

E-MAIL CONTRIBUTIONS

Cognitive differences between men and women may be important**DAVID DEMING**

With regard to the "debate" regarding women in science, I have the following observations.

(1) In order for there to be a debate, there has to be a conflict of some type. All of the postings I have read here are in virtual agreement. The typical post doesn't "debate" anything. It simply extolls the virtue of one or another government or institutional program which advances women's career's by discriminating against their male colleagues.

(2) Are the proponents of "gender equity" really interested in gender equity, or are they interested in advancing their own interests? Any inequality which may accrue to the advantage of men tends to be viewed as a profound sociological problem, while those inequalities which work against men are ignored.

Many people seem to be experiencing considerable angst over the dominance by men of the engineering and physical sciences. However, no one seems the least bit bothered by the fact that women dominate the nursing profession. If gender equity is really desirable in the scientific professions, why not in other areas as well? Approximately 94 per cent of all prisoners in the United States are male. Should we increase parole opportunities for male prisoners and pursue the prosecution of females more vigorously?

(3) The funny thing about many scientists is that when they discuss women in science, they seem to forget about science itself. It always seems to be implicit that gender inequities which work against women are the result of some vague, pervasive societal bias. However, we know from the philosophy of science that truth is best found within a framework of multiple working hypotheses. Below, I present two alternative hypotheses which could explain why fewer women choose careers in the physical sciences, and why those who do choose such careers do not achieve at the same levels as their male colleagues.

Cognitive difference between men and women

There are cognitive differences between men and women, and these differences may be important to achievement in science. On average, females have better verbal abilities than males. Males, however, tend to be superior in visual-spatial skills and mathematics. Contrary to popular opinion, there is virtual unanimity in the psychological sciences that these differences exist^{1,4}.

Differences in mathematical ability become greatly pronounced at the upper end of the scale. Among seventh- and eighth-grade youth identified as mathematically talented, the male to female ratio on the mathematical section of the SAT test was 2:1 for scores in the range 500-600, but increased to 17:1 for scores greater than 700⁵.

A more difficult question is to what degree these differences are due to intrinsic biological factors, and to what degree they are due to environmental influences that could reflect endemic biases. A recent authoritative review by Halpern⁴ stated that "Our current knowledge of biological-cognitive influences remains sketchy and largely incomplete." In other words, it is entirely plausible that a substantial portion of sex-based cognitive differences may be biological in origin. In 1995, Shaywitz *et al.*⁶ found "clear evidence for a sex difference in the functional organization of the brain for language." Spatial aptitudes are closely linked with mathematical ability, and the evidence for a biological

influence on sex differences in spatial ability is greater than for any other area. For example, male rats do better in mazes than do females¹. I concede it is possible that the female rats performed poorly because they were distressed by the lack of proper role models, but somehow this seems implausible.

Time taken out

Women may tend to have lower achievement levels because of time taken out of their professional careers to devote to child-rearing. Many female scientists are married, and many have children. When presented with the decision of who shall stay home with their children, most married couples choose the female member of the husband-wife team. Like other professions, science and engineering are very competitive. It follows that professionals who lose several years from their careers in full-time child-rearing may be seriously handicapped in their ability to achieve professional status on a par with those who devote full time to their work without interruption. Halpern⁴ concluded that "family life commitments can explain sex differences in demanding occupations that require years of preparation such as physicist, mathematician, and engineer." Sommers⁷ referred to this phenomenon as "the experience gap," and noted that "many women choose to move into and out of the work force during childbearing and child-rearing years."

There is empirical evidence that supports the above hypothesis. A study of attorneys 15 years after graduation found that fewer than 1/5 of women who took extensive time off from their professional duties for child-rearing had achieved partner status in their law firm, while 4/5 of those who took little or no time off had made partner⁸.

(4) Equality in opportunities is desirable, but it does not always lead to equality in outcomes.

In previous generations, women were discouraged and actively prevented from choosing careers in the physical sciences. This is no longer true. However, the removal of discriminatory barriers has not resulted in equal numbers of women choosing and prospering in careers in the physical sciences. This seems to bother some people. They fail to understand or accept that when people with different abilities and inclinations make decisions in a free society, inequalities result.

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