

Males vs. Females: Have Women Finally Caught Up To Men?

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The United States finally has a woman Vice President and three Supreme Court Justices. In addition, women own businesses, and some are CEOs of Fortune 500 companies. However, no one dreamed that women could be successful in 1960. So where do women stand today in 2023? Have they caught up with men in these areas, or are women still far behind?

Data from the United States Census Bureau's 2021 American Community Survey 1-Year Estimates gives a good picture of how women compare to men today. The measurable variables are Labor Participation Rate, Employment Rate, Income, High School Graduation Rate, and College Graduation Rate. State and Sex are the value variables. The downloaded information is combined into one dataset using State and Sex as keys. In addition, two ID variables representing State and Sex when only numeric values are allowed are added to the dataset. A Codebook containing additional information about this dataset was also created.

Direct comparisons of employment, education, and income between the genders were performed to identify the minimum and maximum numbers and the states associated with these values. The mode, variance, and standard deviations were also examined. In addition, the Probability Mass Functions (PMFs) for High School Graduation and Cumulative Distribution Functions (CDFs) for College Graduation and Annual Income were created to display the results by gender. Correlation, causation, and Least Squares regression testing were carried out to examine the relationship between labor participation and employment. Whether women make 83% of a man's income was tested based on the Census dataset, and the results were negative. Finally, the mean of the Labor Participation Rate, Employment Rate, Income, High School Graduation Rate, and College Graduation Rate by gender was compared to the historical values

from 1960. For education, women surpassed men; the gap was closed significantly for employment and income.

Given the information in the dataset, this was a comprehensive analysis, but with only two values (State and Sex), a "deep dive" was not possible. The results for education and employment were not surprising, but the income gap was wider than expected.

This project gave me a greater understanding of how this data can be perceived in many ways beyond grouping "like" items together. My only issue is that many different tools, Thinkplot, Matplotlib, Plotly, and Seaborn, were needed to create the visualizations. For example, while one tool would allow for setting the color on histograms, it does not work for line graphs.

This project confirmed that women have "mostly" caught up to men and even surpassed them in some areas, but more work is needed.

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