# Race and Gender Disparities in Academic Pay

Peter Choi & Erick Axxe

11/6/2020

# Acknowledgements

# 5 Professors Sue Rutgers, Saying It Shortchanges Women on Pay

The five women say they are paid tens of thousands of dollars less than men with similar qualifications. The university says it is "committed to pay equity."

- Author: Jillian Kramer
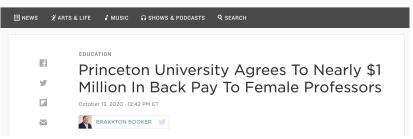- Date: October 15th, 2020

EDUCATION

# Princeton University Agrees To Nearly $1 Million In Back Pay To Female Professors

October 13, 2020 · 12:42 PM ET

BRAKKTON BOOKER

- Extract race & gender from pictures to examine inequality in faculty pay

# Agenda

- ▶ Briefly review literature on pay disparities
- ▶ Introduce our data and methods
- ▶ Results for University of California system (and preliminary results from Arkansas)
- ▶ Our study's next steps

# Gender and Racial Pay Gap

- Allocative, valuative, and within-job wage discrimination (Peterson and Morgan, 1995)
  - (Dwyer 2013; Glenn 1992; Pager, Bonikowski, and Western 2009)
- Racial wage inequality (Huffman and Cohen, 2004)
- Gender income gap (Blau and Kahn, 2017)

# Specifically in Academia

- 11% gender gap at Ohio State (Chen and Crown, 2019)
- Women allocated to lower-paying academic locations (Renzulli et al., 2013)
- Faculty of color may have reached parity in pay with white colleagues (Toutkoushian, Bellas, and Moore, 2007)

# Our Research

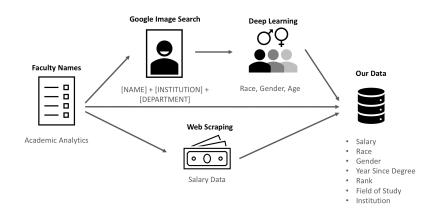Are there disparities in academic pay?

- ▶ Race and gender
- ▶ All public US universities
- ▶ 8 years of data (2012-2018)

This Study

- ▶ UC (University of California) Schools
- ▶ 2018 Salary

# Data



**Faculty Names**

Academic Analytics

**Google Image Search**

[NAME] + [INSTITUTION] + [DEPARTMENT]

**Deep Learning**

Race, Gender, Age

**Web Scraping**

Salary Data

**Our Data**

- Salary
- Race
- Gender
- Year Since Degree
- Rank
- Field of Study
- Institution

# Data

| Categorical Variables | N | % | UC Faculty |
|---|---|---|---|
| **Race** | 5252 | 100.00% | 100.00% |
| White | 3242 | 61.73% | 67.3% |
| Asian | 870 | 16.57% | 17.1% |
| Other | 605 | 11.52% | 5.8% |
| Latino/Hispanic | 375 | 7.14% | 6.9% |
| Black | 160 | 3.05% | 2.9% |
| **Gender** | 5252 | 100.00% | 100.00% |
| Male | 3444 | 65.58% | 65.9% |
| Female | 1808 | 34.42% | 34.1% |

# Method

- Linear Mixed-Effects Model
- Random Intercepts
  - Field of Study
  - Institution

|  | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| **Race** (White) | | | | | |
| Asian | −14,017*** | −12,288*** | −1,197 | −3,094 | −827 |
|  | (3,176) | (3,155) | (2,855) | (2,779) | (2,753) |
| Black | −22,628*** | −21,936*** | −12,697* | −6,415 | −6,807 |
|  | (6,712) | (6,655) | (5,992) | (5,855) | (5,786) |
| Latino/Hispanic | −8,840 | −9,085* | −3,465 | −4,716 | −3,469 |
|  | (4,513) | (4,475) | (4,028) | (3,929) | (3,884) |
| Other | −2,813 | −7,117 | 571 | 976 | 2,033 |
|  | (3,665) | (3,662) | (3,301) | (3,221) | (3,184) |
| **Gender** (Male) | | | | | |
| Female |  | −23,676*** | −12,577*** | −11,131*** | −9,842*** |
|  |  | (2,482) | (2,254) | (2,201) | (2,178) |
| Year since Degree |  |  | 2,986*** |  | 1,327*** |
|  |  |  | (85) |  | (118) |
| **Rank** (Professor) | | | | | |
| Associate Professor |  |  |  | −67,051*** | −49,825*** |
|  |  |  |  | (2,650) | (3,033) |
| Assistant Professor |  |  |  | −92,944*** | −64,893*** |
|  |  |  |  | (2,557) | (3,547) |
| Constant | 182,394*** | 191,763*** | 126,972*** | 223,098*** | 185,377*** |
|  | (14,955) | (14,597) | (14,423) | (13,730) | (14,288) |
| $N$ | 5,252 | 5,252 | 5,252 | 5,252 | 5,252 |
| Log Likelihood | −66,892 | −66,838 | −66,277 | −66,135 | −66,067 |

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| **Race** (White) | | | | | |
| Asian | −14,017*** | −12,288*** | −1,197 | −3,094 | −827 |
| | (3,176) | (3,155) | (2,855) | (2,779) | (2,753) |
| Black | −22,628*** | −21,936*** | −12,697* | −6,415 | −6,807 |
| | (6,712) | (6,655) | (5,992) | (5,855) | (5,786) |
| Latino/Hispanic | −8,840 | −9,085* | −3,465 | −4,716 | −3,469 |
| | (4,513) | (4,475) | (4,028) | (3,929) | (3,884) |
| Other | −2,813 | −7,117 | 571 | 976 | 2,033 |
| | (3,665) | (3,662) | (3,301) | (3,221) | (3,184) |
| **Gender** (Male) | | | | | |
| Female | | −23,676*** | −12,577*** | −11,131*** | −9,842*** |
| | | (2,482) | (2,254) | (2,201) | (2,178) |
| Year since Degree | | | 2,986*** | | 1,327*** |
| | | | (85) | | (118) |
| **Rank** (Professor) | | | | | |
| Associate Professor | | | | −67,051*** | −49,825*** |
| | | | | (2,650) | (3,033) |
| Assistant Professor | | | | −92,944*** | −64,893*** |
| | | | | (2,557) | (3,547) |
| Constant | 182,394*** | 191,763*** | 126,972*** | 223,098*** | 185,377*** |
| | (14,955) | (14,597) | (14,423) | (13,730) | (14,288) |
| $N$ | 5,252 | 5,252 | 5,252 | 5,252 | 5,252 |
| Log Likelihood | −66,892 | −66,838 | −66,277 | −66,135 | −66,067 |

|  | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| **Race** (White) | | | | | |
| Asian | −14,017*** | −12,288*** | −1,197 | −3,094 | −827 |
| | (3,176) | (3,155) | (2,855) | (2,779) | (2,753) |
| Black | −22,628*** | −21,936*** | −12,697* | −6,415 | −6,807 |
| | (6,712) | (6,655) | (5,992) | (5,855) | (5,786) |
| Latino/Hispanic | −8,840 | −9,085* | −3,465 | −4,716 | −3,469 |
| | (4,513) | (4,475) | (4,028) | (3,929) | (3,884) |
| Other | −2,813 | −7,117 | 571 | 976 | 2,033 |
| | (3,665) | (3,662) | (3,301) | (3,221) | (3,184) |
| **Gender** (Male) | | | | | |
| Female | | −23,676*** | −12,577*** | −11,131*** | −9,842*** |
| | | (2,482) | (2,254) | (2,201) | (2,178) |
| Year since Degree | | | 2,986*** | | 1,327*** |
| | | | (85) | | (118) |
| **Rank** (Professor) | | | | | |
| Associate Professor | | | | −67,051*** | −49,825*** |
| | | | | (2,650) | (3,033) |
| Assistant Professor | | | | −92,944*** | −64,893*** |
| | | | | (2,557) | (3,547) |
| Constant | 182,394*** | 191,763*** | 126,972*** | 223,098*** | 185,377*** |
| | (14,955) | (14,597) | (14,423) | (13,730) | (14,288) |
| $N$ | 5,252 | 5,252 | 5,252 | 5,252 | 5,252 |
| Log Likelihood | −66,892 | −66,838 | −66,277 | −66,135 | −66,067 |

# Conclusion

- There is a significant gender gap ($\sim 10k$) in salary even when accounting for rank and year since degree

- The pay gap for black professors disappears when controlling for rank, suggesting they may be at lower professorial ranks than white professors

## Total Salary for 2017 (Arkansas Professors)

|  | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| **Race** (White) | | | | | |
| Asian | −10,083* | −10,100* | −3,962 | −4,710 | −4,516 |
|  | (3,955) | (3,943) | (3,666) | (3,339) | (3,365) |
| Black | −4,301 | −6,095 | −1,928 | 3,023 | 2,961 |
|  | (7,444) | (7,460) | (6,861) | (6,309) | (6,314) |
| Other | 623 | −61 | 8,285 | 6,371 | 6,645 |
|  | (7,310) | (7,293) | (6,743) | (6,164) | (6,192) |
| **Gender** (Male) | | | | | |
| Female | | −8,747* | −4,005 | −5,616 | −5,424 |
|  | | (3,754) | (3,476) | (3,168) | (3,194) |
| Year since Degree | | | 1,191*** | | 75 |
|  | | | (112) | | (151) |
| **Rank** (Professor) | | | | | |
| Associate Professor | | | | −33,531*** | −32,686*** |
|  | | | | (2,975) | (3,436) |
| Assistant Professor | | | | −46,057*** | −44,442*** |
|  | | | | (3,035) | (4,465) |
| Constant | 105,265*** | 107,235*** | 80,380*** | 126,609*** | 124,369*** |
|  | (14,758) | (14,487) | (14,498) | (14,636) | (15,304) |
| N | 615 | 615 | 615 | 615 | 615 |
| Log Likelihood | −7,291 | −7,279 | −7,222 | −7,157 | −7,151 |

*p < .05; **p < .01; ***p < .001

Base categories for race, gender, and rank are white, male, and professor.

# Next Steps

- All public universities in the US
- Longitudinal (2012 - 2018)
- Add productivity measures (Publications, Grants, Citations, H-index)
- Oaxaca-Blinder decomposition analysis