

The Impact of Implicit Bias on Women and Underrepresented Minorities in STEM

LEAD 2008

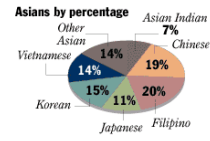
Dr. Sapna Cheryan
Department of Psychology
University of Washington
July 21, 2008

Increasing emphasis on diversity...



Asians in Washington

The Asian population grew rapidly during the 1990s led by Asian Indians whose numbers nearly tripled. Despite the surge of Chinese, Koreans and Vietnamese, Filipinos are still the majority Asian group in the state.



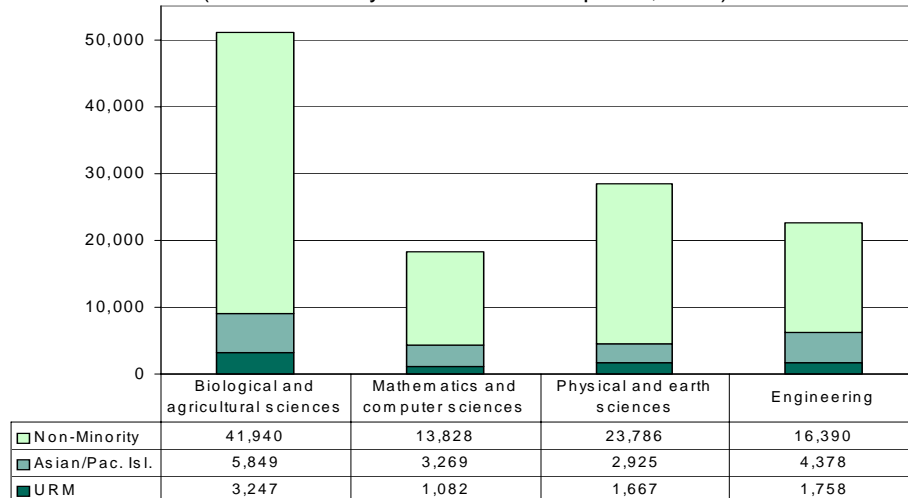
	1990	2000	% change
All Asians	195,918	322,335	65%
Filipino	43,799	65,373	49%
Chinese	33,962	59,914	76%
Korean	29,697	46,880	58%
Vietnamese	18,696	46,149	147%
Japanese	34,366	35,985	5%
Asian Indian	8,205	23,992	192%



Yet women and minorities are still underrepresented in many domains.

Number of Doctoral-Degreed Faculty (All Tenure Statuses) by Discipline and Ethnicity, 2003

(Source: Survey of Doctorate Recipients, 2003)



<http://www.cpst.org>

Data provided by CPST and Lisa Frehill

A majority of faculty at R1 schools earned Ph.D.s at R1s . . . URM and Asian/Pacific Islanders at R1s are more likely to have come from non-R1 schools than non-minority faculty.

(Source: National Study of Postsecondary Faculty, 2004)

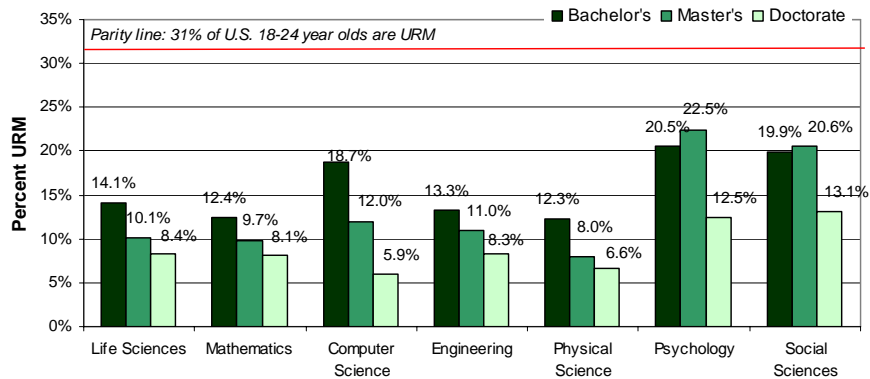
		Current Institution					
		URM		Asian/Pacific Islander		Non-Minority	
		R1	< R1	R1	< R1	R1	< R1
PhD Inst.	R1	79.2%	63.7%	81.7%	68.4%	86.9%	65.4%
	<R1	19.8%	34.7%	16.7%	31.5%	10.2%	33.2%
	Unk.	1.1%	1.6%	1.6%	0.1%	2.9%	1.4%



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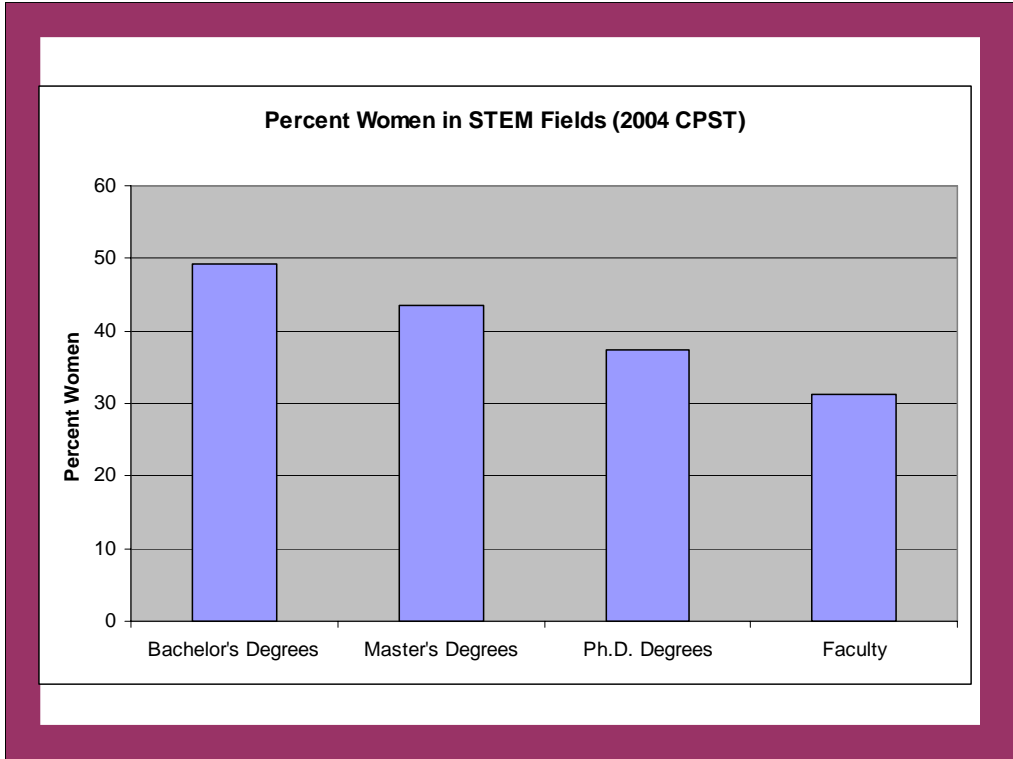
The URM pipeline to doctoral degrees is far from “full” . . .
 Not at “parity” with representation in the population.
 (Degree awards, 2005)



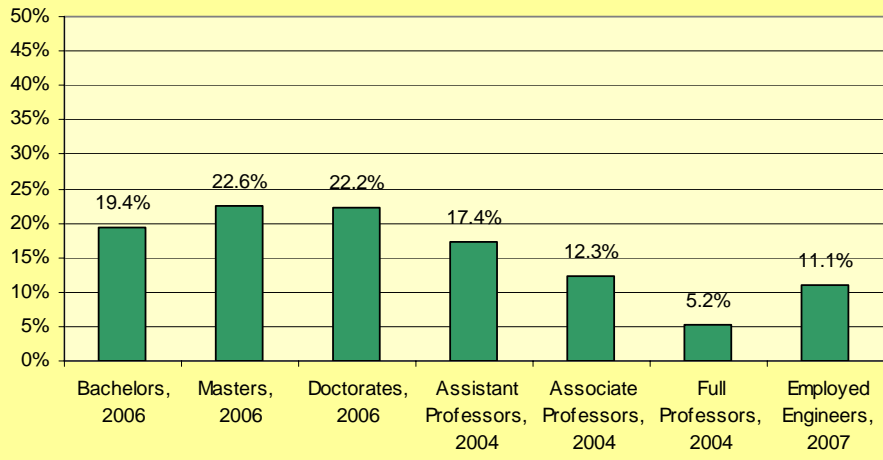
Source: CPST analysis of IPEDS data using NSF's WebCASPAR system. Life Sciences includes biological and agricultural sciences; Physical sciences includes the earth, atmospheric and ocean sciences disciplines. URM = Under-represented minority and includes African American, American Indian and Hispanics.



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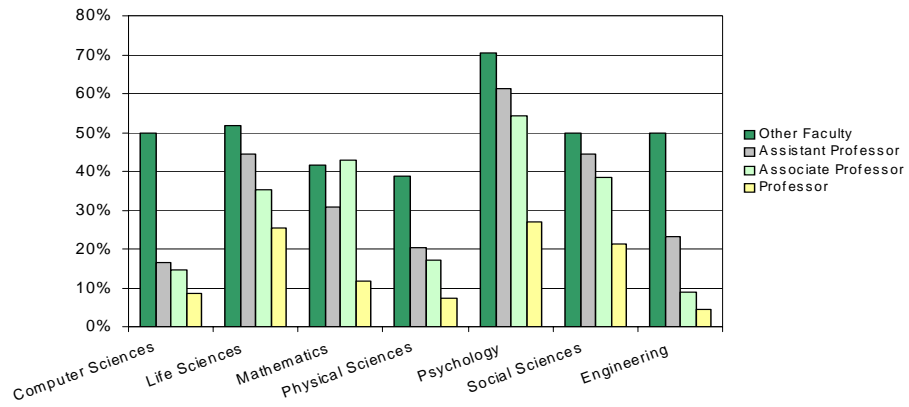


Women in the Engineering "Pipeline"



Source: CPST analysis of NSF's WebCASPAR database (degree data), American Society for Engineering Education (faculty data), and Bureau of Labor Statistics (overall employment).

Women as a Percent of Ph.D.s Employed in Universities & 4-Year Colleges by STEM Field and Rank, 2003



Source: Analysis of original data from: *National Science Foundation. Women, Minorities, and Persons with Disabilities in Science and Engineering, 2007.*



<http://www.cpst.org>

Why we care

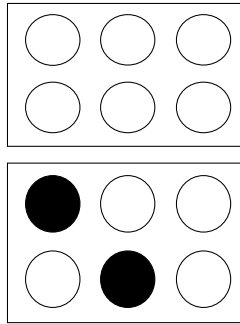
- 1) People are missing out on well-respected, influential, and flexible careers (Kalwarski, Mosher, Paskin, & Rosato, 2007)
- 2) STEM fields are missing out on potential talent (National Academy of the Sciences, 2003)
- 3) STEM fields are missing other perspectives (Margolis & Fisher, 2002)



- 4) Strength of diverse groups (Sommers, 2006)

Influence of racial composition on jury decision making (Sommers, 2006)

N = 29 juries (6 people each)



Influence of racial composition on jury decision making (Sommers, 2006)

Diverse juries:

- More information exchange
 - Took longer
 - Discussed more case facts
 - Discussed more missing evidence
- More accurate
 - Fewer inaccurate statements
 - Fewer uncorrected inaccuracies
- More openness to discussing race
 - Discussed more race-related topics
 - Fewer objections to considering race

Almost all driven by Whites!

Influence of racial composition on
jury decision making (Sommers, 2006)

Whites' in diverse groups less likely to vote
guilty, *even before deliberations began*

In diverse juries, Whites are:

- Reminded to not be prejudiced
- Processing trial info more closely
- More receptive to discussing racism

Benefits of diversity

cut

Why are we not there?

the role of bias

Bias is not what most people think it is

Common understanding:

bias = conscious, intentional, to inflict harm

But what the research shows:

bias = automatic, outside of our awareness,
unintentional, conflicts with our conscious
beliefs

TAE CAT



Unconscious bias:
The Implicit Association Test

A demo

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

Resume study (Neumark, 1996)

STACY BENJAMIN

2089 Beacon Hill, Boston, MA 02127
(H) 617-238-2344 (C) 617-222-9998 benjamins@aol.net

OBJECTIVE: Dedicated Registered Nurse with ten years' practical experience, now seeking a Pharmaceutic al Sales position, which will make use of comprehensive health care training, excellent communication skills and self-directed determination.

PROFILE:

- Extensive knowledge of medical equipment, products and pharmaceuticals.
- Demonstrated aptitude for developing new skills.
- Readily develops rapport with patients, families, staff and other health care professionals.
- Relate well to people from a variety of cultures and socio-economic conditions.
- Strong analytical skills easily assess conditions and implements appropriate intervention.
- Possess special sensitivity to meeting diverse needs in varied situations.
- Proven record of reliability and responsibility.
- Recognized for excellent teaching and coaching abilities.
- Proven skill in completing projects; ability to multitask effectively.
- Dedicated individual; reputation for consistently going beyond what is required.

EXPERIENCE:

Boston General Hospital, Boston, MA 2003
Surgical Nurse, Surgical Unit

- Fulfilled the role of charge nurse, with responsibility to supervise 2RN's, 3 LVN's and a Unit Secretary on the weekend shift.
- Evaluate staffing requirements, floor assignments and organize unit activities for a 29 bed surgical unit, which provided services to orthopaedics, neurology and general surgery.
- Implement total patient care through a team nursing process covering 8-10 high acuity patients per shift.
- Act as patient advocate; assess patient status and notify physicians of clinical changes.
- Coordinate services, treatments and consultations using Meditech computer system.

Massachusetts Military Base 2002
Nurse Manager, PACU/AFU

- Supervised a staff consisting of 4 nurses, 2 medical technicians and 1 British Cavalry Personnel, scheduling work commitments, coordinating activities and providing direction.
- Responsible for patient care in a complex environment providing care for post-dunk patients through to general patients.
- Coordinate the resuscitation and up to 15 emergency care during inter-arrivals with ambulances.

SCOTT BENJAMIN

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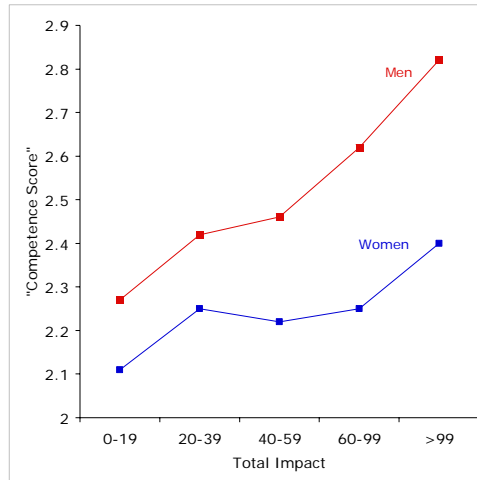
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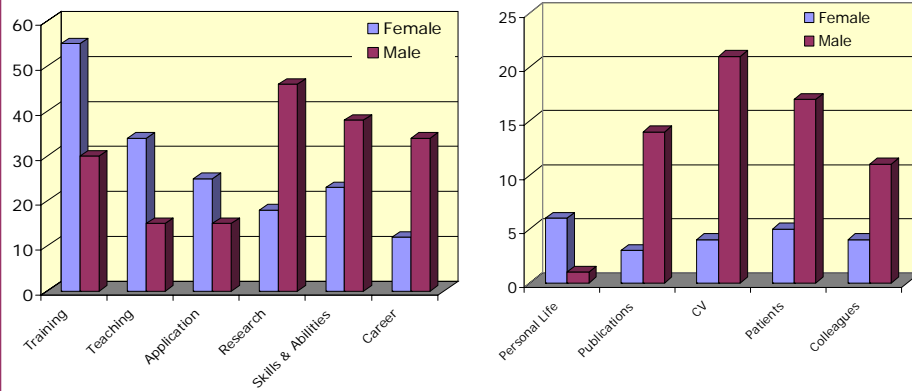
Post-doc applications (*Wennerås & Wold, 1997*)

- Study of Swedish Medical Research Council review
- Women needed to produce more than 99 “impact factors” to be perceived as competent as men with only 20 impact factors.



Nature 387:341-343.

Recommendation letters (*Trix & Psenka, 2003*)



"Exploring the color of Glass: Letters of Recommendation for Female and Male Medical Faculty"
Discourse & Society 14: 191-220.

- Analysis of 300 letters of recommendation for medical faculty.
- Descriptions of women by letter writers emphasized teaching.
- Descriptors of men by letter writers emphasized their role as researchers and professionals.
- Fewer superlatives used to describe women.

Responding to Leaders (Butler & Geis, 1990)



Asking favors (Flynn, 2007)



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service

Impact of stereotypes on career aspirations

(Cheryan, Plaut, Davies, & Steele, under review)

Computer science majors are...

“Nerdy, techie, stay up late coding and drinking energy drinks, no social life.”

“Pale, sometimes socially frustrated, inquisitive, skilled, focused.”

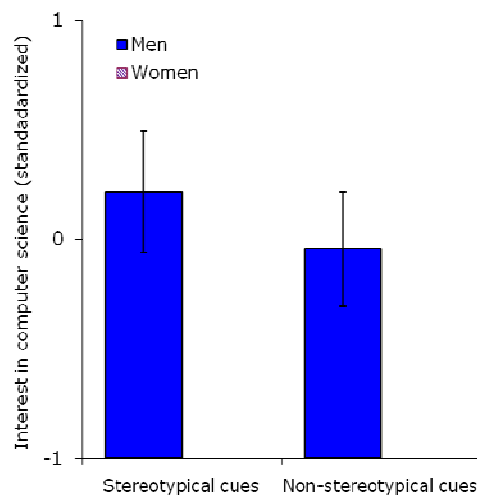
“They are usually guys, very intense, very intelligent, intuitive, and quick. They don't frequently take showers.”

Signaling belonging (Cheryan et al., under review)

Room in Gates CS building decorated with stereotypical or non-stereotypical objects



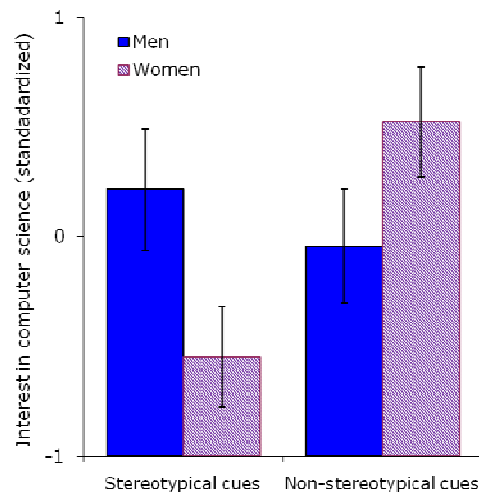
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Cheryan, Plaut, Davies & Steele (under review)

Interaction: $F(1, 35) = 10.22, p < .01$

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Stereotype threat (Steele, 1997)

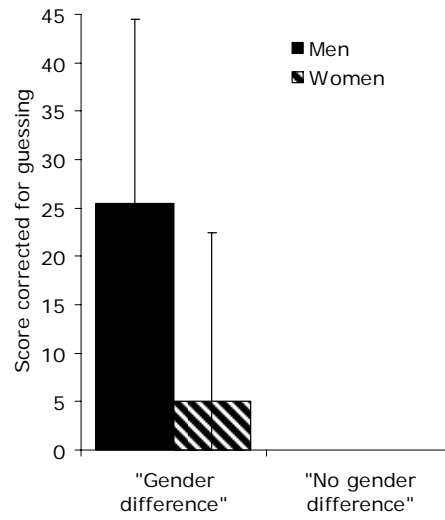
stereotype threat - fear of confirming a negative stereotype about your group (Steele, 1997)

Method (Spencer, Steele, & Quinn, 1999)

- Male (N = 24) and female (N = 30) students with college math experience
- Administered a 30 minute GRE math subject test, divided:
“gender differences” vs. “no gender differences”

Stereotype threat

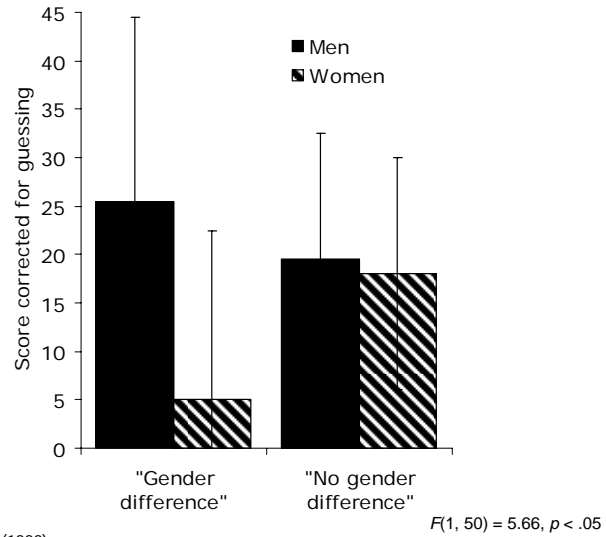
Results



Spencer, Steele, & Quinn (1999)

Stereotype threat

Results



Spencer, Steele, & Quinn (1999)

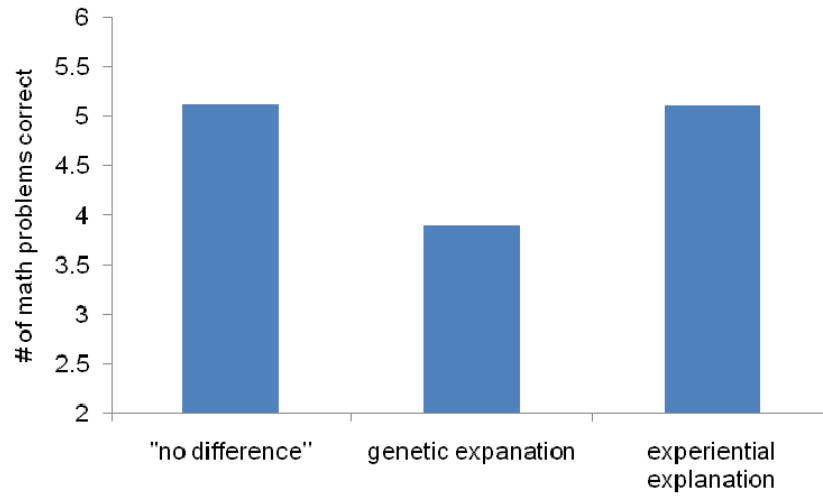
Stereotype threat (Dar-Nimrod & Heine, *Science*, 2006)

Method

- Female students with college math experience
- Administered two math sections separated by a verbal comprehension section
 1. “No gender differences”
 2. Gender differences because of genes
 3. Gender differences because of experience

Gender diff vs. no gender diff manip remind you of anything

Stereotype threat (Dar-Nimrod & Heine, *Science*, 2006)



Takeaways

Bias can manifest in different ways

- deliberate
- unconscious
- “in the air”

Impact behaviors

Finding solutions (stay tuned)

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Lessons from jury study

Indiv & structural & cultural

...linking it to the rest of the workshop

David's fall email

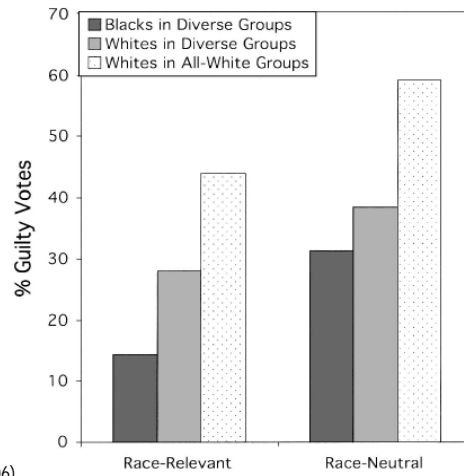
A few solutions

- Acknowledge that diversity can be a competitive advantage
- Establish clear written procedures that minimize cognitive errors
- Promote diversity and ensure an equitable workplace at every level of the institution
- Construct welcoming environments

Thank you!

Influence of racial composition on jury decision making (Sommers, 2006)

Pre-deliberation opinions



Sommers (2006)

Main effect of race
Main effect of prime
Whites in diverse groups had fewer guilty votes than Whites in all-White groups

end