"Algorithmic Bias? A study of the data-based discrimination in the serving of ads in Social Media"

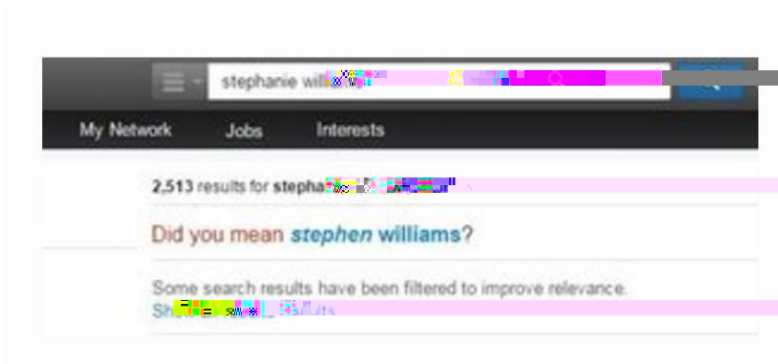## Discussion

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Gender bias in STEM

- "STEM has a girl   problem"
  - Many recent articles about the gender bias in STEM (CNN, NPR, BBC)
  - Research has found bias in perceptions of applications and test grading
    - Initiatives to try to overcome this – e.g. UK universities piloting a name/gender free application process

- In this paper the authors consider an "algorithmic bias"
  - That is even when a campaign is intended to be gender neutral – algorithmic advertising network result in more exposure to men

- LinkedIn recently had a similar "algorithmic bias" (Seattle Times)

Field data test in this paper

- Advertisement to promote careers in STEM on a large social network

- Advertisement was targeted to ages 18-

What is causing this "bias"?

- No significant difference across countries driven by gender   -equality
    - A median split on the UN female labor market, education, gender-equality measure

- Collect a different dataset on suggested bids on cost per click
    - In the original field test no difference in average price per click by gender
    - Find that suggested cost per click is about 10c higher for women
    - Report average suggested bid highest for women 25-44
    - "If there are many advertisers aiming towards the same demographics as you, the prices go up and if you're alone, advertising becomes a lot cheaper. " (http://www.qwaya.com/facebook-advertising-costs)

- Why are cost per click higher for women?
    - Collect a third dataset from a US based retailer
    - Find that women 18-35 are more likely to add an item to their carts conditional on a click or impression

Comments

- Women are significantly less likely to see the advert. is robust and convincing
  - Driven by fact that women 24-44 appear to be a prized market for advertisers

- Clean analysis and well written paper
  - Result apparent in the raw data and robust to controls
  - Great that they collected different dataset to make their points clear

- Results consistent with:
  - Advertising suggested price algorithm
  - Public whitepaper
  - Cost per Click/Like/App Install higher for women
    (https://adespresso.com/academy/blog/facebook-ads-cost/)

Other explanations for why women are prized target market

- Many industry reports suggest women make purchasing decision
  - "Women Make Up 85% of All Consumer Purchases" (Bloomberg)
  - "Women drive 70-80% of all consumer purchasing" (Forbes)
  - "Sorry, Young Man, You're Not the Most Important Demographic in Tech" (The Atlantic)

- Are the difference in prices unique to social media?
  - If this is driven by purchasing power we should find such differences in other advertising channels

Source: "The Female Economy"
Silverstein and Sayre, HBR 2009

Equilibrium ad-prices cause "data based bias"

- Consider the variation by country
  - The advertisers had to triple their bids for Switzerland, the UK, the US and Canada due to low responses
  - Had they not done this these 4 countries would be under-represented

- Consider the variation by age-group (aggregating across gender)
  - Over represents 18-24
  - Under represents 35+

What we can learn from this study?

- Advertising Firms
  - Given the difference in suggested prices perhaps there should be mirrored campaigns by demographic group (men-women, age)
  - This is similar to polling or survey where the population may not be representative

- Advertising platform
  - Allow firms to balance across demographics when running a campaign

- Policy markers
  - Shows the importance of considering market environment (here the ad network) when considering if a firm is potentially bias
  - What is the role of policy here?
    - Protect privacy from advertising firms?