

What works and what doesn't: How to increase the representation of women in academia and business

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To improve the numbers of women at every level of business and academia, we first need a good analysis of where the relative absence of women is most acute. This paper focuses on the United States, where there has been progress: men and women make roughly equal starting salaries in academia and business. This progress is not complete, however, since there continues to be evidence that women do not get the same returns on their qualifications as men do even for entry level positions in business and industry, for reasons that may be external to qualifications (for examples from a range of fields with a range of findings, see Black/Haviland/Sanders/Taylor 2008; Keaveny/Inderrieden/Toumanoff 2007; Orazem/Werbel/McElroy 2003; Weinberger 1998, 1999). And a persistent problem remains: advancement is slower for women than for men (Committee on Gender Differences in the Careers of Science, Engineering, and Mathematics Faculty, 2009; Long, 2001). Women are promoted more slowly than men. Women earn progressively less than men as careers continue, even when factors that might differentiate men and women are accounted for. Women are underpaid and underpromoted across the professions generally, including academia. The generality of the problem shows the necessity for a general, social-cognitive explanation.

Before I present that explanation, I would like to present examples of the sort of data that need explanation. In both everyday life and in laboratory settings, women get less credit for their achievements than men do for similar achievements. One example from 1995 is from Sweden. Women were 46% of the applicants for Swedish Medical Research Council postdoctoral fellowships, but they were only 20% of the recipients (Wennerås/Wold 1997). An analysis of the judgments made by the senior scientists on the panels showed that women received lower “scientific competence” scores than men did. The ratings of scientific competence largely determined, as one would expect, who received a fellowship. To determine what contributed to scientific competence, the investigators tried out several models. One model that worked well used a combination of the scientist's productivity and the prestige of the journals in which they had published. Wennerås and Wold correlated those “impact points” with the scien-

tific competence ratings. The model predicted scientific competence scores well for the young male applicants. But women had to receive 100 or more impact points in order to get the same rating from the judges than a man with 40 or fewer impact points got.

One encouraging result of this study was the apparent elimination of gender bias in determining who receives funding from the Medicine subdivision of the Swedish Medical Research Council (though an unfair boost for a connection to a committee member remained strong, Sandström/Hällsten 2008). Such results suggest that convincing evidence of an unwarranted gender gap results in more equitable judgments. The first suggestion we can offer, then, is to provide people with data that will persuade them that the system is not completely meritocratic, even though they intend for it to be. Web-based tutorials I have developed can be used for teaching purposes (see www.hunter.cuny.edu/gendertutorial).

Women in academic science in the United States fare worse than their male peers in achieving the rank of full professor, the highest standard rank. (There are also distinguished professorships and named chairs that generally indicate performance above the ordinary for full or associate professors.) In 2006, for full-time scientists less than 10 yrs post-PhD, about 3.3% of men were full professors, compared to 1.6% of women. Although the difference is small, there is already an indication that men will fare better than women. Between 10-19 yrs post-PhD, 41% of full-time men were full professors, compared to 26% of full-time women. And between 20-29 years post-PhD, 71% of men and 55% of women were full professors. Thirty or more years post-degree, 81% of men and 75% of women are full professors. Women never fully catch up among scientists as a whole. (Data are from NSF Table H-22, S&E doctorate holders employed in universities and 4-year colleges, by broad occupation, sex, years since doctorate, and faculty rank: 2006.)

In some subfields, such as biology and the life sciences, the disparities are smaller. Earlier than 10 years post-PhD, about 1% of men and less than 1% of women are full professors. But between 10-19 years out post-PhD, 31% of men and 23% of women are full professors. At 20-29 years post-degree, 73% of men and 55% of women are full professors. Thirty or more years post-degree, 79% of men and 78% of women in the biological and life sciences are full professors. (Data are from NSF Table H-22, S&E doctorate holders employed in universities and 4-year colleges, by broad occupation, sex, years since doctorate, and faculty rank: 2006.) Within biology, then, women do catch up to men in achieving full professor rank – 30 years post-PhD. That may or may not be considered heartening.

What is responsible for such gender disparities? Instead of flawed evaluations on the part of people who are doing the hiring and promoting, people some-

times propose two other explanations of women's lower rates of achievement. One popular explanation for the small number of women in the natural sciences, math, and engineering, for example, is that there are not enough women in the pipeline. It is true that there are not. But it is also true that the pipeline selectively leaks women and that the women who remain are not appropriately compensated and rewarded. Data from the National Science Foundation also show, for science fields, greater attrition of women than men from the bachelor's to the master's to the PhD level (Valian, 2008a). Finally, in fields where there are many women in the pipeline, such as psychology doctorates, lawyers, and physicians, women still do not reap the same rewards as men. Thus, the pipeline is only one part of the problem.

Another popular explanation is that the lack of child care facilities makes it too difficult for women – the presumed only caregivers – to have enough time for research. Child care facilities *are* lacking and, overall, working fathers do not perform an equal share of child care. But women with children do not publish less than women without children, once suitable controls are introduced (e.g., Sax/Hagedorn/Arredondo/Dicrisi 2002), although women with young children may publish less (Stack 2004) – so child care cannot be the sole explanation. In addition, women without children do not succeed at the same rate as men – so women's extra responsibilities with children cannot be the sole explanation for women's earning less money and being tenured and promoted less quickly. We need good child care facilities and we need to make parenting an equal-opportunity activity, but child care is only one part of the problem.

My explanation relies on two key concepts, gender schemas and the accumulation of advantage, to explain how inaccurate evaluations come into being, their effects in many small aspects of everyday professional life, and their long-term consequences. The cognitive representations responsible for our evaluations of men and women are gender schemas. Schemas are hypotheses that we use to interpret social events (Fiske/Taylor 1991). Schemas are similar to stereotypes but the term “schema” is more inclusive and more neutral, and a more appropriate term because it brings out the proto-scientific nature of our social hypotheses. We need schemas to make sense of our world: they help us have the right expectations of others, predict others' behavior, and orient our own behavior. Schemas are often nonconscious.

Gender schemas are hypotheses about what it means to be male or female, hypotheses that we all share, male and female alike. Schemas assign different psychological traits to males and females (Martin/Halverson 1987; Spence/Helmreich 1978). We think of males as capable of independent action, as oriented to the task at hand, and as doing things for a reason. We think of females as nurturant, expressive, and behaving communally. In brief: men act; women

feel and express their feelings. Further, our beliefs have support. In questionnaires, men endorse more “instrumental” characteristics and women endorse more “expressive” characteristics (Spence/Helmreich, 1978).

If we consider our schema of a competent professional, we can see that the schema for men meshes much better with the schema for professional jobs than does the schema for women. Are competent professionals capable of independent action, oriented to the task at hand, and doing things for a reason? Certainly. Are they nurturant and communal? Perhaps. But the qualities that we connect with women are not the core of the qualities we connect with competent scientists and businesspeople.

Statistical data can only take us so far in demonstrating gender disparities. With statistical data we can never control all the variables that might differentiate men and women. Statistical data leave open the possibility that men's and women's performance is different in a way that accounts for the difference in their achievement. Laboratory data allow control of all relevant variables so that the role of sex can be confidently assessed.

Laboratory data demonstrate that men and women – to the same degree – overvalue men and undervalue women in professional settings. Here is one example, by Heilman and her colleagues (Heilman/Wallen/Fuchs/Tamkins 2004). They investigated how males and females rated people who were 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 was described as about to have a performance review; thus, in this condition, evaluators didn't know how well the person was doing in the job. In the other half of the cases, the person was described as having been a stellar performer. The evaluators' job was to rate how competent the employees were and how likeable they were.

When evaluators had no information about how well people were doing in the job, they rated the man as more competent (7.11/9) than the woman (5.51/9), and rated them as equally likeable (6.79, 6.94). When the background information made clear that the individuals were extremely competent, evaluators rated the man and the woman as equally competent (8.21, 8.03), but they rated the woman as much less likeable (5.81) than the man (7.13). They also perceived the woman as considerably more hostile (3.99/9; here a low score indicates more hostile) than the man (5.29).

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. Notably, as is the case in almost all such experiments, there were no differences between male and female subjects.

Both males and females see competence as the norm for men and as something that has to be demonstrated unequivocally for women. Both males and females see competent men as likeable. Neither males nor females see competent women in male-dominated positions as likeable.

And likeability matters: in a follow-up experiment, the experimenters described targets as high or low in competence and high or low in likeability. People rated the targets who were high in likeability as better candidates for being placed on a fast track and as better candidates for a highly prestigious upper-level position. We cannot tell women just to be competent, because likeability can make the difference in whether or not people get rewards. Again, there are no male-female rater differences.

Another example (Norton/Vandello/Darley 2004) demonstrates that people shift their standards in order to justify a choice that seems a priori reasonable to them. In this experiment, gender schemas determine what seemed reasonable. The experiments asked male undergraduates to select 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 resumé were competitive. One candidate had more education – both an engineering degree and certification from a concrete masonry association – than the other, who only had an engineering degree. The other candidate had more experience – 9 years – than the other, who only had 5 years.

In the control condition, the candidates were identified only by initials. Here, the evaluators chose the candidate with more education three-quarters of the time and education was the reason most often cited as important for their decision. In one of the experimental conditions, a male name was given to the resumé that had more education and a female name to the resumé that had more experience. Here, too, evaluators chose the candidate with more education three-quarters of the time and also rated education as very important. In the second experimental condition, a female name was given to the resumé with more education and a male name to the resumé with more experience. Now, less than half the evaluators picked the person with more education and few people cited education as the most important characteristic.

Men look more appropriate than women for the job of construction engineer, whether they have more education *or* more experience. The standards by which we judge people shift depending on our a priori judgments about their goodness of fit. Gender schemas help determine goodness of fit. When candidates are being evaluated for hiring or promotion, shifting standards can easily come into play. If a man has grant funding but few publications, he can be seen as the better candidate than a woman with no grant funding and publications, because those in favor of hiring him can point to the likelihood that his grant

funding will eventually result in publications. If the situation is reversed, and the man has more publications but less grant funding, those in favor of hiring him can say that he will eventually achieve grant funding because his papers are being published.

A third study addresses the question of a trade-off for women between competence and femininity (Phelan/Moss-Racusin/Rudman 2008). Observers heard fictitious interviews for a computer lab manager job; the interviews were conducted by actors who used exactly the same scripts. The observers were told that the job required strong technical skills as well as social skills because of the need to help students and faculty. In one condition, the interviewees adopted an assertive style emphasizing their competence; in the other they adopted a style that emphasized how communal they were. Observers rated the interviewees on their competence, their social skills, and how hireable they were.

To determine the relative weights of competence and social skills for hireability, the researchers conducted a regression analysis. That analysis showed that evaluators generally gave more weight to competence than social skills. The notable exception was women who were assertive. In that case observers gave more weight to social skills. Since assertive women were seen as not having social skills, they were also seen as less hireable than assertive men. There was no difference in judgments on the part of female *vs* male observers.

Women are thus in a difficult position. If they are not perceived as competent they will not get the job. But if they make their competence clear by behaving assertively, they will be seen as lacking social skills and will be downgraded for that reason. One solution for women is to combine agency with warm, communal behavior (Eagly/Carli 2003; Heilman/Okimoto 2007).

Even when they achieve leadership positions, women are less likely to be seen as leaders than men are. In the head-of-the-table experiment, college students saw pictures displaying 5 people seated around a table. The group was described as working together on a project. Two people sat at each side and one person sat at the head of the table. Sometimes all the people were male, sometimes they were all female, and sometimes the group included both males and females (Porter/Geis 1981). The students were asked to identify the leader of the group. In same-sex groups, the man or woman sitting at the head of the table was always identified as the leader. In mixed-sex groups, a man at the head of the table was always identified as the leader. But if a woman was at the head, she was not reliably labeled as the leader; a man seated elsewhere at the table was labeled as the leader about equally often.

There were no differences between male and female observers. Both made the same judgments. There was no intention to discriminate. Nevertheless, the female leader who is sitting at the head of a table loses out compared to the male

leader. The symbolic position of leadership carries less symbolic weight for a woman than a man. Women are less likely to obtain the automatic deference that marks of leadership confer for men. Women are objectively hurt in situations of that sort, even if observers intend no hurt. A woman has to work harder to demonstrate that her apparent position of leadership is a real position of leadership.

One might be tempted to dismiss concern about such imbalances as making a mountain out of a molehill. For example, women comment informally that in a meeting they might make a suggestion that is ignored, only to hear a male colleague make the same suggestion ten minutes later and be acclaimed for his good idea. A woman who comments on that might be told that it is not important and that she is being oversensitive.

But mountains *are* molehills, piled on top of one another over time. Small imbalances add up to disadvantage women. Success is largely the accumulation of advantage, exploiting small gains to get bigger ones (Merton 1968). A computer simulation (Martell/Lane/Emrich 1996) shows the importance of very small amounts of bias. The researchers simulated an 8-level hierarchical institution, with a pyramidal structure. They staffed this hypothetical institution with equal numbers of men and women. The model assumed a tiny bias in favor of promoting men, a bias accounting for only 1 % of the variability in promotion. After many iterations of promotions, the top level was 65% male. Even very small amounts of disadvantage accumulate.

Evaluations come into play at every point in a person's career. Some of the examples are small ones that happen on a frequent basis. Others are large ones that occur at the time of hire or promotion. People who are not consistently recognized as having good ideas and doing good work are people who are unlikely to be hired or promoted.

What is responsible for women's lack of progress in the professions and in academia is the gender schemas through which we all – male and female alike – perceive and evaluate women. The small but systematic undervaluation of women culminates in women's smaller salaries compared to men, and slower rates of promotion.

We would like to think that our genuinely held egalitarian and meritocratic beliefs and ideals would buffer us from the effects of gender schemas (Lerner 1975). But our evaluations and reactions occur unintentionally and outside awareness. Indeed, our belief in our own good will can make it difficult for us to see what we are doing. That does not mean that we cannot institute remedies. We can, but we need to understand that good intentions are not enough. We need to understand how gender schemas work and the importance of the small daily inequities in our treatment of our colleagues.

What, then, is to be done? The schema analysis has implications for remedies. Schemas resist change and their effects are ubiquitous. No single solution

will do. People will persistently make errors in evaluating others (and themselves), and need good procedures and policies that will buffer them from errors.

Helping people understand the basis for their errors of judgment is an important start. On the education front, everybody has to understand how gender schemas work, their persistence and ubiquity, and the limitations they set on our ability to judge others accurately. Everyone needs to know the data and know the theory, and to communicate the data and communicate the theory. Hiring and promotion committees particularly need to know where errors are likely to occur in their evaluations. No one is at fault, but everyone is responsible for improving the accuracy and fairness of evaluations.

The next step is to demonstrate that institutions can benefit from increasing diversity. For example, mixed sex groups appear to have more patent citations than single-sex groups (Ashcraft/Breitzman 2007). Diversity leads to more innovative solutions, under optimal conditions (Page 2007; Polzer/Milton/Swann 2002). Those optimal conditions include congruity between what a person thinks she has to offer a group and how that group sees her. If people do not feel valued and free to speak up, the value of diversity vanishes and, worse, strife and conflict occur.

The third step is to develop multiple remedies. There is no single remedy because the problem is multi-faceted. For a multi-faceted problem we need multiple remedies, carried out by multiple people, multiple times, in multiple places. We need remedies that people can carry out immediately as well as longer-term remedies.

An example of a remedy that people can carry out immediately is to look at lists of colloquium speakers or conference speakers. If the list does not have the same proportion of women as there are women in the field that is a reason to search harder for qualified women. We know that young women are negatively affected by viewing professional settings in which men are overrepresented and are discouraged from further participation (Murphy/Steele/Gross 2007).

A remedy that requires more effort is data collection, data analysis, and data publication – a set of benchmarks. For example: what percentage of new hires are women?, how long do women and men stay in a given rank?, how many women are present on powerful committees?, how are teaching responsibilities distributed by sex?, what differences are there in salary? Many of the US institutions that have received ADVANCE Institutional Transformation Awards from the National Science Foundation have developed methods for collecting and analyzing data. Those methods are on the institutions' websites. (See, for example, www.hunter.cuny.edu/genderequity.) Since inequity is likely to reappear because gender schemas are continually in action, it is necessary to check the benchmarks annually.

A roadmap of activities would contain the following suggestions, among others (Valian, 2008b):

- Develop policies for recruitment to minimize errors of evaluation and create a balanced short list
- Develop policies such as those developed by Georgia Tech for retention and promotion that ensure all members receive equal resources
- Provide individuals with information about how to be successful, such as the sponsorship program developed at Hunter College (Rabinowitz/Valian, 2007)
- Ensure institutional recognition of achievements
- Ensure accountability: chairs, deans, provost – everyone must be accountable
- Ensure visible, verbal, financial, and practical commitment on the part of leaders; leaders must say why diversity is important and demonstrate that it is a priority
- Create a diversity team or task force; in academia, the team should be composed of faculty who are respected and credible in their fields
- Develop policies to help dual-career couples
- Create child-care facilities or resources
- Ensure positions of power for women as well as men

A study by the RAND Corporation examined 8 companies taken from *Fortune's* 2003 list of the 50 best companies for minorities and compared them with 6 companies taken from the 2003 list of the 100 best companies to work for (Marquis/Lim/Scott/Harrell/Kavanagh 2008). The best diversity firms cited competitive advantage, consumer service, and improved work environment as motivations for diversity. In contrast, of the 6 best firms to work for, only half cited two or more reasons for diversity.

The firms also differed in their leadership practices. Seven of the 8 high-diversity firms used all of the best practices that the diversity literature suggests (leadership involvement, formal commitment, formal objectives or plan, organizational structure, communication), but only one of the best places to work for did. Three of the 6 best firms to work for pursued none of the practices.

Similarly, the diversity firms had a range of diversity initiatives, ranging from recruitment to development of social networks and awareness (recruiting, promotion, retention; professional development for minorities; workforce education; supplier and franchise diversity; educational and community outreach; social networks and awareness). The firms that were good to work for had many fewer initiatives.

Accountability for diversity was also greater in diverse firms than in firms that were good to work for.

In sum, then, what characterizes diverse firms is exactly what the diversity literature tells us should work: articulating why diversity is important (making the business case), having committed leaders, pursuing many initiatives, and maintaining accountability.

A large study of 829 companies over a 31-year period had somewhat similar results (Dobbin/Kalev/Kelly 2007). The companies had 100 or more employees. The two features that most helped increase the number of women and underrepresented minorities in management positions were having a diversity taskforce composed of individuals from different sections of the company and having a diversity manager. Mentoring programs were effective for most groups (but not white women). Network programs were not effective (except for white women), and diversity training was also not effective (except for Hispanic women). From this study, the main message is that teams that are in charge of ensuring diversity do work. Diversity training may be ineffective in companies because it happens infrequently and may not concentrate on providing useful data.

To sum up, it is possible, both in academia and in business, to motivate attention to diversity and to implement successful programs for change. Success comes not from a single bold stroke but from effort that involves many people at many levels across the institution, all of them with an eye on how to improve the representation of women and minorities and with an understanding of why there is a problem in the first place.

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