SEX SEGREGATION IN UNDERGRADUATE ENGINEERING MAJORS


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Gender inequality in engineering persists in spite of women reaching parity in college enrollments and degrees granted. To date, no analyses of educational sex segregation have comprehensively examined segregation within one discipline. To move beyond traditional methods of studying the long-standing stratification by field of study in higher education, I explore gender stratification within one field: engineering. This dissertation investigates why some engineering disciplines have a greater representation of women than other engineering disciplines. I assess the individual and institutional factors and conditions associated with women's representation in certain engineering departments and compare the mechanisms affecting women's and men's choice of majors.

I use national data from the Engineering Workforce Commission, survey data from 21 schools in the Project to Assess Climate in Engineering study, and Carnegie Foundation classification information to study sex segregation in engineering majors from multiple perspectives: the individual, major, institution, and country. I utilize correlations, t-tests, cross-tabulations, log-linear modeling, multilevel logistic regression and weighted least squares regression to test the relative utility of alternative explanations for women's disproportionate representation across engineering majors.

As a whole, the analyses illustrate the importance of context and environment for women's representation in engineering majors. Hypotheses regarding hostile climate and discrimination find wide support across different analyses, suggesting that women's under-representation in certain engineering majors is not a question of choice or ability. However, individual level factors such as having engineering coursework prior to college show an especially strong association with student choice of major. Overall, the analyses indicate that institutions matter, albeit less for women, and women's under-representation in engineering is not reducible to individual choice.

This dissertation provides a broad, descriptive view of the state of sex segregation in engineering as well as a careful analysis of how individual and institutional factors inhibit or encourage sex segregation. This study contributes to the research literature through the use of novel data, testing of occupational segregation theories, and the use of multiple levels of analysis. The analyses provide new insight into an enduring phenomenon, and suggest new avenues for understanding sex segregation in higher education.