BI-CO MATHEMATICS COLLOQUIUM

Lynne Steuerle Schofield
Swarthmore College

"Measurement Error in Variables that Predict STEM Retention"

Monday, February 17, 2014

Talk at 4:00 – Park 338
Tea at 3:30 – Park 355, Math Lounge

Abstract:

Under-represented minorities (URMs) and women are both less likely to declare a college major in science, technology, engineering, and mathematics (STEM) disciplines and less likely to persist in their STEM major to graduation. I investigate two possible explanations of these disparities: differentials in high school mathematics proficiency and differences in personality traits. Both mathematics proficiency and personality traits are "latent variables," variables that are unobserved and not directly measurable. Therefore, analyses should (but often do not) account for the measurement error when these latent variables are used as predictors. I present a new model, the Mixed Effects Structural Equations model, which simultaneously models the latent variables, the measurement error and the effect of the latent variable on STEM retention. Using data from the 1997 National Longitudinal Survey of Youth, I find the effects of prior mathematics proficiency and personality have been previously underestimated in the STEM retention literature and explain portions of the racial and gender gaps.

BRYN MAWR COLLEGE