EFFECTS OF STEREOTYPING ON PERFORMANCE OF WOMEN IN MATH TESTS

KRITIKA SINGH

STEREOTYPES

A stereotype is a belief/bias built either through experience or influence about a class of people which may be true for some but not all people belonging to that class.

Some examples -

- **Blondes are unintelligent**
- **Asians are good in maths**
- **White men are weak in sports**
- **Elderly people are unreliable**

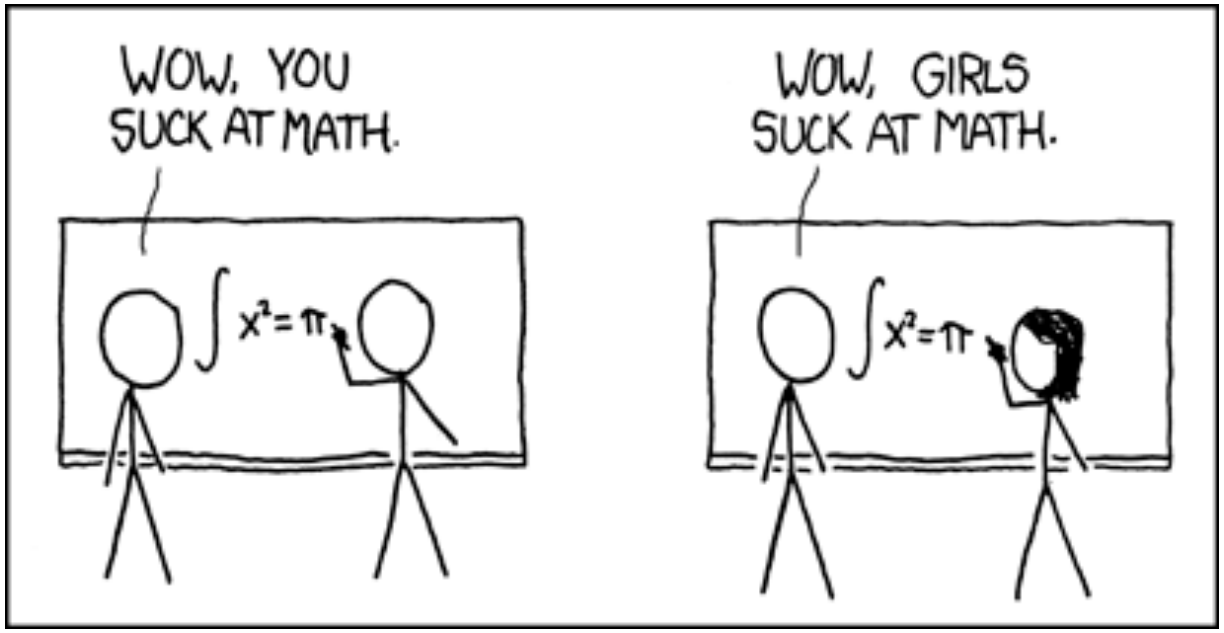
Source : http://www.bizarro.com/

STEREOTYPE THREAT

Stereotype threat refers to being at risk of confirming, as self-characteristic, a negative stereotype about one's group - Steele & Aronson, 1995

- **Potential contributor to racial and gender gaps in academic performance**
- **Decreased performance of targeted groups in non-academic domains(e.g. sports)**
- **Causes disengagement and disidentification**
- **Alters aspirations**

WOMEN ARE WEAK IN MATHS?



Source : xkcd

Previous explanations

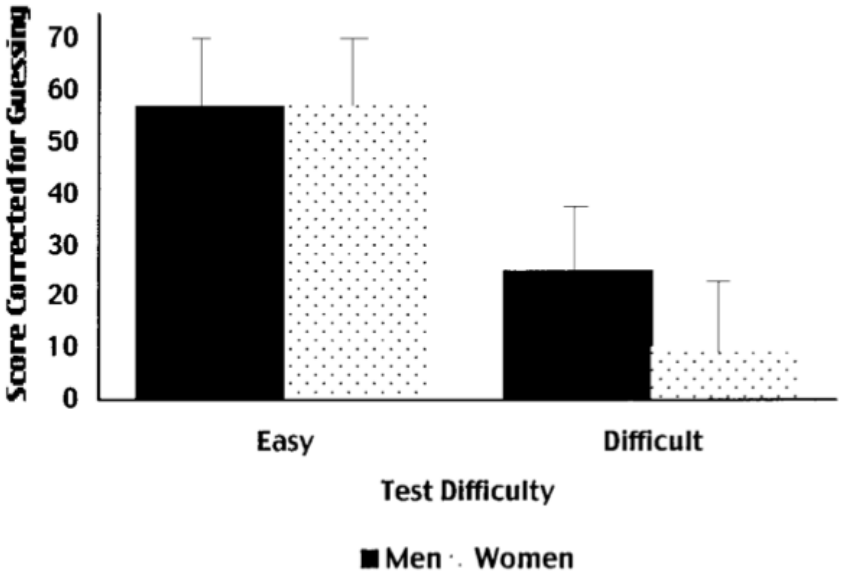
Nature - genetically rooted sex differences in math ability

Nurture - males are encouraged more to participate in math

EXPERIMENTS BY SPENCER ET AL.

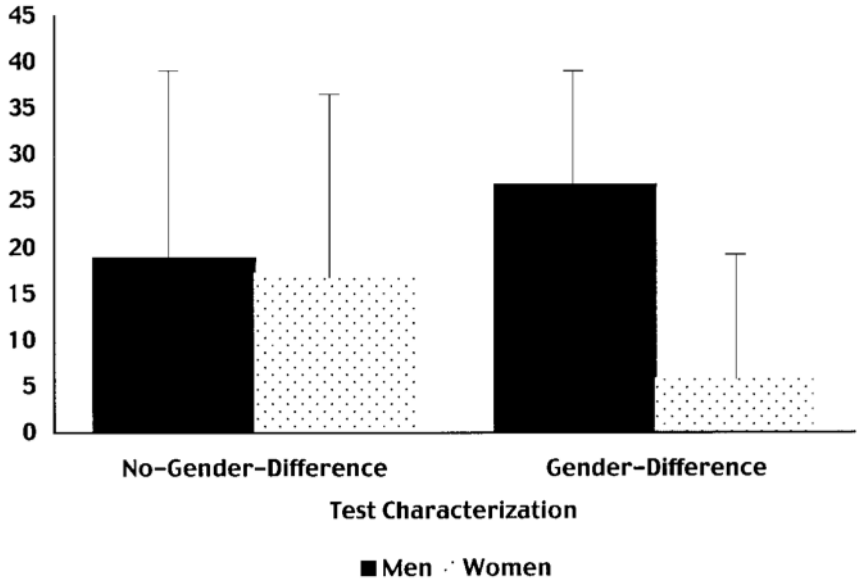
Hypothesis : Apprehension caused by stereotype threat may disrupt women's math performance

STUDY 1



No reference to gender made
Conclusion : women underperform on difficult tests

STUDY 2



Primed with difference in performance
Conclusion : hypothesis proved

MY EXPERIMENT

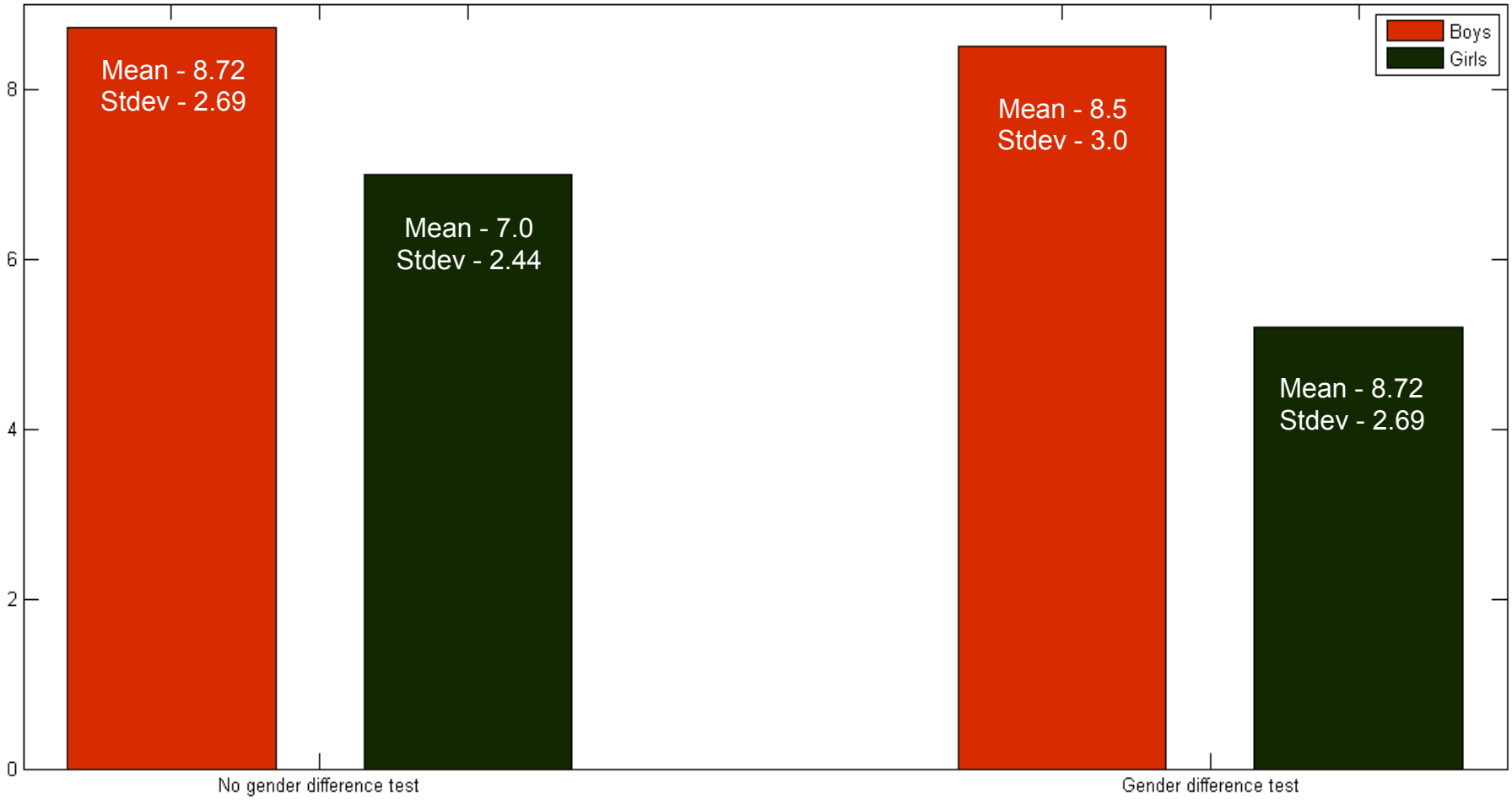
Two tests : 15 difficult questions(for XII std) from GRE in each

Participants : 22 boys and 15 girls from Central School, IITK

Before the first test - "We are making some new math ability tests and first want to evaluate them on XII standard students."

Before the second test - "This is also a math ability test and it has shown difference in performance of girls and boys in the past. We want to see if this is really true."

RESULTS


Boys
Girls
Mean - 8.72
Stdev - 2.69
Mean - 7.0
Stdev - 2.44
Mean - 8.5
Stdev - 3.0
Mean - 8.72
Stdev - 2.69
0
2
4
6
8
No gender difference test
Gender difference test

OTHER EXPERIMENTS

1. Women encouraged to think of themselves in terms of their valued and unique characteristics were less likely to experience stereotype threat in mathematics
2. Women who created complex self-representations of themselves were less likely to experience stereotype threat in math manipulations
3. Women tended to perform as well as men on a math test when the test was administered by a woman with high competence in math
4. Women who used a fictitious name showed significantly higher math performance relative to those who used their real names. Men were unaffected

[1] Ambady, Paik, Steele, Owen-Smith, & Mitchell 2004

[2] Rosenthal & Crisp, 2006; Gresky, Ten Eyck, Lord, & McIntyre, 2005

[3] Marx & Roman, 2002, Marx, Stapel, & Muller, 2005

[4] Zhang, Shen and Schmader, Toni and Hall, William M, 2012

POSSIBLE EXPLANATIONS

- Anxiety
- Negative cognitions and dejection
- Lowered performance expectations
- Physiological arousal
- Reduced effort
- Reduced self-control
- Reduced working memory capacity
- Reduced creativity, flexibility and speed

REFERENCES

[1] Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. Journal of Experimental Social Psychology, 35, 4–28.

[2] Schmader, T. (2002). Gender Identification Moderates Stereotype Threat Effects on Women's Math Performance. Journal of Experimental Social Psychology, 38, 194-201.

[3] Shen Zhang, Toni Schmader, William M. Hall. L'eggo My Ego: Reducing the Gender Gap in Math by Unlinking the Self from Performance, Self and Identity, 2012