

# Letter

## Child Study Center



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### Editors' Comment

*We're seeing a significant shift in gender differences in academic achievement, a change which will enable us to plan our educational system in new ways. The disparities in scores between males and females apparent only fifteen years ago are now not discernible in many areas. Although gaps still exist in certain higher levels of math and science, the percentage of girls and women taking these courses and entering these fields is steadily increasing.*

*A view that there may be "innate differences" between men and women that account for the fact that women do not excel as men do in math and science has been challenged, and university presidents have reiterated their commitment to the advancement of women in science. Although brain researchers have uncovered some subtle differences in male and female brains, it is not clear how these differences affect aptitude. New brain-imaging techniques may shed new light on the complex interaction of biology and environment.*

*In this issue of the NYU Child Study Center Letter we present the results of recent government testing, discuss the implications for both males and females, and specify the areas in which equity has not yet been attained. In the computer sciences, for example, women are underrepresented among the problem-solvers and creators of information technology, a gap not only detrimental for women but also for a society increasingly affected and dependent on technology. The goal of our education efforts should be to encourage the broadest possible participation in all areas of study and endeavor.*

ASG/HSK

## The Gender Gap in Education An Update

### Introduction

*"It's assumed that every girl will take math and science" said Jessica Friedland, a 17-year-old senior at the Marlboro School in Los Angeles, who participates in a class in mastering the mathematics of chemical equations, otherwise known as stoichiometry," as reported in the New York Times, April 27, 2005.*

The gender gap between boys and girls in education has been shifting over the past fifteen years. In 1992, a report issued by the American Association of University Women stated "Girls and boys enter school roughly equal. Twelve years later, girls have fallen behind their male classmates in key areas." At that time girls showed a steep drop in their interest and their grades in math and science as they moved from elementary to high school and college. Current surveys, however, show that girls and women have made substantial educational gains in many areas.

### A new comparison Boys and girls from kindergarten through graduate school

Both the recent gains made by females and the areas where gaps still exist have been documented in a study conducted by the U. S.

Department of Education. In elementary, secondary school and in college, females are now doing as well as or better than males in many indicators of achievement and educational attainment. The study also reports that the large gaps that once existed between males and females have been eliminated in some cases and have significantly decreased in other cases. For example, females scored better than males in reading and writing at the fourth, eighth and twelfth grades. In math, according to the report, the gender gap has been small and has fluctuated very little.

Other results showed additional gains for females. They are less likely than boys to repeat a grade and to drop out of high school, they are more likely to enroll in college immediately following graduation from high school, and a majority of undergraduate college students are female.

At the college level female students were more likely than male students to graduate within 6 years (66% vs 50%). At the graduate level, females made even larger gains. The majority of first-professional students are still men, but women have made dramatic and consistent gains.

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## Taking a closer look

The gender gap in some fields of study, although closing, still exists. In computer science, engineering, the physical sciences, as well as in doctoral and professional degree programs males predominate. The study reports that there are some gender differences favoring male students in mathematics and science, and stresses the importance of this trend. Proficiency in science and mathematics has become particularly important, as jobs in our technological society increasingly require workers to use complex mathematics skills and scientific knowledge to solve problems. Overall, the gender gap in mathematics and science *course-taking* appears to be shrinking. However, the subject matter of the courses is still skewed. Women high school graduates in 2000 were more likely than their male peers to have taken advanced algebra and biology and chemistry, while males, by contrast, were more likely than females to take physics.

### The technology gender gap

Computers play a prominent role in our economy and in our culture, and the job market for people with expertise in computer technology is growing rapidly. Reflecting this rapid spread of technology, the percentages of students in elementary and secondary school using computers at school has been increasing. Females are just as likely as males to use computers at home and at school, both in general and for schoolwork. However, through high school, girls are more likely than boys to use home computers for e-mail, word processing and completing school assignments. But only 15-20% of computer science majors at leading colleges are female. Boys leave high school with greater interest

in and specialized knowledge of computers (for example, males accounted for 86 % of students who took advanced examinations in computer science in 2002, and males had higher average scores on the examination than females.)

A closer look shows that males and females perform different computer jobs. Girls and women use the computer for word processing, the internet for communication and the web for information retrieval; it's the men who are doing the creative and the higher paid work. Men are *programming* the computers, *designing and fixing* the systems and *inventing* the technology that will have widespread effects on our lives.

### College and graduate degrees

Degrees in certain fields of study continue to be disproportionately awarded. Historically, females have tended to account for the majority of bachelor's degrees in fields that often lead to lower paying occupations, such as education and health professions, while males have typically predominated in higher paying fields, such as computer science and engineering. While some of these disparities persist, many changes have taken place. Certain fields in which men received the majority of degrees in 1970, such as social sciences, history, psychology, biological sciences and business management and administrative services, attained relative gender parity or were disproportionately female by 2001. Other fields, such as computer and information sciences, physical sciences and science technologies and engineering continue to have a larger proportion of males, but the *percentages* of females majoring in these areas have risen. The

percentages of advanced degrees still tend to follow traditional patterns with women accounting for the majority of master's and doctor's degree recipients in education and health, and men accounting for the majority of recipients in computer and information sciences and engineering. From 1970 to 2000 the percentages of women in college rose, in graduate school and in professional schools. The following table illustrates women's progress in attaining advanced degrees in certain professions:

	<u>Women students</u>	
	<u>1970</u>	<u>2001</u>
Law	5%	47%
Medicine	8%	43%
Dentistry	1%	39%
Engineering	1%	3%

### Sports participation

Gender differences in participation rates in collegiate sports have also narrowed. Males still outnumber females in collegiate sports participation, but the gap is closing. Between 1981 and 2001 the number of females participating in Division I sports increased 150%, compared with 15% for males.

## The Job Market

A discussion of equity in education must consider the benefits for males and females at the end of schooling. The higher the level of educational attainment the higher the likelihood of employment and of higher

earnings. The employment rates for females have increased across all levels of educational attainment. The gap between male and female employment rates has narrowed, but still exists.

This gap is also reflected at the college professorial level which shows a significant gap among male and female tenured science professors. Although 52% of the current student body in college are women, only

- 16% of college and university presidents are women
- 13% of chief business officers are women
- 25% chief academic officers are women

Although females are getting better grades and more females are earning higher degrees, the gender gap in women's employment choices and in wages continues.

## Summary

Society has made significant progress in reducing some of the barriers confronting girls and women who choose traditionally male academic courses or jobs. Gaps have narrowed but still exist in areas such as computer technology and physics. There is further work to be done to insure that the academic gains made in elementary, middle and high school are maintained through the college and graduate years. Progress has come about as teachers, parents and all those concerned with education are working together to implement policies and programs that benefit

both girls and boys. Although problems exist in our schools, it is no longer helpful to think of them as concerning only boys or only girls. Boys and girls are not in competition for a good education; each child should be encouraged to pursue and to develop his or her own academic interests and abilities.

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