Analyzing Gender Pay Gap in STEM Fields by Life Trajectory

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Background

STEM field occupations are in high demand and nevertheless exposed to the gender wage gap, resulting in an underrepresented female workforce.

- Women are underrepresented in academia and account for just 15% of tenure-track faculty [1].
- Recruiters are less interested in a female candidate with comparable qualifications [2].

Motivation

The conventional approach of using multivariate regression to analyze the relative relevance of attributes [3] may not be viable in real-life situations:

~~Which factor will affect salary most (relative importance of attributes)?~~

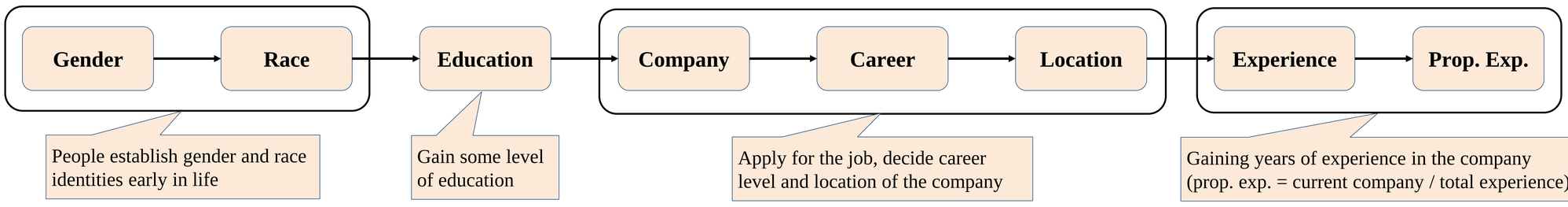
How will your life choices affect your salary?

Life Trajectory Analysis

Data

- We gathered over **62,000 user-shared salary and personal data** posted between 2018 and 2021 from *levels.fyi*, an online platform.
- **Five US** companies to focus on: Amazon, Microsoft, Google, Facebook, and Apple
- Career levels standardized into **software engineer (SWE), Senior SWE, and Manager**.

Life Trajectory Analysis



Results

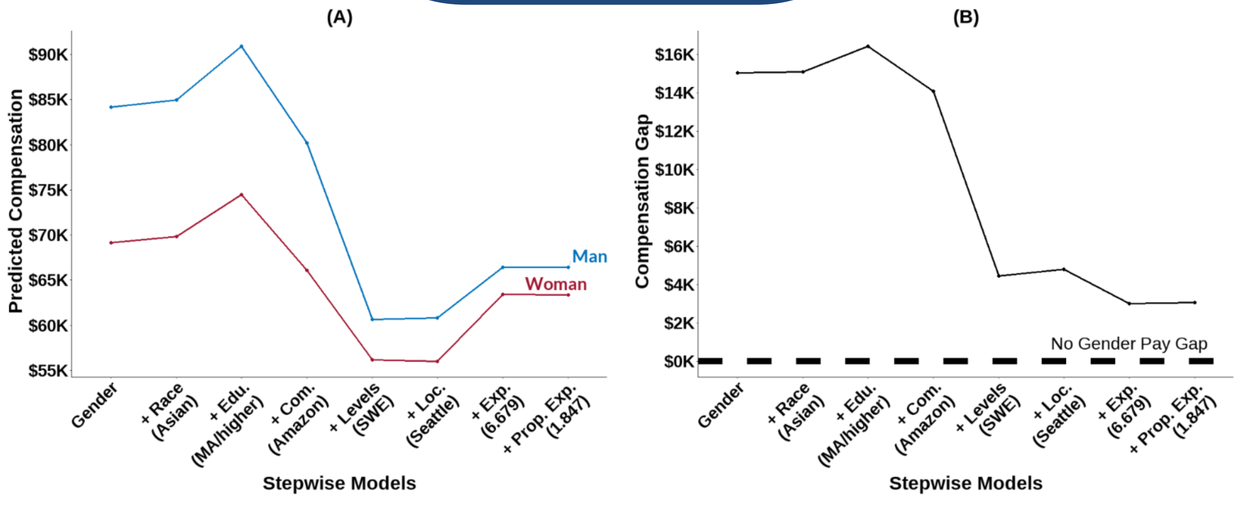


Figure 1: The predicted compensation salary using stepwise regression models (A) for each gender and (B) for the difference between men and women. Factors are cumulatively added from left to right, mimicking choices over life trajectory.

Conclusion

- **Race, Education, Company Choice, Location:** not significantly impacting compensation gap
- **Career Levels:** explain more than 50% of the gap - fewer women taking high-level positions
- **Working Experience:** gap in compensation drops to less than 25% of the initial one - women owning shorter careers

- **Gender pay gap is less pronounced when women and men have similar career levels**
- **Fewer women taking high-level positions and owning shorter careers in STEM fields**
- **Improving the gender disparity will lead to a more talented women workforce joining the STEM field**

Reference

[1] Way, Samuel F., Daniel B. Larremore, and Aaron Clauset. "Gender, productivity, and prestige in computer science faculty hiring networks." In Proceedings of the 25th International Conference on World Wide Web, pp. 1169-1179. 2016.

[2] Murciano-Goroff, Raviv. "Missing women in tech: The labor market for highly skilled software engineers." Management Science, 2021.

[3] Tonidandel, Scott, and James M. LeBreton. "Relative importance analysis: A useful supplement to regression analysis." Journal of Business and Psychology 26, no. 1: 1-9, 2011.