

STEREOTYPICAL SELECTION

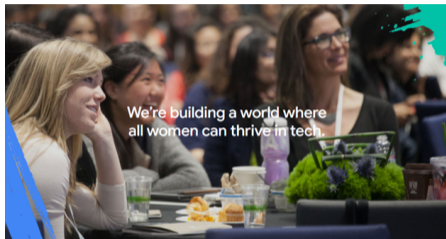
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EEA-ESEM Conference

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EXPLOSION OF POLICIES TO LEVEL THE PLAYING FIELD. WILL IT BE ENOUGH?



We're building a world where all women can thrive in tech.

About us

Google's Women Techmakers program provides visibility, community, and resources for women in technology.

Women in International Economics Conference

The goal of this conference is to enhance diversity within the field of international economics by providing junior women with a forum to present work and receive constructive feedback and mentorship. We hope that the conference will facilitate the development of networks between junior and senior women in the field.

CSWEP Programs

CSWEP sponsors an array of programs and resources designed to promote the careers of female economists.



Claudia Goblin (Harvard, CSWEP Board 2001-04) and Robert Pullak (Washington University in St. Louis, CSWEP Board 2000-03) talk with junior economists about research and publishing at the 4th Annual Mentoring Breakfasts for Junior Economists

CeMENT Mentoring Workshops



WE NEED TO UNDERSTAND SELECTION

- ▶ Stereotypes, norms, and social identity considerations shape the distribution of groups across fields by influencing payoffs from economic choices

(Akerlof and Kranton, 2000; Card et al., 2008; Bertrand, 2011; Oxoby, 2014; Pan, 2015; Cortes and Pan, 2018; Bertrand, 2020; Del Carpio and Guadalupe, 2022; Kugler et al., 2021)

- ▶ The individuals that we observe in the **minority group** are often people who made **choices against stereotypes**, selecting into **counter-stereotypical** fields where their group is **under-represented**
- ▶ Example: *Women in STEM*

ACKNOWLEDGING SELECTION HAS IMPORTANT IMPLICATIONS

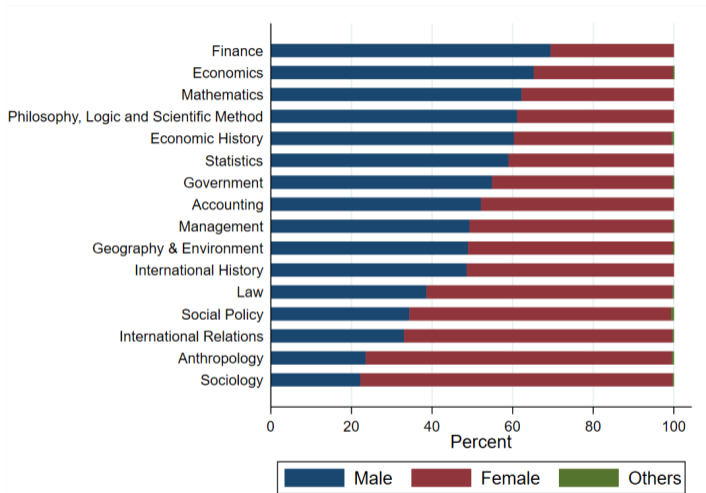
- ▶ Experiments: minority status detrimental for performance, especially in counter-stereotypical fields (e.g. *Women in STEM*)
 - ▶ under-representation reduces opportunities for interaction and assistance → “*homophily*” (e.g. Inzlicht and Good, 2006; McPherson et al., 2001)
 - ▶ under-representation triggers “*stereotype threat*” in counter-stereotypical fields (e.g. Steele and Aronson, 1995; Spencer et al., 2016; Bordalo et al., 2019; Karpowitz and Stoddard, 2020)
- ▶ Findings from experiments may **not apply** to real-world environments
 - ▶ not random assignment to minority status but often **endogenous** selection
- ▶ Margin mostly remained **unexplored**
 - ▶ minority status and choices against stereotypes go hand-in-hand and often overlap

How Does Minority Status Affect Performance When Selection is Endogenous?

- ▶ Study performance in **first-year courses** for 14,313 students enrolled in **undergraduate** programs at the LSE across 10 academic years (2008-2017) and **16 departments**
 - ▶ Independent variation in *stereotypical choices* and *peers' identity*
 1. **Choice of major** in line/against gender stereotypes
→ stereotypical and counter-stereotypical choices
 2. **Quasi-random** allocation of students into class groups
→ exogenous variation in peers' identity
- ⇒ Estimate effect of changes in peers' identity for students who made different choices

- ▶ Empirically disentangle the effects of peers' identity and selection
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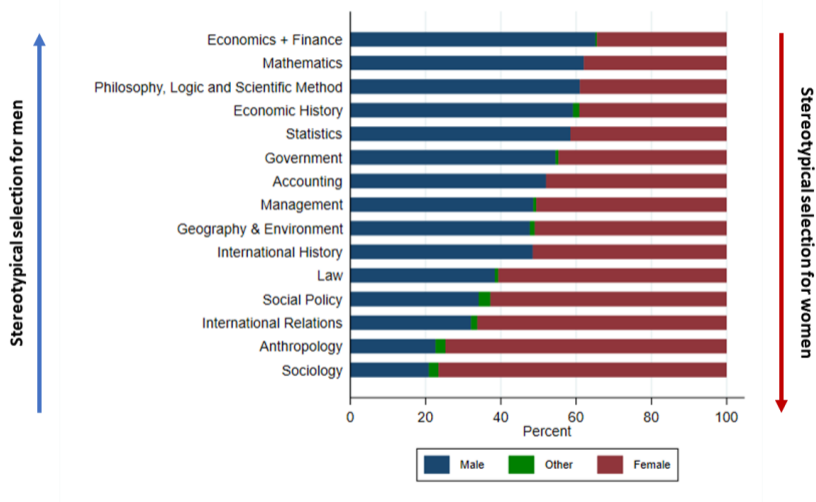
1 STEREOTYPICAL SELECTION: CHOICE OF MAJOR



"Women are worse in math, but better at reading than men" (Ellemer, 2018; Reuben et al., 2014)

1 STEREOTYPICAL SELECTION: CONTINUOUS DEFINITION

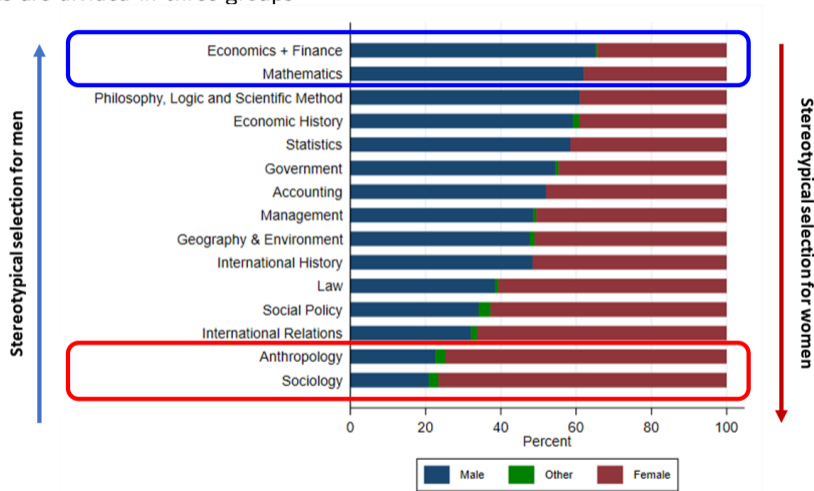
- ▶ Proxy: average share of men/women enrolled in each department between 2008 and 2017



"Women are worse in math, but better at reading than men" (Ellemers, 2018; Reuben et al., 2014)

1 STEREOTYPICAL SELECTION: CATEGORICAL DEFINITION

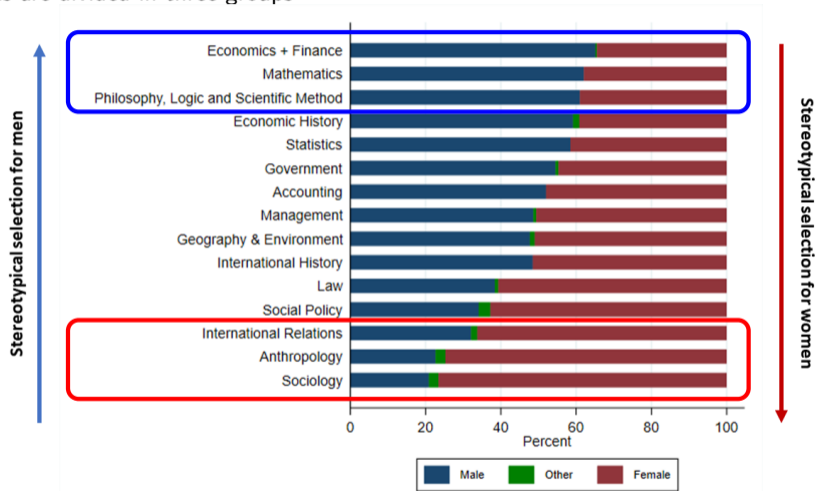
- ▶ Students are divided in three groups



"Women are worse in math, but better at reading than men" (Ellemers, 2018; Reuben et al., 2014)

1 STEREOTYPICAL SELECTION: CATEGORICAL DEFINITION

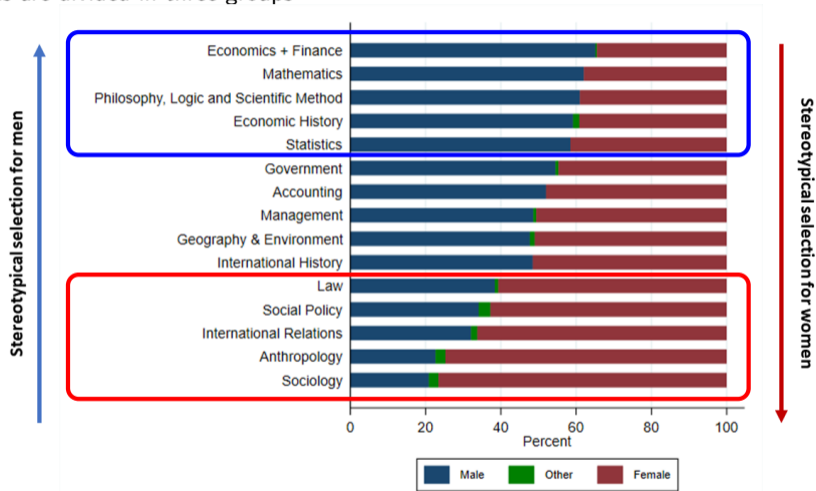
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"Women are worse in math, but better at reading than men" (Ellemers, 2018; Reuben et al., 2014)

1 STEREOTYPICAL SELECTION: CATEGORICAL DEFINITION

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- ▶ Empirically disentangle the effects of peers' identity and selection
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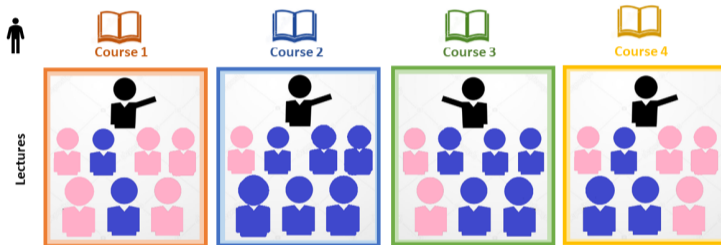
2 ENVIRONMENT COMPOSITION

- ▶ Students attend **multiple** courses during their first year (on average 4)



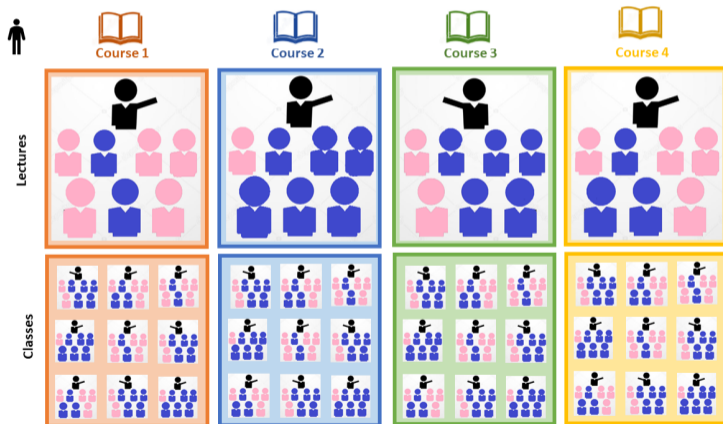
2 ENVIRONMENT COMPOSITION

- ▶ For each course, they attend courses - where they are all together



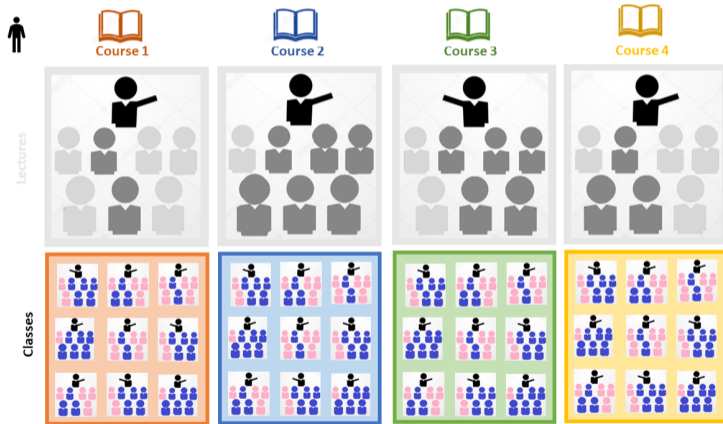
2 ENVIRONMENT COMPOSITION

- ▶ For each course, they attend courses - where they are all together
- ▶ They also attend classes - for which they are divided in **small groups**



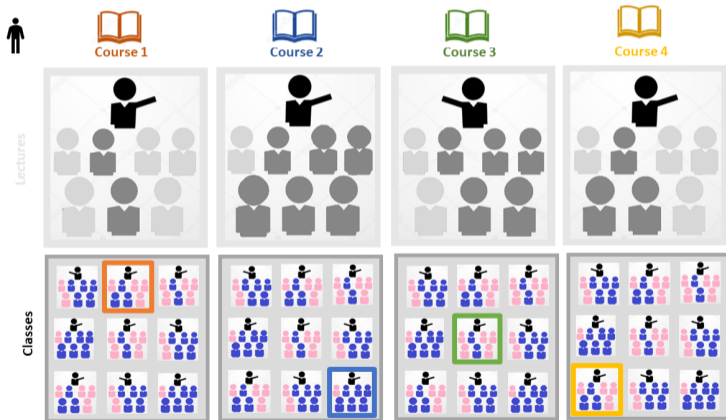
2 ENVIRONMENT COMPOSITION

► Treatment: **class composition**



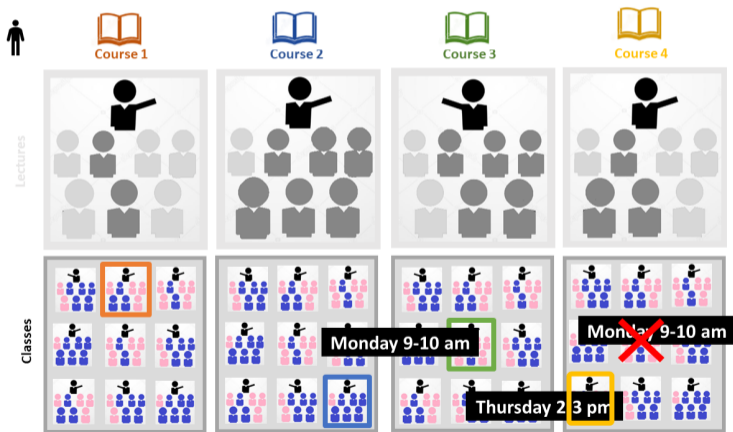
2 ENVIRONMENT COMPOSITION

- Treatment: **class composition** → Exploit the allocation of students into classes



2 ENVIRONMENT COMPOSITION

- ▶ Treatment: **class composition** → Exploit the allocation of students into classes
 - ▶ Allocation only constrained by scheduling conflicts → **exogenous** peers' identity



$$y_{iacg} = \alpha_{ac} + \alpha_i + \beta_1 \times SLM_{iacg} + \beta_2 \times SLM_{iacg} \times STS_i + \epsilon_{iacg}$$

- ▶ y_{iacg} : grade of student i in class group g of first-year course c and academic year a
- ▶ α_{ac} and α_i : course and student fixed effects
- ▶ SLM_{iacg} : share of students like me - share of same gender classmates
- ▶ STS_{iacg} : stereotypical selection
- ▶ Standard errors are clustered at class level

- ▶ Estimate the effect of class composition by exploiting a **within-student variation**
 - ▶ compare the performance of the **same** student **across courses** where they are allocated to classes with **exogenous peers' characteristics**, net of *course* and *student* fixed effects
- ▶ β_2 : Assesses whether the effect differs depending on the choice of major

OPPOSITE EFFECT COMPARED TO WHAT WE WOULD HAVE PREDICTED IF WE HAD GENERALIZED EXPERIMENTAL FINDINGS

- ▶ The students who suffer the most from being in a **numerical minority** are those who made **stereotypical** choices (e.g. men in math)

	Course grade (1)
Share of students like me	-5.937*** (1.701)
Share of students like me × Stereotypical selection	12.390*** (3.166)
Observations	54603
Mean Dependent Variable	60.320 (16.345)

Note: Course and student FE included. SEs in parentheses clustered at class level.

CHOICES OF MAJOR MATTER

- ▶ Students who made different choices are differentially affected by class composition

	Course grade		
	Top and Bottom 2 (1)	Top and Bottom 3 (2)	Top and Bottom 5 (3)
Panel A: Interaction			
Share of students like me	-3.555*** (1.232)	-2.884*** (1.042)	-1.167 (0.725)
Share of students like me × Neutral	3.757*** (1.300)	3.154*** (1.132)	1.028 (0.954)
Share of students like me × Stereotypical	7.759*** (1.555)	6.138*** (1.313)	3.447*** (0.944)
Panel B: Absolute Effect			
Counter-stereotypical: Share of students like me	-3.555*** (1.232)	-2.884*** (1.042)	-1.167 (0.725)
Neutral: Share of students like me	0.202 (0.423)	0.270 (0.452)	-0.139 (0.622)
Stereotypical: Share of students like me	4.204*** (0.901)	3.254*** (0.774)	2.280*** (0.587)
Observations	54603	54603	54603

Note: Course and student FE included. SEs in parentheses clustered at class level.

WHAT DO THESE RESULTS MEAN?

Small magnitude...

- ▶ Stereotypical: 10% ↑ share of same-gender \implies ↑ course grades by 2.0% sd
- ▶ Counter-stereotypical: 10% ↑ share of same-gender \implies ↓ course grades by 1.8% sd

Crucial implications...

1. Even in competitive and selective environments, peers' identity affects performance
 - ▶ magnitude in line with other studies in higher education (e.g. Zölitz and Feld, 2021, Booth et al., 2018)
2. Counterfactual scenario: reallocation policy \rightarrow **more equal gender ratio in male-fields**
(10% ↑ share of women ceteris paribus)
 - ▶ share of women: 30%, negative gender gap: -2.43 points
 - \implies ↓ **inequality** in performance and ↓ **average** performance
 - ▶ ↓ gender gap by 5.9%: ↓ women + ↓↓ men Evidence

HOW DOES SELECTION PLAY A ROLE?

- ▶ Hypothesis: students **internalize** stereotypes & gender composition when choosing majors
⇒ who makes a choice against stereotypes is more **resilient** to being in a minority
 1. Framework to rationalize how peers' identity affects performance in **absence** of selection
(e.g. Akerlof and Kranton, 2000; Ashraf et al., 2014; Bordalo et al., 2019; Bursztyn et al., 2019)
 - key channels: "*homophily*" and "*stereotypes*"
 - key traits: preferences for same gender peers & stereotypical associations
 2. **Selection**: Roy model of occupational choice + social identity considerations
 - ⇒ Students who make different choices are heterogeneous along the **traits** related to the **strength** of the effect of peers' identity on performance
 - preferences for same gender peers & stereotypical associations

WHO MAKES A CHOICE AGAINST STEREOTYPES IS MORE RESILIENT TO BEING IN A MINORITY

- ▶ *IAT*: Stereotypical associations “*scientific - men, humanistic - female*” Evidence
 - ▶ *Social networks*: Preferences for same gender peers Evidence
 - ▶ *Qualifications at entry*: Ability Evidence
 - ▶ *Alternative mechanisms*: Ex-ante traits rather than environment or decision effects
GGI YearHet
- ⇒ Ex-ante “sensitivity” to stereotypes and social norms induce students to select different majors and then react to the composition of the environment in a self-fulfilling way

CONCLUSIONS AND POLICY IMPLICATIONS

- ▶ Targeting and nudging **minorities** might not be enough and might even backfire by reinforcing stereotypes in the mind of the majority group
- ▶ Especially in selective environments where success is the result of strategic choices
- ▶ This is the case at the LSE, but also in decision making bodies or leadership positions
- ▶ Alternative policy recommendation: normalize entering into certain occupations?
 - ▶ act down the ladder rather than up the ladder (e.g. counter-stereotypical examples)
 - ▶ bans of harmful gender stereotypes in ads (U.K. ASA 2019)
 - ▶ quotas? → next steps

THANK YOU!!

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