

CHAPTER ONE · CHANGING STEREOTYPES

IN ELEMENTARY SCHOOL, ABOUT AS MANY GIRLS AS BOYS HAVE A POSITIVE ATTITUDE TOWARD SCIENCE. IN A RECENT SURVEY, FULLY 66 PERCENT OF FOURTH-GRADE GIRLS (AND 68 PERCENT OF FOURTH-GRADE BOYS) REPORTED THAT THEY “LIKE” SCIENCE.¹ BUT SHORTLY THEREAFTER, MORE GIRLS THAN BOYS BEGIN TO TURN AWAY FROM SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH (STEM).^{2,3} THIS BEGINS THE “LEAKING PIPELINE” THAT RESULTS IN SIGNIFICANT UNDERREPRESENTATION OF WOMEN IN MANY STEM CAREERS.⁴

A PRINCIPAL REASON IS CULTURAL STEREOTYPES—STEREOTYPES THAT ARE CHANGING, BUT NOT QUICKLY ENOUGH. GIRLS’ DECLINING INTEREST IN STEM OFTEN RESULTS FROM CULTURAL BELIEFS, IMAGES, AND PRACTICES THAT COMMUNICATE STEREOTYPED MESSAGES THAT THESE SUBJECTS ARE MORE APPROPRIATE FOR BOYS THAN FOR GIRLS. AS A RESULT, GIRLS BEGIN TO CONCLUDE THAT STEM IS NOT FOR THEM. THESE BELIEFS OFTEN BEGIN EARLY AND INFLUENCE CHOICES THEY MAKE THROUGHOUT SCHOOL.⁵

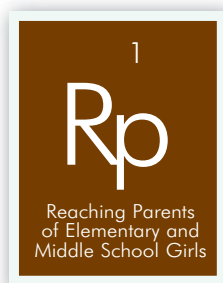
THE CONSEQUENCES OF GIRLS DROPPING OUT OF THE SCIENTIFIC PIPELINE ARE REAL. TODAY, WOMEN MAKE UP 49 PERCENT OF THE WORKFORCE BUT ONLY 25 PERCENT OF THE STEM WORKFORCE. CHANGING STEREOTYPES ABOUT GIRLS AND WOMEN IN STEM IS IMPORTANT. HERE’S WHY:

- SCIENCE AND TECHNOLOGY HELP DRIVE THE ECONOMY. TO ENSURE THE PLACE OF THE UNITED STATES IN INTERNATIONAL MARKETS AND AS A SCIENTIFIC WORLD LEADER, WE MUST TAP OUR AVAILABLE RESOURCES. IF THERE ARE 12-YEAR-OLD GIRLS WITH THE POTENTIAL TO BECOME SCIENTISTS OR ENGINEERS, WE MUST ENSURE THAT THEY HAVE OPPORTUNITIES TO DEVELOP THEIR TALENTS.
- SCIENCE IMPROVES AND GROWS ONLY THROUGH THE CONTRIBUTIONS OF ITS MEMBERS. EACH SCIENTIST BRINGS A UNIQUE PERSPECTIVE TO THE FIELD, AND EACH PERSPECTIVE IS IMPORTANT. FEW CAN PREDICT WHAT GOOD IDEA IS GOING TO BE THE NEXT GREAT IDEA OR WHO WILL COME UP WITH IT. OPENING THE FIELD TO AS MANY PEOPLE AS POSSIBLE IS ESSENTIAL FOR STEM TO FLOURISH.
- OUR SOCIETY REAPS BENEFITS WHEN ITS MEMBERS ARE SCIENTIFICALLY LITERATE. TECHNOLOGICAL, MEDICAL, AND SCIENTIFIC ADVANCEMENTS ARE BEING MADE RAPIDLY. A SOLID FOUNDATION IN SCIENCE IS VITAL TO UNDERSTANDING HOW TO INCORPORATE THIS NEW INFORMATION INTO OUR DAILY LIVES.

ALL THE PROJECTS DESCRIBED IN THIS CHAPTER SEEK TO CHANGE STEREOTYPES ABOUT GIRLS AND WOMEN IN STEM OR AT LEAST TO UNDERSTAND THEM FURTHER. THEY AIM AT A RANGE OF GRADE LEVELS, FROM UPPER ELEMENTARY TO UNDERGRADUATE. ULTIMATELY, ALL THE PROJECTS SEEK TO INSPIRE IN GIRLS AND YOUNG WOMEN THE CONFIDENCE, ENTHUSIASM, AND PERSISTENCE TO CONTINUE PURSUING THEIR SCIENTIFIC INTERESTS.

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REFERENCES	
¹ Author. 2000. <i>Educational Equity of Girls and Women</i> . National Center for Educational Statistics. Washington D.C.	
² Author. 2000. <i>Women, Minorities, and Persons With Disabilities</i> . National Science Foundation. Arlington, VA.	
³ Thom, Mary. 2001. <i>Balancing the Equation: Where Are Women and Girls in Science, Engineering and Technology?</i> The National Council for Research on Women. New York.	
⁴ Author. 2004. <i>Science and Engineering Indicators 2004</i> . National Science Foundation.	
⁵ Mendoza, E. M., and K. O. Johnson. 2000. <i>Land of Plenty: Diversity as America’s Competitive Edge in Science, Engineering and Technology</i> : Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development.	



REACHING PARENTS OF ELEMENTARY AND MIDDLE SCHOOL GIRLS

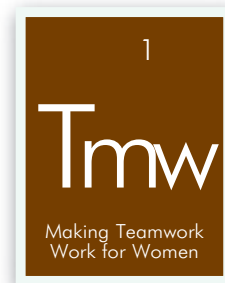
IN THE MEDIA, AT SCHOOL, AND AT HOME, GIRLS HEAR MESSAGES THAT CAN DISCOURAGE THEM, OFTEN SUBTLY, FROM MAINTAINING OR DEVELOPING AN INTEREST IN STEM. PARENTS, TEACHERS, AND PEERS OFTEN PLAY A ROLE IN SHAPING THESE NEGATIVE PERCEPTIONS, WHETHER CONSCIOUSLY OR NOT. RESEARCH SHOWS THAT FROM THE FOURTH TO EIGHTH GRADES IN PARTICULAR, GIRLS TURN AWAY FROM MATH AND SCIENCE IN GREATER NUMBERS THAN DO BOYS.

To help parents encourage their daughters' interest in STEM, Imaginary Lines (also known as Sally Ride Science) has created high-quality handbooks with the facts about girls and science, factors that impede girls' interest in STEM, and ways to overcome these obstacles. MacMillan/McGraw-Hill will print, promote, and distribute the English and Spanish versions of two handbooks, one for parents of girls in kindergarten through third grade, one for parents of girls in grades four through seven. Sally Ride Science and MacMillan/McGraw-Hill will also organize workshops in several school districts. Other partners include Center of Science and Industry-Columbus, the Center for Women and Information Technology, and the San Diego Supercomputer Center's Girls are GREAT program.

Sally Ride Science will complement publication of the booklets with informative and practical workshops for parents in both Spanish and English. The team is also developing an online discussion forum where parents can ask questions of experts and exchange ideas and experiences.

Founded by former astronaut Sally Ride, Sally Ride Science creates innovative programs for students, parents, and teachers to promote interest in science and engineering. Many such events will be used to field-test and distribute the handbooks.

GRADE LEVEL: ELEMENTARY, MIDDLE SCHOOL
IMAGINARY LINES/SALLY RIDE SCIENCE, CENTER OF SCIENCE AND INDUSTRY-COLUMBUS, CENTER FOR WOMEN AND INFORMATION TECHNOLOGY, MACMILLAN/MCGRAW HILL, AND SAN DIEGO SUPERCOMPUTER CENTER (CALIFORNIA, OHIO)
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MAKING TEAMWORK WORK FOR WOMEN

TEAMWORK AND COLLABORATION ARE OFTEN PROPOSED AS WAYS TO IMPROVE THE EXPERIENCES OF FEMALE STUDENTS IN STEM DISCIPLINES. HOWEVER, IN PRACTICE, WOMEN FREQUENTLY HAVE NEGATIVE EXPERIENCES WITH TEAM PROJECTS AND ARE LEFT FEELING EVEN MORE ALIENATED THAN BEFORE. THE UNIVERSITY OF LOUISVILLE IS EXAMINING THE EXPERIENCES AND ATTITUDES OF NEARLY 300 STUDENTS WORKING ON TEAM PROJECTS IN COMPUTER SCIENCE AND SCIENTIFIC AND TECHNICAL WRITING.

In the first phase, researchers observed teams working on technically oriented writing projects. Team interactions were transcribed and analyzed for quantity of interaction, interruptions, roles played by different individuals, reactions to different types of conversational interchanges, and different approaches to problem solving. These analyses were compared with questionnaire and interview data to assess how communication, problem solving, and knowledge styles can affect men's and women's experiences in teams.

The researchers found that men tend to dominate technology in groups, while women do a disproportionate share of the writing. Moreover, the written work produced by women was often downplayed or overlooked as unimportant, while men were often credited for written work they did not produce. The researchers suggest that men's and women's use of body language during face-to-face discussions of written work and differences in the way men and women complain may contribute to some of these inaccuracies in how teams evaluate men's and women's work.

More generally, the researchers also found that student teams spend too much time trying to draft materials in often competitive face-to-face situations; team leaders often inhibit rather than facilitate group progress and learning; and team members tend to do what they already know, without much collaboration or peer-to-peer education. Instructors are often unaware of major breakdowns in team collaboration.

In the second phase of the project, the researchers are testing the effects of various activities and interventions on team dynamics. The following have shown promise in creating more gender-equitable team environments:

- Activities and project instructions that encourage teams to use written communication as a management and collaboration tool. Teams that use written communication effectively have less conflict and distribute written work more equitably than teams that attempt to complete major portions of their projects face to face.
- Computer-mediated groupware tools that archive all e-mail and documents associated with a project. These tools increase students' confidence that their instructors and teammates will evaluate their project contributions accurately.
- Workshops analyzing videotapes of real team interactions for gender inequities and other communication problems. Women on teams completing these workshops have more involvement in the technical aspects of a project than their counterparts on teams that have not gone through the workshop training.

A textbook on teamwork (with accompanying CD-ROM) based on this research is currently under development. Articles based on this study have appeared in *Journal of Business and Technical Communication*, *Written Communication*, and *Proceedings of the Frontiers in Education Conference 2005*.

GRADE LEVEL: UNDERGRADUATE

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KEYWORDS: RESEARCH PROJECT, PROFESSIONAL DEVELOPMENT, LEADERSHIP SKILLS, GENDER-DIVERSITY AWARENESS, BARRIERS, GENDER DYNAMICS, TEACHER TRAINING, STUDY GROUPS, WORKSHOPS, PROJECT-BASED, TEAMWORK APPROACH, QUESTIONNAIRE, SCHOOL-BASED, MIXED-GENDER, COMPUTER SCIENCE, WRITING

GENDER SEGREGATION IN ENGINEERING AND MATH/COMPUTER SCIENCE

RESEARCH ON THE UNDERREPRESENTATION OF WOMEN IN STEM OFTEN LOOKS AT INDIVIDUALS AND THEIR IMMEDIATE SOCIAL ENVIRONMENTS. MANY EXPERTS FEEL THAT CHANGING THE GENDER COMPOSITION OF THESE FIELDS FUNDAMENTALLY WILL REQUIRE CHANGES IN BROADER CULTURAL IDEOLOGIES AND ORGANIZATIONAL PRACTICES. INVESTIGATORS AT THE UNIVERSITY OF CALIFORNIA–SAN DIEGO AND WESTERN WASHINGTON UNIVERSITY ARE EXAMINING DATA FROM 44 DEVELOPED, DEVELOPING, AND TRANSITIONAL COUNTRIES TO DETERMINE HOW CULTURAL IDEOLOGIES AND FEATURES OF NATIONAL EDUCATIONAL AND ECONOMIC SYSTEMS ARE RELATED TO LEVELS OF FEMALE PARTICIPATION IN STEM.

Studies have already found that cultural attitudes about gender roles factor into gender segregation in education. For this study, investigators have collected detailed data on eighth-grade boys' and girls' attitudes and achievement through the Third International Math and Science Surveys, which allow them to evaluate and compare factors across national and cultural lines. The investigators will also look at factors that affect gender segregation in higher education, including overall female enrollment rates, features of national higher education systems, economic opportunities for women, and national economic development.

Data from the study are available at

<http://weber.ucsd.edu/%7Emcharles/datadoc.html>

GRADE LEVEL: MIDDLE SCHOOL (EIGHTH GRADE), UNDERGRADUATE

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KEYWORDS: RESEARCH PROJECT, GENDER-DIVERSITY AWARENESS, ENVIRONMENTAL FACTORS, LONGITUDINAL STUDY, ETHNOGRAPHIC, DATA COLLECTION, INTERNATIONAL COMPARISON, CULTURAL FACTORS, CROSS-CULTURAL STUDY





RADIO SERIES TELLS THE STORIES ABOUT GIRLS AND WOMEN IN SCIENCE

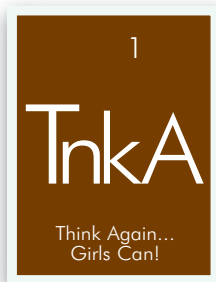
NORTHEAST PUBLIC RADIO (WAMC) REGULARLY FEATURES THE NATIONALLY SYNDICATED PROGRAMS, “51 PERCENT” AND “THE BEST OF OUR KNOWLEDGE.” RESPECTIVELY, THESE SHOWS COVER ISSUES AFFECTING WOMEN AND TOPICS RELATED TO POLICY, RESEARCH, AND INNOVATION IN EDUCATION. OVER THE PAST FEW YEARS, WAMC HAS USED THESE SHOWS TO BROADCAST “HER-STORY,” “OUT-LOUD,” AND “THE TECH CLUB”, THREE SPECIAL RADIO SERIES ABOUT WOMEN IN SCIENCE AND TECHNOLOGY.

Now WAMC is launching “Powerful Signals,” a two-part series with another new approach to disseminating information critical to the national gender-equity effort in STEM. The first part consists of nine feature-length, magazine-style radio modules on innovative gender-diversity programs and projects around the country that demonstrate actual effects and measurable results, with an emphasis on methods and strategies that help increase girls’ and women’s participation in STEM. The second part comprises three multisegment “audio diaries,” in which young women—both students and professionals—describe their experiences in STEM fields. Both parts highlight teaching styles, curriculum designs, pedagogical approaches, and studies that illuminate gender-related differences in STEM learning.

Content from both is now available on WAMC’s Women in STEM radio Web site (<http://www.womeninscience.org>) as well as through distribution of CDs. Full audio of the radio stories, as well as text from the previous series, is already available on the site.



GRADE LEVEL: ELEMENTARY, MIDDLE SCHOOL, HIGH SCHOOL, UNDERGRADUATE, GRADUATE, PROFESSIONAL DEVELOPMENT		
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THINK AGAIN. . . GIRLS CAN!

THINK AGAIN. . . GIRLS CAN! IS A MEDIA CAMPAIGN TO IMPROVE PUBLIC PERCEPTIONS OF WOMEN IN STEM. DEVELOPED BY STONY BROOK UNIVERSITY IN COLLABORATION WITH THE LONG ISLAND FUND FOR WOMEN AND GIRLS, BRIARCLIFFE COLLEGE, AND TELEVISION STATION WLIW21, THE PROJECT HAS PRODUCED EIGHT INTERVIEWS IN WHICH ACCOMPLISHED WOMEN SCIENTISTS DISCUSS THEIR CAREERS AND THE CHALLENGES THEY FACE.

A DVD of these interviews is currently being disseminated to schools and community organizations, in conjunction with presentations about career opportunities in STEM. Accompanying data collection aims to determine whether “Think Again... Girls Can!” succeeds in increasing young women’s interest in STEM careers.

All eight interviews can be seen online at the program Web site (<http://www.girlscan.org>). The site also includes instructions for obtaining a free copy of the DVD.



GRADE LEVEL: HIGH SCHOOL, UNDERGRADUATE

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CHALLENGING GENDER STEREOTYPES

WITH COMPUTER-BASED SOCIAL MODELS

RESEARCHERS AT FLORIDA STATE UNIVERSITY ARE EMPLOYING “PEDAGOGICAL AGENTS” TO INVESTIGATE HOW DIFFERENT ASPECTS OF COMPUTER-BASED SOCIAL MODELS AFFECT YOUNG WOMEN’S BELIEFS AND STEREOTYPES ABOUT ENGINEERING. PEDAGOGICAL AGENTS ARE THREE-DIMENSIONAL, ANIMATED, COMPUTER-BASED CHARACTERS THAT CAN SERVE AS TEACHERS. THREE DISTINCT POPULATIONS ARE BEING SAMPLED FOR THE RESEARCH: MIDDLE SCHOOL GIRLS, UNDERGRADUATES AT A HISTORICALLY BLACK COLLEGE, AND UNDERGRADUATES AT A SOUTHEASTERN PUBLIC UNIVERSITY. LARGE SAMPLE SIZES (AS MANY AS 200 STUDENTS) ARE STUDIED.

Over the three-year span of the project, research will be conducted in the following areas:

- *Year one:* agent appearance (age, gender, attractiveness, and “coolness”)
- *Year two:* agent message and delivery (content of message and delivery mechanisms)
- *Year three:* agent persona (overall personality of agent, integrating voice, delivery, appearance, and message)

The research team will measure students’ stereotypes of engineering, their motivation to pursue a career in the field, and self-efficacy. Results from this research could guide instructional programmers to the most important features for computer-based role models for young women. Results will also provide some insight into what makes an effective real-life, human role model.

GRADE LEVEL: MIDDLE SCHOOL, UNDERGRADUATE

FLORIDA STATE UNIVERSITY

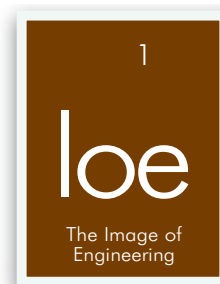
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THE IMAGE OF ENGINEERING

A COMPANY CALLED IMAGINARY LINES (ALSO KNOWN AS SALLY RIDE SCIENCE) IS CREATING TWO VIDEOS AND TWO COMPANION BOOKS AIMED AT ENCOURAGING UPPER ELEMENTARY AND MIDDLE SCHOOL GIRLS TO PURSUE STEM, AND ENGINEERING IN PARTICULAR. ONE VIDEO SHOWS GIRLS FROM DIVERSE BACKGROUNDS AS THEY DESIGN AND ENGINEER TOYS. THE SECOND PORTRAYS PROFESSIONAL FEMALE ENGINEERS DISCUSSING THEIR WORK AND ITS APPLICATIONS. THE FIRST COMPANION BOOK DESCRIBES THE ENGINEERING DESIGN PROCESS FOR ADULTS, INCLUDING RESEARCH-BASED STRATEGIES TO STIMULATE GIRLS' INTEREST IN STEM. THE SECOND IS AN ENGAGING CAREER GUIDE FOR GIRLS THEMSELVES, WITH INTERVIEWS FROM 12 WOMEN ENGINEERS AND ACTIVITIES TO PROMPT GIRLS TO THINK ABOUT THEIR OWN INTERESTS AND POSSIBLE ENGINEERING CAREERS.



Both the videos and the books will incorporate material from two existing projects created by Imaginary Lines: a national toy–design competition called TOYchallenge and a movie about the competition (funded separately). The TOYchallenge has been running for four years, and the company developed the research premises for the corresponding documentary film through a previous grant from NSF. In addition to new footage, hundreds of hours of footage shot for the movie will be available for use in creating both sets of products. The movie's award-winning producer will also produce and direct the videos.

The release of the videos and books will be coordinated with that of the documentary film. Special screenings will occur at

- Film festivals and corporate-sponsored events
- Programs for girls such as the Sally Ride Science Camps and Girl Scouts

- Science center and Engineers Week events
- National conventions, including those for Sigma Xi: The Scientific Research Society and the International Technology Education Association

GRADE LEVEL: ELEMENTARY SCHOOL, MIDDLE SCHOOL
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IMPROVING GIRLS' SELF-EFFICACY WITH VIRTUAL PEERS

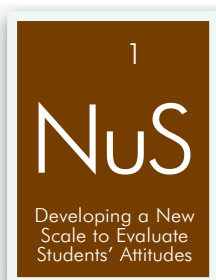
A MULTIDISCIPLINARY RESEARCH TEAM AT UTAH STATE UNIVERSITY IS TRYING TO HELP GIRLS OVERCOME THEIR NEGATIVE SELF-IMAGES WHEN IT COMES TO STEM. IN PARTICULAR, THE TEAM WILL TEST THE POTENTIAL OF VIRTUAL PEERS IN CREATING A CONSTRUCTIVE SOCIAL ENVIRONMENT FOR GIRLS TO LEARN MATH. THESE PEERS ARE CALLED PEDAGOGICAL AGENTS AS LEARNING COMPANIONS, OR PALs, AND THEY HAVE BEEN DEVELOPED IN LINE WITH FINDINGS RELATED TO HUMAN PEER RESEARCH.

Unlike most technology-based programs, which concentrate on cognitive learning, this project aims to influence girls on an affective level. In the first year of a three-year program, the researchers will test whether the age (teacher-like versus peer-like) and gender of a PAL play roles in girls' choices of their PALs as learning partners and in enhancing the girls' self-efficacy. In the second year, the test will move to the areas of ethnicity and competency: girls will select from Caucasian or Hispanic PALs, and PALs at differing levels of competency. The third year will involve an "emotional" component: some PALs will be harsh, others friendly; some will be empathetic, others indifferent.

The study will be conducted in public high schools in middle- to large-size cities across the Mountain West states and will enlist approximately 200 high school girls. PAL interventions will take place regularly over the course of the semester, with researchers evaluating both qualitative and quantitative data.

If PALs are found to be successful, they may offer a cost-effective alternative to face-to-face teaching intended to improve girls' attitudes toward math and the sciences, from kindergarten through twelfth grade. Further, the results could offer specific solutions for girls of both Caucasian and Hispanic origins. The findings are important to influence the growing field of online learning technologies.

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DEVELOPING A NEW SCALE TO EVALUATE STUDENTS' ATTITUDES

TODAY'S UNDERGRADUATE POISED TO ENTER THE STEM CAREER PATH WILL GET HER STRONGEST SUGGESTIONS NOT FROM FRIENDS OR FAMILY BUT FROM HER CULTURAL ENVIRONMENT. TO CHANGE POPULAR ATTITUDES ABOUT WOMEN IN STEM, ONE MUST FIRST UNDERSTAND THEM.

North Carolina State University researchers are using an empirical, psychometrical scale to measure undergraduates' attitudes toward underrepresented groups in science and engineering. The scale's development and implementation will proceed in three stages over three years, gradually expanding from work with small groups of undergraduates to a nationwide campaign.

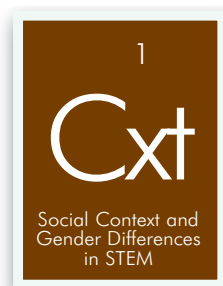
Year one: Researchers will observe undergraduate focus groups and record stereotyped beliefs about the ability of women and people of color to pursue STEM careers. They will then consider how STEM course content may have contributed to the formation of these student attitudes.

Year two: Using the information gathered during the first year, researchers will create an online survey of undergraduate attitudes about women and people of color in STEM disciplines. They will analyze data from 10,000

students across the country and create scales for measuring these attitudes. In addition to a standard scale applicable across disciplines, researchers will derive special scales adjusted for STEM subfields.

Year three: Researchers will conduct a field test to demonstrate the scale's uses and begin promoting its application to further research.

GRADE LEVEL: UNDERGRADUATE
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SOCIAL CONTEXT AND GENDER DIFFERENCES IN STEM

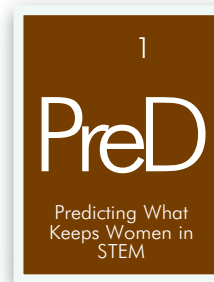
RESEARCHERS AT THE UNIVERSITY OF TEXAS–AUSTIN ARE EXAMINING HOW SOCIAL CONTEXT INFLUENCES MALE AND FEMALE STUDENTS' CHOICES ABOUT HIGH SCHOOL MATH AND SCIENCE COURSES AND COLLEGE MAJORS. THEY ARE LOOKING AT VARIOUS TYPES OF CONTEXT: THE SCHOOL ITSELF (E.G., FRIENDS, ACADEMIC PEERS, AND RIGOROUS ACADEMIC CURRICULA); THE SCHOOLS' BROADER SOCIAL AND ACADEMIC ENVIRONMENT; AND THE SPECIFIC MATH AND SCIENCE COURSES OFFERED. THEY ARE ALSO CONSIDERING SOCIOECONOMIC FACTORS, INCLUDING RACE AND ETHNICITY, SOCIAL CLASS, AND IMMIGRANT GENERATIONAL STATUS.

Students' choices are complex and do not necessarily follow one major pattern. Researchers want to know whether social factors affect discrete groups of students differently and whether different social contexts help shape different decisions. They are analyzing a new, large, nationally representative data set designed to measure multiple social contexts: the Adolescent Health and Academic Achievement component of the Longitudinal Study of Adolescent Health.

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PREDICTING WHAT KEEPS WOMEN IN STEM

THE UNIVERSITY OF WISCONSIN–MILWAUKEE AND ARIZONA STATE UNIVERSITY ARE COLLABORATING IN A STUDY TO IDENTIFY THE BARRIERS AND SUPPORTS AT VARIOUS STAGES (MIDDLE SCHOOL, LATE HIGH SCHOOL, AND SOPHOMORE YEAR IN COLLEGE) THAT AFFECT WOMEN AS THEY DECIDE WHETHER TO CONTINUE PARTICIPATING IN STEM. THE RESEARCHERS BELIEVE THE BARRIERS MAY NOT DIFFER FROM ONE STAGE OF LIFE TO THE NEXT, BUT THEIR STRENGTH MAY AFFECT GIRLS AND WOMEN DIFFERENTLY.



Data collection is taking place in two different metropolitan areas (Milwaukee and Phoenix), so the results will not be specific to a particular geographic region.

Once researchers test the validity of their findings, they will use them to suggest interventions that can help teachers, counselors, and parents keep women on the track toward STEM careers.

Preliminary analysis shows that teachers play an important role. A negative environment (such as a teacher not calling on a student or a student not being recommended for a gifted or talented program) has a

powerful effect. Conversely, teachers who explain subjects well, make subjects interesting, or promote hands-on learning exert a strong positive influence.

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MEDIA LITERACY TRAINING FOR MIDDLE SCHOOL STUDENTS

FOR GIRLS IN AMERICAN SOCIETY, EARLY ADOLESCENCE CAN PRESENT AN ILL-TIMED CONVERGENCE OF EVENTS: GIRLS BEGIN TO MAKE PLANS FOR THE FUTURE—INCLUDING CAREER PLANS—AT A TIME MARKED BY WANING SELF-CONFIDENCE AND A GREATER AWARENESS OF THE CULTURAL NORMS OF FEMININITY. DURING THIS TIME, MEDIA PORTRAYALS OF WOMEN MAY REINFORCE GENDER STEREOTYPES FOR GIRLS AND BOYS, WHICH IN TURN MAY CONTRIBUTE TO THE GENDER GAP IN STEM.

In response, researchers at Western Michigan University are examining the efficacy of a media literacy program designed to spark critical thinking about stereotypes of women in the media. The investigators are assessing how the training affects middle school children's perceptions of women in STEM, their ability to recognize stereotypes in the media, and their attitudes toward STEM and STEM careers. Specifically, the investigators hope to learn whether media literacy training teaches children to recognize and resist gender stereotypes.

Participants are seventh-grade students from three middle schools in the Midwest, randomly assigned to one of three groups: control; training that includes interactive discussion; and training that includes interactive

discussion plus critical viewing of videotaped clips featuring stereotypes and counterstereotypes of women in popular television programs and films. The investigators hope the findings will be used by science teachers and directors of educational programs in their training and instructional materials.

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