

Measuring Motivational and Other Psychological Factors in UREs:

An 11-Year Study of Students Funded Through
Minority Science Training Programs

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Research Team

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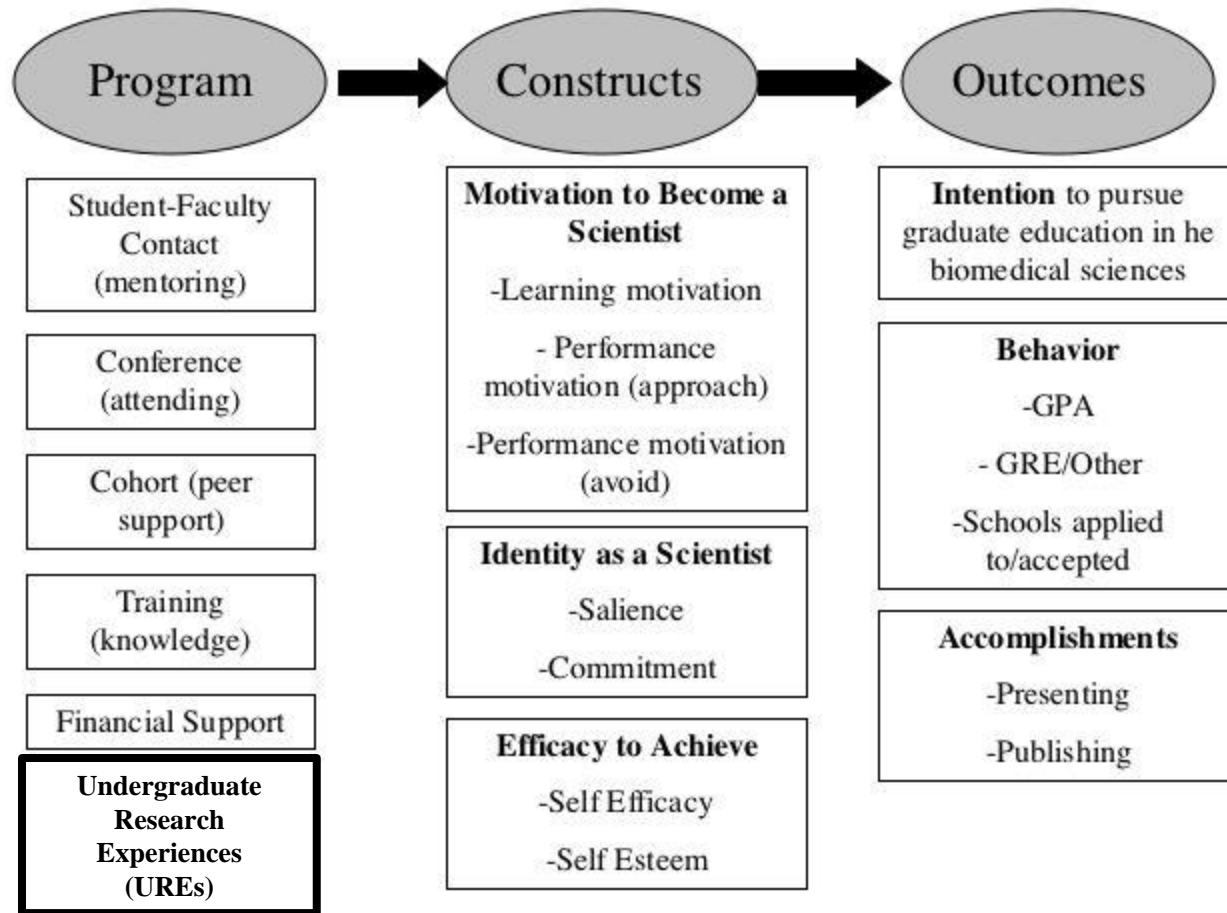


Background: The *ScienceStudy*

- Prospective, propensity matched control
- Longitudinal study of students funded in NIH-funded R.I.S.E. and MARC science training programs
- Launched in 2005
- Participants from 50 campuses nationwide
- Twice yearly surveys from students
- Starting panel of 1420 students (90% Undergraduate)
 - African-American, Hispanic/Latino, Native American



PROCESS MODEL FOR RISE OUTCOMES



Questions we can (begin to) answer

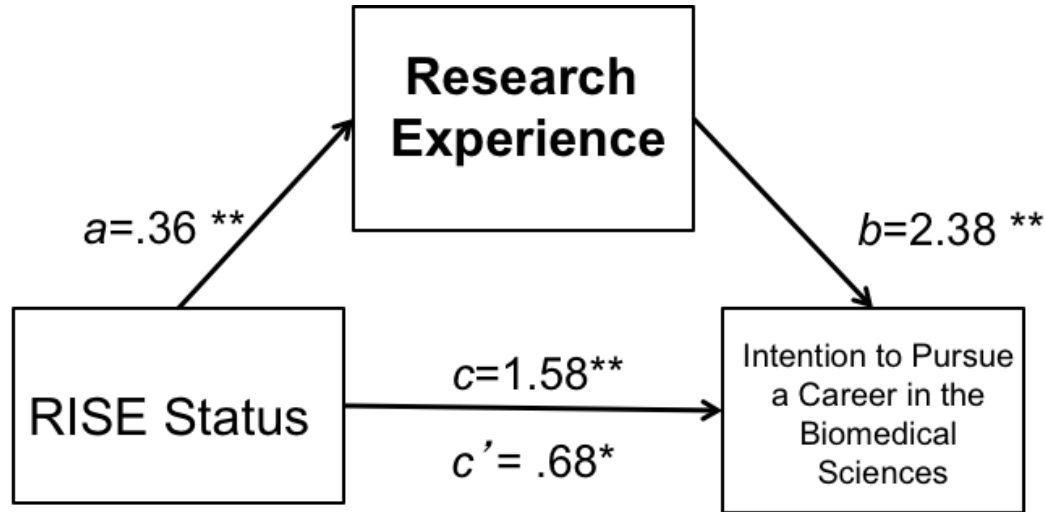
1. Are there elements of the RISE program that are linked with student success? (e.g., Research experience)

- Basic effects (summative outcome):
 - Persistence
 - Graduation rates
 - Admission and completion of graduate training

2. What are the reasons for success (process)?

- Motivation, Efficacy, Identity, & Values

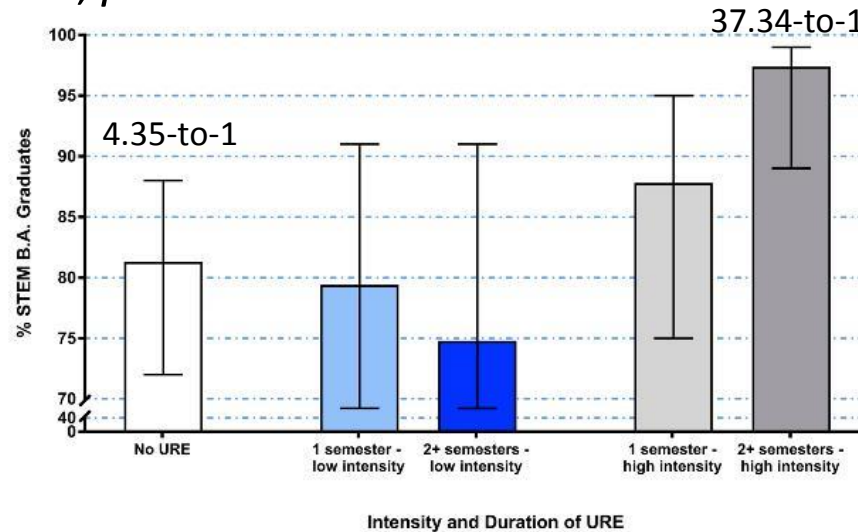
1. Mediation: Research Experience



Note: a, b and c path's are unstandardized coefficients. * $p < .05$, ** $p < .001$
Bootstrapped Indirect Effect: Mean = 0.68, $CI_{99\%} = 1.31$ to 0.45
Sobel: $Z = 4.67$, $p < .001$

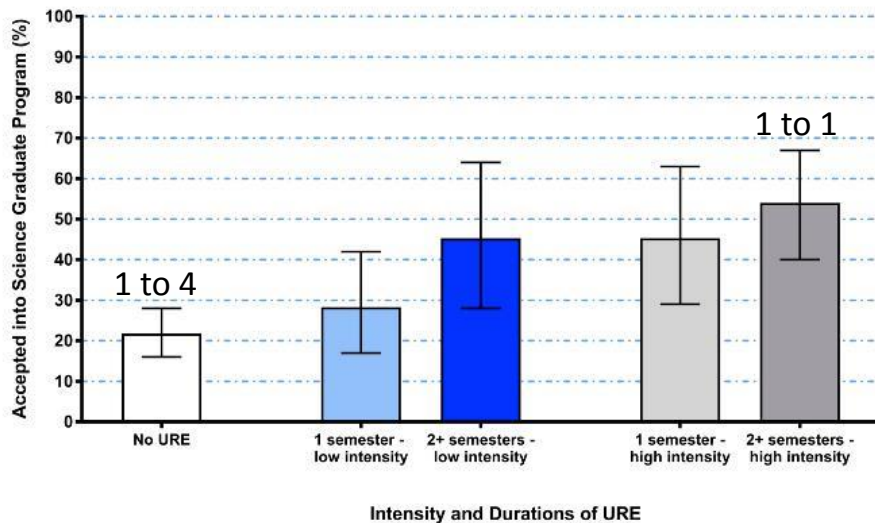
1. Science Baccalaureate Degree

- 2+ Semesters of High-Intensity URE
- Odds Ratio 8.62, $p < .001$



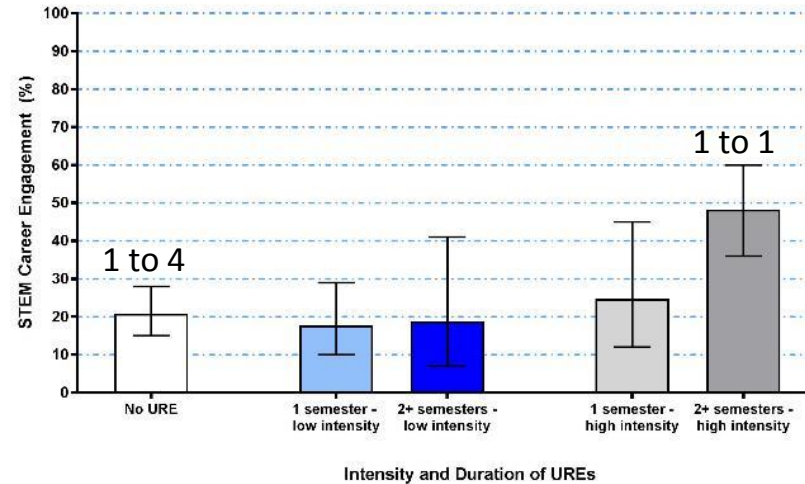
1. Graduate Program Acceptance

- 2+ Semesters of High-Intensity URE
- Odds ratio 4.23, $p < .001$

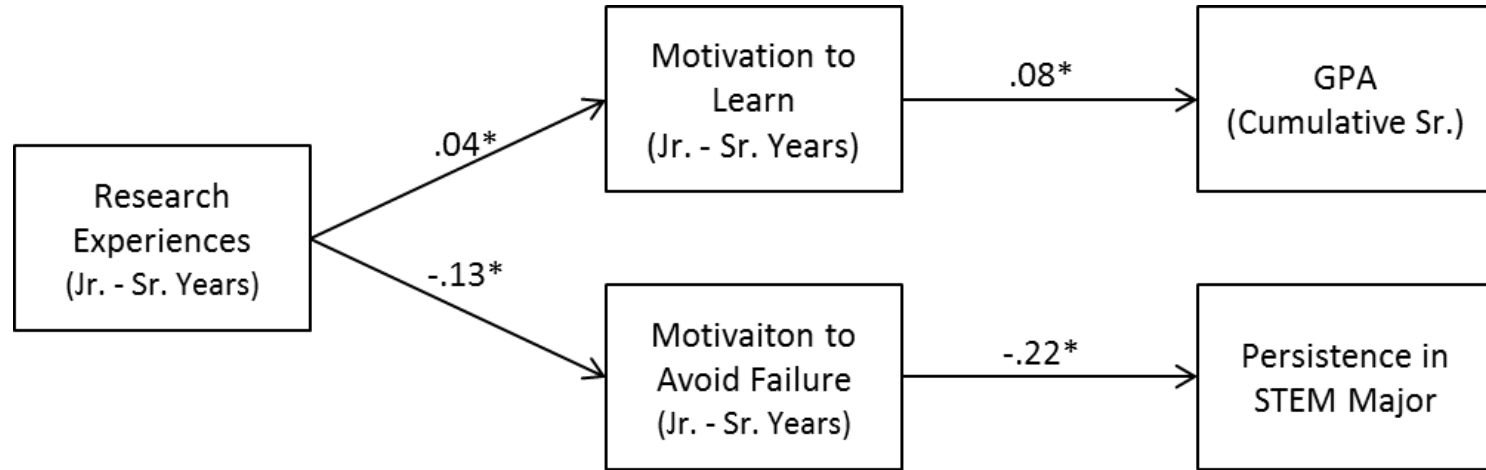


1. Scientific Career Engagement

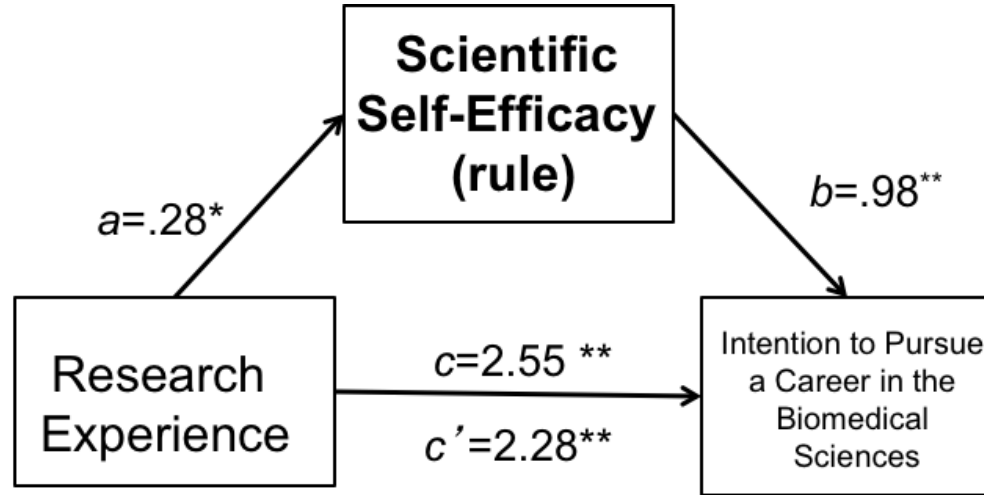
- 2+ Semesters of High-Intensity URE
- Odds 3.54, $p < .001$



2. Motivation

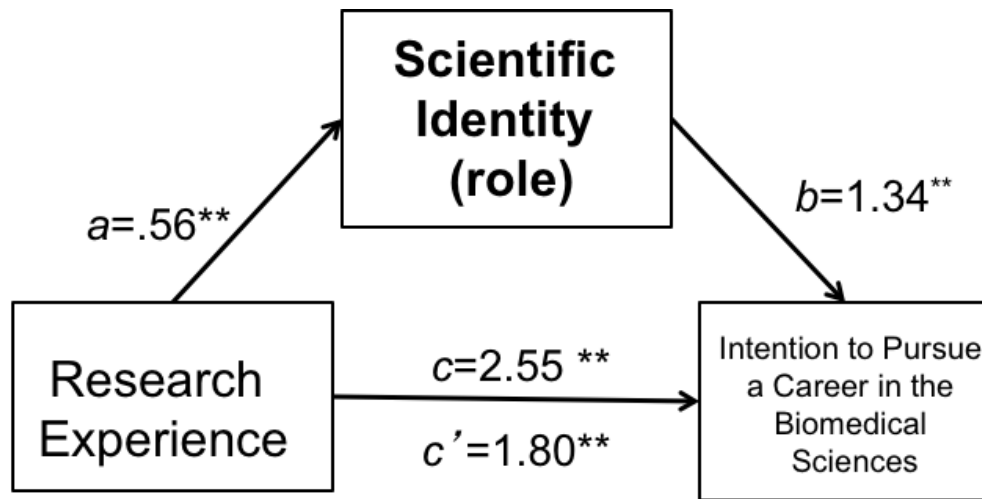


2. Process: Self-Efficacy



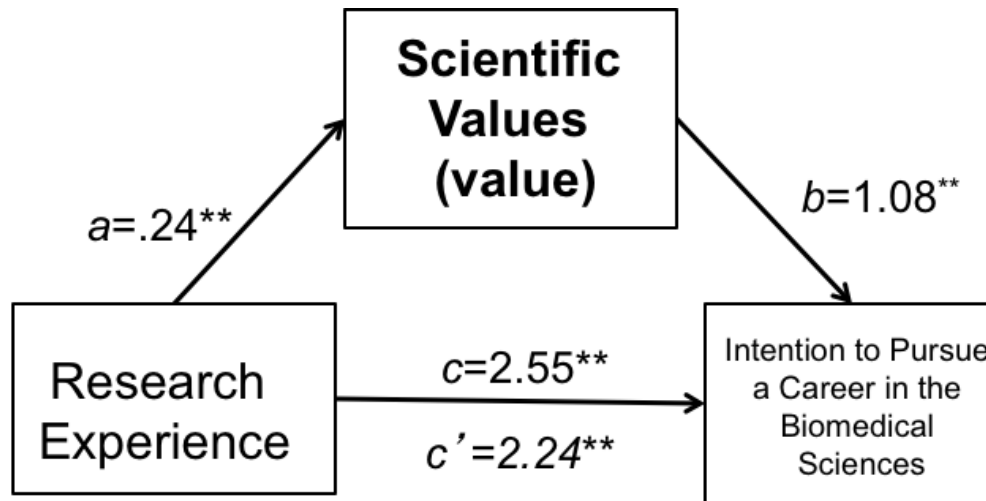
Note: a, b and c path's are unstandardized coefficients. * $p < .05$, ** $p < .01$
Bootstrapped indirect effect: mean = .27, CI_{99%} .06 to .56
Sobel: $Z = 2.57$, $p < .01$

2. Process: Identity



Note: a, b and c path's are unstandardized coefficients. * $p < .05$, ** $p < .01$
Bootstrapped indirect effect: mean = .75, $CI_{99\%}$.33 to 1.23
Sobel: $Z = 4.37$, $p < .001$

2. Process: Values



Note: a, b and c path's are unstandardized coefficients. * $p < .05$, ** $p < .01$
Bootstrapped indirect effect: mean = .27, CI_{99%} .01 to .60
Sobel: $Z = 2.43$, $p < .01$

Acknowledgments

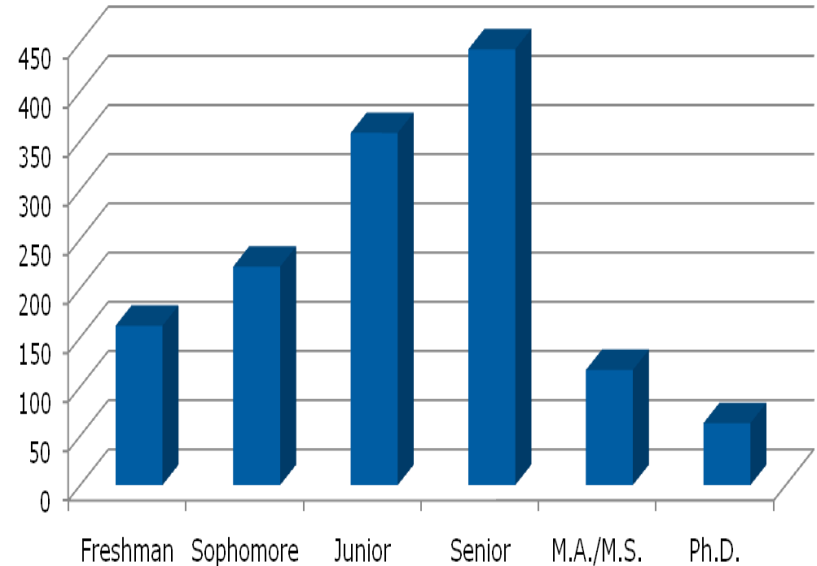
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- Our appreciation goes to *TheScienceStudy* research team and *TheScienceStudy* panel members.

Thank you!

Questions?

Longitudinal Panel

- 72% Female
- Ethnicity/Race:
 - 49% African American
 - 39% Hispanic/Latino(a)
 - 10% Other
 - 1% Native American
- Major (at Wave 0):
 - 63% Biological Sciences
 - 21% Natural Sciences
 - 12% Behavioral & Social Sciences
 - 4% Mathematics & Engineering



Key Publications

- Woodcock, A., Hernandez, P., & Schultz, P. W. (2016). Diversifying science: Intervention programs moderate the effect of stereotype threat on motivation and career choice. *Social Psychological and Personality Science*.
- Estrada, M., Woodcock, A., & Schultz, P. W. (2014). Tailored panel management: A theory-based approach to building and maintaining participant commitment to a longitudinal study. *Evaluation Review*, 38, 3-28.
- Hernandez, P. R., Schultz, P. W., Estrada, M., Chance, R., & Woodcock, W. (2013). Sustaining optimal motivation: A longitudinal analysis of interventions to broaden participation of underrepresented students in STEM. *Journal of Educational Psychology*, 105, 89-107.
- Woodcock, A., Hernandez, P., Estrada, M., & Schultz, P. W. (2012). The consequences of chronic stereotype threat: Domain identification and attrition. *Journal of Personality and Social Psychology*, 103, 635-646.
- Merolla, D., Serpe, R., Stryker, S., & Schultz, P. W. (2012). Structural precursors to identity processes: The role of proximate social structures. *Social Psychology Quarterly*, 75, 149-172.
- Schultz, P. W., Hernandez, P., Woodcock, A., Estrada, M., Chance, R., Aguilar, M., & Serpe, R. (2011). Patching the pipeline: Reducing educational disparities in the sciences through minority training programs. *Educational Evaluation and Policy Analysis*, 33, 95-114.