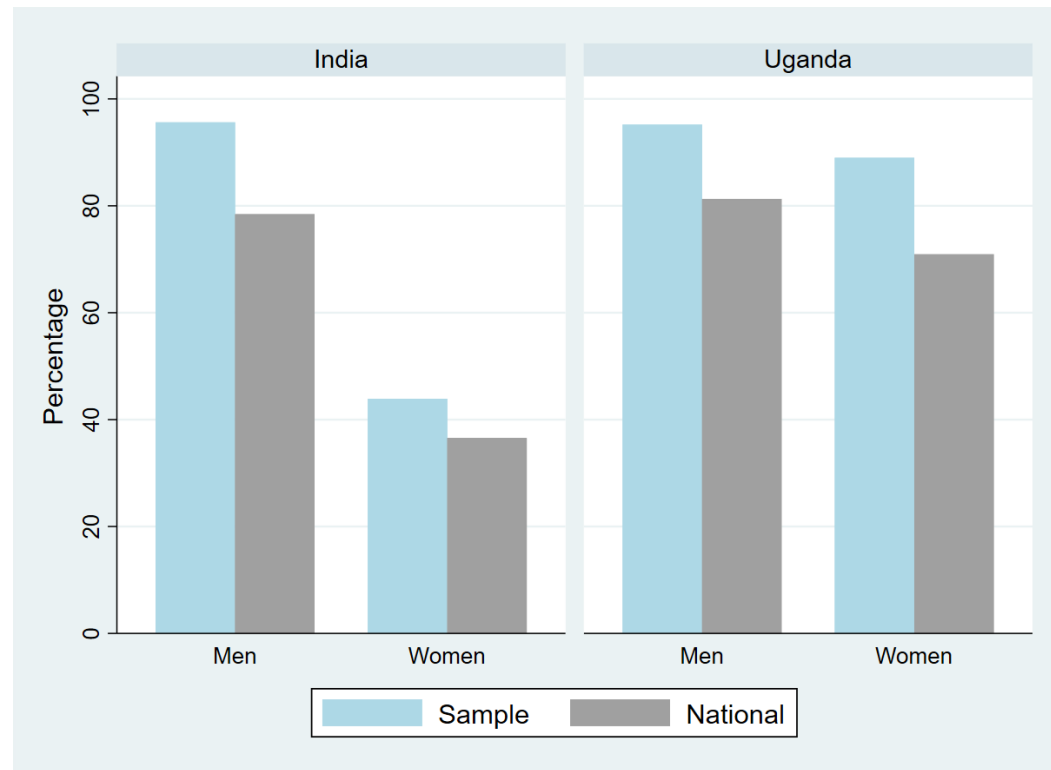
# Alignment with labor force characteristics: ILO data



Much lower women's labor force participation in India → only setting where men exclusively biased towards women working incongruous jobs

ILO: national estimate of the % of population aged 15+ that is in the labor force at the national level

# Alignment with labor force characteristics: surveyed districts



Much lower women's labor force participation in India → only setting where men exclusively biased towards women working incongruous jobs

Uganda: National Panel Survey 2019-2020  
India: Periodic Labour Force Survey 2024

# Results by Gender of Prime Occupation and Respondent: Uganda

	(1) Uganda	(2) Ugandan Men	(3) Ugandan Women
Incongruous = 1	-0.0879*** (0.00565)	-0.0833*** (0.00809)	-0.0917*** (0.00789)
Traditionally Male Occupation = 1	0.0111** (0.00511)	0.0152** (0.00756)	0.00783 (0.00690)
Incongruous*Male Occupation	0.0393*** (0.00710)	0.0346*** (0.00996)	0.0432*** (0.0101)
Observations	61,763	29,120	32,643
R-squared	0.006	0.006	0.007
Average pleasantness (congruous, reference)	0.723	0.723	0.763
Total effect: Incongruous + Incongruous*Male occupation	-0.0486	-0.0487	-0.0485
P-value: Incongruous + Incongruous*Male occupation	0	0	0

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Results by Gender of Prime Occupation and Respondent: India

	(1) India	(2) Indian Men	(3) Indian Women
Incongruous = 1	-0.0277*** (0.00582)	0.00181 (0.00811)	-0.0572*** (0.00821)
Traditionally Male Occupation = 1	-0.00770 (0.00544)	0.0173** (0.00739)	-0.0327*** (0.00788)
Incongruous*Male Occupation	0.0104 (0.00831)	-0.0442*** (0.0112)	0.0651*** (0.0120)
Observations	51,315	25,641	25,674
R-squared	0.001	0.001	0.002
Average pleasantness (congruous, reference)	0.705	0.705	0.755
Total effect: Incongruous + Incongruous*Male occupation	-0.0173	-0.0424	0.00785
P-value: Incongruous + Incongruous*Male occupation	0.00154	1.17e-08	0.324

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Results by Gender of Prime Occupation and Respondent: Robustness Checks

## India - robustness check

	Women				Men			
	(1) Pleasant	(2) Pleasant	(3) Pleasant	(4) Pleasant	(5) Pleasant	(6) Pleasant	(7) Pleasant	(8) Pleasant
Incongruous	-0.051*** (0.009)	-0.057*** (0.008)	-0.057*** (0.008)	-0.000 (0.007)	-0.051*** (0.009)	0.000 (0.008)	-0.001 (0.008)	-0.000 (0.007)
Male Occupation	-0.022*** (0.008)	-0.034*** (0.008)	-0.033*** (0.008)	0.020*** (0.006)	-0.022*** (0.008)	0.016** (0.007)	0.019*** (0.007)	0.020*** (0.006)
Incongruous × Male Occupation	0.054*** (0.013)	0.067*** (0.012)	0.067*** (0.012)	-0.046*** (0.010)	0.054*** (0.013)	-0.044*** (0.011)	-0.047*** (0.011)	-0.046*** (0.010)
Observations	23,298	25,179	25,707	25,641	23,298	25,278	25,641	25,641
R-squared	0.004	0.012	0.125	0.447	0.004	0.005	0.228	0.447
Vignette duration	Yes	No	No	No	Yes	No	No	No
Controls	No	Yes	No	No	No	Yes	No	No
Enumerator FE	No	No	Yes	No	No	No	Yes	No
Couple FE	No	No	No	Yes	No	No	No	Yes

Clustered standard errors at individual level in parentheses. Controls include tool version and duration for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Results by Gender of Prime Occupation and Respondent: Robustness Checks

## Uganda - robustness check

	Women			Men		
	(1) Pleasant	(2) Pleasant	(3) Pleasant	(4) Pleasant	(5) Pleasant	(6) Pleasant
Incongruous	-0.096*** (0.008)	-0.100*** (0.008)	-0.105*** (0.007)	-0.084*** (0.008)	-0.084*** (0.008)	-0.081*** (0.007)
Male Occupation	0.015** (0.007)	0.014** (0.007)	0.011 (0.007)	0.023*** (0.008)	0.021*** (0.007)	0.030*** (0.007)
Incongruous × Male Occupation	0.044*** (0.011)	0.050*** (0.010)	0.057*** (0.009)	0.029*** (0.010)	0.031*** (0.009)	0.023*** (0.008)
Observations	28,865	28,865	28,865	26,324	26,324	26,323
R-squared	0.009	0.204	0.365	0.007	0.296	0.457
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Enumerator FE	No	Yes	No	No	Yes	No
Couple FE	No	No	Yes	No	No	Yes

Clustered standard errors at individual level in parentheses. Controls include tool version and duration for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Relationship w/ attitudes

## India - attitudes (individual level)

	Women						Men					
	(1) PCAD	(2) PCAD	(3) PCAD	(4) Rejection IPV	(5) Rejection IPV	(6) Rejection IPV	(7) PCAD	(8) PCAD	(9) PCAD	(10) Rejection IPV	(11) Rejection IPV	(12) Rejection IPV
Bias	0.012 (0.015)	0.012 (0.015)	0.014 (0.015)	-0.007 (0.008)	-0.006 (0.008)	-0.006 (0.008)	0.013 (0.018)	0.014 (0.018)	0.013 (0.018)	-0.014 (0.012)	-0.013 (0.012)	-0.010 (0.012)
Observations	640	640	640	779	779	779	715	715	715	777	777	777
R-squared	0.001	0.010	0.033	0.001	0.008	0.028	0.001	0.012	0.044	0.002	0.036	0.066
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Socio-Dem controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses. Tool controls include tool version and duration, and socio-demographic controls include age, marital status, and educational attainment for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Relationship w/ attitudes and norms

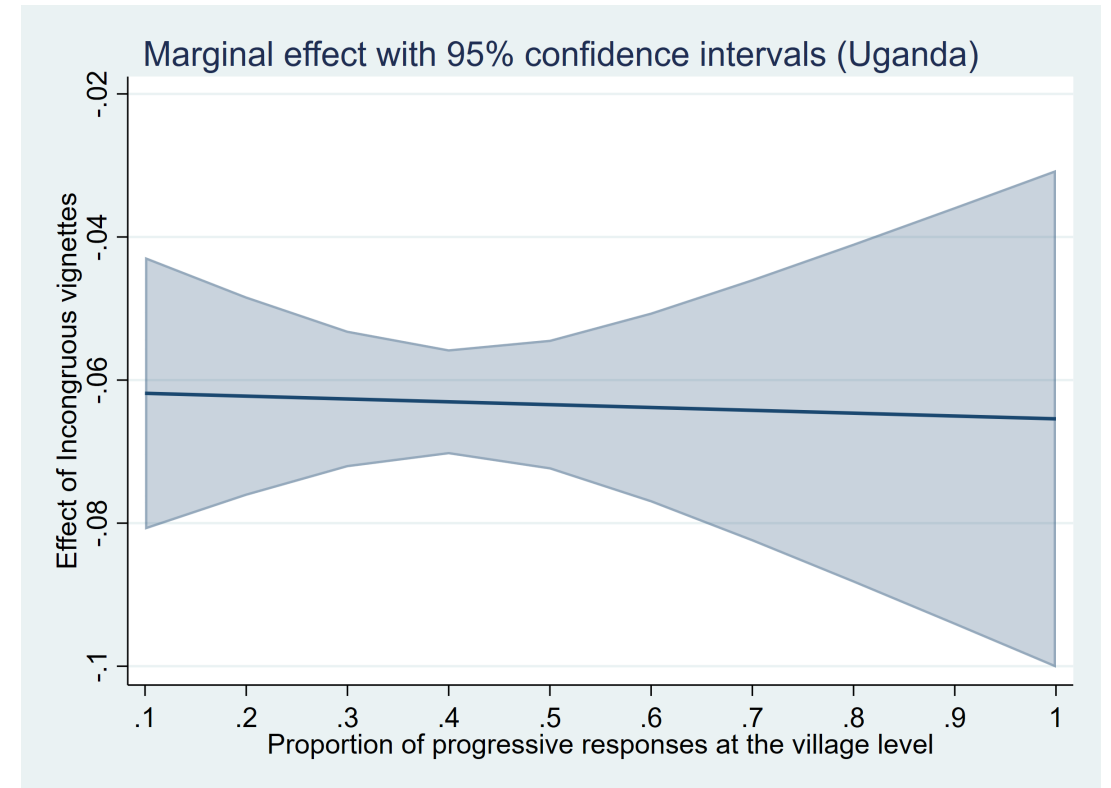
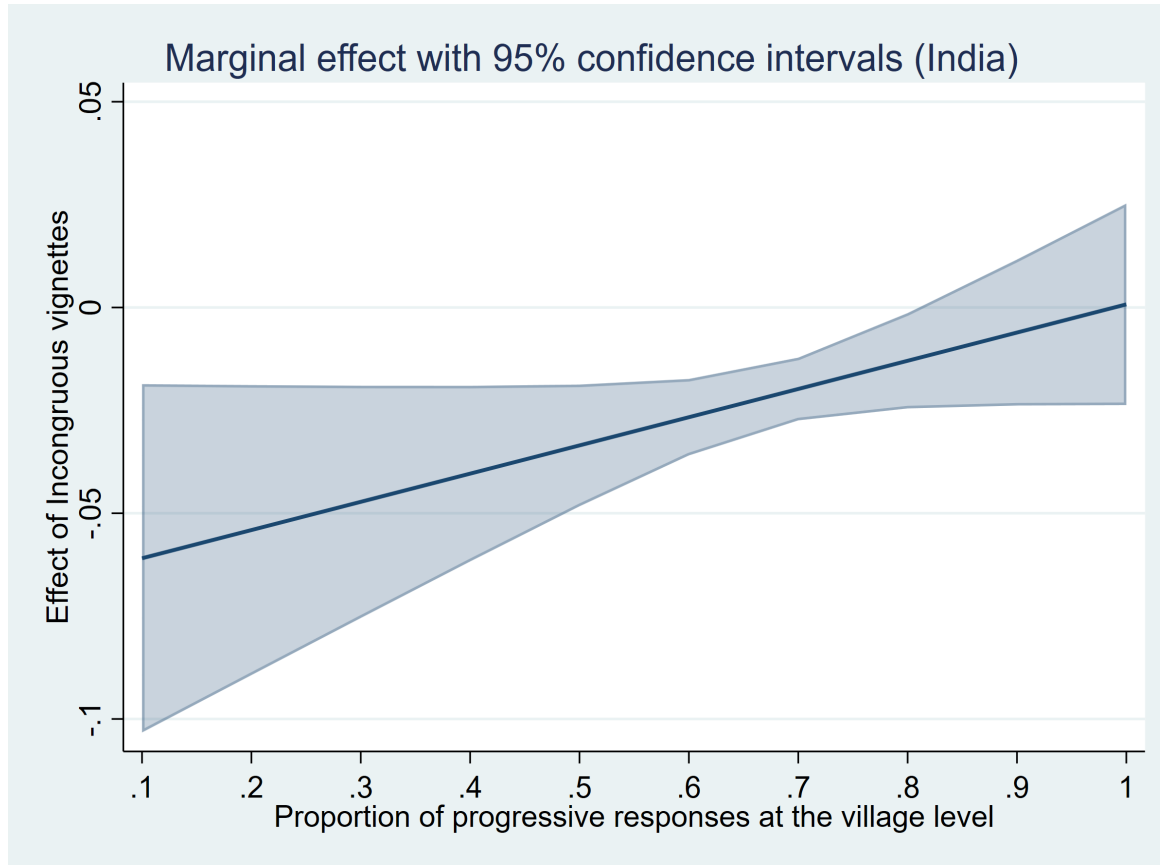
## Uganda - attitudes (individual level)

	Women						Men					
	(1) PCAD	(2) PCAD	(3) PCAD	(4) Rejection IPV	(5) Rejection IPV	(6) Rejection IPV	(7) PCAD	(8) PCAD	(9) PCAD	(10) Rejection IPV	(11) Rejection IPV	(12) Rejection IPV
Bias	-0.020* (0.011)	-0.022** (0.011)	-0.021* (0.011)	-0.006 (0.009)	-0.005 (0.010)	-0.007 (0.010)	-0.019 (0.012)	-0.020* (0.012)	-0.021* (0.012)	-0.000 (0.005)	0.002 (0.005)	0.002 (0.005)
Observations	810	810	810	1,025	1,025	1,025	850	850	850	914	914	914
R-squared	0.005	0.007	0.028	0.000	0.001	0.029	0.003	0.007	0.010	0.000	0.002	0.014
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Socio-Dem controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses. Tool controls include tool version and duration, and socio-demographic controls include age, marital status, and educational attainment for each respondent.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Relationship w/ norms around women's work



→ in India

# Respondent occupation: classification

<b>Occupation (India)</b>	<b>Gender</b>
No work	Women (in nw)
Agriculture, forestry and fishing	Men
Mining and quarrying	Men
Manufacturing	Men
Electricity, gas, steam and air conditioning supply	Men
Water supply; sewerage, waste management and remediation activities	Men
Construction	Men
Wholesale and retail trade; repair of motor vehicles and motorcycles	Men
Transportation and storage	Men
Accommodation and food service activities	Women
Information and communication	Men
Financial and insurance activities	Men
Real estate activities	Men
Professional, scientific and technical activities	Men
Administrative and support service activities	Women
Public administration and defence; compulsory social security	Men
Education	Women
Human health and social work activities	Women
Arts, entertainment and recreation	Women
Other service activities	None
Activities of households as employers; undifferentiated goods and services pro	Women
Activities of extraterritorial organizations and bodies	Men

# Respondent occupation: classification

<b>Occupation (Uganda)</b>	<b>Gender</b>
No work	Women (in nw)
Agriculture & Forestry	Men
Fishing	Men
Mining & Quarrying	Men
Food Processing	Women
Other Manufacturing	Men
Utilities	Men
Construction	Men
Trade	Men
Transport, Storage & Communications	Men
Accommodation & Food Services	Women
Information & Communication	Men
Financial & Insurance	Men
Real Estate & Business	Men
Education, Health & Social Services	Men
Recreation & Personal	Women