College major choices can predict gender wage gaps

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For the first time ever, college-educated women appear on track to outnumber college-educated men in the workforce, a milestone in what has been a decades-long trend. However, those women still trail their

male peers in compensation.

One potential explanation: Many women specialize in lower-pay fields, such as elementary education, both in the college classroom and in the labor market.

According to research from University of Chicago economists, this has started to change: Compared to their predecessors, recent generations of college women are sorting into traditionally male-dominated majors more often.

Published by the Becker Friedman Institute, the new working paper also found that this gender gap in major choice strongly predicts gender wage gaps—even when accounting for occupation choice.

The paper was co-authored by Prof. Dan Black of the Harris School of Public Policy and Prof. Erik Hurst of the Booth School of Business. The lead author was Carolyn Sloane, MBA, Ph.D., a UChicago alum who is now an assistant professor of economics at the University of California, Riverside.

"Why have we seen women moving into fields as disparate as pharmacy, accounting, biology—in fact, becoming the majority of graduates for those fields of study," Black said, "and not seen them make as much progress in other disciplines, such as engineering, computer science and economics?"

It is difficult, Black added, to empirically separate women who are not interested in engineering as a subject, from those who decided not to pursue engineering to avoid facing sexism in a male-dominated field.

The authors studied recently released data from the U.S. Census Bureau's American Community Survey (ACS), including responses from

millions of college-educated people about their choice of major and their career outcomes.

Among their findings: For baby boomers born between 1950 and 1954, only one woman majored in engineering for every 20 men. For millennials born 40 years later, the ratio changed to one woman for every five men. This trend is also recorded in the physical and life sciences. Among biology majors, women outnumber men.

"The knowledge we develop and use in our occupations is built upon all the specialized learning investments we've made our entire lives," said Hurst, the Frank P. and Marianne R. Diassi Distinguished Service Professor at Chicago Booth. "For that reason, people who work as biochemical engineers have science and not humanities majors as their primary undergraduate major.

"If men and women sort into field of study in systematically different patterns, it follows that major choice should affect the college gender wage gap."

To examine the wage effects of these decisions, the researchers assigned each person a potential wage solely on the basis of their major choice—the wage the individual would receive if they were compensated like a native-born white male in his peak earnings years who studied the same subject. The idea was to isolate the specific effect of these choices.

When Sloane, Hurst, and Black documented patterns in potential wages across five-year birth cohorts by gender, their analysis revealed that, on average, women chose majors with lower potential wages than men did.

But while there is an ever-present female penalty in potential wages, that gap has also narrowed. Overall, women born in 1950 chose majors that reduced their potential wages, relative to their male counterparts, by

12.5%. For those born in 1990, that gap narrowed to 9.5%.

However, the research also suggests that women who major in a high-wage field such as chemical engineering may still end up working fewer hours and making less money. Curious about the connections between educational specialization and occupational specialization, the researchers find that—conditional on making the same major choice—women still sort into occupations with lower potential pay and fewer hours than their male peers.

Sloane pointed out that although women are twice as likely to major in education, men who choose the same major are twice as likely to end up in high-level management roles. Women, on the other hand, are twice as likely to end up in administrative support roles.

"The differences in occupational paths for men and women who major in the same subject are stark," said Sloane, who previously taught at Harris Public Policy as a visiting assistant professor. "We see this in potential wages based on occupation, in the rank or prestige of the occupation, and even in the variety of occupations.

"When market returns to a major are low, men tend to disperse into a wider set of occupations—kind of throw anything at the wall. In contrast, when market returns to a major are high, men hone in on a narrower set of occupations."

Understanding why this happens is a topic for future research, the authors noted.

"Campuses have a lot of women relative to men," Black said. "I think firms have got to get ready for the new era. You're going to have a lot of talented people that are, quote, 'the wrong gender' by the firms' own standards. Keeping these women in the workforce and working is going

to be very important."

More information: A Cross-Cohort Analysis of Human Capital Specialization and the College Gender Wage Gap: bfi.uchicago.edu/working-paper … ege-gender-wage-gap/

Provided by University of Chicago