

Online Appendix:

How Does the Intersection of Sex and Nonbinary Gender Identity Affect Hiring Discrimination? Evidence from a Correspondence Field Experiment

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This Appendix includes:

- **Control Variables:** Tables A2 and A3 contain descriptions of all variables included in the vector of resume controls (X_i) and job posting controls (Z_j) respectively.
- **Alternative Linear Probability Results:** Recall that equation (2) does not include FD_j interactions (where FD_j equals one for female-dominated occupations). The following alternative specification is presented here, including those interactions:

$$(2)' \quad y_{iocj} = \lambda_1 F_i + \lambda_2 [F_i \cdot FD_j] + \lambda_3 [F_i \cdot MD_j] \\ + X'_i \beta_1 + Z'_j \beta_2 + \eta_o + \delta_c + \varepsilon_{iocj}$$

Results for are presented in Table A4. For both presumably cisgender and nonbinary people, there is no statistically significant difference in positive employer response in female-dominated and mixed occupations (and point estimates are near zero). However, considering all three occupation categories reduces power and precision; hence, specification (2) is preferred and presented in the main paper.

- **Additional Linear Probability Results:** Equations (2) and (2)' show that presumably cisgender and nonbinary applicants experience the same direction of discrimination and that estimated magnitudes are similar. However, they do not formally test whether discrimination magnitude is different for these groups. To address this, I run the following triple-interaction linear probability model including all applicants:

$$(4) \quad y_{iocj} = \lambda_1 F_i + \lambda_2 [F_i \cdot MD_j] + \gamma_1 NB_i + \gamma_2 [NB_i \cdot MD_j] \\ + \xi_1 [F_i \cdot NB_i] + \xi_2 [F_i \cdot NB_i \cdot MD_j] + X'_i \beta_1 + Z'_j \beta_2 + \eta_o + \delta_c + \varepsilon_{iocj}$$

$$(4)' \quad y_{iocj} = \lambda_1 F_i + \lambda_2 [F_i \cdot PM_j] + \gamma_1 NB_i + \gamma_2 [NB_i \cdot PM_j] \\ + \xi_1 [F_i \cdot NB_i] + \xi_2 [F_i \cdot NB_i \cdot PM_j] + X'_i \beta_1 + Z'_j \beta_2 + \eta_o + \delta_c + \varepsilon_{iocj}$$

where in equation (4)' sex composition indicator variables are replaced with PM_j which represents the percent of the occupation's workers who are male. In these regressions,

$\hat{\xi}_2$ can be interpreted as the estimated difference in discrimination magnitude between females who are presumably cisgender and those who are nonbinary. Results are shown in Tables A5 and A6. First, the estimated difference in discrimination magnitude is statistically insignificant. Further, by comparing the upper and lower bounds of $\hat{\xi}_2$ to estimated $\hat{\lambda}_2$, I can estimate that sex-based discrimination against nonbinary females in male-dominated occupations ranges from 30% to 126% of the magnitude faced by presumably cisgender females via equation (4); 28% to 136% via equation (4)'.

- **Wald Test Results:** I conduct a Wald test on linear combinations of coefficients in Table 4 of the main paper (derived from equation (3) in the main paper) to determine whether applicants who are both the non-dominant sex and disclose “they/them” pronouns face greater discrimination than applicants minoritized along only one of these dimensions. Results are as follows:

- Compared to applicants who are the non-dominant sex only, applicants who are both the non-dominant sex and disclose “they/them” pronouns experience a 5.2 percentage point lower positive employer response rate. This difference is statistically significant at the 1% level, with a 95% confidence interval of [-0.085, -0.019].¹
- Compared to applicants who disclose “they/them” pronouns only, applicants who are both the non-dominant sex and disclose “they/them” pronouns experience a 4.7 percentage point lower positive employer response rate. This difference is statistically significant at the 0.1% level, with a 95% confidence interval of [-0.068, -0.026].²

These findings demonstrate that discrimination is significantly larger when applicants possess both minoritized identities compared to one only.

- **Chi-Squared Test Results:** I conduct a series of Chi-Squared tests to compare employer response rates across groups, examining differences based on whether applicants are the dominant or non-dominant sex and whether they do or do not disclose “they/them” pronouns. Response rates for each group are compared against all other groups; results are presented in Table A7, and are consistent with Wald test findings. In addition, results indicate that there is no statistically significant difference in the discrimination faced by applicants who are minoritized once via sex compared to once via nonbinary gender identity (i.e., by applicants who are the non-dominant sex and do not disclose any pronouns, and applicants who are the dominant sex and disclose “they/them” pronouns).
- **Semi-Parametric Results:** Equations (2), (2)', and (4) assume that sex-based discrimination follows a step-function pattern, meaning discrimination occurs only after

¹To do this, I tested whether the addition of coefficients ‘Non-Dominant Sex’ and ‘Non-Dominant Sex × they/them’ are different from zero.

²To do this, I tested whether the addition of coefficients ‘they/them’ and ‘Non-Dominant Sex × they/them’ are different from zero.

the sex composition crosses a specific threshold. To investigate this, I also semi-parametrically investigate the relationship between positive employer response and occupation sex composition using a two-step approach. First, I estimate the following linear probability model that controls for resume and job posting characteristics but omits the variables of interest, and compute residuals $(y_{iocj} - \hat{y}_{iocj})$, representing the portion of employer response unexplained by baseline characteristics, ignoring applicant sex and pronoun disclosure:

$$(5) \quad y_{iocj} = X_i' \beta_1 + Z_j' \beta_2 + \eta_o + \delta_c + \varepsilon_{iocj}$$

Second, I apply Nadaraya-Watson kernel smoothing to estimate average residuals as a function of occupation sex composition (percent of workers male). This is done separately for males and females who disclose “they/them” pronouns and who do not disclose any pronouns. Average residuals above zero indicate that, at a given sex composition, the group’s employer response rates are being systematically underestimated; below zero indicate overestimation. As such, this kernel estimation flexibly and non-linearly estimates how occupation sex composition affects employer response, allowing unique patterns for each group.

Results are shown in Figures A1 and A2, which present group-specific semi-parametric relationships between an occupation’s sex composition (percent of workers male) and average residual, estimated via the two-step strategy described above. While precision is low, results visually suggest that the parametric assumptions associated with equation (2) and (4) are reasonable: the proposed step-function relationship appears to hold. Results are also consistent with those shown in the main paper: semi-parametric estimates indicate that females have higher positive employer response rates than males in female-dominated and mixed occupations, but this reverses in male-dominated occupations. Notably, residual trends for applicants with both female-sounding and male-sounding names are similar whether or not they disclose nonbinary pronouns. Instead, disclosure appears to impose an approximately consistent penalty across all compositions (i.e., the same male and female curves are shifted down).

Tables

Table A1: Occupations

Occupation	% Male	Category	N
Admin Assistant (AA)	6	F Dominated	365
Receptionist (R)	9	F Dominated	500
Certified Nursing Assistant (N)	11	F Dominated	642
Housekeeper (H)	15	F Dominated	380
Cashier (Ca)	28	F Dominated	316
Server (S)	36	Mixed	332
Baker (B)	44	Mixed	159
Cook (Ck)	59	Mixed	573
Retail Salesperson (RS)	62	Mixed	834
Assembler (A)	62	Mixed	271
Janitor (J)	70	M Dominated	379
Warehouse Worker (W)	80	M Dominated	552
Landscaper (L)	94	M Dominated	358
Truck Driver (T)	95	M Dominated	663
Construction Worker (C)	97	M Dominated	356

Worker sex composition data is from the 2019 American Community Survey. Occupation categories were pre-specified—"F Dominated" is female-dominated; "M Dominated" is male-dominated.

Table A2: Resume Characteristics (X_i Control Variables)

Variable	Type	Description
Binary Pronouns	Indicator	Equals 1 if the applicant lists “he/him” or “she/her” pronouns congruent with name-implied sex on his or her resume
Sent first	Indicator	Equals 1 if the resume was sent first
Resume lag	Discrete	Equals 0 if the resume was sent first, and the hours between the first and second application if the resume was sent second
Resume lag ²	Discrete	Above squared
GED	Indicator	Equals 1 if the applicant achieved a GED
Associate’s	Indicator	Equals 1 if the applicant achieved an Associate’s degree
Bachelor’s	Indicator	Equals 1 if the applicant achieved a Bachelor’s degree
High Score High School	Indicator	Equals 1 if the applicant went to a high school with test scores rated ‘A’ by Niche
Low Score High School	Indicator	Equals 1 if the applicant went to a high school with test scores rated ‘C’ or below by Niche
Worked in HS	Indicator	Equals 1 if the applicant worked during high school
Years relevant	Discrete	Equals the number of years of “relevant” work experience.
Years relevant ²	Discrete	Above squared
Current relevant	Indicator	Equals 1 if the applicant’s most recent work experience is “relevant”
Current most common	Indicator	Equals 1 if the applicant’s most recent work experience is “most common”
Current common	Indicator	Equals 1 if the applicant’s most recent work experience is “common”
Prior most common	Discrete	Equals the years of “most common” experience, omitting most recent experience
Prior most common ²	Discrete	Above squared
Prior common	Discrete	Equals the years of “common” experience, omitting most recent experience
Prior common ²	Discrete	Above squared
Summary	Indicator	Equals 1 if the resume includes a summary or objective section
Skill: communication	Indicator	Equals 1 if the applicant’s resume lists “clear communicator” as a skill
Skill: computer	Indicator	Equals 1 if the applicant’s resume lists “computer skills (tech savvy)” as a skill
Skill: detail oriented	Indicator	Equals 1 if the applicant’s resume lists “detail oriented” as a skill
Skill: fast learner	Indicator	Equals 1 if the applicant’s resume lists “fast learner” as a skill
Skill: fast-paced	Indicator	Equals 1 if the applicant’s resume lists “thrives in fast-paced settings” as a skill
Skill: leader	Indicator	Equals 1 if the applicant’s resume lists “leadership abilities” as a skill
Skill: organized	Indicator	Equals 1 if the applicant’s resume lists “organized and efficient” as a skill
Skill: team player	Indicator	Equals 1 if the applicant’s resume lists “team player” as a skill
Binary Pronouns	Indicator	Equals 1 if the applicant’s resume lists “he/him” or “she/her” pronouns congruent with name-implied sex. This was an additional treatment arm in Eames (2024); this treatment arm is out-of-scope for this paper.

Work experience is considered “relevant” if it is in the position being applied for (e.g., if an applicant is applying to a janitor position, janitorial experience is “relevant”). Work experience is considered “most common” if it is in the position observed to be most common among non-“relevant” past experiences. This position is occupation-specific, and identified from the resume-scraping process described in Section A1.6 in the Online Appendix of Eames (2024): of the 12 positions identified for each occupation, this position is most commonly observed before the worker obtained a job in the occupation of interest. Work experience is defined as “common” if it is the second or third most common position. Identifying relevant and common positions is done to control for past work experience in a way that is consistent across occupations. These variables are included in lieu of position fixed effects because experience in a given position influences the probability of positive employer response heterogeneously across occupations. For example, cashier experience may be seen as generally relevant when applying as a sales associate but generally irrelevant when applying as a janitor.

Table A3: Job Posting Characteristics (Z_j Control Variables)

Variable	Type	Description
Estimated applications	Discrete	Equals the lower bound of the range of applicants estimated to have applied to the job posting (this was scraped from the job board website, values range from 1 to 1,496). Equals 0 if the job board website did provide an estimated application range
Estimated applications ²	Discrete	Above squared
Missing estimated applications	Indicator	Equals 1 if the job board did not provide an estimated application range
Relative income	Continuous	The lower bound of estimated income expressed as a percent of the occupation-specific average
Relative income ²	Continuous	Above squared
Relative income difference	Continuous	The difference between the upper and lower estimated income bounds expressed as a percent of the occupation-specific average
Relative income difference ²	Continuous	Above squared
Missing estimated income	Indicator	Equals 1 if the job posting did not include an associated income range

Table A4: Patterns in Sex-Based Discrimination (Considering Three Occupation Categories)

	Coefficient Estimate
<i>Panel A: No pronouns disclosed</i>	
Female	0.049 * (0.026) [-0.002, 0.100]
Female $\times$ Female-Dominated	0.009 (0.036) [-0.061, 0.079]
Female $\times$ Male-Dominated	-0.128 *** (0.035) [-0.197, -0.059]
Observations	3,985
<i>Panel B: "they/them" pronouns disclosed</i>	
Female	0.035 (0.030) [-0.025, 0.094]
Female $\times$ Female-Dominated	0.012 (0.042) [-0.069, 0.094]
Female $\times$ Male-Dominated	-0.104 ** (0.041) [-0.184, -0.024]
Observations	2,695
<i>Panel C: Controls included in Panels A and B</i>	
Resume Controls	✓
Job Controls	✓
Occupation Fixed Effects	✓
City Fixed Effects	✓

Note: This table reports coefficient estimates from equation (2)', where the dependent variable equals 1 if the applicant received a positive employer response. Standard errors are clustered at the job posting level and reported in parentheses. Confidence intervals are reported in square brackets. Stars indicate statistical significance: *** 1%, ** 5%, * 10% level.

Table A5: Triple-Interaction Discrimination Estimates
(Using Occupation Sex Composition Categories)

	Coefficient Estimate
Female	0.055 *** (0.018) [0.020, 0.090]
Female $\times$ Male-Dominated	-0.134 *** (0.030) [-0.192, -0.075]
“they/them”	-0.047 *** (0.013) [-0.073, -0.020]
“they/them” $\times$ Male-Dominated	-0.016 (0.023) [-0.061, 0.030]
“they/them” $\times$ Female	-0.015 (0.020) [-0.054, 0.024]
“they/them” $\times$ Female $\times$ Male-Dominated	0.029 (0.033) [-0.035, 0.093]
Observations	6,680
Resume Controls	✓
Job Controls	✓
Occupation Fixed Effects	✓
City Fixed Effects	✓

Note: This table reports coefficient estimates from equation (4), where the dependent variable equals 1 if the applicant received a positive employer response. Standard errors are clustered at the job posting level and reported in parentheses. Confidence intervals are reported in square brackets. Stars indicate statistical significance: *** 1%, ** 5%, * 10% level.

Table A6: Triple-Interaction Discrimination Estimates
(Using Percent of Workers Male)

	Coefficient Estimate
	0.100 *** (0.027) [0.046, 0.153]
Female	
	-0.172 *** (0.044) [-0.257, -0.086]
Female $\times$ Percent of Workers Male	
	-0.039 * (0.020) [-0.078, 0.001]
“they/them”	
	-0.025 (0.033) [-0.091, 0.040]
“they/them” $\times$ Percent of Workers Male	
	-0.022 (0.030) [-0.080, 0.036]
“they/them” $\times$ Female	
	0.031 (0.048) [-0.062, 0.124]
“they/them” $\times$ Female $\times$ Percent of Workers Male	
Observations	6,680
Resume Controls	✓
Job Controls	✓
Occupation Fixed Effects	✓
City Fixed Effects	✓

Note: This table reports coefficient estimates from equation (4)', where the dependent variable equals 1 if the applicant received a positive employer response. Standard errors are clustered at the job posting level and reported in parentheses. Confidence intervals are reported in square brackets. Stars indicate statistical significance: *** 1%, ** 5%, * 10% level.

Table A7: Difference in Positive Employer Response Rates
(by the Intersection of Sex and Pronoun Disclosure)

Pronouns	Sex	No Pronouns		“they/them”	
		Dominant	Non-Dominant	Dominant	Non-Dominant
No Pronouns	Dominant	...			
No Pronouns	Non-Dominant	-0.067 *** {0.000}	...		
		[-0.037, -0.096]			
“they/them”	Dominant	-0.061 *** {0.000}	0.006 {0.736}	...	
		[-0.028, -0.093]	[0.038, -0.026]		
“they/them”	Non-Dominant	-0.115 *** {0.000}	-0.048 *** {0.002}	-0.054 *** {0.002}	...
		[-0.084, -0.146]	[-0.018, -0.079]	[-0.020, -0.088]	

Note: This table reports the results of Chi-squared tests of proportions, comparing positive employer response rates between job applicants in the row group compared to job applicants in the column group. ‘No Pronouns’ indicates the applicant did not disclose any pronouns; “they/them” indicates the applicant disclosed “they/them” pronouns. Applicants are the ‘Dominant’ sex when they have a female-sounding name and apply in female-dominated or mixed occupations or when they have a male-sounding name and apply in male-dominated occupations; they are the ‘Non-Dominant’ sex otherwise. For each comparison, the difference in proportions (row group proportion less column group proportion) is reported first, p-values are reported in curly brackets, and the 95% confidence interval is reported in square brackets. Stars indicate statistical significance: *** 1%, ** 5%, * 10% level.

Figures

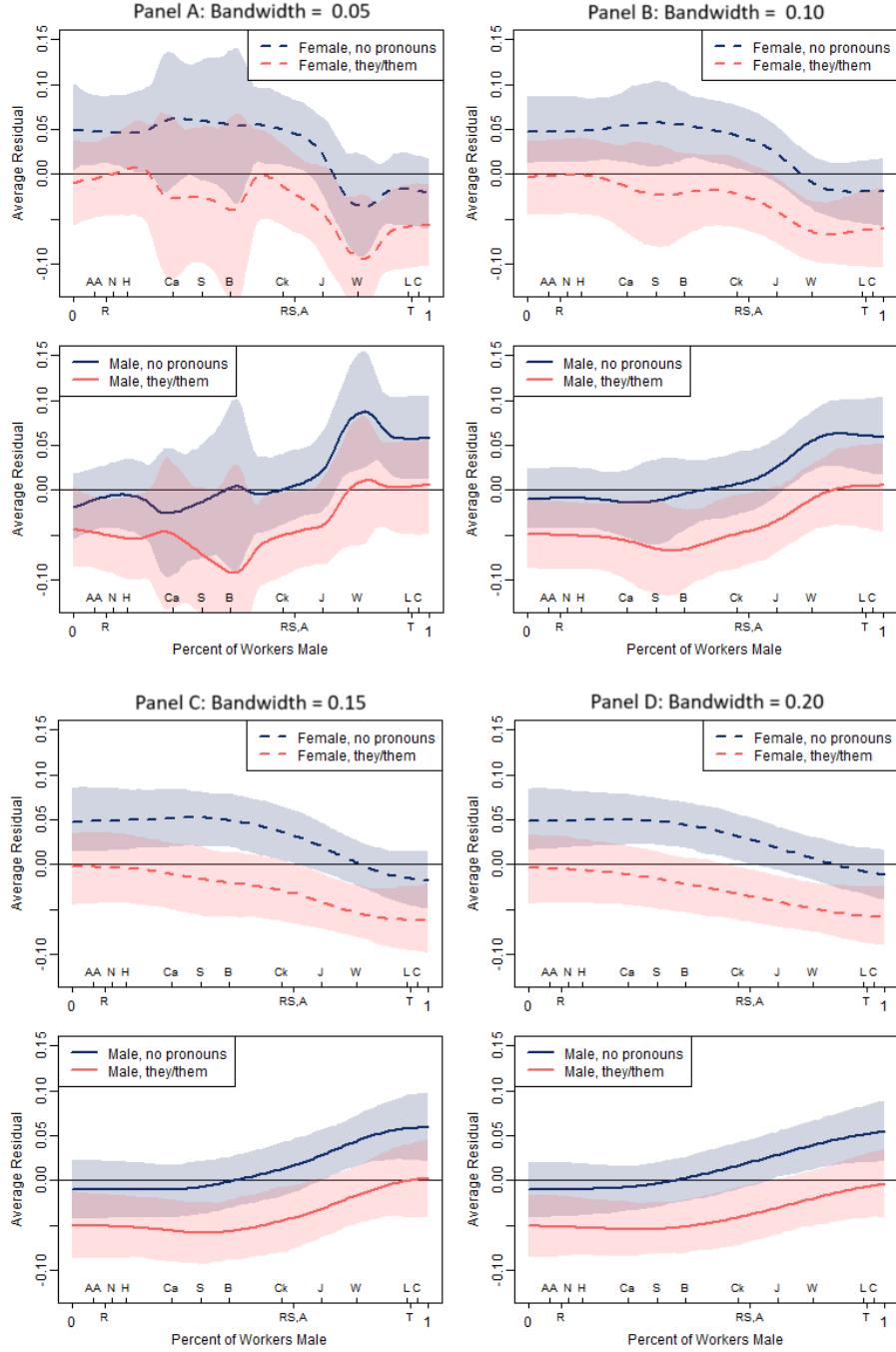


Figure A1: Average Residuals by Sex and Pronouns

Note: This figure reports group-specific average residuals from equation (2), estimated via Nadaraya-Watson kernel smoothing. Occupation sex compositions are indicated along the x-axis; see Table A1 for occupation names. The shaded areas around the average residual estimates represent 95% confidence intervals, using bootstrapping with 1,000 resampled datasets.

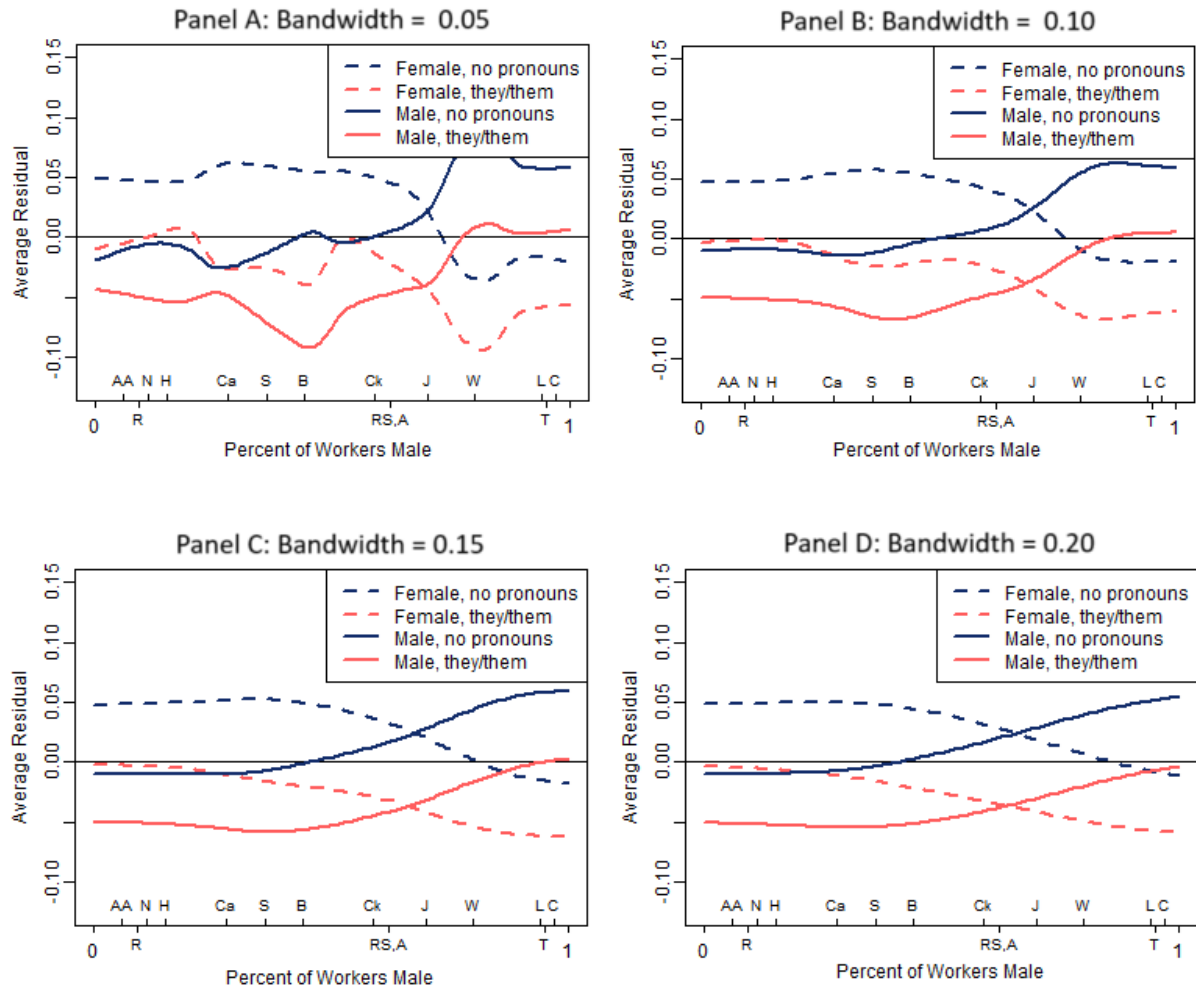


Figure A2: Average Residuals by Sex and Pronouns

Note: This figure reports group-specific average residuals from equation (2), estimated via Nadaraya-Watson kernel smoothing. Occupation sex compositions are indicated along the x-axis; see Table A1 for occupation names.