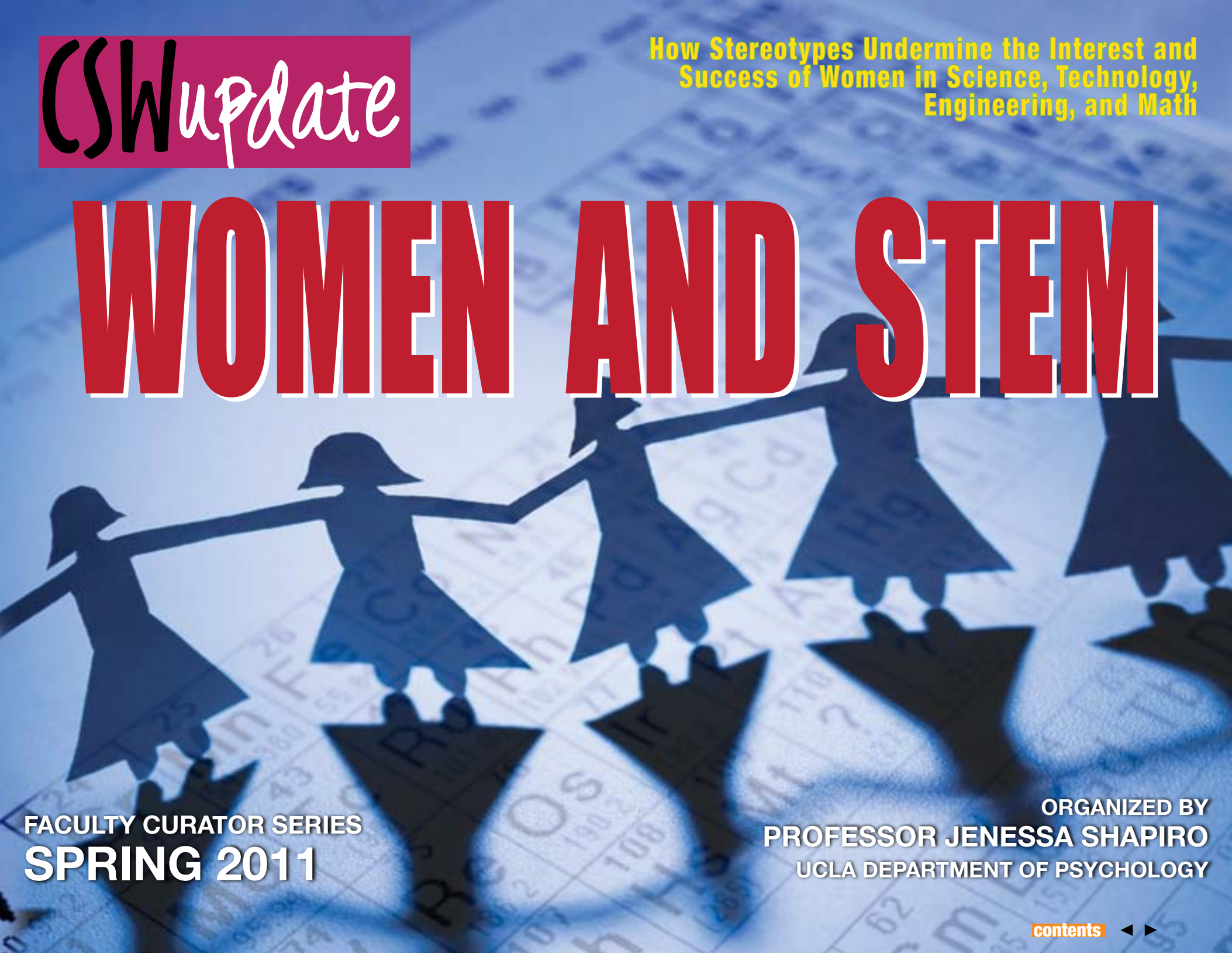
CSWupdate

How Stereotypes Undermine the Interest and Success of Women in Science, Technology, Engineering, and Math

WOMEN AND STEM



FACULTY CURATOR SERIES
SPRING 2011

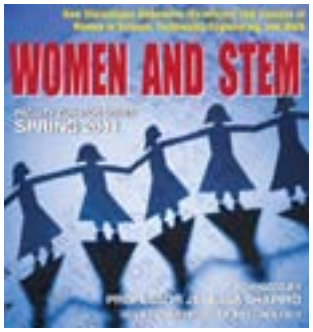
ORGANIZED BY
PROFESSOR JENESSA SHAPIRO
UCLA DEPARTMENT OF PSYCHOLOGY

contents ◄ ►

spring 2011

CSWupdate

WOMEN and STEM



Organized by Professor Jenessa Shapiro, this Faculty Curator Speaker Series addressed why women are underrepresented and underperforming in the fields of science, technology, engineering, and math

WOMEN EARN only 25% of the Ph.D.s in the physical sciences and 15% in engineering. Furthermore, women make-up only 3-4% of engineering associate professors and 6% of physical sciences associate professors. In the workforce, although women constitute half of all employees, they only make-up one-fifth of the nation's scientific and technical workers. Why are women under-represented and under-performing in science and technology fields? This spring's CSW Faculty Curator series titled, "Women and STEM: How stereotypes undermine the interest and success of women in science, technology, engineering, and math," addresses this question from a perspective that is very different than what we traditionally hear in mainstream media. That is, previous explanations have focused on biological or socialization factors that may contribute to these disparities. In contrast, this curator series will focus on a phenomenon called *stereotype threat*.

Stereotype threat points to the causal role situational cues play in undermining women's motivation and performance in STEM fields. Stereotype threat research has found that simple cues in STEM environments, such as identifying one's gender before taking a standardized test or being the only woman in a class, office, or department can highlight the negative stereotypes associated with women in these domains. As a result, women are at risk for distracting stereotype-relevant thoughts that interrupt concentration and undermines learning and performance on a range of activities, including standardized tests. This spring's curator series brought to

Stereotype threat points to the causal role situational cues play in undermining women's motivation and performance in STEM fields. Stereotype threat research has found that simple cues in STEM environments, such as identifying one's gender before taking a standardized test or being the only woman in a class, office, or department can highlight the negative stereotypes associated with women in these domains.

UCLA leaders in the field of stereotype threat. These speakers presented research demonstrating the emergence of stereotype threat in STEM domains, the mechanism that account for this phenomenon, and the ways in which we can intervene to prevent the deleterious influence of stereotype threat.

STEVEN SPENCER

Known for his essential work in identifying stereotype threat as a challenge to women's performance in STEM fields, Steven Spencer, Professor of Psychology at the University of Waterloo, will speak on April 21th. His talk is titled "A Chilly Climate for Women in STEM: How It Develops and How It Can Be Overcome." His research focuses on motivation and the self, particularly on how these factors affect stereotyping and prejudice. He examines how implicit processes that are outside of people's awareness affect people's thoughts, feelings, and behaviors. In examining stereotyping and prejudice, he looks at how threats to the self-concept can lead to stereotyping and prejudice, and how this stereotyping and prejudice affects subsequent feelings about the self. Professor Spencer's publications include *Motivated Social Perception: the Ontario Symposium, Vol. 9,* co-edited with Steven Fein, Mark P. Zanna, and James M. Olson (Psychology Press, 2002); "Implicit Self-Esteem, Explicit Self-Esteem and Defensiveness" (co-authored C.H. Jordan) in the *Journal of Personality and Social Psychology* (2003); and "When Do Stereotypes Come to Mind and When Do They Color Judgment? A Goal-Based Theory of Stereotype Activation and Application" (co-authored with Z. Kunda) in *Psychological Bulletin* (2003).

TONI SCHMADER

Toni Schmader, Professor of Psychology at the University of British Columbia, will speak on "Stereotype Threat Deconstructed " on April 28th. Professor Schmader is known for groundbreaking work uncovering the processes that account for reduced performance in stereotype threatening situations: taxed working memory. Her work has focused on the cognitive, affective, and motivational processes that are altered by stereotype threatening situations and the ways in which important working memory resources are hijacked by distracting stereotype relevant concerns. Her publications include "Gender Identification Moderates Stereotype Threat Effects

on Women's Math Performance" in the *Journal of Experimental Social Psychology* (2002); "A Meta-Cognitive Perspective on Cognitive Deficits Experienced in Intellectually Threatening Environments" (co-authored with C. E. Forbes, S. Zhang, and M.J. Johns) in *Personality and Social Psychology Bulletin* 2009); and "Killing Begets Killing: Evidence from a Bug-Killing Paradigm that Initial Killing Fuels Subsequent Killing" (co-authored with Andy Martens, Spee Kosloff, Jeff Greenberg, and Mark J. Landau) in *Personality and Social Psychology Bulletin* (2007).

NILANJANA DASGUPTA

Nilanjana Dasgupta, Professor of Psychology at the University of Massachusetts, Amherst, will speak on May 12. Her talk is titled "STEMing the Tide: Female Experts and Peers Enhance Young Women's Interest in Science, Technology, Engineering, and Mathematics." At the forefront of research on implicit stereotypes, Dasgupta investigates experimentally how mental processes influence attitudes, beliefs, and behavior without people's awareness or control. Her recent projects focus on specifying factors that create and magnify stereotypes and prejudice without people's awareness or control, examining their influence on behavior, and developing strategies aimed at undermining such biases. Her publications include "Implicit Measures of Social Cognition: Common Themes and Unresolved Questions" in the *Journal of Psychology* (2010); "Mechanisms Underlying Malleability of Implicit Prejudices and Stereotypes: The Role of Automacity Versus Cognitive Control" in *Handbook of Prejudice, Stereotyping, and Discrimination* (Psychology Press, 2009); and "Color Lines in the Mind: Unconscious Prejudice, Discriminatory Behavior, and the Potential for change" in *Twenty-First Century Color Lines: Multiracial Change in Contemporary America* (Temple University Press, 2008).

JOSHUA ARONSON

Joshua Aronson, Professor of Applied Psychology at New York University, will speak on "Stereotypes and the Nurture of Intelligent Thought and Behavior" on May 19th. Professor Aronson, along with Claude Steele, first introduced the theory of stereotype threat in 1995. Since then, Professor Aronson has continued to explore the role of stereotype threat in undermining the performance of women in STEM fields in addition to developing and testing stereotype threat interventions both in the lab and in the field. Professor Aronson's publications include "Stereotype Threat and the Intellectual Test Performance of African Americans" (co-authored with CM Steele), *Journal of Personality and Social Psychology* (1995); *Improving Academic Achievement: Impact of Psychological Factors on Education, Academic Press* (Academic Press, 2002); *Readings about the Social Animal*, co-edited with Elliot Aronson (Worth Publishers, 2007); and "Stereotypes and the Fragility of Human Competence, Motivation, and Self-Concept" (with co-author Claude M. Steele) in *Handbook of Competence & Motivation* (Guilford, 2005).

While they were at UCLA, each speaker kindly agreed to speak one-on-one with a graduate student in the Department of Social Psychology. Those interviews are presented here. In addition, each speaker agreed to have their talk filmed and posted on the UCLA YouTube channel. Links to those videos are included here as well. Finally, a selected bibliography of research on stereotype threat is also included.

Jenessa Shapiro is an Assistant Professor in the Department of Psychology at UCLA. She received her Ph.D. from Arizona State University in 2008. She received a CSW Faculty Curator Grant to organize this speaker series.

Q&A with Steven Spencer

BY COURTNEY HOOKER

Speaker in the Women and STEM series talks about how he became interested in studying psychology, dissonance, and stereotype threat

Spencer's talk, "A Chilly Climate for Women in STEM: How It Develops and How It Can Be Overcome," which took place on April 21st, is available for viewing on the CSW playlist on UCLA's YouTube channel

AS I TALKED WITH Steven Spencer, Professor at the University of Waterloo and a groundbreaking researcher in the field of stereotype threat, I was impressed by his kind demeanor and effective speaking style. He shared information about his academic career, advice for graduate studentsas well as discussing this research on how to dismantle the negative stereotypes that inhibit women's progression in science, technology, engineering, and math fields (STEM).

What drew you to this field of study?

When I was an undergraduate, I was a psychology major. I thought I was going to go into pre-med, but took [a class on] comparative anatomy and realized it was not for me. I started an undergraduate research project in my second year and finished in my honors study my third year doing dissonance studies. I realized I loved doing research, and so I decided to go to graduate school doing research in social psychology.

How did you get started in your career as an academic?

Well, when I was an undergraduate doing dissonance research, I began reading the new stuff on dissonance and at that time it was Claude Steele's self-affirmation theory. I loved his work so I decided to go work with him for graduate school. My first year project was a dissonance study but at that time, Claude was starting to think about stereotype threat. Therefore, I had the really good fortune of starting in graduate school focusing on stereotype threat. In fact, my dissertation was the first study done on stereotype threat, and consequently it was very good for my career.

Which writers, researchers, or professors particularly influenced or inspired you?

You don't work with Claude without being inspired by a whole bunch of people. For me, there were both social psychology influences and broader influences. As my mentor, Claude would have me read Jean-Paul Sartre, Ralph Ellison, and other really inspiring authors. Social psychology-wise, Claude was fundamentally important, but a book on stigma by Ned Jones and Hazel Markus really influenced me. Jennifer Crocker and Brenda Major also both had a huge influence on my career as well. In addition, Toni Schmader ended up at my school as well and certainly inspired me.

What is on your research agenda right now?

One of the things I am interested in is "belonging"

and an intervention for women in engineering. I think you can create a sense of belonging and connection between individuals. I also have some ideas about how to use that sense of connection through intergroup relations. Another way to say this is that in our engineering intervention, we focus on ways to help the women in this environment to feel more comfortable in their environment and give them tools to make them feel more comfortable even if they don't feel this way. Women will create a bit of a virtuous circle because women are motivated to do well, so if we can help them get past these barriers, that motivation will carry them further. But it seems to me what you really want to do in the long run is create this sense of connection between people. You want to get men in the environment when it's women in STEM to change, which is difficult because they may not be as motivated to change. I think this sense of connection could create the motivation for them. So, the next part of my research will attempt to change the bad culture of certain organizations, starting with engineering programs.

How do you see the field of social psychology developing?

There are broader things that are going to be relevant. We need to step outside and think of the major themes and influences that are affecting social psychology. Here are some:

- *Culture really matters. We've come to appreciate that and have more sophisticated models of culture, and a better understanding of this will allow us to examine how we can better understand intergroup relations.*
- *Neuroscience. Culture and neuroscience is a society-level analysis, but we can make it part of a lower-level analysis to better understand intergroup relations.*
- *Our field needs to be better at returning to our roots. We need to make the case that we matter. Research moving toward interventions is going to be important and as a field, we need to support this work.*

What advice would you give grad students?

Null findings are part of the game, but graduate students need to remember that it is a marathon, not a sprint. One of the things that keeps me going is the fact that I have a lot of studies going on at a given time. At the moment, I have around thirty. If more than half fail, I know that I at least will be able to write around two to three papers every year. Graduate students tend to put so much into a specific project that it can be discouraging when it doesn't work. As a graduate student, you need to be working on five to six studies at any given time. One of the nice developments in the field over the past few years is short reports. By the end of year 2, students should aim to write something up for a short report. This gives you the opportunity to get through that review process, which typically takes a lot of time.

Who are the people you look to now? Your current mentors or collaborators?

My colleagues at Waterloo are the first people I look toward. I publish with Mark Zanna, Joanne Woods, and John Holmes, to name a few. I also talk to my friends from graduate school as well and, even more, former students.

Looking back at your graduate career, what is the one piece of advice you wish someone had told you that would have helped you?

Claude was wonderful, and so not much was left out. One piece of advice that Claude gave me (that I needed, but not everyone needs) is that writing is something you get better at with effort and time. As a mentor, Claude made me keep an ideas journal and wanted me to write every day. He cared about writing and the quality of writing. If I had to tell one thing to graduate students, I would tell them writing is not something you have or you don't. It's a very incremental process and ability that requires continuous work.

At the end of the day, its not about the number of articles you have. Rather, it's about the influence they have. You want to shape the field and the way the world works. Focusing on doing too many and not making the quality the best that you can is a mistake.

Courtney Hooker is a graduate student in the Department of Social Psychology at UCLA.

Q&A with Toni Schmader

BY LAUREN WONG

Speaker in the Women and STEM series talks about how she became interested in studying educational outcomes

Schmader's talk, "Stereotype Threat Deconstructed," which took place on April 28th, is available for viewing on the CSW playlist on UCLA's YouTube channel

I RECENTLY HAD the wonderful opportunity to sit down with Dr. Toni Schmader, Professor at the University of British Columbia, to talk about her groundbreaking research on stereotype threat among women in science, technology, engineering and math (STEM). We talked about how she began her academic career, advice she has for graduate students, and her insights into her latest research on examining the mechanisms behind stereotype threat.

What drew you to this field of study?

As far back as high school I was interested in differences in education outcomes, although minority groups were my original focus. It's been more recent that I've been interested in how it pertains to women in science. It was interesting to me how situational factors can lead to impairments in how people think, form, and conceive of themselves. My training in graduate school was related to this and I've continued to pursue those ideas since then.

How did you come to study women in STEM fields?

The study of social psychology is usually interested in fairly basic processes. The study of stereotype threat, or the idea that you would be concerned about doing something that might inadvertently confirm a stereotype about your group, is something that anybody can experience. In some sense, I first got interested because women were a convenient sample to study, as the honest truth. But it's really fascinating, too, because the more you actually get into science yourself, as a women, you realize it takes on a personal significance as you see friends of yours start on an academic track and then they don't continue. Going back, I can trace some of my personal experiences through stereotype threat, though at the time I didn't necessarily frame them in the context of these theories. It's interesting to see the way that stereotypes add pressure that shape the path you end up taking, without necessarily knowing that is what's happening.

How did you get started in your career as an academic?

I originally wanted to do sociology in undergraduate. However, there was a psychology professor who offered a class called "Coercion," which was taught from a behaviorist perspective. She was interested in how people influence others from a stimulus-response angle, and I was just fascinated. I thought that sociology was the place

contents ◄ ►

where I would understand how context influences people, but after taking that class, I realized I was much more interested in the individual point of view, as opposed to the societal point of view. So I started taking psychology classes and never looked back. I knew that I wanted to go on and do a PhD, and so the question was figuring out what topic I was going to be most interested in. Once I settled on psychology, that became the direction I took.

Which writers, researchers, or professors particularly influenced or inspired you?

I always had an interest in educational disparities. As a high school student, I remember reading a book by Jonathan Kozol, who has written several books from a sociological perspective about the poverty of schools in inner cities that then lead to educational disparities for ethnic minority students. I was fascinated with that idea. Within the field, Brenda Major was my doctoral supervisor. I was very interested in the study of stigma and how people cope with being a member of a stigmatized group. Working with her was really inspiring, I learned a lot, and it gave me grounding in studying issues of stigma and stigmatization from a social psychological and experimental perspective. Given that I do research in stereotype threat, I've been inspired by the original work of Claude Steele and Josh Aronson. The first time I was on the UCLA campus was when I was a graduate student at UC Santa Barbara and Claude Steele was giving a colloquium here and a group of us caravanned down to hear him present. Also, when I started grad school at SUNY-Buffalo, Steve Spencer was on the faculty and I took his methods class, and so I owe him a debt for teaching me the philosophy of science in what we do.

What is on your research agenda right now?

In terms of the research we are doing on stereotype threat, we're starting to examine the ways in which conversations themselves can cue the kinds of processes that we've been studying in terms of testing contexts, and seeing how this pertains women in STEM. What can we do about the dearth of female faculty members in STEM disciplines? We got really interested in the question of whether these processes play out amongst graduate students and amongst faculty members.

We did a study that got published last year in which we had male and female faculty members from a school of science wear an audio-recording device that came on periodically. It was a matched sample on department, rank, and productivity. They wore a device that periodically turned on and recorded ambient sound throughout the day, and they agreed to wear it for three consecutive work days. An amazing team of research assistants transcribed the conversations that we captured.Each conversational snippet was about 50 seconds. We coded those conversations to look at the conversations that take place between colleagues. We were interested in looking at when faculty members talk about research and also when they talk about social things (for example, how was your weekend?). We didn't find overall differences between our male and female participants in the amount they talk about research or the amount they socialize with their colleagues. In general, people talk more about research than social things, which makes sense because they are at work.

One interesting mean difference was that we were able to code the gender of the person they were talking to, and when people were talking to women they were less likely to talk about research than when they were talking to men. We were also able to correlate having research or social conversations with a self-report measure of job disengagement. For men, we had an expected, intuitive and non-surprising pattern: if you're at work, the more you're talking to your male colleagues about research, the more engaged you are with what you do. The more time you're spending socializing, the less engaged you say you are with what you're doing. For women, the pattern was exactly the opposite. If their conversations with male colleagues are more about research, the less engaged they say they are with their jobs. If their conversations with male colleagues are about social things, the more engaged they say they are with their jobs.

It's preliminary because it is correlational, but it's real world data. If it makes sense to interpret this data in light of stereotype threat theory, then you might argue that being part of an organization where you're underrepresented—and women are vastly underrepresented in STEM, as we know—those social connections (being able to talk about your family, your weekend, your hobbies, for example) provides a sense of community, belonging, and fit to the organization, which can help boost

engagement. At the same time, those research conversations are places where stereotype threat processes can come into play—talking about your recent grant ideas, talking about the rejection you just got on a manuscript. Those are the places where even faculty members might feel tested in their conversations with their colleagues. We're following up experimentally, trying to understand these processes better with grad student samples in STEM, where we're bringing in science grad students, pairing them up in cross-gender pairs to talk about research or talk about social things and measure the effect on levels of engagement.

How do you see the field of social psychology developing?

I think we see more interest in integrating ideas across different levels of analysis. We have had an upswing of interest in neural mechanisms that underlie thoughts and behaviors. At the same time, I think there's also more interest in making sure that that the ideas that we study have real world applications. I think there's been a push to measure real behavior or real people and get outside of college student sampling. I think we see an expanding of the field, into microlevel mechanisms and into how all our processes tie to the real world. When I entered the field, it felt that social psychology had a bit more of an insular feel, it seemed that the focus was to study basic processes, not necessarily for the wider public to understand or for policymakers to apply. There's been a movement in psychology more generally about "giving psychology away." I think we see more of that in social psychology, of people being more cognizant of their audience not being just other academic social psychologists but also people in other disciplines and the general public.

What advice would you give current graduate students?

One piece of advice would be to have fun studying the ideas. One change that I see is that there seems to be an arms race for publishing more, faster, and sooner. Now, all of a sudden, to get a faculty job it takes many more publications than before. The problem is that it shifts so much more of what we do to a focus on outcome—What is the publication going to be? Where is it going to go? What kind of attention is it going to attract?—rather than on studying the questions that you find interesting and letting your own internal motivation monitor what's an interesting question guide what you do and motivate you to take it to the outcome of getting it published and advertised to others. Having the motivation come from external pressures makes it much less fun. I know that's easier advice to give than to take. When I think back to the project that I've been most excited to dive into, they've always been questions that I've found intrinsically interesting. Graduate school is a time when you can explore more readily and equip yourself with the tools that you'll need later in your career. For example, it's rare to get a chance to take a statistics class once you're a faculty member. All of the methods and statistics are essential tools to have under your belt and guide the type of research you end up doing later. Form collaborations with your grad school friends because they can end up sustaining you. I know a lot of people who still publish with people who were friends as grad students.

Who are the people you look to now? Who are your current mentors or collaborators?

Once you are into a faculty position, the faculty members around you play a large role, even if you're not directly collaborating, and they start shaping the way that you think and it starts becoming a mutual mentorship. Jeff Greenberg, a senior member of the social psychology program at Arizona, was an extraordinary mentor to me as a junior faculty member. We did end up collaborating on a couple of projects and we're still collaborating on a writing project, not because we had similar theoretical interests but more because he is such a supportive colleague. Currently, at UBC all of my colleagues have been really wonderful in helping to shape and mentor my transition.

Lauren Wong is a graduate student in the Department of Social Psychology at UCLA.

Q&A with Nilanjana Dasgupta

Speaker in the Women and STEM series talks about how She became interested in studying psychology, choice, and social justice

BY INES JURCEVIC

Dasgupta's talk, entitled "STEMing the Tide: Female Experts and Peers Enhance Young Women's Interest in Science, Technology, Engineering, and Mathematics," which took place on May 12th, is available for viewing on the CSW playlist on UCLA's YouTube channel.

I SAT DOWN WITH Nilanjana Dasgupta, Professor of Psychology at the University of Massachusetts, Amherst, to discuss her influential research on the effect of role models on women's interest in science, technology, engineering, and math (STEM). She talked about the path that led to her social psychological research, provided some advice for graduate students, outlined her current research directions, and discussed the role of choice in understanding why women may or may not enter STEM fields.

What drew you to the field of psychology?

I started as a biology major and had never taken psych as an undergrad. I went to a liberal arts college, and my pre-major advisor suggested I take a variety of courses; so, I took psychology and loved it. I think the thing I loved about it is that we think we know ourselves, but we don't really. I was fascinated by the idea that you could study the mind using science, not opinion. I didn't want to give up biology, so I ended up doing a psychology major and a neuroscience minor. So when it came to deciding what I wanted to do, I knew I wanted to do research and again I wanted to do both psychology and neuroscience (social cognitive neurosicence didn't exist at the time). I had to make a choice and I chose social psychology because it is the social mind aspect that I liked the most.

How did that lead you into becoming an academic?

I went to graduate school because I was interested in social justice. Part of this interest came because I went from being a majority group member in India and then I came to the U.S., and I suddenly was a minority group member. There were very few people who were brown, and I felt like I stood out. In some sense, my experience of immigration was like being a participant in a pre-test/post-test study where I had previously been in the "high-status condition" and post-immigration I was in the "low-status condition." I got interested in social justice and psychology allowed me to answer questions about social justice. These were questions that I wanted to ask due to personal interest, but now I was able to ask and test these questions more broadly and scientifically.

contents ◄ ►

In the first year of graduate school I began to really wonder if doing research was the way I wanted to pursue social justice or if I wanted to do something grassroots or NGO related. I decided, alright – I would go and do my masters and then I would decide if this was something I really liked or not. After I finished my masters, I liked it enough to continue, but it wasn't until my third year that something finally clicked and I got it; I realized I was good at empirical research, I loved it, and was no longer floundering. Of course, there was a big gap between the change I wanted to see and the research I was doing. However, that gap exists in a different way between grassroots action and actual change. I realized I wanted to pursue social change in terms of research.

How did you get interested in STEM?

I am interested in when and how societal stereotypes become a part of our own choices and decisions and when people do things that defy societal stereotypes. My own research has had a lot to do with changing stereotypes and attitudes toward other people (outgroups) but I became more interested in the other less studied and more politically difficult question – When do people fall into stereotypes and, without realizing it, carry them out in their own decisions – especially when they feel like personal choices? I can easily imagine studying it in terms of any underrepresented group in any life domain – in business, in law, in science, academia, sports, etc. Women in the sciences are clearly an underrepresented group so I thought I'd start there and later broaden to other groups.

What do you say to those, specifically with women in STEM, who say it's just a woman's choice to not be in the field and that it's not stereotypes or stigma, it's a choice.

I think in our lay understanding of choices, we think of choice as being entirely free. That anything a person chooses, by definition, is something that is guided by that person's intrinsic motivation, by their talent, or any factor they choose. Either way it is their choice and that justifies any group differences we might observe. However, I don't think women's professional and academic decisions in STEM fields constitute a free choice in the way that non-psychologists think about choice. I think it's a constrained choice, at best. This is likely to be true for many other groups that are either underrepresented in a profession and about whom there are these doubts about ability. For majority groups in the same professions who are not burdened by negative stereotypes, the choice is less constrained and more free. If we can equate this and give everybody equal freedom to choose their intellectual and professional paths, then however we end up, we could live with that. There's a lot we can do to make it a freer choice for women and underrepresented minorities in STEM and that's the goal of my research.

What else are you working on in terms of research at the moment?

These days, my professional interests are about taking the work I do on implicit bias or implicit stereotypes and applying it to different domains outside of psychology – to law, natural sciences, education, and policy. The most fun time I have is when I go and talk about the work I do to legal scholars and judges about how implicit bias informs anti-discrimination law. I also enjoy talking to school principals and superintendents about how kids might get more or less interested in science depending on who teaches the subject or because of things that happen in the classroom. I then use their help to enhance my research. They will have some insights that I, as someone who doesn't work in the schools, don't have. I can use their insights to test more questions. A lot of what I do is really interdisciplinary these days.

Secondly, with some of my graduate students, I've become really interested in 1) the effects of multiculturalism and colorblindness and similar ideologies on people's attitudes, and support or opposition to public policy. Of particular interest is the general assumption that multiculturalism is a good thing and colorblindness is a bad thing. That's the narrative we tell. But my students, and a lot of other research, are showing that it isn't as simple as that. Multiculturalism leads to positive effects for some groups and does nothing for other groups. Colorblindness leads to positive effects for some groups and negative effects for others. Also, colorblindness has different compo-

nents. There is colorblindness in terms of ignoring race and there's colorblindness as in we are all part of the same national group. The implications of the two different versions are very different. We are interested in the different, and sometimes non-obvious influence of promoting each of these ideologies and their effects on people's policy support and attitudes.

What are your thoughts on the field of psychology and how it's changing?

I think the field of psychology is changing in two ways, and both of them are good. One is that we are becoming more interdisciplinary. It's not as much about basic behavioral research using just psychological theories. Now we are going into many more directions like psychology and neuroscience, law, health, computer science, linguistics, etc. All of those interdisciplinary sub areas really benefit our field because they bring in new ideas, research, methodology.

Secondly, there is a better connection between basic and applied research today than there was 15 years ago when I was in graduate school. I am a big fan of this. I think that research which takes a basic finding grounded in theory, and then applies it successfully to a specific problem out there in the field is a huge benefit for our field and our theories. Sometimes, things work out very well, and other times we see that things aren't so clear which require modifications to the theory. In the work that I do, I have ended up doing research where some of it is in the lab and other parts of it are in the field. I package them together in the same paper. I start with a question that I think is interesting, then I do some lab experiments and test parallel field environments. I think it's good because it allows us to test our theories, and ensures our work will have more of an effect in the domains where we want it to have an effect.

Who were some of your mentors and who you really looked up to.

The first and obvious person who had a big effect on me going into a research field was my mother, who was a professor of physiology. I think my interest in biology came from her, but I think I didn't want to go into research because I wanted to be different from her, but I ended up doing what she did. Very ironic.

My interest in the human mind over anatomy came from four key people. The first two were my undergraduate advisors: Fletcher Blanchard, a social psychologist, and Brenda Allen, a developmentalist. Fletcher was interested in race and prejudice, and so it was through him that I got interested in prejudice and stereotyping. The two of them were incredibly good undergrad mentors and got me interested in the nitty-gritty research. The third very important mentor who refined my interest in social psychology was Mahzarin Banaji, my graduate advisor. My enjoyment thinking about interdisciplinary ideas and speaking with interdisciplinary audiences comes from Mahzarin. She is a "big ideas" person who is great at translating our science to different audiences. Watching Mahzarin speak to (and write for) different audiences had a huge effect on me in graduate school. Finally, the person who taught me about self-discipline in research and writing is Tony [Greenwald]. Tony has a way of working where he is able to screen everything out and get things done. That is a very important skill I learned from him.

Ines Jurcevic is a Graduate Student in Social Psychology in the Department of Psychology at UCLA.

Q&A with Joshua Aronson

BY AMY WILLIAMS

Speaker in the Women and STEM series talks about his family, research methodology, and makng the world a better place

Aronson's talk, entitled "Stereotypes and the Nurture of Intelligent Thought and Behavior," which took place on May 19th, is available for viewing on the CSW playlist on UCLA's YouTube channel.

I HAD THE PLEASURE of sitting down with Dr. Joshua Aronson, Associate Professor of Applied Psychology at New York University Steinhardt School of Culture, Education, and Human Development, and co-author of the article on stereotype threat that launched an entire field of research, to discuss the challenges and rewards of a career in academia. What follows are his reflections on entering the field of social psychology, insights gained from moving his stereotype threat research from the lab to the field, and why he is convinced that he has found the best teacher in the entire world.

What drew you into this field?

I always loved psychology as an undergraduate. I was absolutely intent on not following in my father's footsteps–he's an eminent social psychologist [Dr. Elliot Aronson]–and my mom's a psychologist, too. I think everyone in my family is genetically tuned to the social psychological, make-the-world-a-better-place wavelength, but I thought I'd be a clinical psychologist. I took a year and did internships in clinical psychology and very quickly realized that I didn't want to do that because I felt like I couldn't control anything. I couldn't just sit back and watch as people's lives stayed entrenched in their problems, and that didn't feel right to me. So I went back to the university, took a graduate course in experimental social psychology and just felt like, "I like this." My need to control and manipulate was very satisfied by that, and it was fun. It just seemed to come really naturally to me.

I went off to grad school and worked with professor Ned Jones [at Princeton University] who was one of the great attribution people. I didn't love attribution as a thing to study but I really loved my mentor and learned a lot from him. We did some pretty cool studies together that nobody has ever read. That first project with my advisor was related, now that I think about it, to the stuff that I eventually did. It was about how teachers determine how smart their students are when they're in the process of teaching them. So it's a really interesting attributional problem: I'm, in a way, inducing your behavior but then I have the attributional task of asking, "Are you smart?" That's an interesting motivational and inferential process

that happened and what we found was really interesting: If your job is to help somebody become smarter versus just boosting their performance you'll be more attentive to signs of learning. Now when I think about the educational paradigm in this country, it's incredibly relevant. I'm surprised it hasn't been cited more because we've shifted from a school system that is about teaching kids important stuff to one that has as its prime directive to get test scores up. Much of what we found in that paper is being played out in schools across the country now. That is, if you're not going to get your test score up, I'm not going to think much of you. It's tragic in some ways but it's interesting to me how the very framework I studied many, many years ago is now front and center in education. Yet we're pushing harder and harder on students even though the effects are not that good, and we should have known. Had they read that study…!

Has transitioning from conducting studies in the lab to the field influenced how you think about the problems you study?

Often when you go into the field you realize you've been studying the wrong thing in the lab. [Social psychologist] Bob Cialdini tells this great story of how he's analyzing his data in the basement of the Ohio State psych department, which is located under the football stadium, and he's thinking, "How can I get this effect to go from .07 to p< .05?" Meanwhile, the whole place is shaking and he thinks to himself, "Maybe I'm studying the wrong thing." That was my experience when I went from the lab into the school -- that although I really believe in what I'm doing, maybe I'm studying the wrong thing. The stuff we found in the lab on stereotype threat and the little tweaks that we do are really important. And really good teachers do this stuff all the time. But there's so much more that happens in classrooms that social psychologists haven't really thought about and I think have been embarrassed, in a way, to think about. It's been a wonderful experience to see that there are big things going on that we're not even studying. I am excited about hopefully getting to be on the forefront of that kind of thing.

Along those lines, what advice would you have for researchers who are interested in moving in the direction of translational research?

What happens when you become a faculty member is you stop running your own subjects. Every year you get farther away from the people that you talk about in your research. So what I've found, and which has been really eye-opening, is to go to where the phenomena are. If you're studying a problem, definitely bring it into the lab but get into the field so that you're not removed from the phenomenon as it occurs in the real world. It's a great way to get ideas, too. The first time I went into a school, all these hypotheses just starting springing up in my head. So that would be my advice: Don't become a one-trick pony where all you do is lab work. Learn to do it well but then stay connected to the phenomenon and to the larger problem so that you really know what you're talking about.

Can you describe what your research method looks like when you're in the field? Are you mainly observing students and teachers?

Sometimes. I went back to school as a high school teacher last year. I wanted to be Bob Cialdini. He's one of my favorites because no one does a progression of studies better than Bob Cialdini. But it's not the best thing about him. The best thing about him is that he learned which questions to ask by going into the field and hanging out with the people who were natural persuaders. And I held that up as sort of a gutsy, man-in-full kind of psychologist. I'd been saying that for a few years and then I found myself thinking, "You really ought to start walking the walk." So I took the opportunity to teach high school for a year and it was really hard but really eye-opening.

You never look at a phenomenon the same way once you've been inside it and I think it's made me infinitely wiser. And I don't accept certain arguments anymore. For example, in the education world, we sort of have a really intense blame game going on. So before it was "the schools are bad." Then it was "the parents are bad" and "the kids are stupid." And now it's the teachers' turn. Everyone's angry at the teachers: "They're greedy,

lazy, and can't get the test scores up." I think anyone who says that should immediately be signed up to be a teacher because you cannot maintain the opinion that it's your fault after being a teacher.

We did an experiment where I would teach 2 or 3 different groups of students. I was the same guy in every situation but all it took was one student and he screwed up the whole feel of the classroom. I was an ineffective teacher in one situation —and I think I'm a pretty good teacher—but all of a sudden my power was gone in that situation. It's something that I believed in the abstract as a social psychologist – that situations matter – but when you are part of the situation, and you feel powerless all of a sudden because of one kid, then you can no longer blame teachers. We've bell-curved the students; we've bell-curved the teachers. And I think if we really want to get it right we have to bell-curve the situation. We have to ask: What are the qualities of these situations that promote learning, engagement, happiness, and curiosity? Ask questions about the situation rather than about the individual player in the situation. I think that's the only approach that makes sense to me now and I wouldn't feel it with such conviction if I hadn't played every single role in that drama.

Being in the field gives you great insight into possible solutions, too. I observe, teach, and do experiments in the high school. And the other way that I'm doing it is by finding out who is doing really great things in the classroom. I go to them and I put them under a microscope. What's making them so successful? And the most gratifying experience I've had lately is finding who I think to be the best teacher I've ever seen in the world. I didn't find her by looking at test scores; she found me because I gave a talk on encouraging girls in math and science. At the end of the talk she came up to me and said, "I do all of those things…I think I'm a very successful teacher."

So I looked into her. She was Principal of the Year two years running in Maryland. When she came into her school as the principal, zero percent of the kids were scoring proficient on the statewide test. It's this run-down little school. Most of the kids live in trailers and some of them have never met one of their parents because they're in jail or because they were murdered. Within two and a half years, everyone's proficient and 60% of the kids are scoring at advanced levels. Well, you do that in a lot of different ways but a lot of what she does are these little social psychological tweaks that shape the way the kids are seeing their life in the school. When you go to this school, you start envying these kids because they're getting this first-class education. And it's not the way the current administration would envision how you get high test scores. None of this Atkins diet way of getting to proficiency. There's not a thing the kids do that doesn't have meaning in some way, that doesn't make them feel more connected to the school. It's more like they're doing science rather than just learning science. I could go on and on about how this works but the basic point is that it's validated social psychology. It's not the children's fault. They come from low IQ parents and bad situations and poverty, but they can do just as well as anyone else because they have a teacher and mostly a principal who is willing to do anything to make their learning experience meaningful and to make them feel accepted. It's something that every kid should get and very few do.

How did you become interested in studying women in STEM fields?

The women research came later for me. When I took a faculty position in Texas one of my first and best students, Catherine Good, heard me give a talk about the Steele and Aronson paper about Black students. She was in math education and immediately changed majors to start working with me. She wanted to do studies on women so that's what we did. When we went into schools we studied all the kids. There were girls, Latinos, and Black kids. We just took whoever came and we got great effects with the girls. I have to say that at this point, now that I'm in schools a lot and read all the data, I think that to talk about women and math as a crisis bewilders me. I don't think women are actively discriminated against as much as some reports have

suggested. And, girls are better than men in every other way. If you look at all the data, they're better writers and readers; they're graduating from high school with higher grades; they're going to college in higher numbers; they're very effective leaders. I think that women are taking over and I think the numbers are looking great when you compare them to 30 years ago.

I asked a group of kids when I was teaching high school to probe what they thought about stereotypes. They hadn't even heard that girls are not as good at math so things are really changing rapidly. The status of Blacks is a much bigger priority for me and it keeps me awake at night because when Black students fail, they end up in prison. It is just so sad and so unnecessary.

Besides the school principal in Maryland, what researchers, writers, or thinkers influence and inspire you?

So many of them. Carol Dweck's learning versus performance orientation research was a big early influence. Claude [Steele] obviously. I went to work with him on self-affirmation and I resisted working on what he was then referring to as "stigma vulnerability" because I didn't feel like I had any insights about that. Lo and behold, when I designed the first stereotype threat studies on the Black students and saw the effects, I was completely hooked. Interviewing every single one of those students and they had no clue that their brain had just been compromised by this little detail. So I haven't gotten over that. My dad has been a huge influence. I think I share with him a certain boredom and impatience with trivial stuff. That if this is not the study that you always dreamed about doing then why are you doing it? I love the way he writes, the way he talks, and how he gets exuberant about stuff. Other [psychologists] include Bob Cialdini, Tim Wilson, and Dan Gilbert. Ed Deci and [Richard] Ryan, I love their stuff and how much care there is for human beings while at the same time it's very hard-nosed science. There's a choice one makes: Do you want to do social psychology or humanistic social psychology? I've always been attracted to not just seeing the world as it is and saying here's why, but seeing what could be and saying why not? Psychology is not physics. It was borne out of a tradition of how are we going to understand people so that we can create a better world for them and I'm proud to be part of that tradition.

Given the positive mentoring experiences you've had, what advice do you have for graduate students?

As a graduate student your job is to spend as much time in the lab as possible and really understand how to do research. Work very hard. Gain the knowledge about your field and become proficient at the methodologies while in graduate school. And, don't worry about having a big idea. Just study what you're passionate about and find most interesting.

Amy Williams is a Ph.D. student in Social Psychology in the Department of Psychology at UCLA. Her research focuses on identifying and developing stereotype threat interventions that can be used to buffer against multiple forms of stereotype threat.

BY LINDSEY MCLEAN

Further Reading

Research on Stereotype Threat

ARTICLES/BOOKS

Aronson, J., Steele, C. M., Salinas, M. F. Lustina, M. J. (1998). The effects of stereotype threat on the standardized test performance of college students. In E. Aronson, (Ed.), *Readings About the Social Animal* (8th edition). New York: Freeman.

Brown R.P., Josephs R.A. (1999). "A burden of proof: Stereotype relevance and gender differences in math performance." *Journal of Personality and Social Psychology* 76(2), 246–257.

Cadinu M., Maass A., Rosabianca A., Kiesner J. (2005). "Why do women underperform under stereotype threat? Evidence for the role of negative thinking." *Psychological Science* 16(7), 572–578.

Davies P.G., Spencer S.J., Quinn D.M., Gerhardstein R. (2002) "Consuming images: How television commercials that elicit stereotype threat can restrain women academically and professionally." *Personality and Social Psychology Bulletin* 28(12), 1615–1628.

Good C., Aronson J., Inzlicht M. (2003). "Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat." *Journal of Applied Developmental Psychology* 24(6), 645–662.

Good C., Aronson J., Harder J.A. (2008). "Problems in the pipeline: Stereotype threat and women's achievement in high–level math courses." *Journal of Applied Developmental Psychology* 29(1), 17–28.

Gonzales P.M., Blanton H., Williams K.J. (2002). "The effects of stereotype threat and double–minority status on the test performance of Latino women." *Personality and Social Psychology Bulletin* 28(5), 659–670.

Hyde J.S. (2005). "The gender similarities hypothesis." American Psychologist 60(6), 581–592.

Inzlicht M., Ben–Zeev T. (2000). "A threatening intellectual environment: Why females are susceptible to experiencing problem–solving deficits in the presence of males." *Psychological Science* 11(5), 365–371.

Johns M., Schmader T., Martens A. (2005). "Knowing is half the battle – Teaching stereotype threat as a means of improving women's math performance." *Psychological Science* 16(3), 175–179.

Keller J. (2002). "Blatant stereotype threat and women's math performance: Self–handicapping as a strategic means to cope with obtrusive negative performance expectations." *Sex Roles* 47(3–4), 193–198.

Leyens J.P., Desert M., Croizet J.C., Darcis C. (2000). "Stereotype threat: Are lower status and history of stigmatization preconditions of stereotype threat?" *Personality and Social Psychology Bulletin* 26(10), 1189–1199.

Martens A., Johns M., Greenberg J., Schimel J. (2006). "Combating stereotype threat: The effect of self– affirmation on women's intellectual performance." *Journal of Experimental Social Psychology* 42(2), 236–243.

Marx D.M., Roman J.S. (2002). "Female role models: Protecting women's math test performance." *Personality and Social Psychology Bulletin* 28(9), 1183–1193.

Murphy M.C., Steele C.M., Gross J.J. (2007). Signaling threat: How situational cues affect women in math, science, and engineering settings." *Psychological Science* 18(10), 879–885.

O'Brien L.T., Crandall C.S. (2003) "Stereotype threat and arousal: Effects on women's math performance." *Personality and Social Psychology Bulletin* 29(6), 782–789.

Pronin E., Steele C.M., Ross L. (2004). "Identity bifurcation in response to stereotype threat: Women and mathematics." *Journal of Experimental Social Psychology* 40(2), 152–168.

Quinn D.M., Spencer S.J. (2001). "The interference of stereotype threat with women's generation of mathematical problem–solving strategies." *Journal of Social Issues* 57(1), 55–71.

Schmader, T. (2002). "Gender identification moderates stereotype threat effects on women's math performance." *Journal of Experimental Social Psychology* 38(2), 194–201.

Schmader T. (2010). "Stereotype Threat Deconstructed." *Current Directions in Psychological Science* 19(1), 14–18.

Schmader T., Forbes C.E., Zhang S., Mendes W.B. (2009). "A Metacognitive Perspective on the Cognitive Deficits Experienced in Intellectually Threatening Environments." *Personality and Social Psychology Bulletin* 35(5), 584–596.

Schmader T., Johns M., Barquissau M. (2004). "The costs of accepting gender differences: The role of stereotype endorsement in women's experience in the math domain." *Sex Roles* 50(11–12), 835–850.

Sekaquaptewa D., Thompson M. (2003). "Solo status, stereotype threat, and performance expectancies: Their effects on women's performance." *Journal of Experimental Social Psychology* 39(1), 68–74.

Shapiro, J. R. (2011). Different groups, different threats: a multi-threat approach to the experience of stereotype threats. *Personality and Social Psychology Bulletin*, 37, 464-480.

Shapiro, J.R., Neuberg, S.L. (2007). "From stereotype threat to stereotype threats: implications of a multi– threat framework for causes, moderators, mediators, consequences, and interventions." *Personality and Social Psychology Review* 11(2), 107–130.

Shih M., Pittinsky T.L., Ambady N. (1999). "Stereotype susceptibility: Identity salience and shifts in quantitative performance." *Psychological Science* 10(1), 80–83.

Spencer S.J., Steele C.M., Quinn D.M. (1999). "Stereotype threat and women's math performance." *Journal of Experimental Psychology* 35(1), 4–28.

Stangor C., Carr C., Kiang L. (1998). "Activating stereotypes undermines task performance expectations." *Journal of Personality and Social Psychology* 75(5), 1191–1197.

Steele, Claude. (1999). Thin Ice: Stereotype Threat and Black College Students, *Atlantic Monthly Online*, http://www.theatlantic.com/magazine/archive/1999/08/thin–ice–stereotype–threat–and–black–college–students/4663/

Steele, C.M. (1997). "A threat in the air – How stereotypes shape intellectual identity and performance." *American Psychologist* 52(6), 613–629.

Steele, C. M. & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African–Americans. *Journal of Personality and Social Psychology* 69(5), 797–811.

Steele C.M., Spencer S.J., Aronson J. (2002). "Contending with group image: The psychology of stereotype and social identity threat." *Advances in Experimental Psychology* 34, 379–440.

Stout J.G., Dasgupta N., Hunsinger M., McManus M.A. (2011). "STEMing the Tide: Using Ingroup Experts to Inoculate Women's Self–Concept in Science, Technology, Engineering, and Mathematics (STEM)." *Journal of Personality and Social Psychology* 100(2), 255–270.

Walton G.M., Cohen G.L. (2003). "Stereotype Lift." *Journal of Experimental Social Psychology* 39(5), 456– 467.

ASSOCIATIONS/CONFERENCES

American Psychological Association Annual Conference.
Division 8: Society for Personality and Social Psychology
Division 9: Society for the Psychological Study of Social Issues (SPSSI)
Division 21: Applied Experimental and Engineering Psychology
Division 35: Society for the Psychology of Women
Association for Psychological Science Annual Conference
Association for Research in Personality Biennial Conference
Social Psychology Section Annual Conference
Society for Personality and Social Psychology Annual Conference
The Society of Experimental Social Psychology (SESP) Annual Conference

WEBSITES

Social Psychology Network: www.socialpsychology.org
Reducing Stereotype Threat: http://www.reducingstereotypethreat.org/
Psychology Wiki: http://psychology.wikia.com/wiki/Stereotype_threat

ucla center for the study of women

CSW update

DIRECTOR *Kathleen McHugh*
PROFESSOR, ENGLISH AND CINEMA AND MEDIA STUDIES

ASSISTANT DIRECTOR *Julie K. Childers, Ph.D.*

MANAGING EDITOR *Brenda Johnson-Grau*

ADMINISTRATIVE SPECIALIST *Erma Acebo*

ADMINISTRATIVE ASSISTANT *Emily Walker*

STUDENT ASSISTANTS *James Altmann, Hao Dieu, Maryssa Hall, Jackie Hunt, Angelica Lai, Susan McKibben, Lindsey McLean, Ben Sher, Cathy Son, and Dayo Spencer-Walters*

UCLA CENTER FOR THE STUDY OF WOMEN
1500 PUBLIC AFFAIRS BUILDING/BOX 957222
LOS ANGELES, CA 90095-7222

CAMPUS MAILCODE: 722203

310 825 0590 / 310 825 0456 (FAX)

CSW Update is the newsletter of the UCLA Center for the Study of Women. It is published monthly during the academic year. UCLA faculty, staff, and students are welcome to submit articles for inclusion. If you have questions, please email the publications staff at cswpubs@women.ucla.edu

EDITOR/DESIGNER: *Brenda Johnson-Grau*

EDITORIAL ASSISTANTS: *James Altmann, Hao Dieu, Maryssa Hall, and Lindsey McLean*