Advancing Women: Annotated Bibliography

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Data on women and men in academia

For a review of current data, see Tutorial 1 - The Data on Sex Disparities in Rank and Salary from Valian's Tutorials for Change: Gender Schemas and Science Careers. This web-based tutorial can be found at: www.hunter.cuny.edu/gendertutorial

Also see Sex disparities in advancement and income (Valian, 2003), available at www.hunter.cuny.edu/genderequity

Also see online data at nsf.gov


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.


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

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.


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.

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.

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

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


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


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 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


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.


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.


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.


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


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


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


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.


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.


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.


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.


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.


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.


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.


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.


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.


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

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.


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 education, 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**


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

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.


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


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.


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.

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.


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 outperformed 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 administrators can do - case studies


The Johns Hopkins University Department of Medicine successfully developed a program to advance women from assistant professor to associate professor.


How medical schools can improve the status of female faculty.


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

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.

**What individual women can do**


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.


A manual on how to achieve power in organizations. She 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.


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


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.


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.


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).


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.

For other readings on negotiation, see http://www.hunter.cuny.edu/genderequity/seminars/f03_seminar_Dec03.htm