

# Unconscious and Implicit Bias and the Impact on Women and Under-represented Minorities in Science and Engineering

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<http://www.engr.washington.edu/advance>

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## Bias is not what most people think it is.

- Prejudice and discrimination are commonly understood as intentional, conscious, and harm drive. While this can be true, often it's the exception.
- Psychological advances demonstrate that bias is often unintentional, automatic, and outside our awareness. It may also be contradictory to our conscious beliefs.
- Bias often exists within many well intentioned women and men of all different backgrounds.
- Men and women often exhibit the same bias trends, for example, having a stronger association of men with science and engineering than women with science and engineering.
- One way to examine your own automatic, unintentional bias is to take the Implicit Association Test (<http://implicit.harvard.edu>).

## Implicit Assumptions and Evaluation

A large body of research shows that implicit assumptions impacts evaluation. A great summary of some of the research is the University of Wisconsin's brochure: *Reviewing Applicants: Research on Bias and Assumptions*

*Research on Bias and Assumptions*

([http://wiseli.engr.wisc.edu/initiatives/hiring/BiasBrochure\\_2ndEd.pdf](http://wiseli.engr.wisc.edu/initiatives/hiring/BiasBrochure_2ndEd.pdf)).

## What are the results of (Implicit) Discrimination?

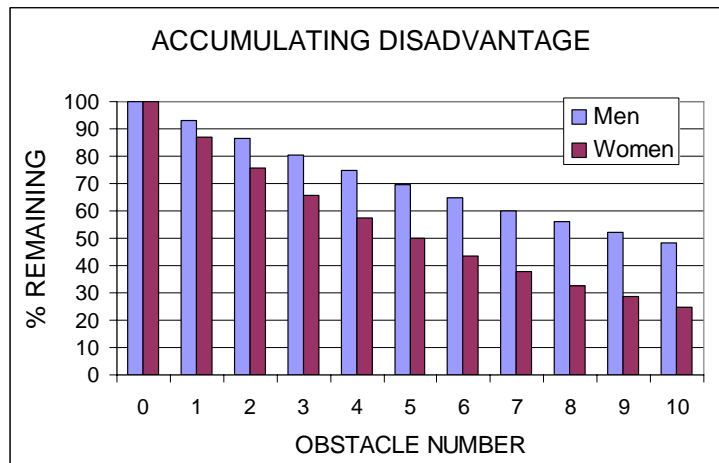
- Lower expectations
- Uneven evaluation
- Narrow view of excellence
- Exclusion from informal networks
- Other people feel uncomfortable
- Accumulation of Disadvantage

## Accumulation of Disadvantage

Most of the time, people believe they are making fair decisions, but even if the decision is slightly skewed, a big difference will emerge over time.

- Example 1: Over time small differences become BIG differences
  - If **men** and **women** are weighted equally in every decision (**50/50**), at the end of 10 decisions, the ratio will still be **1** [(**50/50**)<sup>10</sup>=1].
  - At the end of 10 decisions, a 2% swing in the decision weights (**51/49**) leaves **men 1½ times** [(**51/49**)<sup>10</sup> ≈ 1.5] as successful as **women**.
  - At the end of 10 decisions, a 4% swing in the decision weights (**52/48**) leaves **men more than twice** [(**52/48**)<sup>10</sup> ≈ 2.2] as successful as **women**.

- Example 2: Accumulation of disadvantage in the pipeline.  
Consider the following: Suppose there is a 90 percent survival rate for each obstacle, but that males and females have a 6 point difference in their survival percentage. At the end of 10 obstacles, the graph below shows the percent remaining of men and women in this system.



- Subtle bias can have powerful effects on how decisions are made and on its targets
- People’s affinity for, or aversion toward, particular disciplines can develop at an implicit level as a function of their local environments. These decisions are not solely a matter of conscious choice.

### What can we do?

- Personally
  - Take the Implicit Association Test ([implicit.harvard.edu](http://implicit.harvard.edu))
  - Slow down. Research shows that we rely on our automatic (implicit) associations most when we are pressed for time.
  - Stretch – Create opportunities to have new experiences which can nudge our implicit biases
- Institutional Change
  - Learn the research and share with your colleagues
  - Ask different questions because results depend on how the questions are framed.
  - Be Pro-active

### Change is happening

- Awareness is growing and there are more women in science, engineering, and mathematics than before
- Programs like the NSF’s ADVANCE program are impacting change
- **Actions trump implicit association – actively advocate for diversifying science and engineering. Change needs constant and consistent attention.**

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