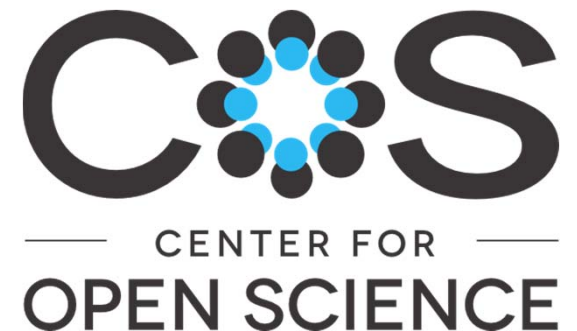


Mindbugs: Implicit predictors of STEM engagement

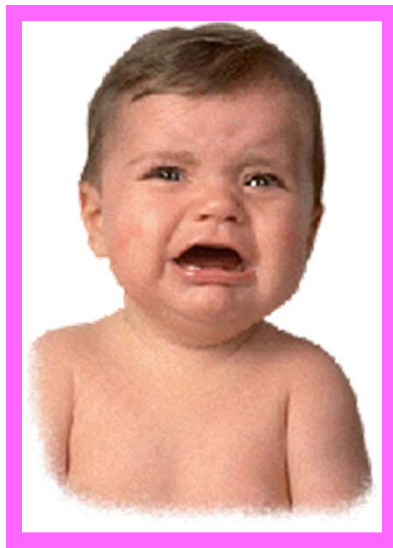
Brian Nosek

University of Virginia
Project Implicit
Center for Open Science

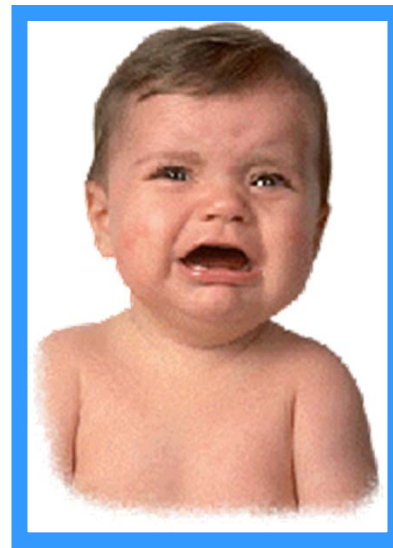
<http://briannosek.com/>



Gender and Expectations



“Afraid”



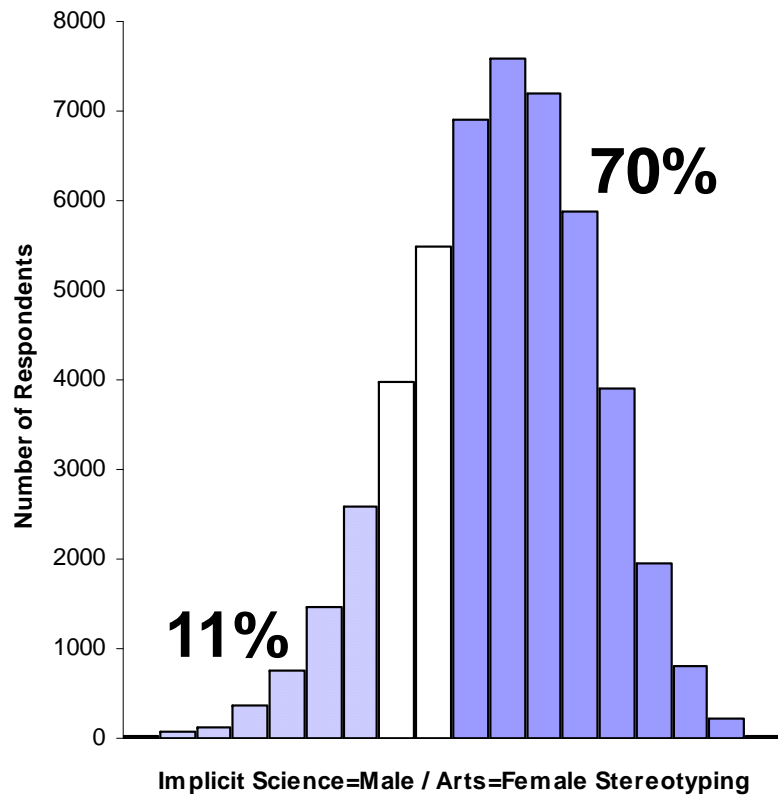
“Angry”

Implicit Association Test

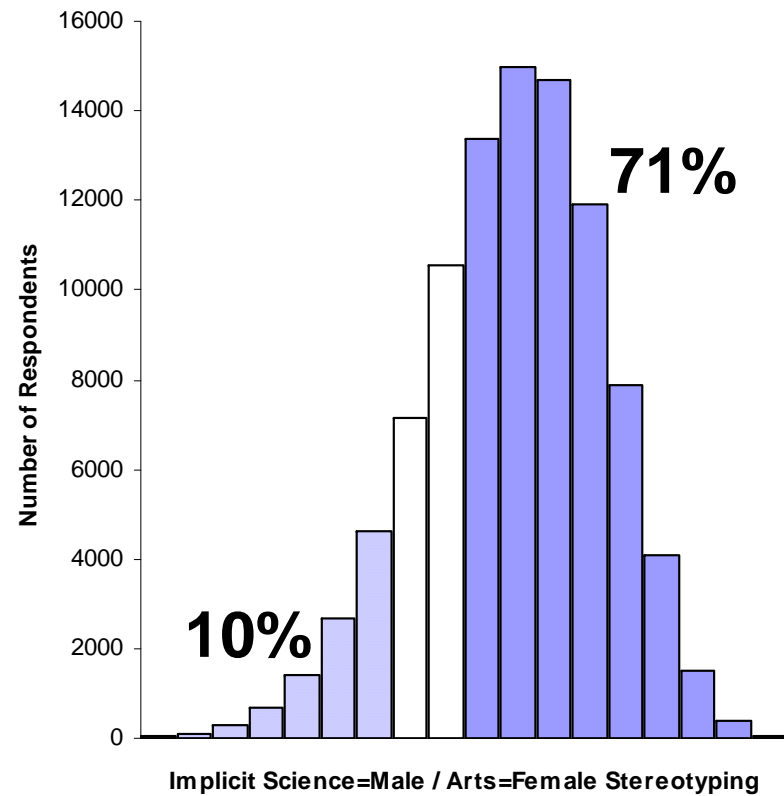
[Demonstration](#)

Implicit Gender-Science Stereotypes

Male Respondents

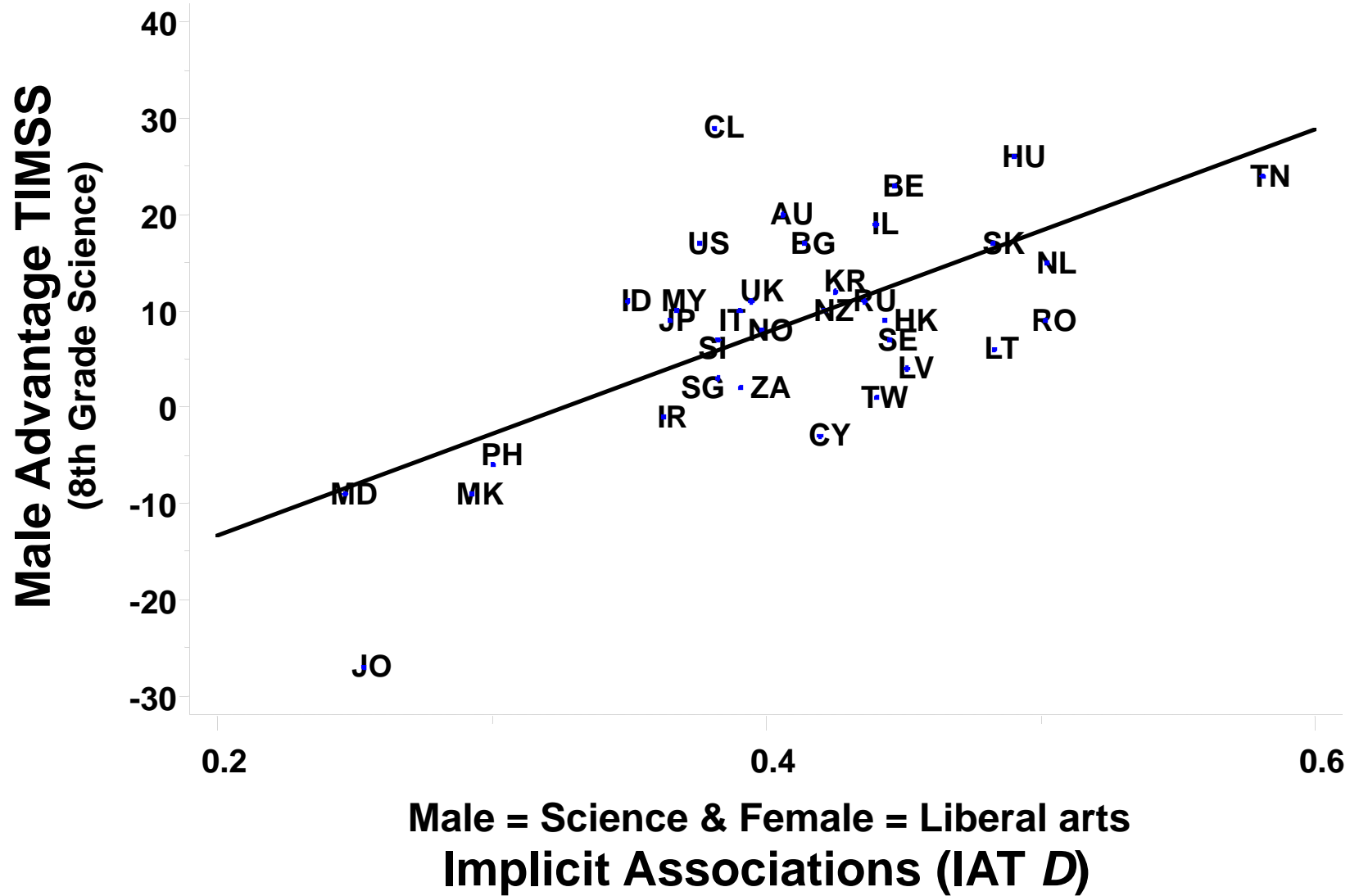


Female Respondents

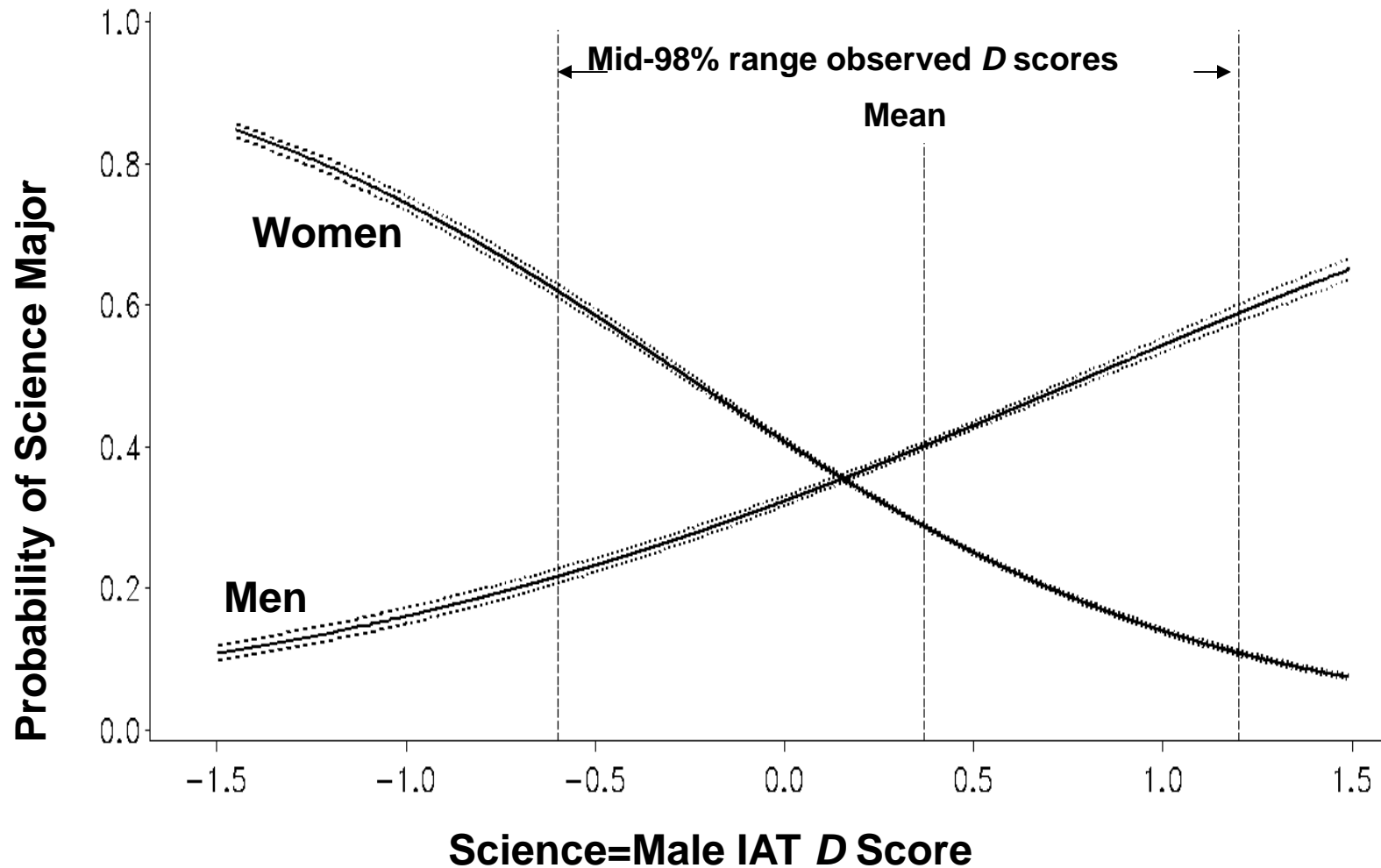


Women are not being kept out of science by force so “they must be *choosing* not to enter, presumably because they don’t *want* to; presumably because (by and large) they don’t *like* these fields or (on average) don’t tend to excel in them, which is nearly the same thing.”

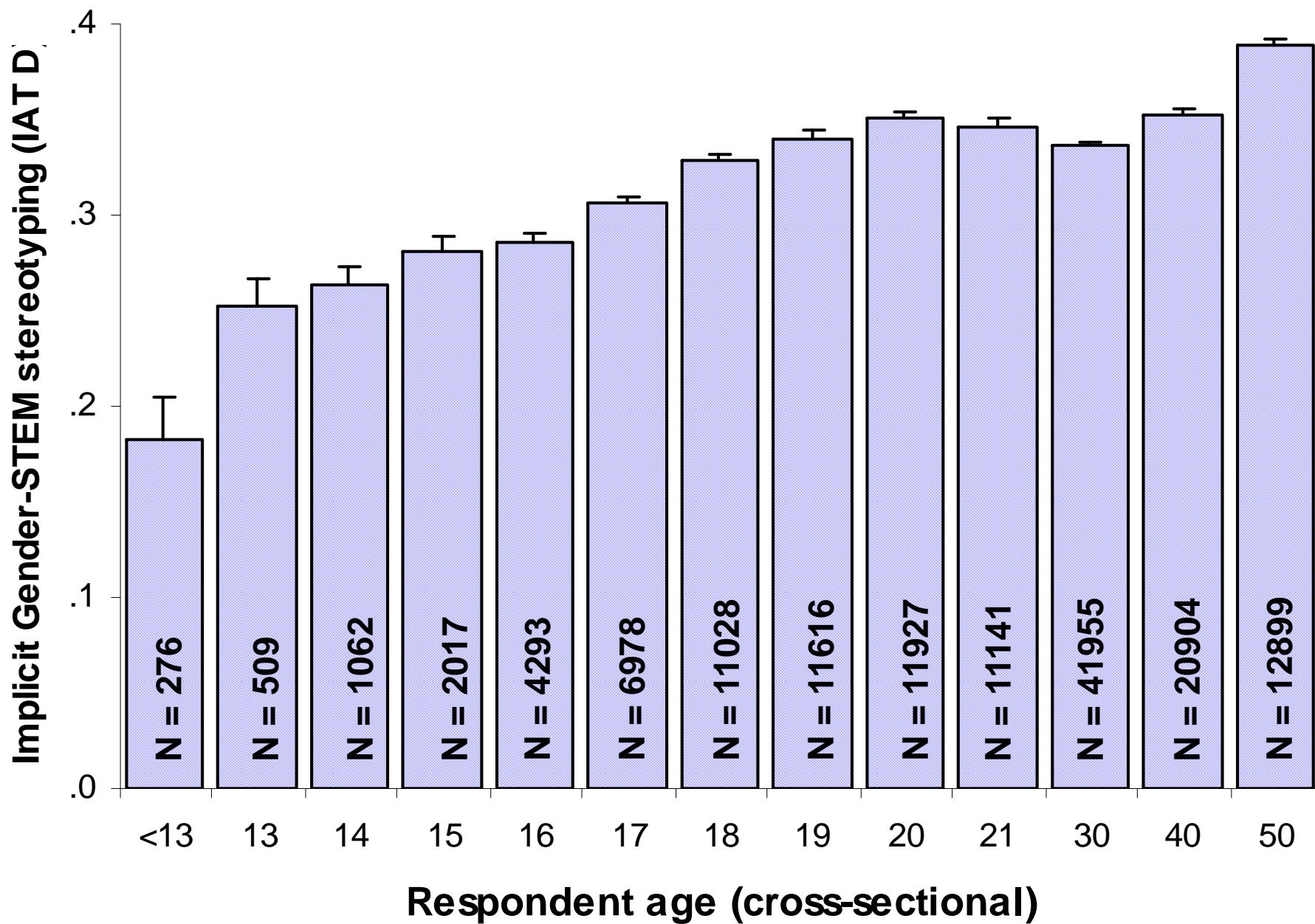
(David Gelernter, Department of Computer Science, Yale University, 1999, italics in original)



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



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



Science faculty assessment of resumes



3 Any Road, Any Town, Manchester, AN1 1CV

Telephone: 0111 899 2255
Mobile: 07777 111 222
Fax: 0111 805 3599
Email: marydoe12@aol.com

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 ($d = .60$)

http://implicit.harvard.edu/

- Black-White attitudes
- Young-Old attitudes
- Gay-Straight attitudes
- Thin-Fat attitudes
- Religion attitudes
- Skin-tone attitudes
- Disability attitudes
- Gender-science stereotypes
- Gender-career stereotypes
- American = White?
- Race-Weapons stereotypes
- Native American stereotypes

+ 36 country specific sites in 24 languages

The screenshot displays the Project Implicit website interface. At the top, the logo "Project Implicit®" is visible. Below the logo, there are three main sections:

- PROJECT IMPLICIT SOCIAL ATTITUDES**: A section for logging in or registering to find implicit associations about race, gender, sexual orientation, and other topics. It includes an "E-mail Address" input field, "LOGIN" and "REGISTER" buttons, and a guest access option with a country selector (currently set to "United States (English)") and a "GO!" button.
- PROJECT IMPLICIT MENTAL HEALTH**: A section for finding implicit associations about self-esteem, anxiety, alcohol, and other topics, with a "GO!" button.
- PROJECT IMPLICIT FEATURED TASK**: A section for measuring implicit race evaluations, specifically asking "Whom do you implicitly prefer among Whites, Blacks, Asians, and Hispanics?", with a "GO!" button.

Summary

- We do not observe our mental operations
- We cannot be certain about the causes of our decisions
- Implicit assumptions (mindsets) influence decisions
- Default = Decisions made, then reasons generated

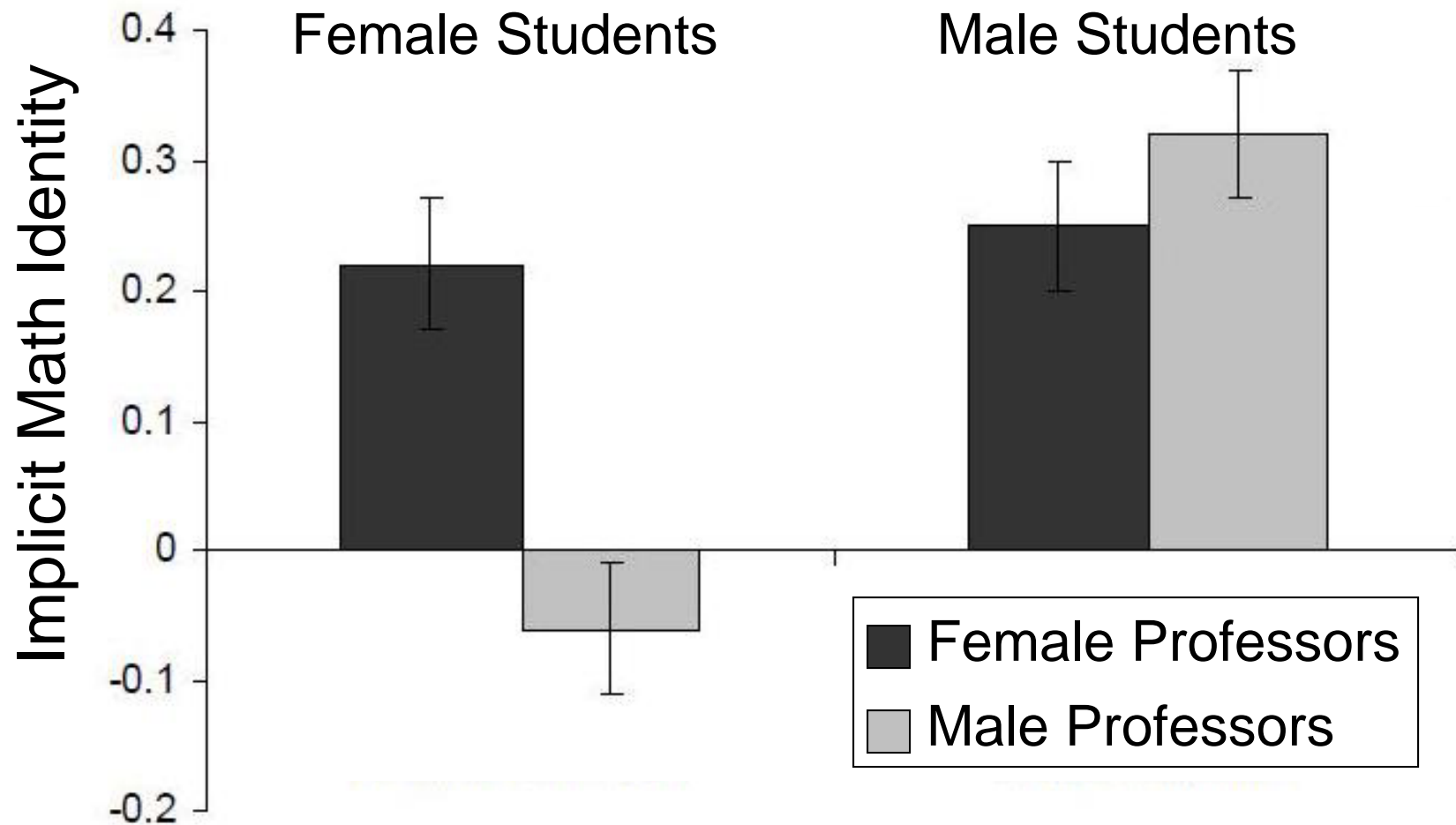
Part II

Brian Nosek (nosek@virginia.edu)

<http://projectimplicit.net/>; <http://briannosek.com/>

Practical steps for addressing
implicit bias

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

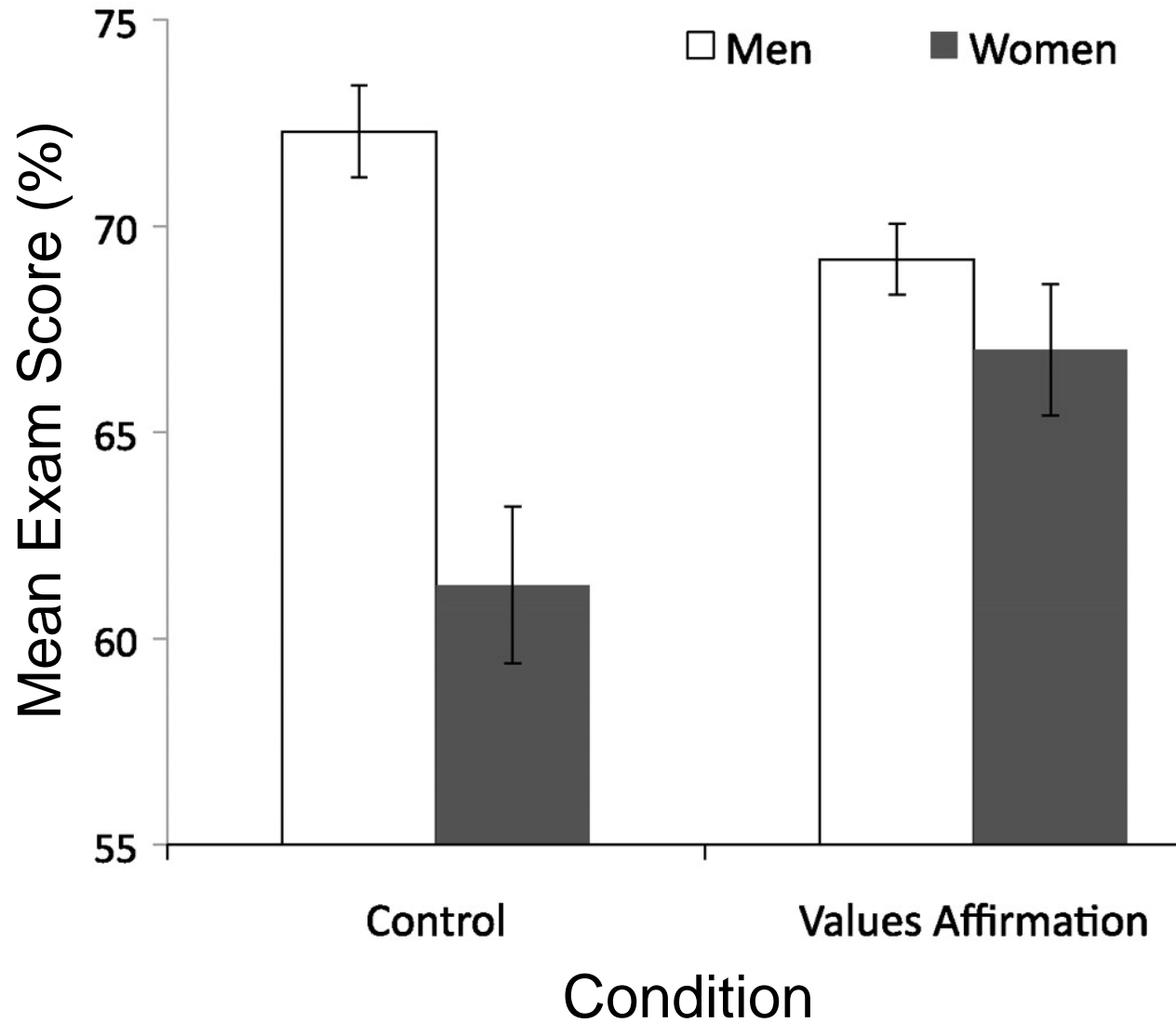
Music

Relationships with family and friends

Sense of humor

Spiritual or religious values

College Physics



Miyake,
et al., *Science*,
2010

When Is Bias Influential?

(tentative list)

- When decisions must be made quickly
- When we are stressed or tired
- When decision-making criteria are unclear
- When information is ambiguous or incomplete
- When we are overconfident in objectivity
- When organizational climate promotes it

What to do?

1. Changing implicit biases
2. Training skills to avoid influence of bias
3. Restructuring decision-making processes

Practical Steps

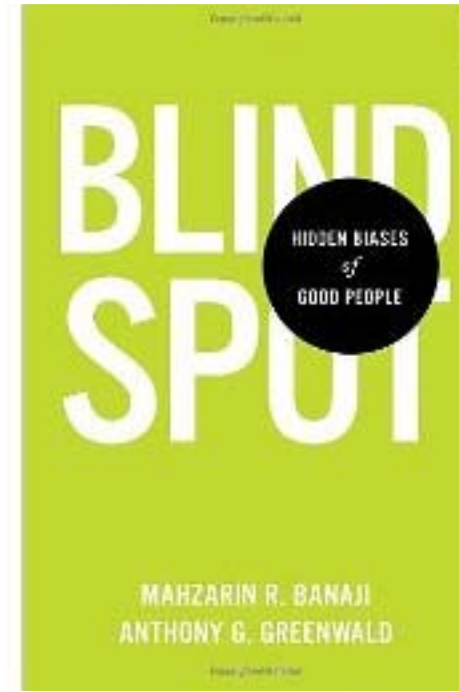
1. Search for counterevidence: Team of rivals
2. Make assumptions explicit
3. Direct comparison – to standard or among candidates
4. Consider favors
5. Address self-fulfilling prophecies
6. Data!

Brian Nosek
nosek@virginia.edu

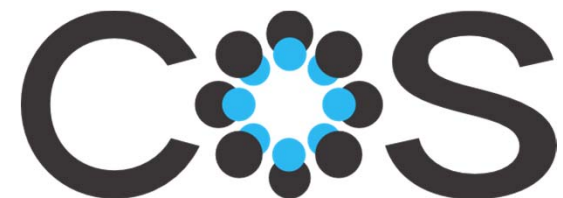
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<http://briannosek.com/>

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<http://implicit.harvard.edu/>

Center for Open Science
<http://cos.io/>



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