

Factors Influencing Persistence for Undergraduate Women in Mathematics or Statistics

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Few women enroll in collegiate mathematics-intensive Science, Technology, Engineering, and Mathematics (STEM) programs compared to non-STEM programs (Rivers, 2017). Meanwhile, the few women pursuing these STEM degrees in colleges are about 1.5 times more likely than men to leave their STEM programs (Ellis et al., 2016). Some studies have explored the factors that account for women's dropout from STEM programs (e.g., O'Connell & McKinnon, 2021). But for the women who continue to enroll in STEM programs, particularly those in math-intensive programs, what college factors explain their continued enrollment in their majors?

In an attempt to better understand this situation, we explored the experiences of undergraduate women in mathematics and statistics programs with a focus on their perception of academic development opportunities and social support in relation to persistence. We define persistence as students' continuous enrollment through the third year, placing them on a presumed path to STEM degree attainment from the university. Academic development refers to the formal and experiential learning opportunities provided officially within the program (e.g., courses, office hours). Likewise, social support describes the help and guidance students receive beyond the official capacity of the program/department (e.g., study groups, major-related clubs).

The participants in the study included 24 self-identified women who completed the student survey sent to all students enrolled in the mathematics and statistics programs at Pink University (pseudonym) located in the Midwestern region of the United States. The survey was intended for only women in the programs. We used an online survey to collect data on key variables such as demographics and persistence factors. The survey consisted of 31 items on a 5-point Likert scale and 5 open-ended questions. The larger study involves group interviews with select respondents but the current analysis focuses on the survey responses to address the following research question: What college factors do women in mathematics or statistics undergraduate degree programs indicate as influencing their persistence in those programs?

We found that women rated academic factors as more influential on their persistence than social factors. Specifically, 91% of the women indicated that the relevance of courses to their career goals and their performance in the courses contributes strongly to their persistence. Likewise, 69% of the women declared that the quality of instruction and internship opportunities influences their persistence in mathematics or statistics programs. However, 75% of the women revealed social support factors have a low to moderate influence on their persistence.

Our results echo similar studies (e.g., Espinosa, 2011; Brainard & Carlin, 1998), and we extend this work by looking beyond introductory calculus to hear from women in their third and fourth years about how these academic and social factors have influenced persistence. Centering undergraduate women's experiences can point to areas where interventions and support can be targeted to improve women's experiences in STEM education.

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