

# Advancing Women: Annotated Bibliography

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[www.hunter.cuny.edu/gendertutorial](http://www.hunter.cuny.edu/gendertutorial)

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## Data on women and men in academia

### Summary data and benchmarks

*Tutorial 1 - The Data on Sex Disparities in Rank and Salary* from Valian's *Tutorials for Change: Gender Schemas and Science Careers*.

[www.hunter.cuny.edu/gendertutorial](http://www.hunter.cuny.edu/gendertutorial)

*Sex disparities in advancement and income* (Valian, 2003),

[www.hunter.cuny.edu/genderequity](http://www.hunter.cuny.edu/genderequity)

Figures from 2001 for academic scientists and engineers show slight disparities in tenure and tenure-track positions, as well as rank, even for people less than 10 years post-PhD. Median annual salaries in academia are lower for women than men beginning 6 years post-PhD.

Examples of Hunter College benchmarks for 2006-2007 at

<http://www.hunter.cuny.edu/ir/GEP/gep0607.html>

[www.nsf.gov](http://www.nsf.gov)

*Preparing figures to represent gender equity benchmark data*

[http://www.hunter.cuny.edu/genderequity/benchmark/Preparing\\_figures.pdf](http://www.hunter.cuny.edu/genderequity/benchmark/Preparing_figures.pdf)

How to create bubble graphs, time-in-rank box plots, and flux charts.

Long, J. S. (Ed.). (2001). *From scarcity to visibility: Gender differences in the careers of doctoral scientists and engineers*. Washington, D. C.: National Academy Press.

Excellent in-depth review of sex differences in salary, rank, and tenure among men and women in the sciences and engineering, using NSF synthetic cohort data. Presentation of both overall analyses and analyses that control for time since degree, rank, specialty, type of institution, and familial status. Among the notable findings: there is a cost to a woman of being a woman, net other variables; the heaviest cost for women with children is movement from full-time to part-time work; women who remain full-time differ from their female peers without

children only in achieving full professorship slightly later; being in a field with many women (such as the social sciences) does not guarantee better advancement than being in a field with few women.

Xie, Y. & Shauman, K. A. (2003). *Women in science: Career processes and outcomes*. Cambridge, MA: Harvard University Press.

Examination of synthetic cohort data at key transition points in a scientist's life: high school to college, college to an advanced degree or the science workplace, an advanced degree to a career in academia or industry. At each transition point, science loses more females than males. Among the notable findings: ability (as measured by standardized tests) does not determine youngsters' interest in science; the primary effect of childbirth is the disproportionate loss of mothers from the full-time labor force; the sex disparity in productivity is decreasing; productivity differences are not attributable to parental status. N.B. The sex difference in choosing to major in science is unrelated to the sex differences in ability as measured by standardized tests.

Valian, V. (1998). *Why so slow? The advancement of women*. Cambridge, MA: MIT Press. Chapters 11 and 12.

Summary of data on women in science and humanities faculties in the US: salary, rank, tenure, productivity, and teaching.

Ross, M. & Green, M. F. (1998). *The American college president*. Washington, DC: American Council on Education.

Corrigan, M. (2002). *The American college president*. Washington, DC: American Council on Education.

In 1995, women were 6 % of the presidents at private universities which grant the PhD but 25% of presidents of private two-year colleges; in 2001, the respective figures were 9% and 28%. The figures show the common inverse relation between representation of women and prestige: women are more numerous at low-prestige institutions.

Nonnemaker, L. (2000). Women physicians in academic medicine. *New England Journal of Medicine*, 342, 399-405.

How many associate or full professors "should" there be, given the number of assistant or associate professors? Via cohort data of medical school graduates from 1979 to 1993, Nonnemaker shows that at both the associate and full level, more women would be expected than are present, even controlling for specialty. Income figures show advantages for women over men in pediatrics and family medicine; those advantages do not carry over to promotion where, in almost every specialty where there are enough numbers for a meaningful comparison, men are advantaged relative to women.

## Productivity

Fox, M. F. (1981). Sex, salary and achievement: Reward-dualism in academia. *Sociology of Education*, 54, 71-84.

Fox, M. F. (1985). Publication, performance, and reward in science and scholarship. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 255-282). NY: Agathon.

Sonnert, G. & Holton, G. (1996a). Career patterns of women and men in the sciences. *American Scientist*, 84, 63-71.

Sonnert, G. & Holton, G. (1996b). *Gender differences in science careers: The Project Access study*. New Brunswick, NJ: Rutgers University Press.

Zuckerman, H. (1987). Persistence and change in the careers of men and women scientists and engineers: A review of current research. In L.S. Dixon (Ed.), *Women: Their underrepresentation and career differentials in science and engineering* (pp. 123-156). Washington, DC: National Technical Information Service.

Women publish fewer articles than men do, but the average article by a woman is cited more often than the average article by a man. Women emphasize quality, men quantity.

## Sources of gender inequities

### Gender schemas

Fiske, S. T. & Taylor, S. E. (1991). *Social cognition, 2nd ed.* NY: McGraw-Hill.

Kunda, Z. (1999). *Social cognition: Making sense of people.* MIT Press.

Schemas are implicit, often nonconscious, hypotheses that we use to interpret social events. These books review different kinds of schemas and how they operate.

Valian, V. (1998). *Why so slow? The advancement of women.* Cambridge, MA: MIT Press. Chapters 6 and 7.

Our schemas about males and females directly include expectations about their professional competence and they bias our interpretation of actual performance. To oversimplify, we expect men to do well, and see men's actual performance in the rosy light of our positive expectations; men carry a small plus sign. Conversely, we expect women to do less well, and see their actual performance in the darker light of our negative expectations; women carry a small minus sign. Gender schemas are held by both males and females. The content of gender schemas is widely shared throughout a culture. Most experiments show no differences in the judgments males and females make. Schemas are cognitive in origin but have motivational and emotional consequences as well as consequences for judgments and evaluations.

### Accumulation of advantage

Martell, R. F., Lane, D. M., & Emrich, C. (1996). Male-female differences: A computer simulation. *American Psychologist, 51*, 157-158.

A computer simulation of promotion practices at a hypothetical corporation provides a convincing demonstration of the cumulative effects of small-scale bias. The simulation "created" an organization with an 8-level hierarchy. It staffed each level of the hierarchy with equal numbers of men and women. The simulation assumed a certain percentage of incumbents would be promoted from one level to the next. Finally, it assumed a tiny bias in favor of promoting men, a bias that accounted only for 1% of the variability in promotion. The simulation then ran through a series of promotions. After repeated promotions, the highest level in the hierarchy ended up being 65% male. This scenario demonstrates that operating at a systematic minute disadvantage can have substantial long-term effects.

Merton, R.K. (1948). The self-fulfilling prophecy. *Antioch Review, 8*, 193-210.

Merton, R.K. (1968). The Matthew Effect in science. *Science, 159*, 56-63.

Merton originated the notion of the accumulation of advantage and disadvantage. Like interest on capital, advantages accrue; like interest on debt, disadvantages accrue. Very small differences in treatment can, as they accumulate, have major consequences in salary, promotion, and prestige. It is unfair to men and women to neglect small cases of group-based bias, because those small cases add up.

Who perceives gender inequity when?  
 belief in a just world  
 benevolent sexism  
 parenthood

Lerner, M. J. (1975). The justice motive in social behavior: An introduction. *Journal of Social Issues, 31*, 1-19.

People want to believe in a "just world" and will interpret data accordingly, failing to perceive contrary evidence. We see the rewarded as deserving and the deserving as rewarded.

Valian, V. (1998). *Why so slow? The advancement of women*. Cambridge, MA: MIT Press. Chapter 7.

If one wants to believe that advancement is determined by merit, as most people (especially those who are successful) do, the data available to us are easily interpreted in line with our hypothesis that the world is a "just world". In a just world bad things do not happen to good people, and good things do not happen to bad people. The fact that some women make it to the top is interpreted as showing that evaluations are basically fair and that truly able women will succeed. The fact that we have admired the competence of some women is interpreted as showing that we are free of gender bias, or at least free enough. It is hard for us to see that we are in error. We have the beliefs we do because we view ourselves as fair and impartial. That allows us to place in the background the rule of our behavior and put in the foreground the exceptions to it. We fail to see just how often the rule operates. It is hard to remember that an exception is just that: an atypical event.

Glick, P. & Fiske, S. T. (2001). An ambivalent alliance: Hostile and benevolent sexism as complementary justifications for gender inequality. *American Psychologist, 56*, 109-118.

Glick, P., Fiske, S. F., Mladinic, A., et al. (2000). Beyond prejudice as simple antipathy: Hostile and benevolent sexism across cultures. *Journal of Personality and Social Psychology, 79*, 763-775.

Prejudice against women can be benevolent as well as hostile. Benevolent sexism includes the ideas that women should be cherished, protected, and financially provided for and that women are purer, more refined, and more moral. Men and women who endorse benevolent sexist attitudes also tend to endorse hostile sexist attitudes. Men's and women's attitudes are correlated. Nations with less gender equality show higher sexism scores. Because people can hold warm and apparently positive attitudes toward women, it is difficult for them to perceive the sexism latent within those benevolent attitudes.

Warner, R. L. & Steel, B. S. (1999). Child rearing as a mechanism for social change: The relationship of child gender to parents' commitment to gender equity. *Gender & Society, 13*, 503-517.

Women endorse gender equity policies (such as pay equity and affirmative action) more than men do. Men with only daughters endorse equity policies more than do childless men or men with both daughters and sons, and much more than do men with sons only. Women with

only daughters endorse equity policies more than other types of women, but there are no differences among women without children, women with both sons and daughters, and women with sons only.

## Choosing and developing leaders

### Nonconscious evaluations of others - effects of gender schemas

Bargh, J. A. & Chartrand, T. L. (1999) The unbearable automaticity of being. *American Psychologist*, 54, 462-479.

Much of human perception occurs nonconsciously, rapidly, and automatically.

Biernat, M., Manis, M., & Nelson, T. (1991) Stereotypes and standards of judgment. *Journal of Personality and Social Psychology*, 66, 5-20.

College students were shown photographs of other students and were asked to estimate their height in feet and inches (including their footwear). The photos always contained a reference item, such as a desk or a doorway, so that height could be accurately estimated. Unbeknownst to the students who were doing the estimating, the experimenters had matched the photographs so that for every photograph of a male student of a given height there was a female student of the same height. The student judges were affected by their knowledge that men are on average taller than women, so that when they were exposed to a sample contrary to the general rule, they judged the women as shorter than they really were, and the men as taller. There were no differences between female and male judges: both underestimated women's height and overestimated men's height. Judgments are influenced by gender schemas even when objective characteristics are being evaluated.

### Perceptions of competence and professional ability – effects of gender schemas

Scott, K. A. & Brown, D. J. (2006). Female first, leader second? Gender bias in the encoding of leadership behavior. *Organizational Behavior and Human Decision Processes*, 101, 230–242.

Participants (undergraduates) read a sentence that was either associated with the male gender schema ("displays extraordinary talent and competence in every project"; "argues until co-workers see the ideas"; "works on projects outside of working hours") or the female gender schema ("always shows concern for the well being of the team"; "is accommodating when family emergencies arise"; "expresses concern with subordinates that are going through difficult times"). They saw each sentence twice, once with a female name as the subject and once with a male name as the subject. [They also saw neutral sentences and nonwords were paired with them.] After reading the sentence, participants performed a lexical decision task with words that were related to the trait in the sentence, such as "intelligent", "aggressive", "dedicated", "caring", and "sympathetic". Participants were slower to recognize "male" words when they came after a sentence with a female subject than when they came after a sentence with a male subject. There was no difference for "female" words. There was no sex difference and no difference as a function of score on an ambivalent sexism scale.

Trix, F. & Psenka, C. Exploring the color of glass: letters of recommendation for female and male medical faculty. (2003). *Discourse and Society*, 14, 191-220.

Letters of recommendation for successful female and male medical faculty showed differences in terms used to describe them and in the length of letters. Letters for females were shorter than those for males; included more phrases expressing doubts about the candidate; used more "grindstone" adjectives; mentioned their sex more often; were more likely to include only minimal information; mentioned their personal life more often. Letters for males, compared to letters for females, included more repetition of standout words like "outstanding", "excellent", and "superb"; included more references to research, skills and abilities, and career; included fewer references to training and teaching; mentioned their publications, vita, patients, and colleagues more often. Letter writers are at risk of underselling the abilities and qualifications of the women they write for and of overselling the abilities and qualifications of the men they write for.

Heilman, M. E., Block, C. J., Martell, R. F., & Simon, M. C. (1989). Has anything changed? Current characterizations of men, women, and managers. *Journal of Applied Psychology*, 74, 935-942.

Male managers rated different groups of people on a series of adjectives. One group was asked to rate successful managers on 92 different characteristics, according to how typical of successful managers they thought that quality was. The characteristics ranged from "leadership ability" to "fearful". Most people rated successful managers as typically having high leadership ability and not fearful. A second group rated women in general, and a third group rated men in general. Male managers rated men in general and successful managers as very similar, much more similar than they rated women in general and successful managers. Other groups of male managers rated female and male managers described as successful. Most differences in ratings of men and women disappeared, but even successful women managers were perceived as having less leadership ability than successful men managers. Furthermore, women managers were seen as having negative qualities that men managers did not have, such as being bitter, quarrelsome, and selfish.

Heilman, M. E., Wallen, A. S., Fuchs, D., & Tamkins, M. M. (2004). Penalties for success: Reactions to women who succeed at male gender-typed tasks. *Journal of Applied Psychology*, 89, 416-427.

Investigates how males and females rate people who are described as being an Assistant Vice President in an aircraft company. The evaluators read background information about the person, the job, and the company. In half the cases, the person is described as about to have a performance review; thus, evaluators don't know how well the person is doing in the job. In the other half of the cases, the person is described as having been a stellar performer. The evaluators' job is to rate how competent the employees are and how likeable they are. When no information is given about how well people are doing in the job, evaluators rate the man as more competent [7.11/9] than the woman [5.51/9], and rate them as equally likeable [6.79, 6.94]. When the background information makes clear that the woman is extremely competent, evaluators rate the man and the woman as equally competent [8.21, 8.03], but they rate the woman as much less likeable [5.81] than the man [7.13]. They also perceive the woman as

considerably more hostile [3.99/9] than the man [5.29; low score means more hostile]. Thus, in evaluating a woman in a male-dominated field, observers see her as less competent than a similarly-described man unless there is clear information that she is competent. And in that case, they see her as less likeable than a comparable man. No differences exist between male and female subjects.

Butler, D. & Geis, F. L. (1990). Nonverbal affect responses to male and female leaders: Implications for leadership evaluations. *Journal of Personality and Social Psychology*, 58, 48-59.

Both women and men - nonconsciously but visibly - react negatively to women in a situation which is aimed at finding a group solution to a problem. People respond especially negatively to women's attempts to be assertive. Females trained to act as leaders received more negative facial reactions than positive ones. The trained males, in contrast, always received more positive reactions than negative ones.

Dovidio, J. F., Ellyson, S. L., Keating, C. F., Heltman, K., & Brown, C. E. (1988). The relationship of social power to visual displays of dominance between men and women. *Journal of Personality and Social Psychology*, 54, 233-242.

Eye gaze reflects social dominance. The more powerful person in a dyad looks more when speaking than listening; the less powerful person looks as often when listening as speaking. Looking while listening conveys deference. When both the male and female members of a dyad have antecedently said they know little about a topic, they reproduce the phenomenon that occurs when the man has said he knows a lot about a topic and the woman has said she knows little about a topic: men look more while talking than listening; women look similarly whether talking or listening.

Porter, N. & Geis, F. L. (1981). Women and nonverbal leadership cues: When seeing is not believing. In C. Mayo & N. Henley (Eds.), *Gender and nonverbal behavior*. New York: Springer Verlag.

When observers are shown a slide of five people seated around a table and described as a working group, they reliably pick the person sitting at the head of the table as the leader of the group under three conditions: all the participants are male; all the participants are female; the group has a mixed sex composition and the person at the head is male. If it is a mixed-sex group and the person at the head is female, observers choose her half the time and a male seated on either side of the table half the time. No differences between male and female observers.

Eagly, A. H., Karau, S. J., & Makhijani, M. G. (1995). Gender and the effectiveness of leaders: A meta-analysis. *Journal of Personality and Social Psychology*, 117, 125-145.

This meta-analysis of studies which concentrated on evaluations of women as leaders suggests that women are particularly disadvantaged when their style of leading is masculine. Having a style that is assertive to the point of appearing autocratic, rather than cooperative and

participative, is especially costly for a woman. When experiments investigated the effects of autocratic leaders - leaders who told people what to do without consulting them - women were especially negatively evaluated. A highly assertive style is incongruent with our conception of women and women are penalized if they adopt such a style. There are no differences between males and females in their judgments.

Heilman, M. E. & Stopeck, M. H. (1985). Attractiveness and corporate success: Different causal attributions for males and females. *Journal of Applied Psychology, 70*, 379-388.

Attractiveness helps men appear more competent but makes women appear less competent. That is because attractiveness intensifies a person's gender. An attractive man is more of a man and hence more competent than an unattractive man. An attractive woman is more of a woman and hence less competent than an unattractive woman.

Heilman, M. E. (1980). The impact of situational factors on personnel decisions concerning women: Varying the sex composition of the applicant pool. *Organizational Behavior and Human Performance, 26*, 386-395.

Women are judged more positively if they are more than 30% of the applicant pool than if they are 25% or less of the pool.

Sackett, P. R., DuBois, C. L. Z., & Noe, A. W. (1991). Tokenism in performance evaluation: The effects of work group representation on male-female and white-black differences in performance ratings. *Journal of Applied Psychology, 76*, 263-267.

Women are judged more positively in work groups where they make up more than a third of the group.

Dovidio, J. F. & Gaertner, S. L. (2000). Aversive racism and selection decisions: 1989 and 1999. *Psychological Science, 11*, 315-319.

White students in 1999 reported less racial prejudice than did white students in 1989. Nevertheless, in both time periods, white students recommended blacks for a position as a peer counselor less often than they recommended whites when the targets had ambiguous qualifications. (When targets had clearly strong or clearly weak qualifications, white students recommended whites and blacks equally often.) Observers judged the qualifications of both races similarly, but gave whites the benefit of the doubt as far as recommending them for a position. Implications: good intentions are not enough; high-status targets are likely to be recommended over low-status targets when their qualifications are in the mid-range.

Norton, M. I., Vandello, J. A., & Darley, J. M. (2004). Casuistry and social category bias. *Journal of Personality and Social Psychology, 87*, 817-831. (Experiments 1 and 2).

People shift their standards in order to justify a choice that seems a priori reasonable to

them; gender schemas help determine what seems reasonable. Male undergraduates selected a candidate for a job that required both a strong engineering background and experience in the construction industry. The evaluators rated 5 people, only 2 of whose resumes were competitive. One candidate had more education; the other had more experience. In the control condition, where the candidates were identified only by initials, the evaluators chose the candidate with more education three-quarters of the time [76 %] and rated education as the most important determinant of their decision [48 %]. When a male name was given to the resume that had more education and a female name to the resume that had more experience, evaluators also chose the candidate with more education three-quarters of the time [75 %] and also rated education as very important [50 %]. When a female name was given to the resume with more education and a male name to the resume with more experience, less than half the evaluators picked the person with more education [43 %] and less than a quarter [22 %] said that education was the most important characteristic.

## Interventions to promote gender equity

### What administrators can do – implications of laboratory data

Valian, V. (1998). *Why so slow? The advancement of women*. Cambridge, MA: MIT Press, Chapter 14.

This chapter summarizes data showing when erroneous judgments are most likely (little time, divided attention, low accountability), what types of reasoning errors are exacerbated when social groups are involved (failure to appreciate covariation, blocking, illusory correlation), how to improve reasoning about others, and how to use the authority of leaders to legitimate other leaders. Women, more often than men, lack information about what is required for career advancement, take on routine responsibilities which will not help their advancement, and get less mentoring from senior faculty.

Valian, V. (various dates). *Benefits of insuring gender equity; Analyzing and correcting visible gender-equity problems; Analyzing and correcting hidden gender-equity problems; Individual action for gender equity; Gender, power, and influence*. Unpublished frequently-updated manuscripts, Hunter College – CUNY. Available at [www.hunter.cuny.edu/genderequity](http://www.hunter.cuny.edu/genderequity)

These documents summarize a) reasons to promote equity (e.g., gender equity is a window on institutional effectiveness), b) where problems – visible and hidden – are likely to occur and possible solutions for them, c) what individuals can do, and d) how gender is related to power.

Blair, I. V. & Banaji, M. R. (1996). Automatic and controlled processes in stereotype priming. *Journal of Personality and Social Psychology*, 70, 1142-1163.

People can learn to reduce their reliance on gender schemas, even if they cannot eliminate their gender bias entirely.

Moskowitz, G. B., Gollwitzer, P. M., Wasel, W., & Schaal, B. (1999). Preconscious control of stereotype activation through chronic egalitarian goals. *Journal of Personality and Social Psychology*, 77, 167-184.

People who are actively and strongly committed to egalitarian goals (being fair, tolerant, and open-minded) are less likely to be influenced by stereotypes. The article reviews other data showing that being aware of bias, being motivated to be unbiased, and having time and attention to devote to evaluations of others, reduces biased judgments even if a schema is activated.

Brown, V. & Geis, F. L. (1984). Turning lead into gold: Leadership by men and women and the alchemy of social consensus. *Journal of Personality and Social Psychology*, 46, 811-824.

Geis, F. L., Boston, M. B., & Hoffman, N. (1985). Sex of authority role models and achievement by men and women: Leadership performance and recognition.

*Journal of Personality and Social Psychology*, 49, 636-653.

Geis, F. L., Brown, V., & Wolfe, C. (1990). Legitimizing the leader: Endorsement by male versus female authority figures. *Journal of Applied Social Psychology*, 20, 943-970.

Leaders legitimize other leaders. Undergraduate evaluators watched a videotape in which five graduate students had a group discussion (Brown & Geis, 1984). On the tape, a faculty member introduced one of the students as the leader. In one version of the tape the faculty member vouched for the student's expertise, mentioning the student's theoretical knowledge and performance ability. In the other version the faculty member simply said the student would be the leader. The two videotapes were otherwise identical. After watching the video, the evaluators judged the student leader on a number of dimensions, including how much leadership the leader showed, how good the leader's contributions were, how desirable it would be to hire the leader, and how much salary the leader deserved. The leader scored higher on all those measures if the faculty member had vouched for the student's expertise. As usual, there was no difference in how male and female evaluators responded. The same effect occurred whether the student leader was male or female, and there was no difference in how positively male and female leaders were rated. The same effect occurred whether the faculty member was male or female. A credible authority figure can successfully legitimize others. Chief academic officers can create academic leaders of both sexes.

## What administrators can do – case studies and database analyses

Kalev, A., Dobbin, F., & Kelly, E. (2006). Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *American Sociological Review*, 71, 589-617.

EEO data from 1971-2002 on 708 businesses, along with survey data on employment practices, show that the percentage of managers who are white men has dropped from roughly 80% to 60%, the percentage who are white women has increased from roughly 17 % to 28 %, the percentage who are black men has increased from roughly 1 % to 3 %, and the percentage who are black women has increased from roughly 0 to 2%.

Although there are differences in effectiveness depending on the sector of the workplace and the identity of the group, "the most effective practices are those that establish organizational responsibility: affirmative action plans, diversity staff, and diversity task forces. Attempts to reduce social isolation among women and African Americans through networking and mentoring programs are less promising. Least effective are programs for taming managerial bias through education and feedback." The presence of a diversity task force or diversity staff, who have power, improves the representation of women and black men. Networking programs are effective for white women; mentoring programs are effective for black women. Diversity training of managers is ineffective for all groups. The use of evaluations for managers that include diversity as a criterion is effective for white women.

"Structures that embed accountability, authority, and expertise (affirmative action plans, diversity committees and taskforces, diversity managers and departments) are the most effective means of increasing the proportions of white women, black women, and black men in private sector management. The strategies designed to change individuals are less effective than the conventional management solution of setting goals and assigning responsibility for moving

toward these goals." Combinations of responsibility structures and other strategies are particularly effective.

Stewart, A. J., Malley, J. E., & LaVaque-Manty, D. (2007). Faculty recruitment: Mobilizing science and engineering faculty. In A. J. Stewart, J. E. Malley, & D. LaVaque-Manty (Eds.), *Transforming science and engineering: Advancing academic women* (pp. 133-151). Ann Arbor, MI: University of Michigan Press.

The STRIDE (Strategies and Tactics for Recruiting to Improve Diversity and Excellence) program at the University of Michigan is a team of natural scientists who studied the social science literature on gender schemas and developed a presentation based on observational data and key theoretical concepts. They showed the presentation to natural science hiring committees and other faculty, with sections tailored to particular disciplines, and wrote a 27-page handbook on recruitment. Hiring of women increased from 13 % in 2001 to 29 % in 2005.

Fried, L. P., Francomano, C. A., MacDonald, S. M., Wagner, E. M., Stokes, E. J., Carbone, K. M., Bias, W. B., Newman, M. M., & Stobo, J. D. (1996). Career development for women in academic medicine: Multiple interventions in a department of medicine. *Journal of the American Medical Association*, 276, 898-905.

The Johns Hopkins University Department of Medicine successfully developed a program to advance women from assistant professor to associate professor. But by 2002, the percentage was down to 20 (Hopkins Medical News, Spring/Summer 2002, <http://www.hopkinsmedicine.org/hmn/S02/top.html>). Without constant effort, gains fade.

Benz, E. J., Jr., Clayton, C. P., & Costa, S. T. (1998). Increasing academic internal medicine's investment in female faculty. *American Journal of Medicine*, 105, 459-463.

How medical schools can improve the status of female faculty. In 1990 there were only 4 female associate professors (8 %) in the Hopkins Department of Medicine; by 1995 there were 26 (roughly 40 %).

Schaller, M. & Crandall, C. S. (1999). Individual goals in evolving organizations. *American Psychologist*, 54, 778-788.

Organizations with a diverse group of people are more open to innovative ideas.

Hong, L. & Page, S. E. (2004). Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences*, 101, 16385-16389.

When given hard problems, smart problem solvers, and a large group of diverse problem solvers, a diverse group chosen randomly will outperform a group of the best problem solvers. "A random collection of intelligent agents outperforms the collection consisting of only the best

agents." This is a theoretical paper.

Polzer, J. T., Milton, L. P., & Swann, W. B. (2002). Capitalizing on diversity: Interpersonal congruence in small work groups. *Administrative Science Quarterly*, 47, 296-327.

Diverse groups yield better solutions if members' views of themselves are mirrored by others' views of them. Groups where individuals' differences are not valued suffer from their diversity.

Meyerson, D. E. & Fletcher, J. K. (Jan-Feb 2000). A modest manifesto for shattering the glass ceiling. *Harvard Business Review*, 127-136.

Small changes in procedures can have large long-term effects. Such changes can range from lengthening interviews (to insure that male interviewers are as effective with women candidates as they are with men) to ensuring equal access to important institutional committees and positions.

## Mentoring and a circle of advisors

Rabinowitz, V. C. & Valian, V. V. (2007). Beyond mentoring: A sponsorship program to improve women's success. In A. J. Stewart, J. E. Malley, & D. LaVaquer-Manty (Eds.), *Transforming science and engineering: Advancing academic women* (pp.96-115). Ann Arbor, MI: University of Michigan Press.

A sponsorship program for female faculty in the social and natural sciences includes the following components: financial support, up to \$10K/year; provision of a sponsor in the faculty member's discipline but not in their department, who is paid up to \$5K/year, and who provides constructive criticism on everything the faculty member writes, makes suggestions about what conferences to attend, and introduces the faculty member to people; monthly workshops covering every aspect of academic life; immediate access to information and advice from the Hunter College Gender Equity Project. The program stresses developing a circle of advisors rather than relying on a single mentor.

Kram, K. E. (1985). *Mentoring at work: Developmental relationships in organizational life*. Glenview, IL: Scott Foresman.

Mentors can directly help proteges' careers in 5 ways: sponsoring promotions; coaching for desired organizational behaviors; protecting against problems; providing challenges; and showcasing talents and abilities. Mentors can help proteges' personal goals in 4 ways: developing a sense of self as a professional; counseling; friendship; role modeling. Only limited tests for mentors' success in any of the 9 domains exist.

Ragins, B. R. & Cotton, J. L. (1999). Mentor functions and outcomes: A comparison of men and women in formal and informal mentoring relationships. *Journal of Applied Psychology*, 84, 529-550.

Compared to formal mentoring, informal mentoring is spontaneously initiated, lasts for 3-6 years, changes the amount, type, and purpose of contact over time, and may have more motivated and skilled mentors. A survey of 614 proteges in male-, female-, and non-biased occupations compared the effectiveness of formal and informal mentoring. Proteges in informal mentoring reported more career development functions than did those in formal mentoring relationships; they reported higher levels of compensation. Proteges (both male and female) of male mentors made more money than proteges of female mentors. Male proteges of male mentors made the most money; female proteges of female mentors made the least. (Male mentors probably have more organizational power and knowledge than female mentors.)

Formal proteges made the same amount of money and had the same number of promotions as individuals with no mentors; only informal proteges outearned and had more promotions than those with no mentors. Formal mentoring programs should mimic informal mentoring as much as possible. Caveat: the effectiveness of informal mentoring may be due to selection factors.

## What individual women can do for themselves

Valian, V. (1998). *Why so slow? The advancement of women*. Cambridge, MA: MIT Press. Chapter 14.

This chapter summarizes data on personal style and personal effectiveness, but warns that women can do everything "right" and still not advance because of structural problems within the institution. Suggestions: build power, use a "neutral" style in professional settings, become an expert, negotiate, bargain, seek promotion, seek challenging assignments, seek information.

Kanter, R. M. (1979). Differential access to opportunity and power. In R. Alvarez & K. G. Lutterman (Eds.), *Discrimination in organizations* (pp 52-68). San Francisco: Jossey-Bass.

A primer on how to achieve power in organizations. Kanter defines power as efficacy in shaping the goals and policies of an organization or group. Activities build power if they are a) out of the ordinary, pioneering, or not part of the job description; b) visible to others in the group; and c) relevant to current organizational problems. People who want to advance should shun routine, invisible jobs. Administrators should equalize the presence of men and women in such jobs.

Ragins, B. R. & Sundstrom, E. (1989). Gender and power in organizations: A longitudinal perspective. *Psychological Bulletin*, 105, 51-88.

Women are less likely than men to obtain or receive information about promotion possibilities, job openings, and other opportunities for advancement.

Ridgeway, C. L. (1982). Status in groups: The importance of motivation. *American Sociological Review*, 47, 76-88.

To be accepted as a leader, both men and women must demonstrate their competence to

the group, but women in addition must demonstrate that they are not trying to acquire status at the expense of other members of the group. Women must subordinate, and be seen to subordinate, their personal needs to the needs of the group. Attempts at self-aggrandizement by women are particularly negatively perceived. Implications: women should be impersonal, friendly, and respectful.

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

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

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*, 365-371.

Gender schemas are mentally invoked both by observers and by women themselves when women are in a male domain, such as mathematics, and their status as women is highlighted. Women with high aspirations are subject to stereotype threat in such circumstances, resulting in a decrement in performance. Women placed in a group with two other people performed worst on a math test if the other two people were male, next worst if one of the other two was male, and best if none were male. Males were unaffected by the sex composition of the group.

## Negotiation

Stuhlmacher, A. F. & Walters, A. E. (1999). Gender differences in negotiation outcome: A meta-analysis. *Personnel Psychology, 52*, 653-677.

Walters, A. E., Stuhlmacher, A. F., & Meyer, I. I. (1998). Gender and negotiator competitiveness: A meta-analysis. *Organizational Behavior and Human Decision Processes, 76*, 1-29.

Kary, L. J., Thompson, L., & Galinsky, A. (2001). Battle of the sexes: Gender stereotype confirmation and reactance in negotiations. *Journal of Personality and Social Psychology, 80*, 942-958.

Men are more competitive and more successful than women in negotiations. One determinant of negotiation success is the 'opening bid'; men tend to make more extreme opening bids than women. In a laboratory simulation of mixed-sex purchase negotiations, ambitious women did worse when their gender stereotypes were implicitly activated and better when they were explicitly activated (leading to reactance).

Babcock, L. & Laschever, S. (2003). *Women don't ask: Negotiation and the gender divide*. Princeton, NJ: Princeton University Press.

One reason women do not do as well as men is that women attempt to negotiate in fewer areas than men do. Another reason is that organizations are more likely to respond well to men's attempts to negotiate than to women's, especially if women use a "masculine" negotiating style.

Bowles, H. R., Babcock, L., & Lai, L. (2007). Social incentives for gender differences in the propensity to initiate negotiations: Sometimes it does hurt to ask. *Organizational Behavior and Human Decision Processes*, 103, 84–103.

Both males and females have a tendency to view people who negotiate for a higher salary more negatively than they perceive people who do not negotiate, but people see women who negotiate much more negatively than they see men who negotiate. In Experiment 1, participants read a fictitious resumé and fictitious interview notes for someone supposedly interviewing for a job as an intern. In one condition, the interview notes indicated that the applicant had asked about a higher salary and about other benefits. Participants were asked to imagine that they were a bank manager and to make a judgment about how hireable a candidate was. Names were gender-neutral; only the interview notes referred to the candidate's sex. The sexes were seen as equally hireable when neither asked for more money, but women's hireability score plummeted (from 6.19 to 4.63 on a scale from 1-7) and men's significantly decreased but less (from 5.94 to 5.26) when the interview notes indicated they had asked for more salary. In a variant, there were no negative effects when men asked but there were negative reactions when women asked. In all variants there were no differences between male and female evaluators' dislike of women who asked for more money, but in one variant, men and women differed in how they treated men, with only women seeing men who asked for money negatively.

Rose, S., & Danner, M. J. E. (1998). Money matters: The art of negotiation for women faculty. In L. H. Collins, J. C. Chrisler, & K. Quina (Eds.), *Career strategies for women in academe: Arming Athena* (pp. 157-186). Thousand Oaks, CA: Sage.

Tips on what to negotiate for and how to negotiate. Examples of what new hires can negotiate about: base salary; moving expenses; rank; office size and location; start-up money; research space; assistants; summer supplements for teaching or research; equipment; conference or research travel expenses; reduced teaching load; lower number of preparations; teaching schedule. Examples of what more advanced faculty can negotiate for: salary increase; promotion to full professor or appointment to named chair; funding for start up of new research; funds to build a program, including faculty lines; funding or fellowships for graduate students; funding for colloquium series; increased space; resources for journal editing; new building or renovations of current space.

Examples of tips: set goals; conduct the negotiation in person, if possible; let other party name first salary figure; remember that almost everything is negotiable, regardless of the "rule"; be self-confident; use persuasive arguments (for women, it is especially important to avoid appearing self-aggrandizing); approach negotiation as a win-win event; be prepared to trade off.