

# Implicit predictors of STEM engagement

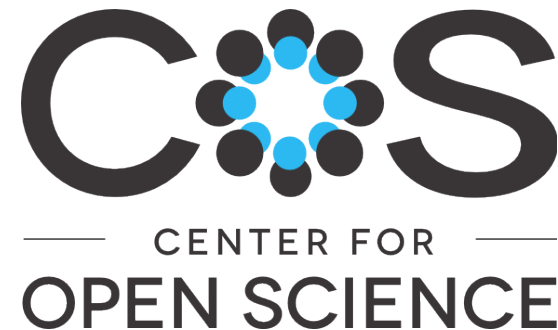
Brian Nosek

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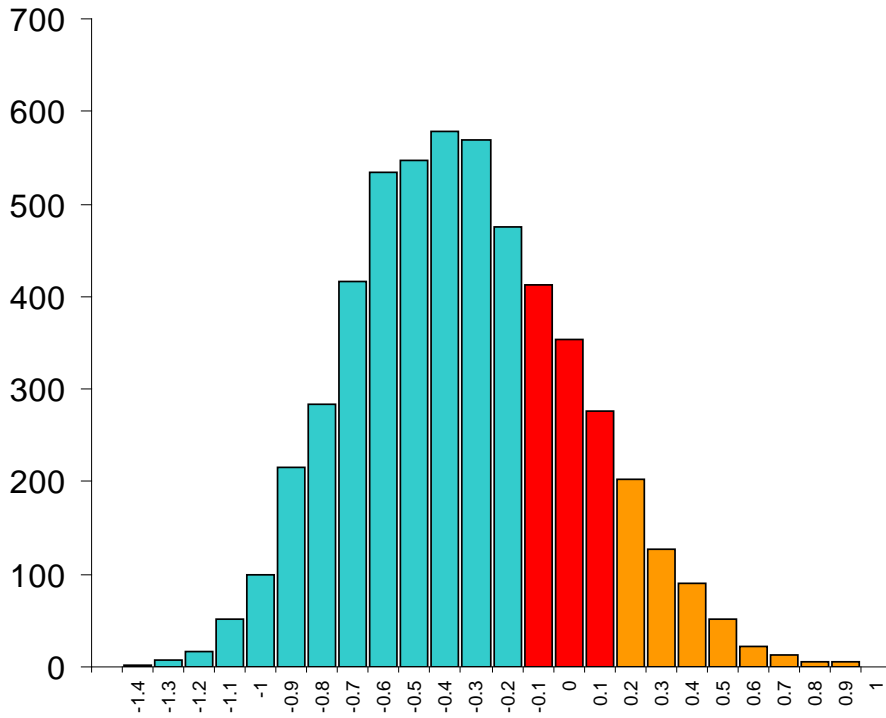


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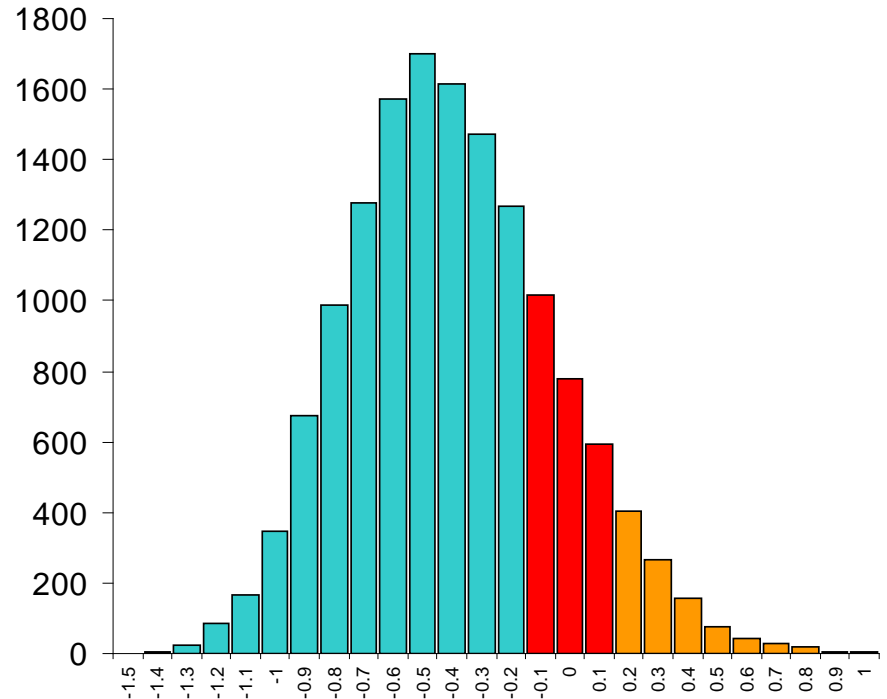
# Implicit Associations between Gender and Career vs Family

## Men



71%

## Women

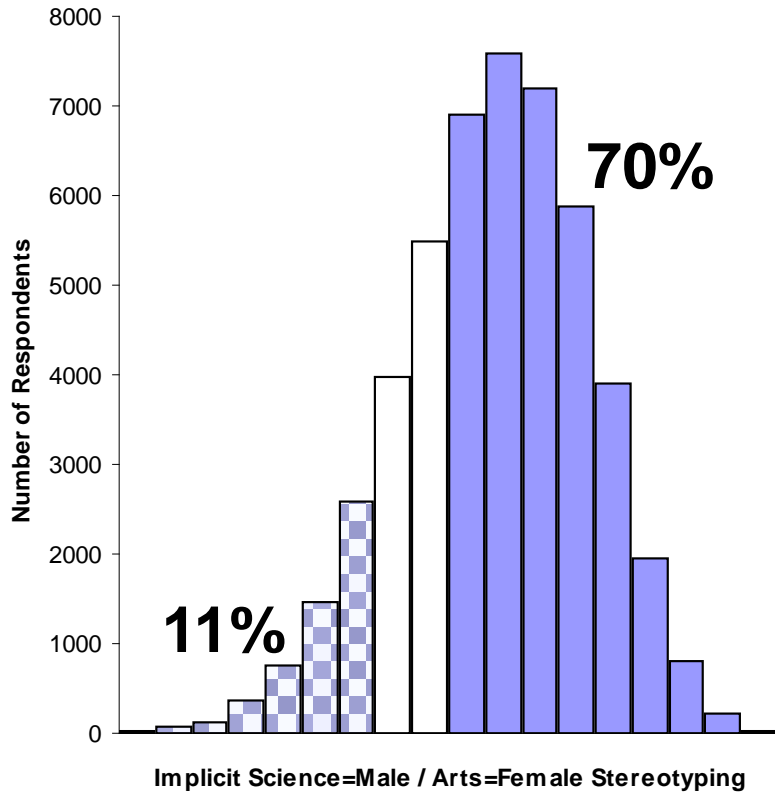


77%

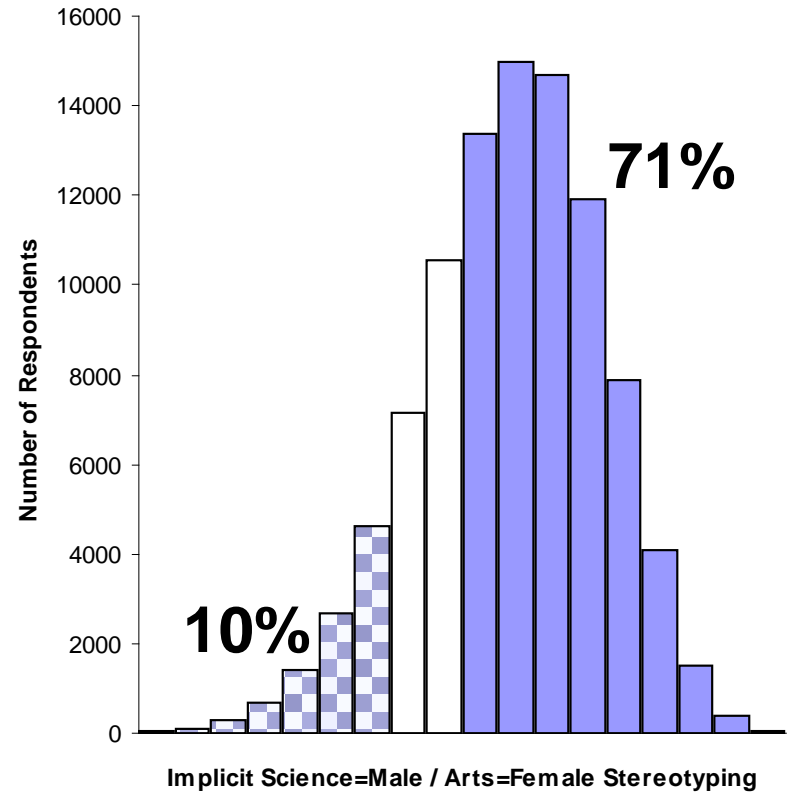
<b>Male</b>	<b>Female</b>	<b>Science</b>	<b>Arts</b>
Daniel	Anna	Math	History
John	Rebecca	Physics	Languages
Paul	Michelle	Chemistry	English
Michael	Emily	Biology	Poetry
Jeffrey	Julia		

# Implicit Gender-Science Stereotypes

## Male Respondents



## Female Respondents



Women are not being kept out of science by force so “they must be *choosing* not to enter, presumably because they don’t *want* to; presumably because (by and large) they don’t *like* these fields or (on average) don’t tend to excel in them, which is nearly the same thing.”

(David Gelernter, Department of Computer Science, Yale University, 1999, italics in original)

# Science faculty assessment of resumes



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## PROFESSIONAL PROFILE

I am an enthusiastic and dedicated professional with extensive experience across all areas of retail management...An exceptional leader who is able to develop and motivate others to achieve targets, I can demonstrate a strong ability to manage projects from conception through to successful completion. A proactive individual with a logical approach to challenges, I perform effectively even within a highly pressurised working environment.

## OBJECTIVE

I am now looking to progress into a senior management position within the retail sector. I am therefore keen to find a new and suitably challenging role within a market-leading organisation.

## CAREER SUMMARY

1994-date *A&B Stores plc*

### SENIOR AREA OPERATIONS MANAGER (2002-date)

- Responsible for meeting budgetary and sales targets through motivating and developing staff, consistently achieving and surpassing Key Performance Indicators
- Reporting to the Retail Operations Manager with responsibility for operational and people (320) management within 14 stores
- Controlling management accounts with attention to essential criteria for net profit, including sales, shrinkage, wages, write-off, cash control and store expenditure
- Monitoring and controlling store compliance in all areas, including customer care, effective planning, staff training and development, organisation and time management
- Supporting management and staff to help create their own successful and productive team and become effective team leaders
- Maximising every sales opportunity by promoting the highest standards of customer care and recognising potential development and training opportunities
- Communicating daily with Customer Support Centre functions - Buying, Retail, Finance & Distribution - to ensure effective control and operation of all areas
- Reviewing and evaluating weekly KPI achievement and producing an end of week spreadsheet
- Supporting and coaching Area Managers to reach their full potential
- Deputising for Retail Operations Manager, responsible for whole region, incorporating 9 Area Managers

### CUSTOMER SERVICES MANAGER (2000-2002)

- Reporting to the Director of service quality, primarily responsible for 16,000 internal customers and all external customers
- Maintaining the Service Quality Customer Service Standards Library for the department
- Developing a CD ROM training programme to be used in all stores, in line with customer service strategy
- Managing and developing stores' monthly incentive programme and cost justifying
- Supervising, motivating and developing team reward and recognition programmes
- Handling and swiftly resolving customer complaints in a professional and effective manner
- Creating and introducing in-store customer awareness and feedback forms with most useful results

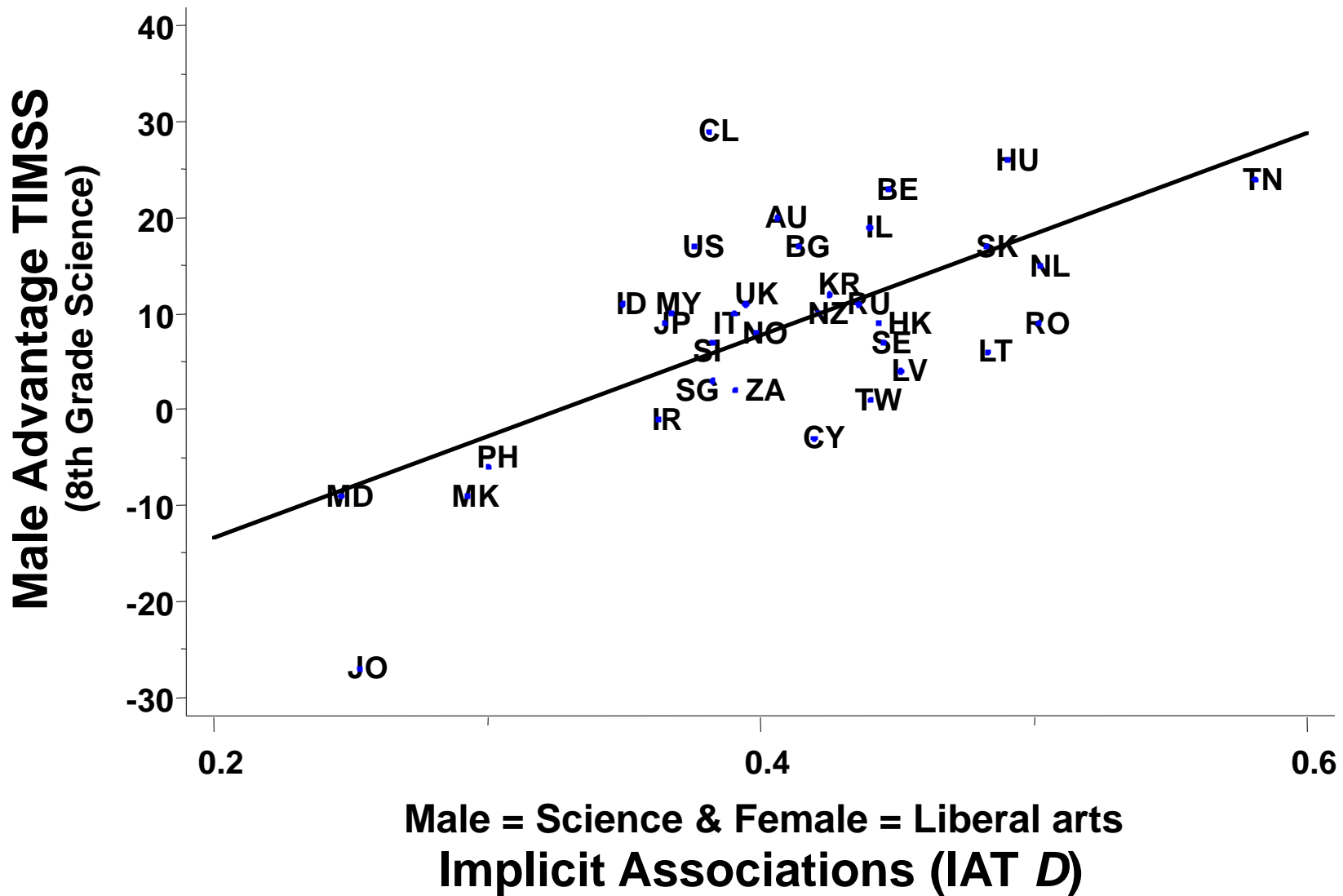
Male  
**John**

Female  
**Jennifer**

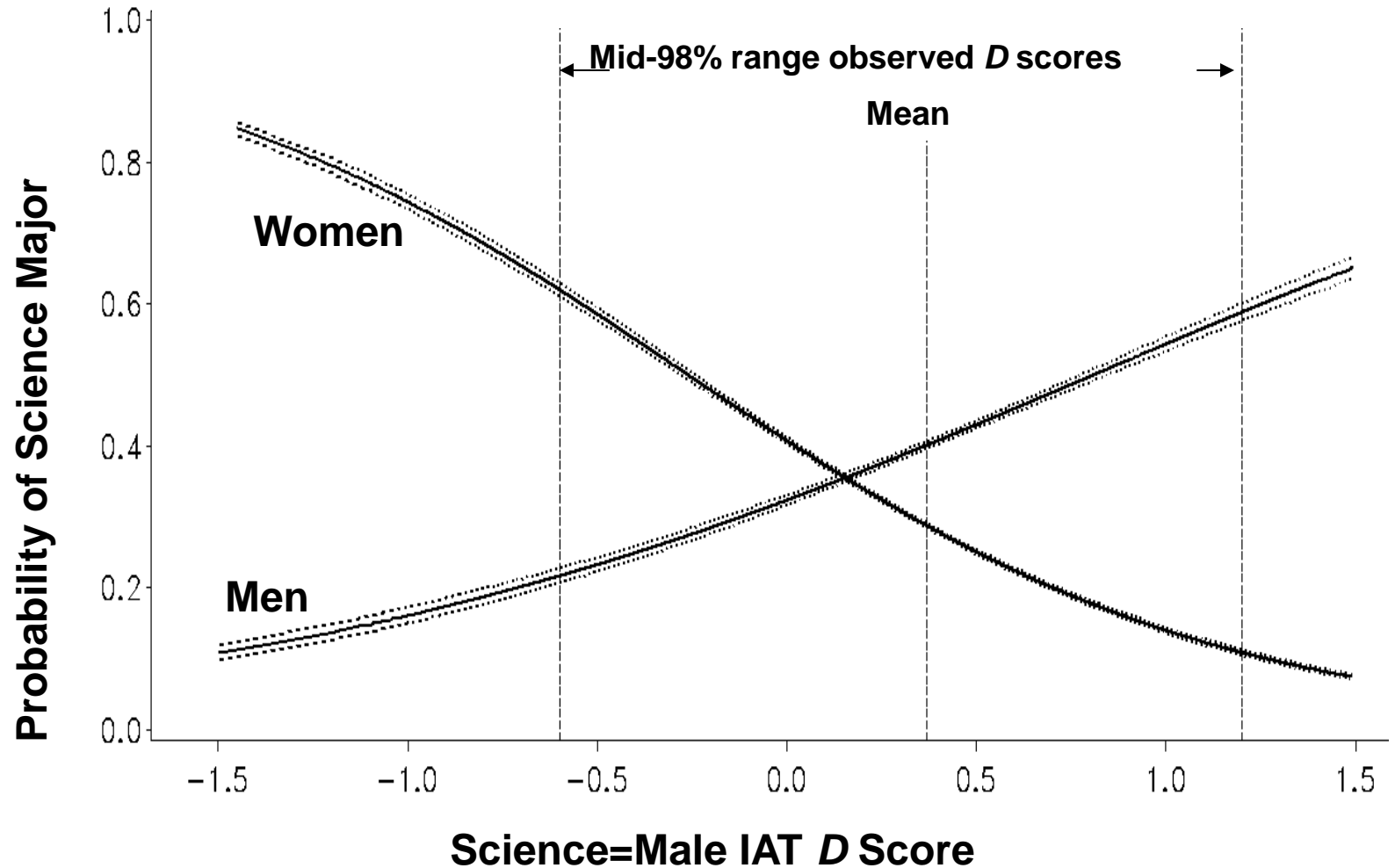
Less competent ( $d = .71$ )

Less hireable ( $d = .75$ )

\$4,000 less starting  
salary ( $d = .60$ )

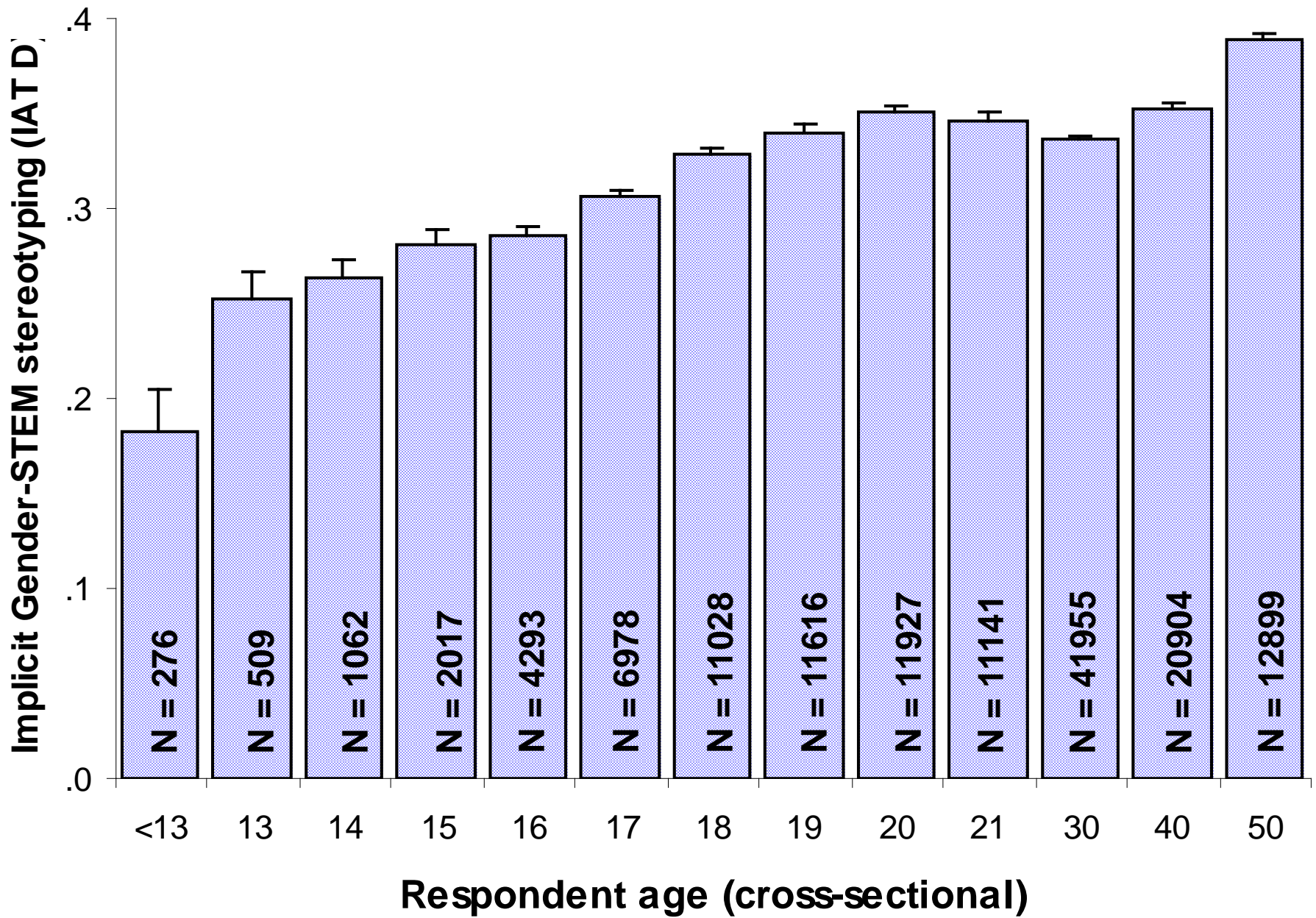


# Estimated probability of majoring in science as a function of sex and implicit gender-science stereotype





Women	Implicit Stereotype	Explicit Stereotype
Explicit Attitude	<b>-.34</b>	<b>-.09</b>
Explicit Identity	<b>-.33</b>	<b>-.08</b>
Explicit Confidence	<b>-.19</b>	<b>-.07</b>
Expect to Participate	<b>-.18</b>	<b>-.05</b>
Self-ascribed skill	<b>-.24</b>	<b>-.04</b>
SAT performance	<b>-.17</b>	<b>-.05</b>
Average	<b>-.24</b>	<b>-.06</b>



# What can we do about it?

(examples)

## Role Models

Affirmation to counter identity threats:

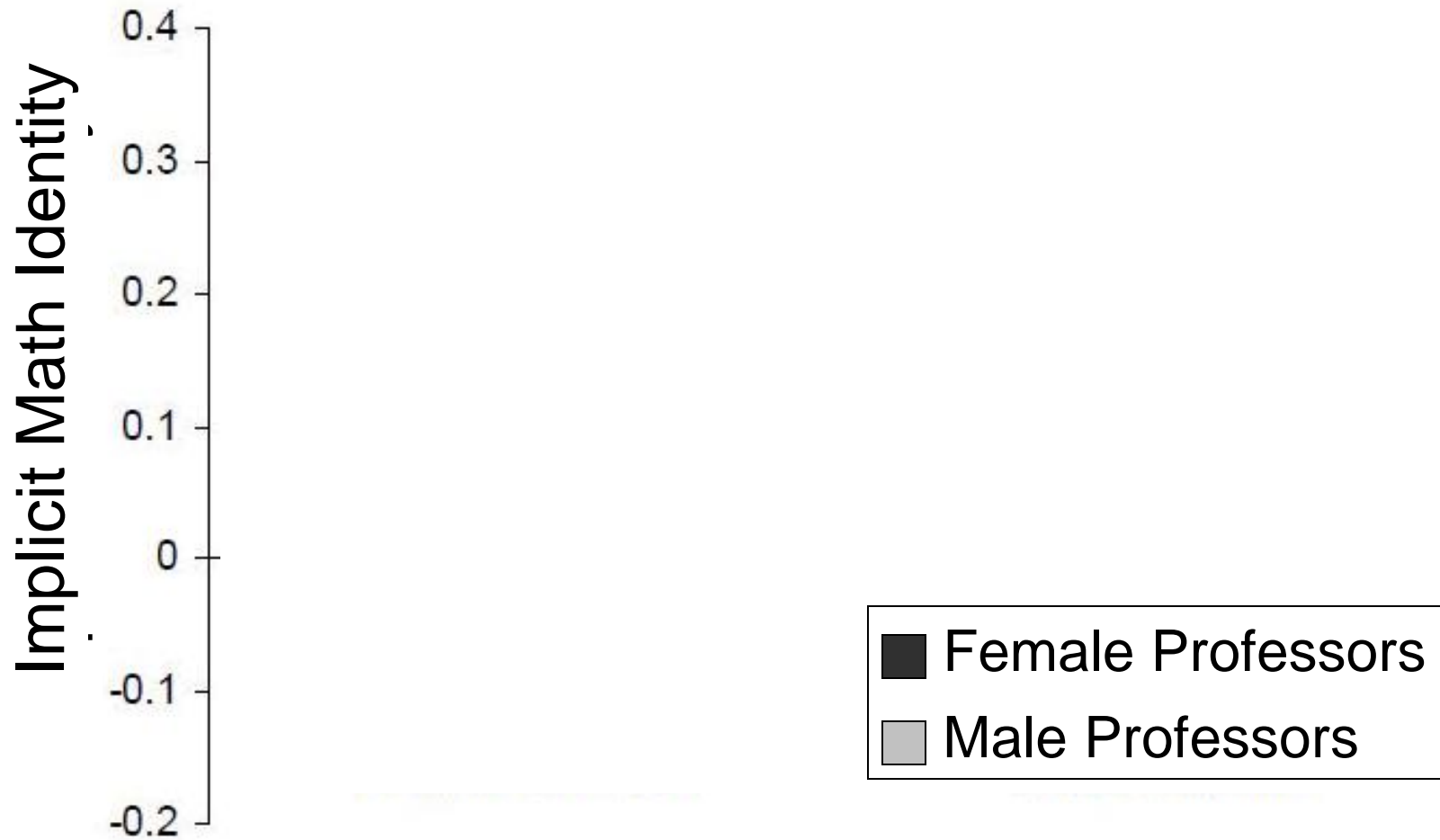
Negative expectations, lack of belonging

Education about bias

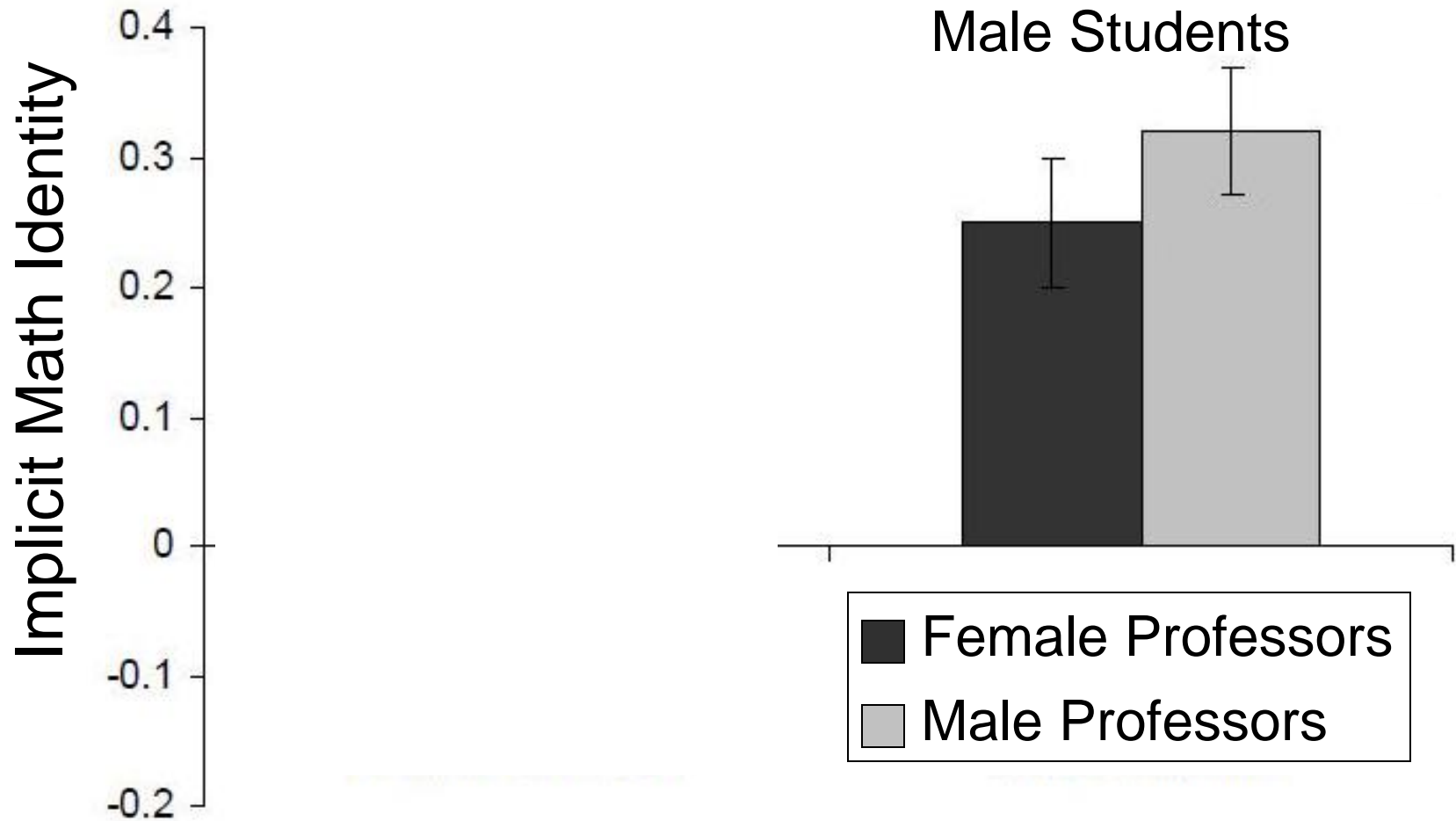
Blinding

Comparative assessment

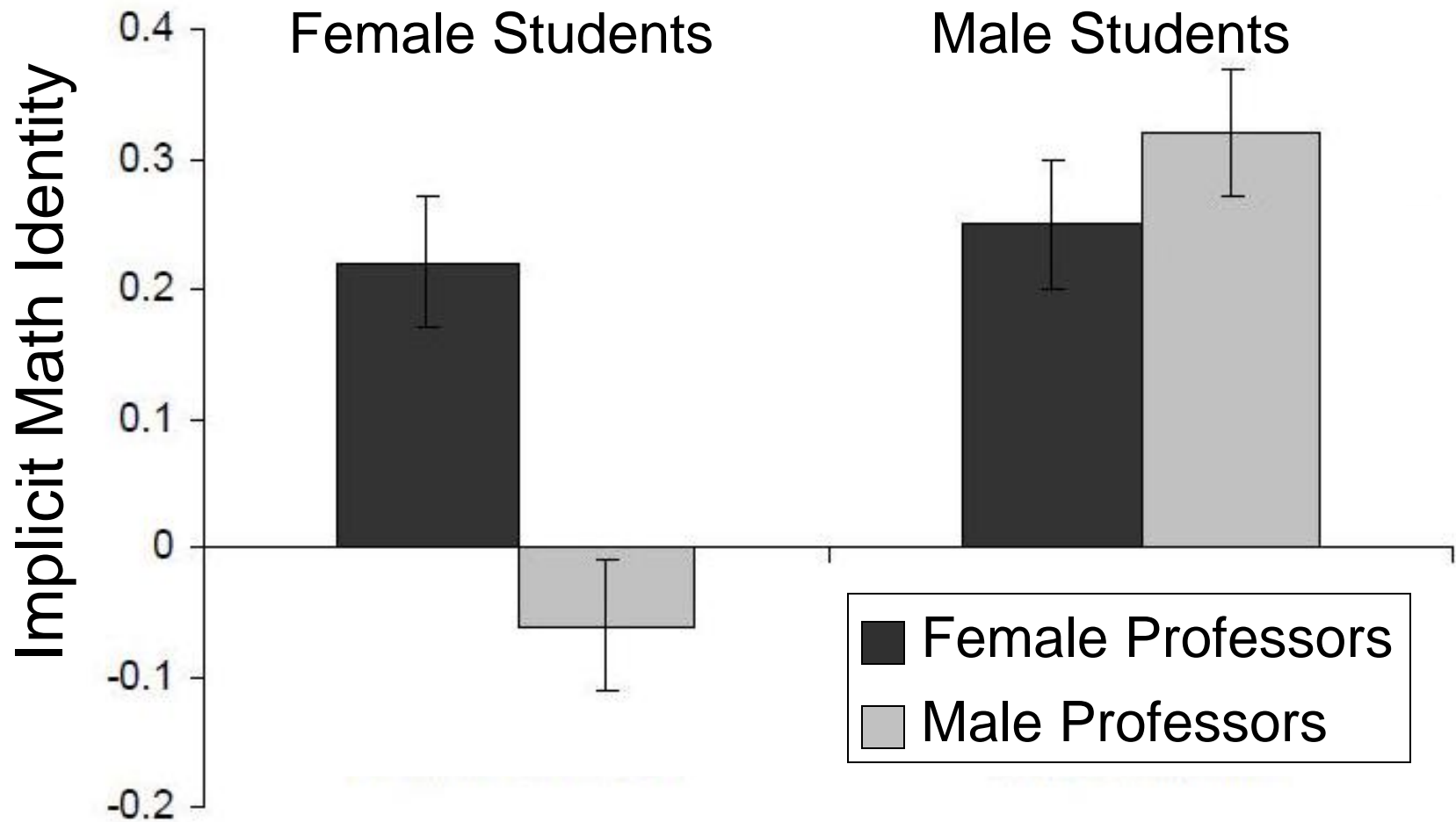
# Instructor as role model



# Instructor as role model



# Instructor as role model



# Benefits of Self-Affirmation

Cohen et al. *Science*, 2006, 2009, 2010

Artistic expression

Athletic participation

Belonging to a social group (e.g., community, racial, professional)

Creativity

Government or politics

Independence

Learning and gaining knowledge

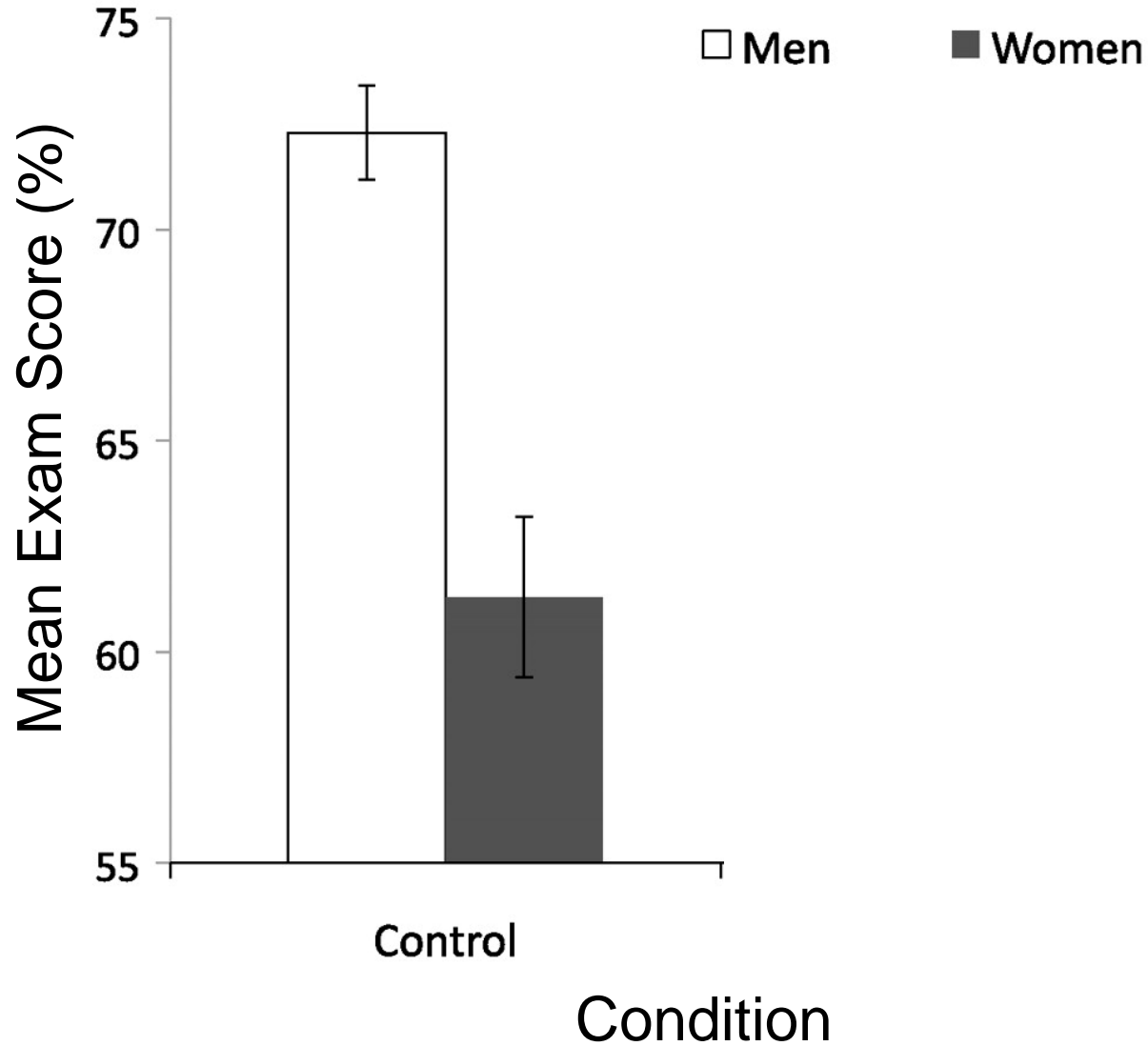
Music

Relationships with family and friends

Sense of humor

Spiritual or religious values

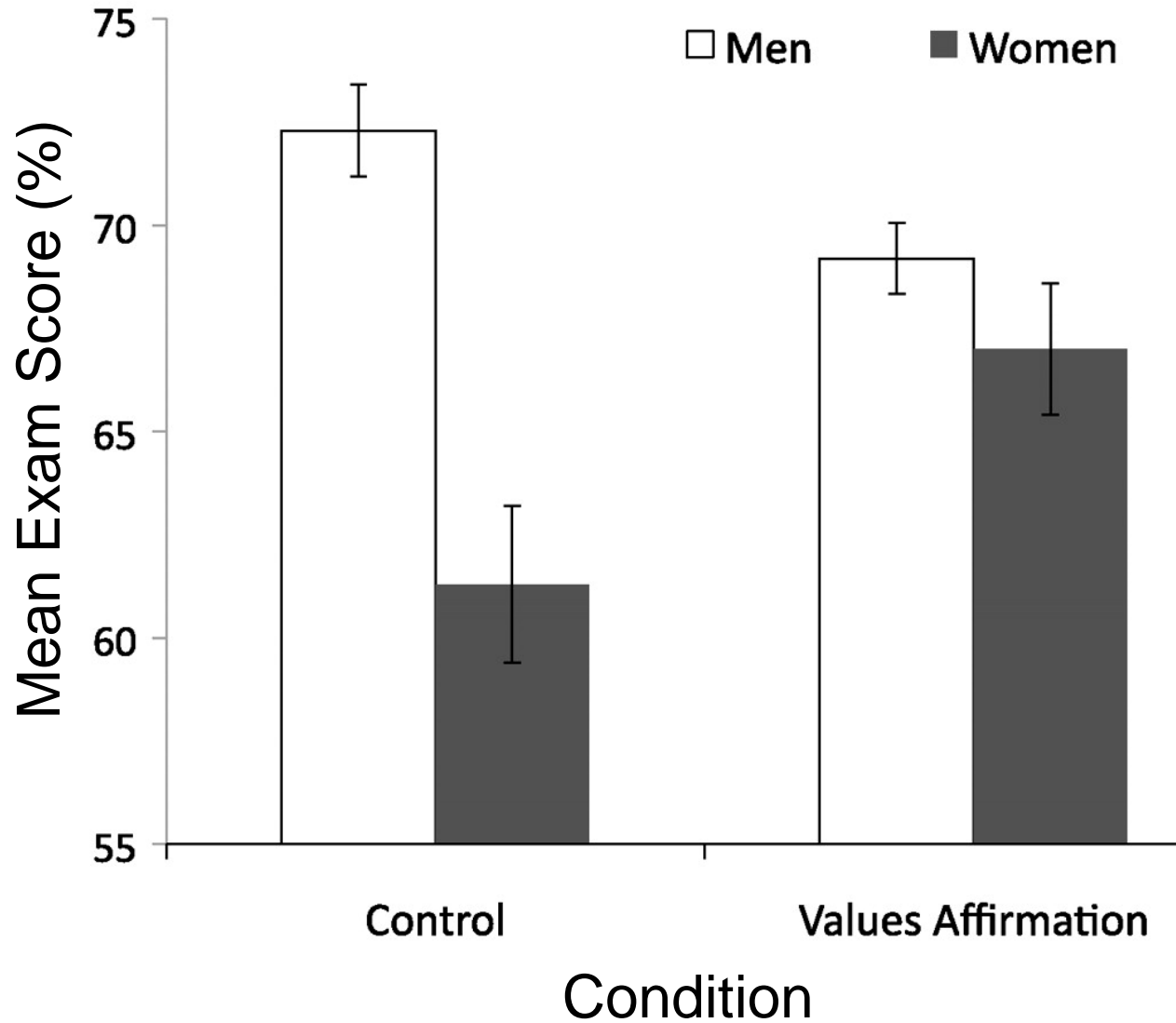
# College Physics



Miyake,  
et al., *Science*,  
2010



# College Physics



Miyake,  
et al., *Science*,  
2010

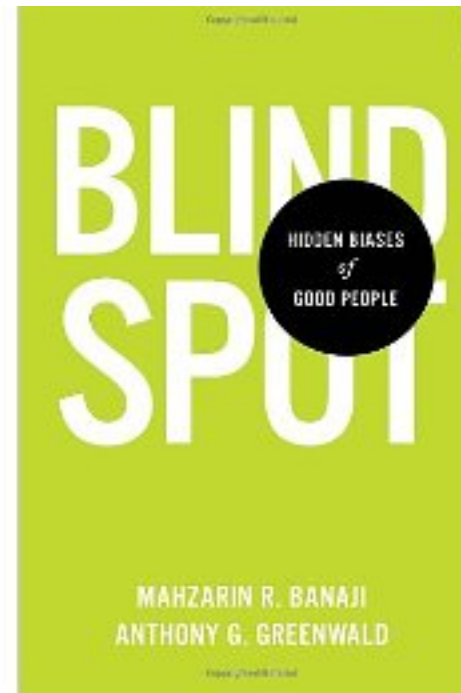
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