Worker Beliefs and the Job Application Decision:
A Lab-in-the-Field Experiment on Gender and Sorting

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January 5th, 2020
"whether taken together or separately, (sorting by) occupation and industry now constitute the largest measured factors accounting for the gender wage gap”
(Blau & Kahn, 2017)
Motivation

"whether taken together or separately, (sorting by) occupation and industry now constitute the largest measured factors accounting for the gender wage gap” (Blau & Kahn, 2017)

What is the underlying mechanism?

- Preferences?
- Discrimination based on First-Order Beliefs?
  - FOB: beliefs about the differences between men and women
- Workers’ Second-Order Beliefs?
  - SOB: beliefs about other people’s first-order beliefs
Second-Order Beliefs as a Mechanism

Belief:
Second-Order Beliefs as a Mechanism

Belief:

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Second-Order Beliefs as a Mechanism

Belief:

Male-Dominated

Female-Dominated
Second-Order Beliefs as a Mechanism

Belief (w.r.t. STEM capability):

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Second-Order Beliefs as a Mechanism

Belief (w.r.t. STEM capability):

- **STEM**
  - [People working on computers]
  - [People thinking]

- **Non-Stem**
  - [People working on computers]
  - [People thinking]
Second-Order Beliefs as a Mechanism

Belief (w.r.t. STEM capability):

**STEM**

**Non-Stem**

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Second-Order Beliefs as a Mechanism

Belief (w.r.t. STEM capability):

STEM 

Non-Stem
Second-Order Beliefs as a Mechanism

Belief (w.r.t. STEM capability):

STEM

Non-Stem

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Research Question

How do workers’ second-order beliefs affect their decision to apply for a job?

- Natural field experiment
  - recruit candidates for a **real** job
  - vary gender of hiring manager
  - vary product sector (gender connotations)

- Online lab experiment
  - elicit first- and second-order beliefs
  - procedure from Dustan, Koutout, & Leo (2019)
Literature Review

**Gender Wage Gap**
- HH Production Constraints: Cortes & Pan (2019)

**Sorting**
- Job Stereotypes: Fernandez & Friedrich (2011)
- Lower-paying Firms: Card, Cardoso, & Kline (2015)
The Job

Outside Business to Business Sales Representative

- Company: regional wholesale distributor of disposable goods
  - Office Products
  - Janitorial Products
- Typically 6-figure income (commission-based)
- Generous benefits
- Flexible work hours/place of work
- 7 locations in the Southeast
Field Experiment

1. Recruit participants
2. Treatment E-mail 1
3. Treatment E-mail 2
4. Recruit for Lab Experiment
Experiment Design: Treatments

Treatment 1

Female Manager

1: Male Sector
2: Female Sector

Treatment 2

1: Female Sector
2: Male Sector
Experiment Design: Treatments

Treatment 3

1: Male Sector
2: Female Sector

Treatment 4

Male Manager

1: Female Sector
2: Male Sector

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Field Experiment

Recruit participants

Timeline starts:

Treatment

E-mail 1

Two weeks later:

Treatment

E-mail 2

And another two weeks later:

Recruit for Lab Experiment
Field Experiment

Recruit participants

Timeline starts:

Treatment E-mail 1

Two weeks later:

Treatment E-mail 2

And another two weeks later:

Recruit for Lab Experiment

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Lab Experiment Recruitment

Participants in the field experiment are invited to participate in an online survey of job seekers conducted by Vanderbilt University.

- $5 participation fee
- $5 belief elicitation
- $500 Amazon gift card
- 10-15 minutes
- NO association with job advertisements
Belief Elicitation

**Binarized Scoring Rule (Hossain & Okui, 2013)**

- Decision affects the *probability* of winning
- Robust to risk aversion/loving
- Robust to some non-expected utility maximizers
- Critical assumption: stochastic monotonicity
- Loss function determines the statistic
Procedure to elicit first- and second-order beliefs about the differences between two populations.
Lab Experiment

Procedure to elicit first- and second-order beliefs about the differences between two populations.

- Collect Sample Measuring Characteristic
- Collect Sample of First-Order Beliefs
- Data Collection Stage: Elicit First- & Second-Order Beliefs
- Male Mgr. in Male Sector
- Male Mgr. in Female Sector
- Female Mgr. in Male Sector
- Female Mgr. in Female Sector
Task 2, Male Manager in a Traditionally Female Product Sector

A computer at the end of this survey will randomly select a male manager responsible for hiring and managing sales representatives in a traditionally female product sector. What did he choose when asked “Who do you believe did better on the sales ability assessment, the randomly selected man or the randomly selected woman, and by how much?”

I believe that the manager guessed they did the same

<table>
<thead>
<tr>
<th>Woman</th>
<th></th>
<th>Man</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I believe that the manager guessed they did the same</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The woman did better by</td>
<td>The man did better by</td>
</tr>
<tr>
<td></td>
<td>50+ 45 40 35 30 25 20 15 10 5</td>
<td>5 10 15 20 25 30 35 40 45 50+</td>
</tr>
<tr>
<td>You win $5 with probability:</td>
<td>50% 55% 60% 65% 70% 75% 80% 85% 90% 95% 100% 95% 90% 85% 80% 75% 70% 65% 60% 55% 50%</td>
<td></td>
</tr>
</tbody>
</table>
Piloting

Lab Pilot
- Validating the survey instrument
- TAMU Human Behavior Lab
- 46 participants (not balanced)
- Higher payments $10/$10

Field Pilot
- 70 participants in field exp. (47 male)
- 37 applications
- 9 participants in lab exp. (7 male)
Second-Order Beliefs: Male Manager/Male Sector

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Second-Order Beliefs: Female Manager/Female Sector

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Second-Order Beliefs: Knoxville Pilot

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Thank You