

# **Sex and Mathematics**

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# The Summers Controversy



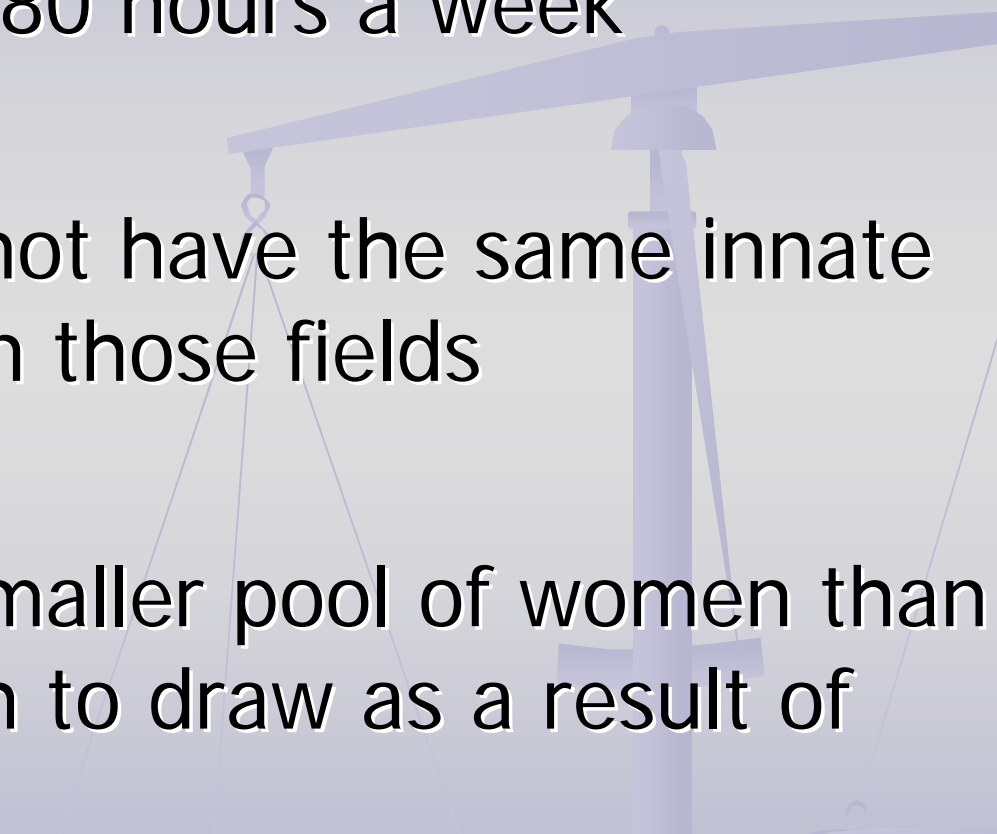
Remarks at NBER Conference on Diversifying the  
Science and Engineering Workforce

14 January 2005

Lawrence H. Summers, president of Harvard

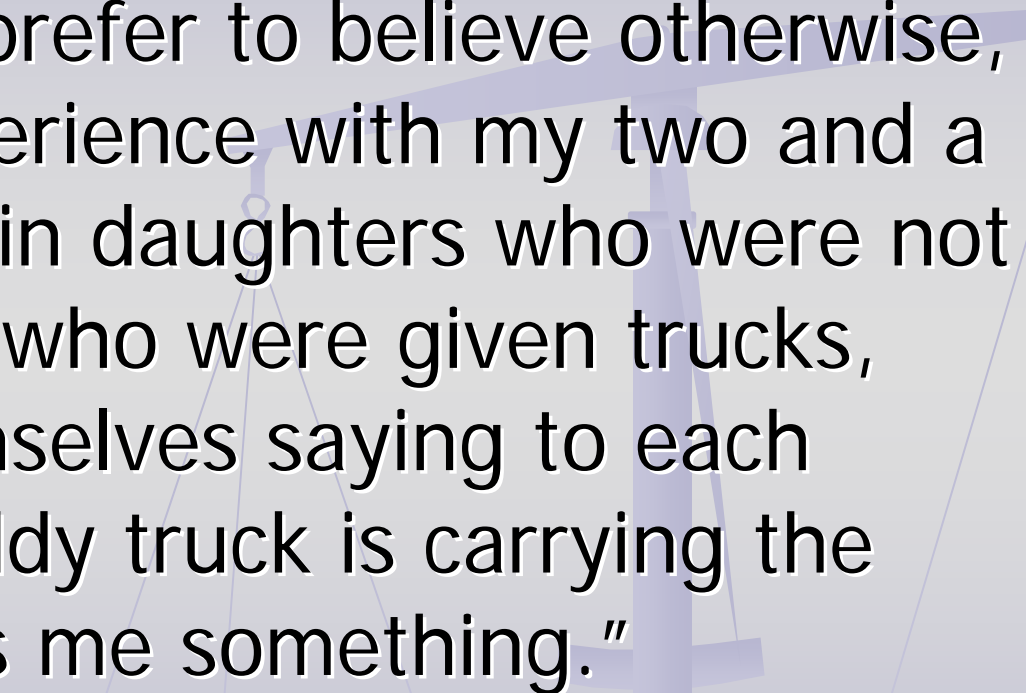
Why so do so few women reach high-level  
positions in science and engineering?

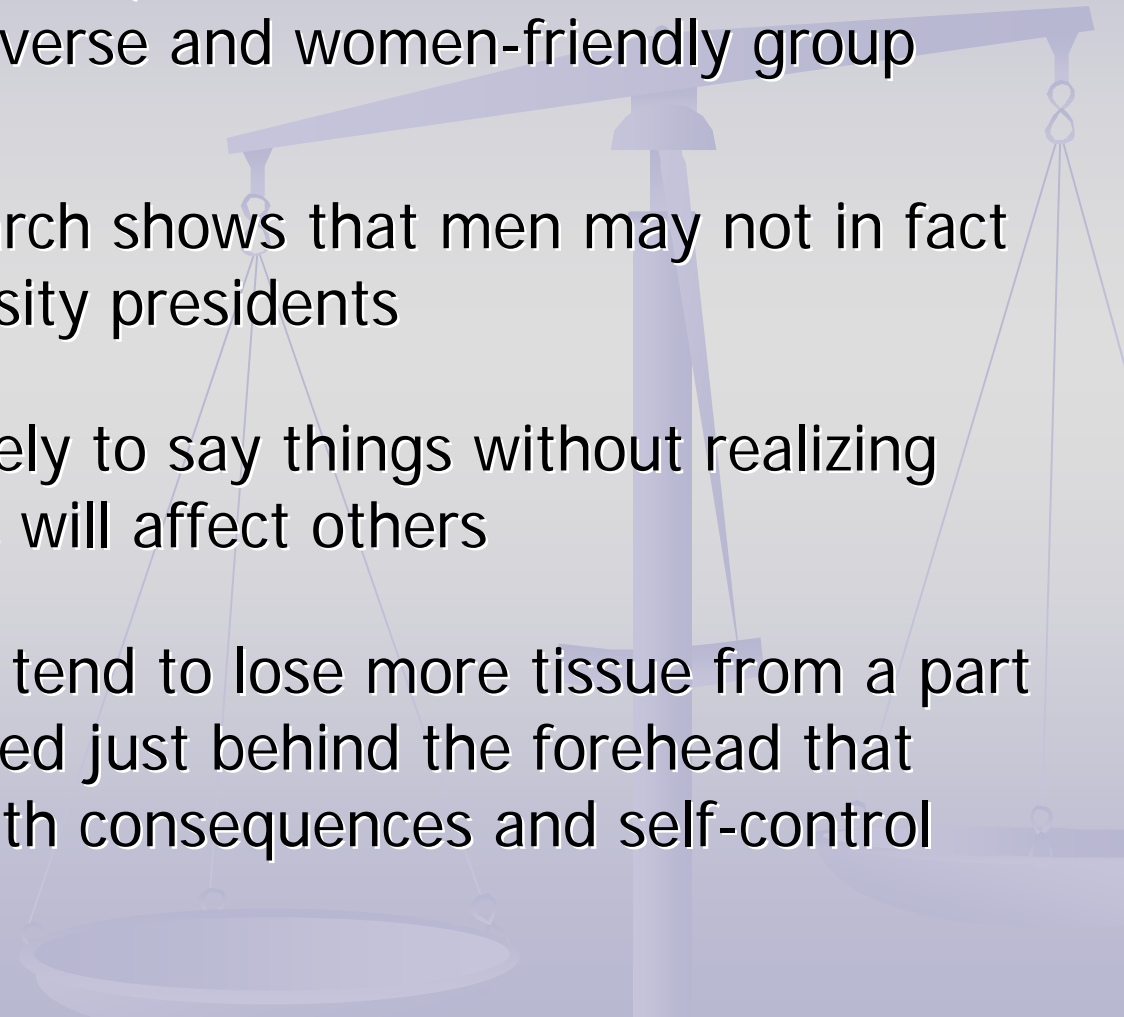
Here is Summers' "best guess," as to reasons (in  
order):

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- 1. Women with children are reluctant or unable to work 80 hours a week
  - 2. Women do not have the same innate ability as men in those fields
  - 3. There is a smaller pool of women than men from which to draw as a result of discrimination

## The evidence?

“...while I would prefer to believe otherwise, I guess my experience with my two and a half year old twin daughters who were not given dolls and who were given trucks, and found themselves saying to each other, look, daddy truck is carrying the baby truck, tells me something.”





Some may believe that this was just a clever strategy to get the resources (\$50 million) to transform the Harvard faculty into a more diverse and women-friendly group

Some believe that research shows that men may not in fact make the best university presidents

Men are more likely to say things without realizing how their actions will affect others

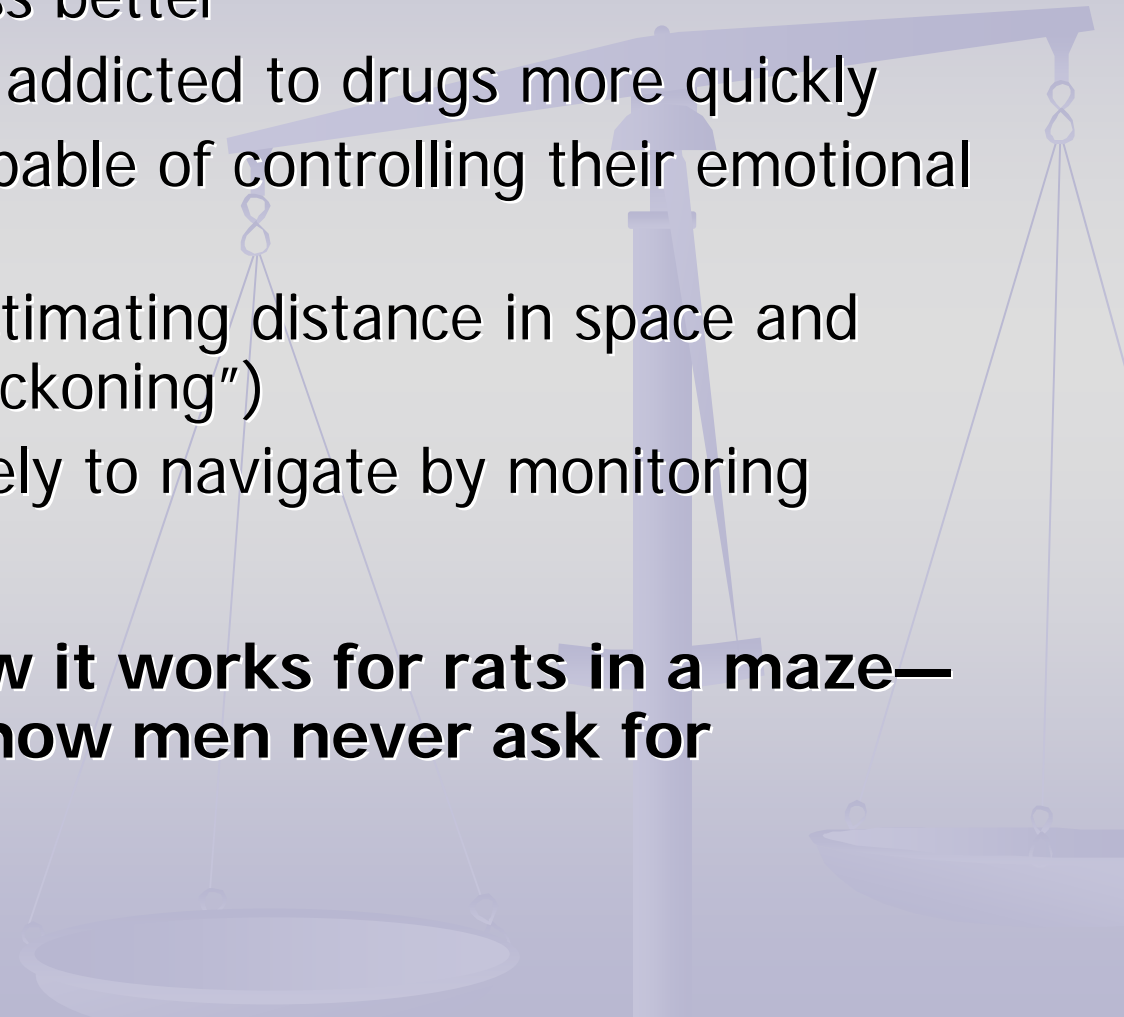
As men age they tend to lose more tissue from a part of the brain located just behind the forehead that concerns itself with consequences and self-control

# Not just politically incorrect, but just plain incorrect

- Yes, there are differences in men's and women's brains—some “favor” men and some “favor” women
- **But** no one has uncovered any evidence that anatomical disparities might render women incapable of achieving academic distinction in mathematics, physics, or engineering

# Differences

- There are insignificant differences on tests of general IZ—sometimes one way, sometimes the other
- Sexes use brains differently to achieve their results
- Significance for clinical trials of drugs
- Physical differences—air bags and air line seats are designed for the “average” man

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- Males may tolerate temporary stress better, females tolerate chronic stress better
  - Women can become addicted to drugs more quickly
  - Women are more capable of controlling their emotional reactions
  - Males navigate by estimating distance in space and orientation (“dead reckoning”)  
Women are more likely to navigate by monitoring landmarks

**At least that is how it works for rats in a maze—  
let’s not mention how men never ask for  
directions!**

# But

- Within group differences are greater than between group differences
- Not everyone is at the mean (or above it, as in Lake Woebegone)

**What is most important is to avoid the mindless application of stereotypes**

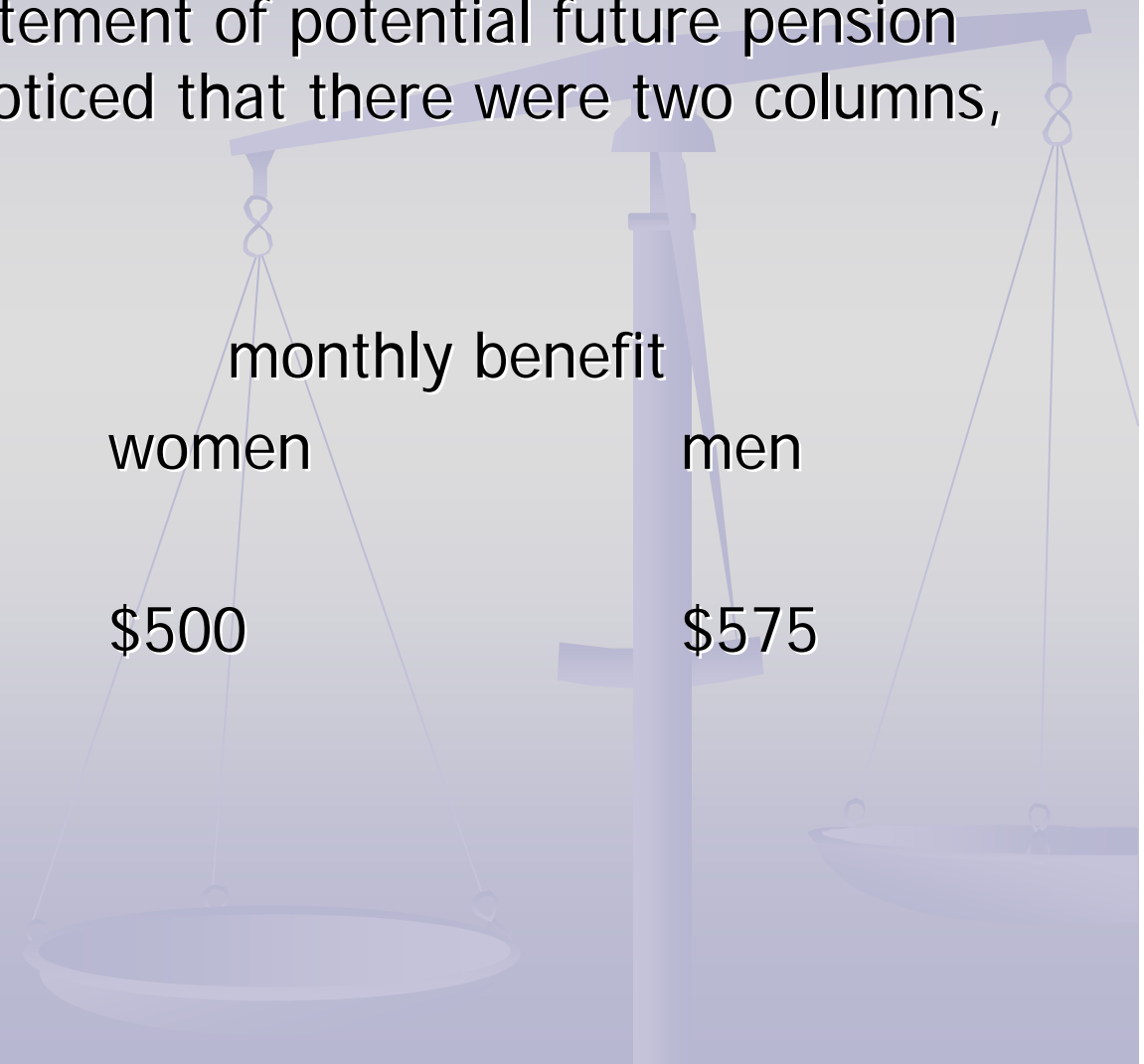
# Why am I a lawyer as well as a statistician?

When I got my first statement of potential future pension benefits from AU I noticed that there were two columns, for example:

Accumulation  
at retirement

\$100,000

	women	men
monthly benefit	\$500	\$575



## **Explanation from the insurance company:**

I pointed out that there was a law against discrimination on the basis of sex in employment benefits and was told:

**It's not discrimination on the basis of sex, it's discrimination on the basis of longevity.**

**Women live longer than men so they deserve to get less each month.**

## **The exchange:**

Me: So are you going to guarantee that I will live longer than my male colleagues?

The company: You don't understand the statistics.

## **My response:**

I started working on the statistics of a case the U.S. Department of Labor had brought against the company and another university that had the same pension plan.

## **Next round:**

(Once they saw some of the statistics we developed):

**You may understand the statistics, but you don't understand the law.**

## **My response:**

A law degree and admission to the U.S. Supreme Court Bar so that I could write a brief when a case involving the same issue came up before the Court

## **The result:**

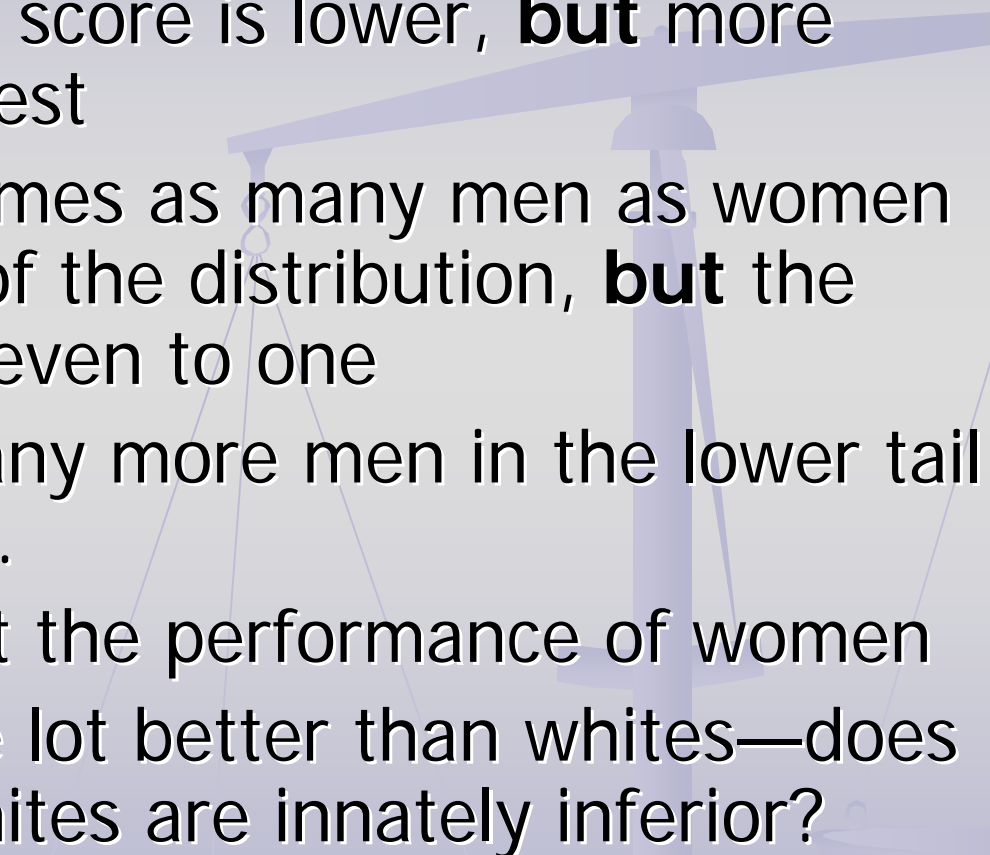
AU (and all other universities) have sex-neutral pension plans.

# A few comments I have heard

- “You shouldn’t be here taking up a place that a man could have.” (in graduate school by a faculty member)
- “My department once hired a woman and her research was not very good, so we didn’t hire any more women.” (at a national meeting of the American Mathematical Society by a former president of the organization)

# What are the facts?

## Math SATs

- Women's average score is lower, **but** more women take the test
  - There are three times as many men as women in the upper 1% of the distribution, **but** the ratio used to be seven to one
  - There are also many more men in the lower tail of the distribution.
  - SATs underpredict the performance of women
  - Asians do a whole lot better than whites—does this mean that whites are innately inferior?
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## Mathematics Olympiad

The male to female ratio: 11 to 1

The ethnic Asian to non-Asian ratio: 9 to 3

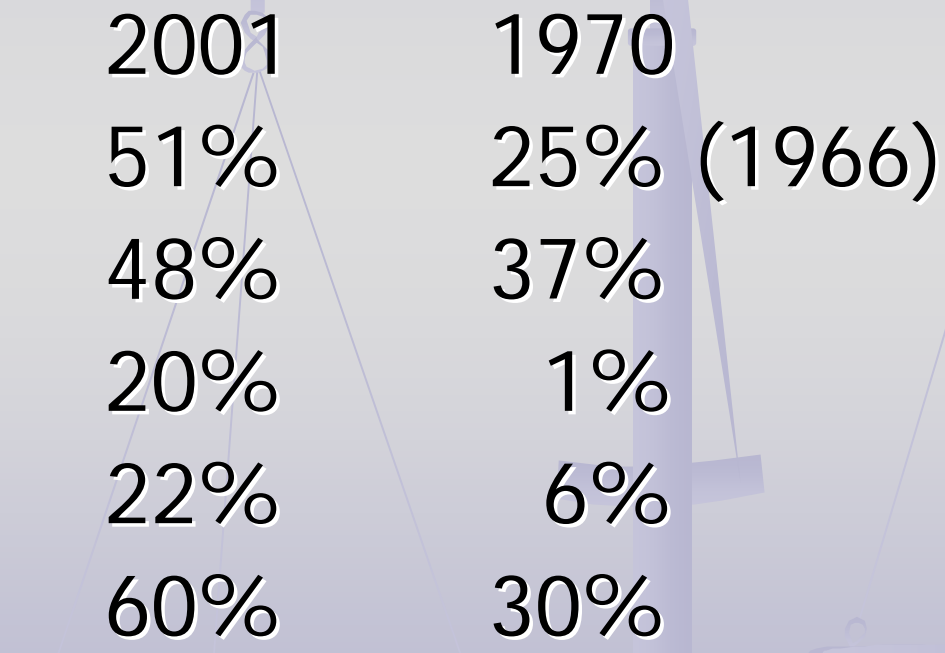
### International results

2003 algebra test given to 8<sup>th</sup> graders: In 22 countries girls outperformed boys; in 3 countries boys outperformed girls.

There are similar results on other tests with Asian girls consistently scoring higher than U.S. men; in countries as varied as Iceland and South Korea, girls do better than boys.

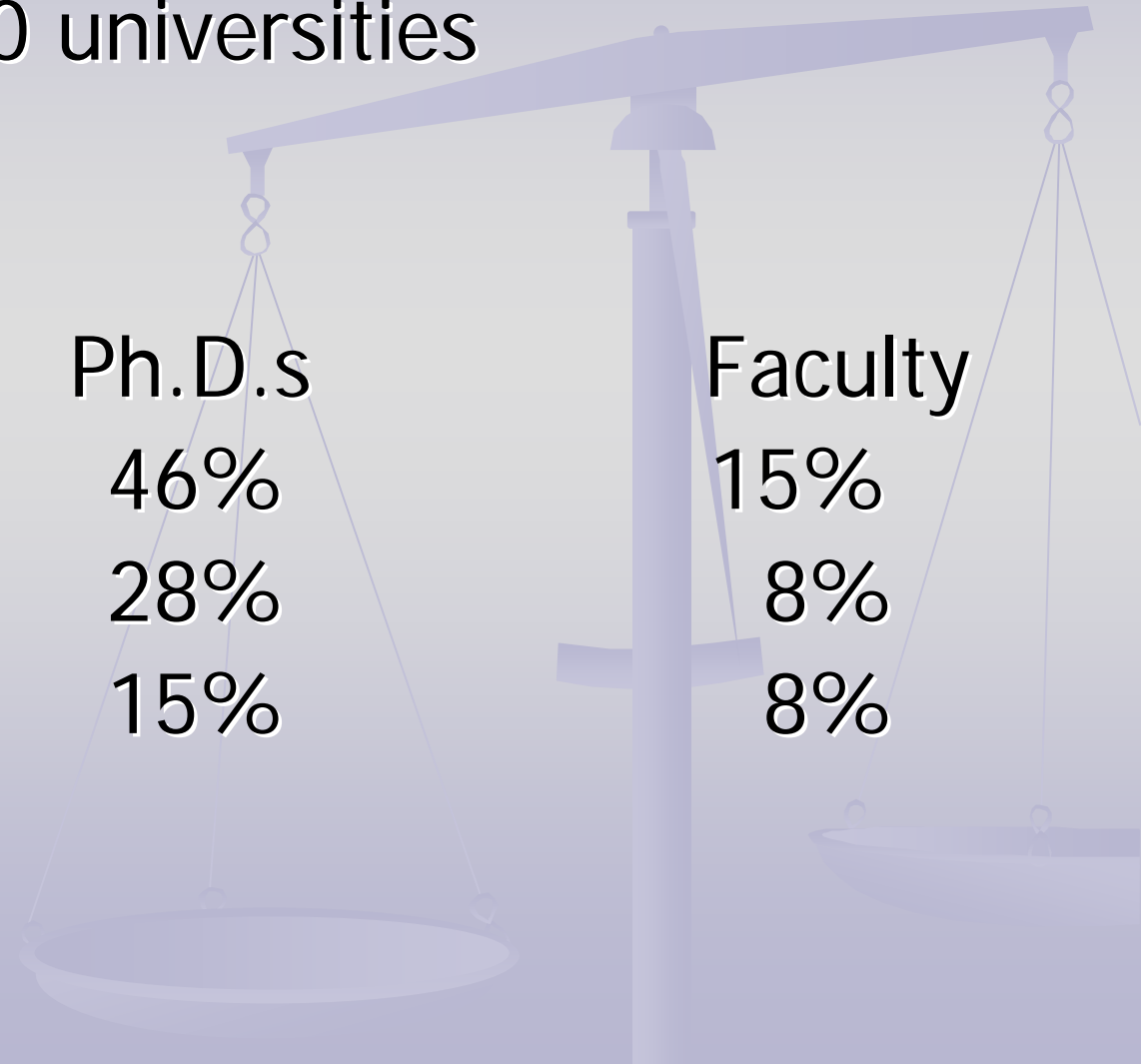
# Is there a small pool?

- Percent of undergraduate degrees going to women



	2001	1970
Science	51%	25% (1966)
Mathematics	48%	37%
Engineering	20%	1%
Physics	22%	6%
Biology	60%	30%

- Percent women tenure and tenure-track faculty at top 50 universities



	Ph.D.s	Faculty
biology	46%	15%
mathematics	28%	8%
engineering	15%	8%

# Some studies

- 1983: The resume' of Joan T. McKay was ranked lower than that of John T. McKay when they were exactly the same (by women as well as by men)
- Today: Princeton engineering majors ranked 75% of those with more education over those with more work experience when the sex was not known; it dropped to 48% if those with more education were women
- Today: If performance information is given and is the same for women and men, men and women are ranked the same on competence but men are ranked higher than women on being likable. If no performance information is given, men are ranked higher than women on competence but equal on being likeable.

**So you can't win!**