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

Discussion

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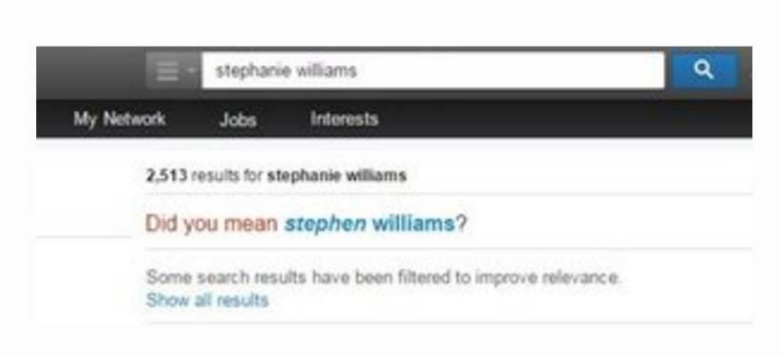
Gender bias in STEM

- **“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

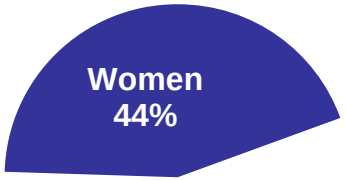
- **Advertisement to promote careers in STEM on a large social network**

Figure 1: Sample Ad

- **Advertisement was targeted to ages 18-65 (and not by gender)**
  - Mirrored campaign run in 191 countries (target reach of 5,000 unique viewers)
    - Maximum bid for a click was set at $0.20 for each country
    - Switzerland, the UK, the US and Canada this was increased to $0.60
  - Collected UN data on different countries

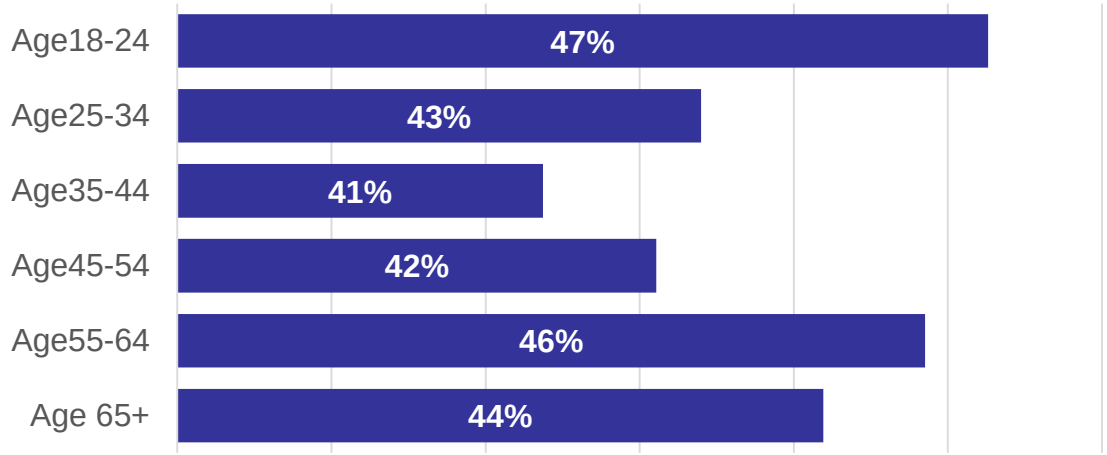
Main results (robust to controls)

- **Women represent less than 50% of reached audience**



- **…. however they represent 50% of clicks [unlikely to be driven by interest]**

- **Difference are largest to 25-44 age group**



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)

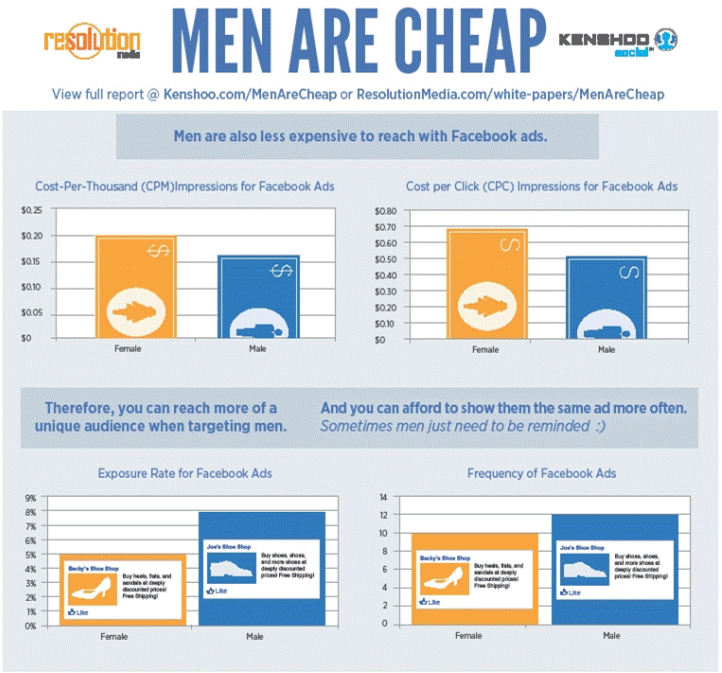
- **Why are cost per click higher for women?**
  - Collect a third dataset from a US based retailer
  - Find that women 18-35 are more likely to add an item to their carts conditional on a click or impression

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

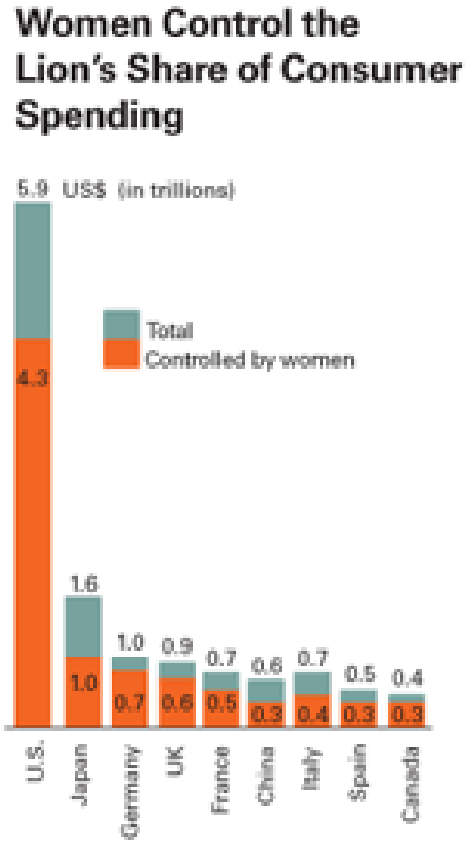
- **Results consistent with:**
  - Advertising suggested price algorithm
  - Public whitepaper
  - Cost per Click/Like/App Install higher for women (https://adespresso.com/academy/blog/facebook-ads-cost/)



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

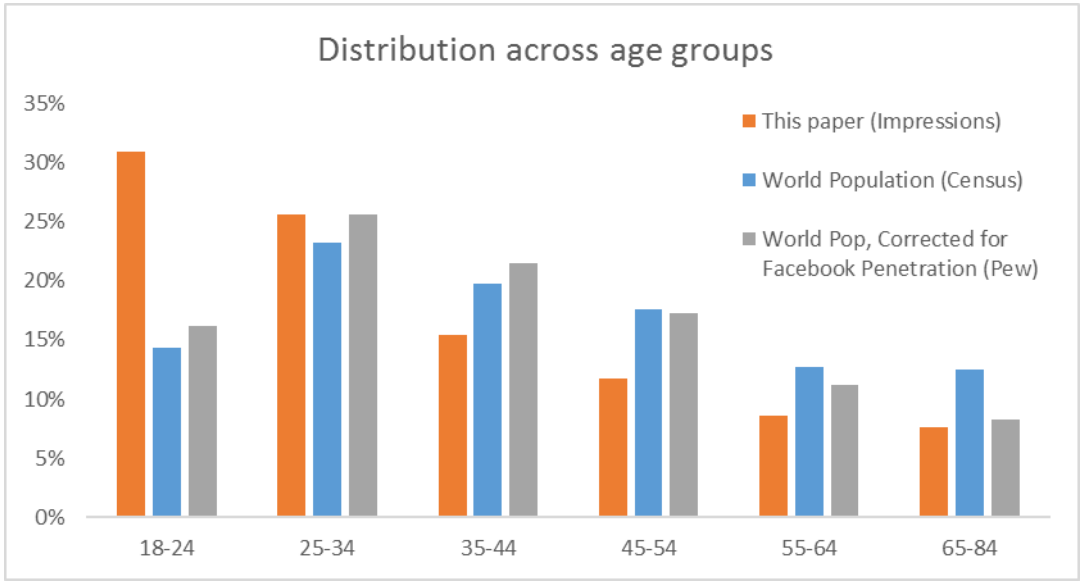


Source: "The Female Economy" Silverstein and Sayre, HBR 2009

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+



Source: http://www.census.gov/population/international/data/idb/worldpop.php and http://www.pewinternet.org/2015/08/19/mobile-messaging-and-social-media-2015/2015-08-19_social-media-update_07/

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?