BIOGRAPHICAL SKETCH

NAME: Catherine Riegle-Crumb

eRA COMMONS USER NAME: riegle

POSITION TITLE: Associate Professor of STEM Education, Department of Curriculum and Instruction

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Texas A&M University, College Station, TX	BA	12/1993	Sociology
Univeristy of Chicago, Chicago, IL	MA	06/1996	Sociology
Univerity of Chicago, Chicago, IL	PhD	06/2000	Sociology
The Univerity of Texas at Austin, Austin, TX	Postdoc	12/2006	Sociological Perspectives on Educational Inequality

A. Personal Statement

I am a sociologist of education with a focus on gender and racial/ethnic inequality in educational trajectories, particularly in science, technology, engineering and mathematics (STEM) fields. My research fits within the Population Research Center's Primary Research Area for Demography: Education, Work, and Inequality, as gender and racial/ethnic disparities in engagement and achievement in STEM fields represent the most enduring case of white male advantage, and have consequences for subsequent inequality in the labor force. Within the next five years, I plan to continue to conduct research in this area, but will expand my focus to concentrate on the direct linkages between STEM educational attainment, labor force entry, and persistence within STEM occupational trajectories. In doing so, my work will make new contributions to our understanding of how and why such trajectories differ by gender and race/ethnicity, as well as social class, at a critical time when increasing diversity in these fields has strong implications not only for decreasing inequality and promoting individuals' success and mobility, but also for maintaining national economic prosperity. As a Faculty Research Associate at the PRC, I have been actively involved in the Education and Transition to Adulthood Working Group, which entails attending weekly meetings, reading research papers and giving feedback to other faculty and graduate students, and presenting my own work in progress. As a PI and Co-PI of several grants from organizations such as NSF and NIH, the knowledge and skills of the PRC's Administrative Core has been critical in enabling me to submit and manage such grants. Additionally, I have relied heavily on the expertise of the Scientific and Technical Core for administering surveys and for data collection and management. Such continued support will be invaluable in the next five years, as I design and submit new grants and continue to work on existing ones.

B. Positions and Honors

Positions and Employment

2000-2002 Research Associate, Bureau of Sociological Research, University of Colorado at Boulder
2002-2006 Postdoctoral Fellow, Population Research Center, University of Texas at Austin
2006-Present Faculty Research Associate, Population Research Center, University of Texas at Austin
2007-2013 Assistant Professor of Department of Curriculum and Instruction, STEM Education, and Department of Sociology (by courtesy), University of Texas at Austin
2013-Present Associate Professor of Department of Curriculum and Instruction, STEM Education, and Department of Sociology (by courtesy), University of Texas at Austin
2015-Present Associate Director of Research, STEM Education Center, University of Texas at Austin

Other Experience and Professional Memberships

2016-2017 Chair-Elect, Section on Sociology of Education, American Sociological Association
2014-2016 Chair, Sociology of Education Special Interest Group (SIG), American Educational Research Association (AERA)
2013-2015 President, Sociology of Education Association (SEA)
2013-2015 Small Grant Review Board, Spencer Foundation

2014	Invited Presentation to Presentation to the Scientific Management Review Board, National Institute of Health (NIH). "Examining Inequality in STEM Fields: Patterns by Gender and Race/Ethnicity."
2013-2016	Committee on Scholars & Advocates for Gender Equity in Education, American Educational Research Association (AERA)
2012-2014	Editorial Board Member, *Sociology of Education*
2011-2013	Treasurer, Sociology of Education SIG, American Educational Research Association (AERA)
2012	Graduate Student Paper Committee, Sociology of Education SIG, American Educational Research Association (AERA)
2011	Program Co-Chair for Section on Sociology of Education, American Sociological Association (ASA) Annual Meeting
2008-2011	Sociology of Education Council, American Sociological Association (ASA)
2007-2009	Board Member, Sociology of Education Association (SEA)
2007	Invited Reviewer for the Institute of Education Statistics, National Center of Education Statistics (NCES)
2003-2015	Invited Reviewer for National Science Foundation (NSF)

Honors

2013	University of Texas Regents' Outstanding Teaching Award

C. Contributions to Science

Gendered Patterns in STEM fields: The Importance of Social Contextual Factors

Science, technological, engineering and mathematics (STEM) fields play a critical role in producing educational stratification within contemporary society. While gender disparities in achievement and attainment have decreased over the last forty years, some important differences remain and contribute to subsequent disparities in income and occupational status. My research has contributed new knowledge on the role of social factors such as contexts and norms in shaping females' STEM-related decisions and outcomes, including an emphasis on the role of high-performing female peers in helping to undermine the salience of stereotypes. Collectively, my research in this area has provided empirical evidence that the proximate social context created by peers and communities has the potential to redefine gender roles in ways that promote girls' and young women's pursuit of STEM fields, and thus contribute to decreasing inequality.

Riegle-Crumb, C. & Moore, C. (2014). "The gender gap in high schools physics: Examining the local context of communities." *Social Science Quarterly*, 95(1): 253-268.

Riegle-Crumb, C., Farkas, G. & Muller, C. (2006). The role of gender and friendship in advanced course-taking. *Sociology of Education,* 79 (3), 206-228.

Frank, K., Muller, C., Schiller, K., Riegle-Crumb, C., Mueller, A., Crosnoe, R. & Pearson, J. (2008). The social dynamics of mathematics course-taking in high school. *American Journal of Sociology,* 113, (6), 1645-1696.

Crosnoe, R., Riegle-Crumb, C., Field, S., Frank, K. & Muller, C. (2008). Peer group contexts of adolescent academic experiences. *Child Development,* 79(1), 139-155.

Racial/Ethnic Inequality in STEM Outcomes: Access to Opportunities to Learn

Black and Hispanic youth continue to trail far behind on test scores, grades, and course-taking throughout the primary and secondary years of schooling, with gaps of a standard deviation or more in size. Yet my research has highlighted how despite these sober facts, Black and Hispanic youth have relatively high levels of interest in and affect towards STEM fields. Therefore a critical consequence of the limited and inferior educational opportunities available to many minority youth in K-12 may be the loss of generations of potential scientists and engineers. My research on this topic has highlighted the role that school composition and segregation plays in shaping inequitable opportunities to learn in math and science for minority youth. Additionally, my work in this area offers evidence that by studying race/ethnicity from a lens that presumes disadvantage, we risk overlooking a strong commitment and resiliency among many Black and Hispanic youth. This research offers

compelling evidence that increasing equitable opportunities to learn math and science for minority youth in secondary school could lead to much higher rates of diversity in STEM postsecondary and perhaps occupational fields than typically imagined.

Morton, K., &Riegle-Crumb, C. (2016). “Equal Opportunity Schooling? Examining Inequality in 8th Grade Algebra.” Paper presented at the American Educational Research Association (AERA) Annual Meeting, Washington, DC.

Riegle-Crumb, C. & Grodsky, E. (2010). Racial-ethnic differences at the intersection of math course-taking and achievement. *Sociology of Education,* 83(3), 248-270.

Riegle-Crumb, C. & King, B. (2010). Questioning a white male advantage in STEM: Examining disparities in college major. *Educational Researcher,* 39, 656-664.

Muller, C., Riegle-Crumb, C., Schiller, K., Wilkinson, L. & Frank, K. (2010). Race and academic achievement in racially diverse high schools: Opportunity and stratification. *Teachers College Record,* 112 (4), 1038-1063.

Inequality in the Classroom: Examining the Attitudes and Biases of Teachers

As adults who spend large amounts of time with young people during their formative years, and whose opinions and viewpoints carry the added weight of presumed expertise, teachers have a large role to play in either promoting or ameliorating gender and racial/ethnic differences in educational engagement and achievement. Despite this fact, within the sociological literature, teachers are often less-studied than families and peers. My research has made contributions in this area by empirically measuring the existence of teacher bias, or the extent to which high school teachers rate white males as consistently more skilled in math relative to their female and minority peers, net of multiple measures of observable academic performance. On a more positive note, my work also looks at how teacher training programs can promote elementary teachers’ confidence in their own science skills, which could be a critical step to interrupting the transmission of science anxiety from female teachers to female students. Additionally, my current work examines how teachers that establish equitable norms in the classroom actually promote the confidence and performance of minority youth. This research provides new information relevant to efforts to promote minority youths’ general levels of educational attainment as well as female students’ attainment in STEM fields.

Morton, K., Riegle-Crumb, C., & Buontempo, J. (2016). “The Effects of Perceptions of Teacher Equity on Students’ Outcomes in Mathematics”. Paper submitted to the American Educational Research Association (AERA) Annual Meeting.

Riegle-Crumb, C., Morton, K., Moore, C., Chimonidou, A., Labrake, C. & Kopp, S. (2015). "Do inquiring minds have positive attitudes? The science education of preservice elementary teachers." *Science Education*, 99: 819–836. PMC5034297

Riegle-Crumb, C. & Humphries, M. (2012). Exploring bias in math teachers’ perceptions of students’ ability by gender and race/ethnicity. *Gender and Society,* 26(2), 290-322. PMC3812955

Masculinity and the Maintenance of Gender Segregation Across Fields

When examining the reasons behind women’s continued under-representation in many high-status and high-income STEM fields, research typically focuses on women’s prior experiences as well as their beliefs and attitudes. Within the extant literature, the gendered viewpoints of young men, and specifically their endorsement or sensitivity to gender stereotypes and norms, is much less examined. My current and recent research represents a new contribution to the literature on inequality and gender segregation across fields of study. Specifically, I find evidence which suggests that young men are deterred from pursuing traditionally female fields such as nursing and teaching due to social sanctions. My research also provides evidence that interactions with female peers and teachers can work to decrease the gender stereotypical beliefs held by young male engineers, which could be critical in helping to ensure that future workplaces are not discriminatory environments that discourage women’s persistence. By uncovering the obstacles and processes that underlie

the gendered attitudes and behaviors of male youth, this research contributes to a critically important perspective on disrupting gender segregation across fields of study.

Riegle-Crumb, C., Moore, C., & Buontempo, J. (Forthcoming). "Shifting STEM Stereotypes? Considering the Role of Peer and Teacher Gender". *Journal of Research on Adolescence*. NIHMS 816701

Riegle-Crumb, C., Morton, K., & Blanchard, S. (2016) . "Gendered Expectations: Examining How Peers Shape Students' Intent to Pursue STEM Fields." Paper presented at the Sociology of Education Association (SEA) Annual Meeting, Asilomar, CA.

Riegle-Crumb, C., King., B., & Moore, C. (2016). "Do they stay or do they go? The switching decisions of students who enter gender-atypical college majors". *Sex Roles,* (74): 436-449*.* NIHMS 756607

Link to Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/catherine.riegle-crumb.1/bibliography/50998207/public/?sort=date&direction=descending

D. Research Support

Ongoing Research Support

EEC-1636449 (M. Borrego, PI) 08/01/16-07/31/19
National Science Foundation
Collaborative Research: Engineering Identity, its Predictors, and its Impact on Retention across Educational Stages
This project investigates the emergence and maintenance of engineering identity, a critical factor behind individuals' motivations and decisions to enter and remain in engineering fields, with a particular emphasis on understanding the predictors and consequences of engineering identity for women and minority youth. Survey data will be collected from high school students enrolled in engineering classes, as well as engineering undergraduate majors and graduate students, in an effort to examine identity across different stages of engineering educational trajectories.
Role: Co-Principal Investigator
Responsibilities: Assisting with survey design, conducting quantitative analyses of survey data, writing academic manuscripts, and making academic presentations.

HRD-1348819 (C. Riegle-Crumb, PI) 06/01/14-05/31/19
National Science Foundation
The Role of Academic Achievement and Social Inclusion in Broadening STEM Participation: Intended and Actual Attainment at the Intersection of Gender and Race/Ethnicity.
This study examines the STEM trajectories of different gender and racial/ethnic subgroups with an explicit focus on the experiences of minority females as well as those of minority males to gain a more comprehensive and comparative picture of contemporary patterns of inequality The project utilizes data from five large-scale and longitudinal datasets that collectively provide the chance to investigate STEM trajectories at the intersection of race/ethnicity and gender from 6th grade to the end of college.
Role: Principal Investigator
Responsibilities: Overseeing survey design and data collection, training graduate students in data collection and quantitative analyses; conducting quantitative analyses of survey data, overseeing quantitative analyses conducted by graduate students, writing academic manuscripts, and making academic presentations.

DGE-1432673 (J. Glass, PI) 09/01/14-08/31/19
National Science Foundation
Collaborative Research: Early Career Transitions into STEM Employment: Processes Shaping Retention and Satisfaction
This study examines the transitions from high education into the labor force for individuals in the STEM field of chemistry and chemical engineering, focusing specifically on exploring gender differences in the experiences

and outcomes of this critical transition period in the STEM pipeline. Both survey data and qualitative interview data will be collected at two postsecondary institutions, and respondents will be followed over time.
Role: Co-Principal Investigator
Responsibilities: Assisting with survey design, conducting quantitative analyses of survey data, writing academic manuscripts, and making academic presentations.

HRD-1348789 (B. Dasgupta, PI) 06/01/14-05/31/19
National Science Foundation
Peer Influences on Adolescents' Self-concept, Achievement, and Future Aspirations in Science and Mathematics: Does Student Gender and Race Matter?
This project will investigate how the gender composition of classrooms and schools contributes to differences in the creation of supportive learning environments for male and female students, and whether it is subsequently linked to attitudes towards and engagement towards STEM fields. The project entails both original data collection in a selection of middle schools, as well as a comparative analyses using national data.
Role: Co-Principal Investigator
Responsibilities: Conducting quantitative analyses of survey data, writing academic manuscripts, and making academic presentations.

Completed Research Support

201400078 (C. Riegle-Crumb, PI) 09/01/13-08/31/15
Spencer Foundation
Developing STEM Aspirations: An Examination of Contextual Influences and Inequality by Gender and Race/Ethnicity
This project examined the formation of expectations to pursue STEM fields among adolescents, with a particular focus on how social contextual factors, such as peer attitudes and behaviors, shaped gender differences in such future expectations. Survey data was be collected from high school students in a large, diverse urban district.
Role: Principal Investigator
Responsibilities: Overseeing survey design and data collection, training graduate students in data collection and quantitative analyses; conducting quantitative analyses of survey data, overseeing quantitative analyses conducted by graduate students, writing academic manuscripts, and making academic presentations.

R01HD061551 (C. Muller, PI) 09/28/10-10/31/15
National Institute of Child Health and Human Development
Education and the Transition to Adulthood
This project involved the collection of postsecondary transcripts from respondents in the NLSY-1997 sample with the goal of capturing the complexity of their educational experiences and consequences for later occupational and health trajectories.
Role: Co-Principal Investigator
Responsibilities: Assisting with design of variables measuring curricular exposure and degree attainment.

DRL-0831811 (D. Allen, PI) 09/01/08-08/31/16
National Science Foundation
UTeach Engineering: Teaching Secondary Teachers to Deliver Design-Based Engineering Instruction.
This project developed a high school engineering course, trained high school teachers, and oversaw the implementation of the course in more than one hundred high schools across the country, with a particular focus on bringing innovative, project-based instruction to a diverse population of students and broadening gender and racial/ethnic participation.
Role: Collaborator
Responsibilities: Overseeing survey design and data collection, training graduate students in data collection and quantitative analyses; conducting quantitative analyses of survey data, overseeing quantitative analyses conducted by graduate students, writing academic manuscripts, and making academic presentations.