Breaking the Bias Habit:
A Cluster Randomized Controlled Study of an Educational Intervention in STEMM Departments

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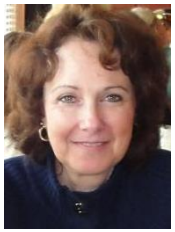

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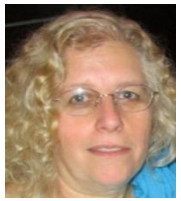

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Premise:

1. The mere existence of cultural stereotypes leads to unintentional and unwitting bias in judgment and decision-making
2. These “implicit biases” occur as *habits of mind* even in those who personally disavow prejudice
3. If they are habits, they should be remediable

R01 GM088477
NIH RFA-GM-09-012:
Research on Causal Factors and Interventions that Promote and Support the Careers of Women in Biomedical and Behavioral Science and Engineering (R01)

Cultural stereotypes about men and women

- Men are *agentic:* Decisive, competitive, ambitious, independent, willing to take risks
- Women are *communal*: nurturing, gentle, supportive, sympathetic, dependent

Works of multiple authors over 30 years: e.g. Eagly, Heilman, Bem, Broverman

Supporting Evidence

- Funding discrepancies occur with type 2 (renewal) R01s (Ley & Hamilton. *Science* 2008; Pohlhaus et al., *Acad Med* 2011)
- "Goldberg" designs indicate that work performed by women is rated of lower quality than work performed by men regardless of the rater's gender (Isaac et al. *Acad Med* 2009)
- Science faculty rated a male applicant as more competent, hireable, deserving of mentorship, and worth a higher salary than an identically credentialed female student whom they found more likeable. *(Moss-Racusin et al. PNAS 2012)*

Race Context

Implicit bias predicts behavior:

- Awkward body language in conversations between a White student and a Black student *(Dovidio, et al., 2002)* or Black experimenter *(McConnell and Leibold, 2001)*
- Interpretation of friendliness in facial expressions *(Hugenbert & Bodenhausen, 2003)*
- More negative evaluations of a Black vs. a White individual's ambiguous actions *(Devine, 1989; Rudman & Lee, 2002)*
- Inadequate prescription of opioid analgesics in identical clinical vignettes of Black vs. White patients in pain *(Sabin, 2012)*
- Failure to follow treatment guidelines in prescribing thrombolytic therapy in identical vignettes of Black vs. White patient with acute myocardial infarction *(Green et al., 2007)*

Breaking a habit takes *more than good intentions*

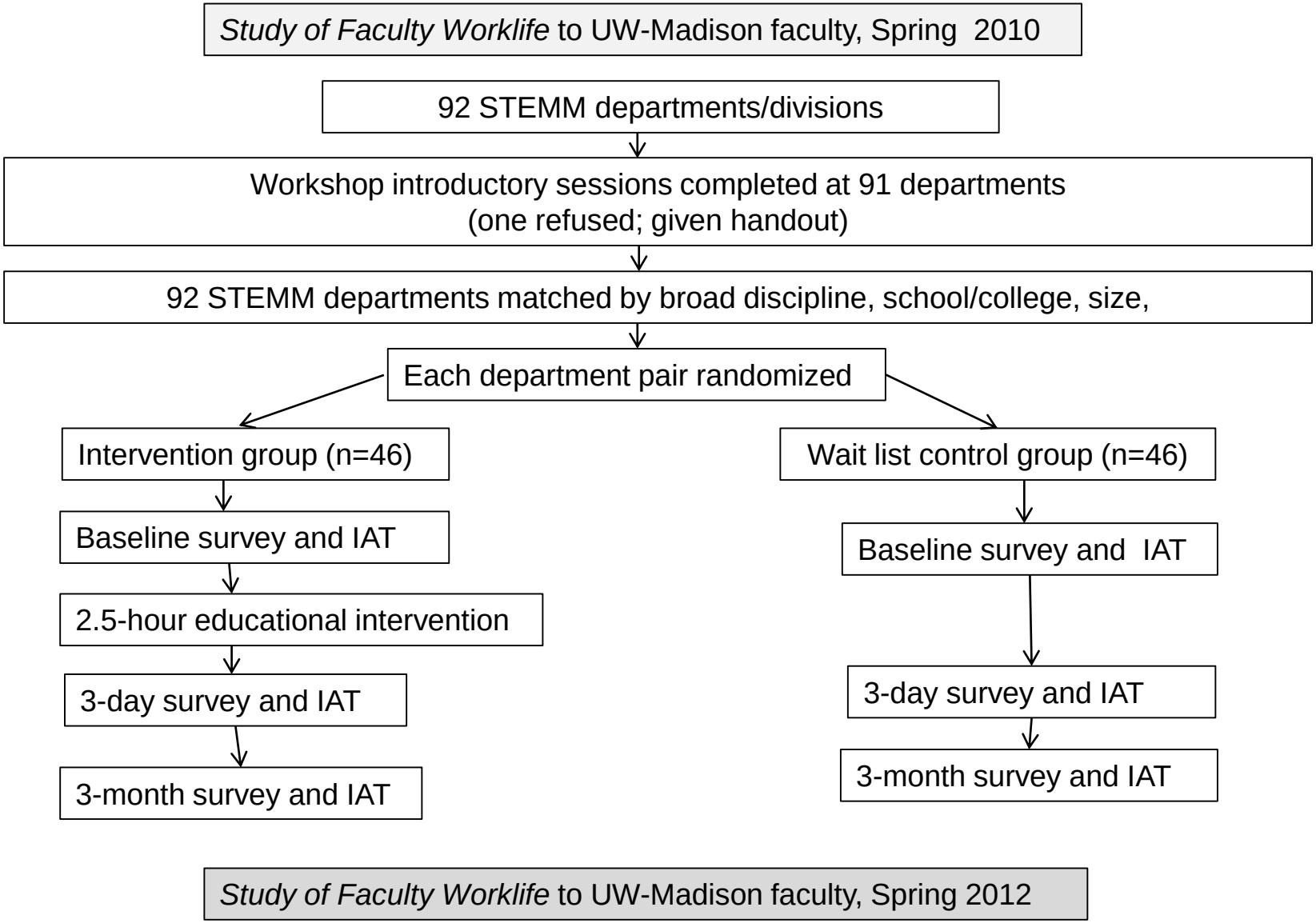
- Awareness
- Motivation
- Self-efficacy
- Positive outcome expectations
- Deliberate practice

e.g. Bandura, 1977, 1991; Devine, et al., 2000, 2005, 2008; Ericsson, et al., 1993; Prochaska & DiClemente, 1983, 1994

Breaking the Bias Habit in STEMM Faculty

- Cluster Randomized Controlled Study
- 92 departments – 46 pairs
  - Division, School/College, Size
  - Randomized to intervention or wait-list control
- Intervention = Bias Literacy Workshop
- Measures
  - Implicit Association Test (gender and leadership)
  - Motivation to engage in gender bias reduction
  - Gender equity self-efficacy
  - Gender equity outcome expectations
  - Self-reported gender equity action
- *Study of Faculty Worklife Survey*

Study Design



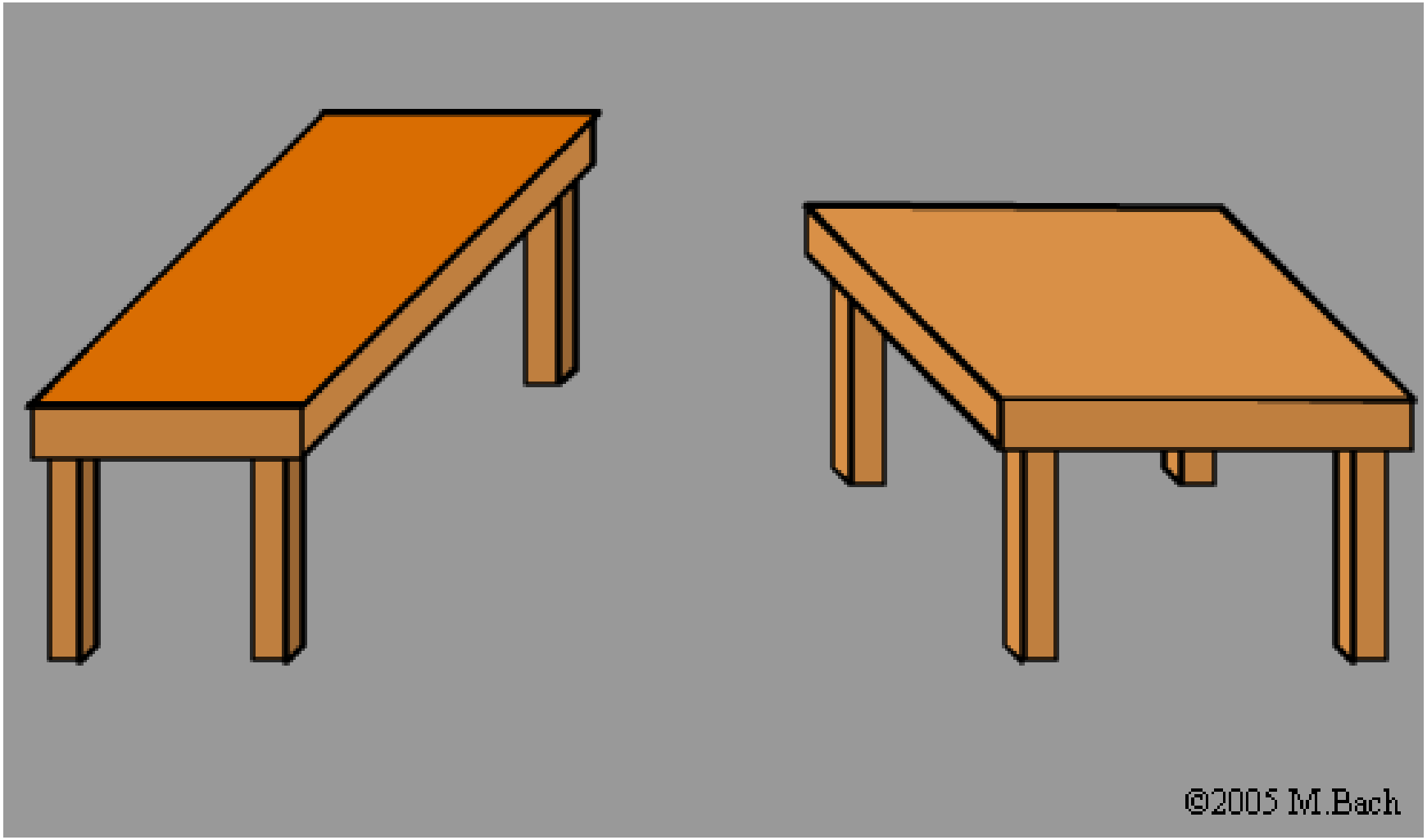
Workshop Format

- Introduction – make the case with evidence, economic issue, paired activity
- Module 1 origins of implicit bias
- Module 2 bias literacy
- Module 3 bias-reducing strategies
- Summary – written commitment to action

Carnes et al. J Diversity in Higher Educ, 5:63-77, 2012

Module 1 – Origins of Bias

- Demonstrate how habits of mind can be subject to error and fail our intentions
- Lead participants conceptually from object perception to social perception
- Discuss IAT as measure of strength of association between trait and social group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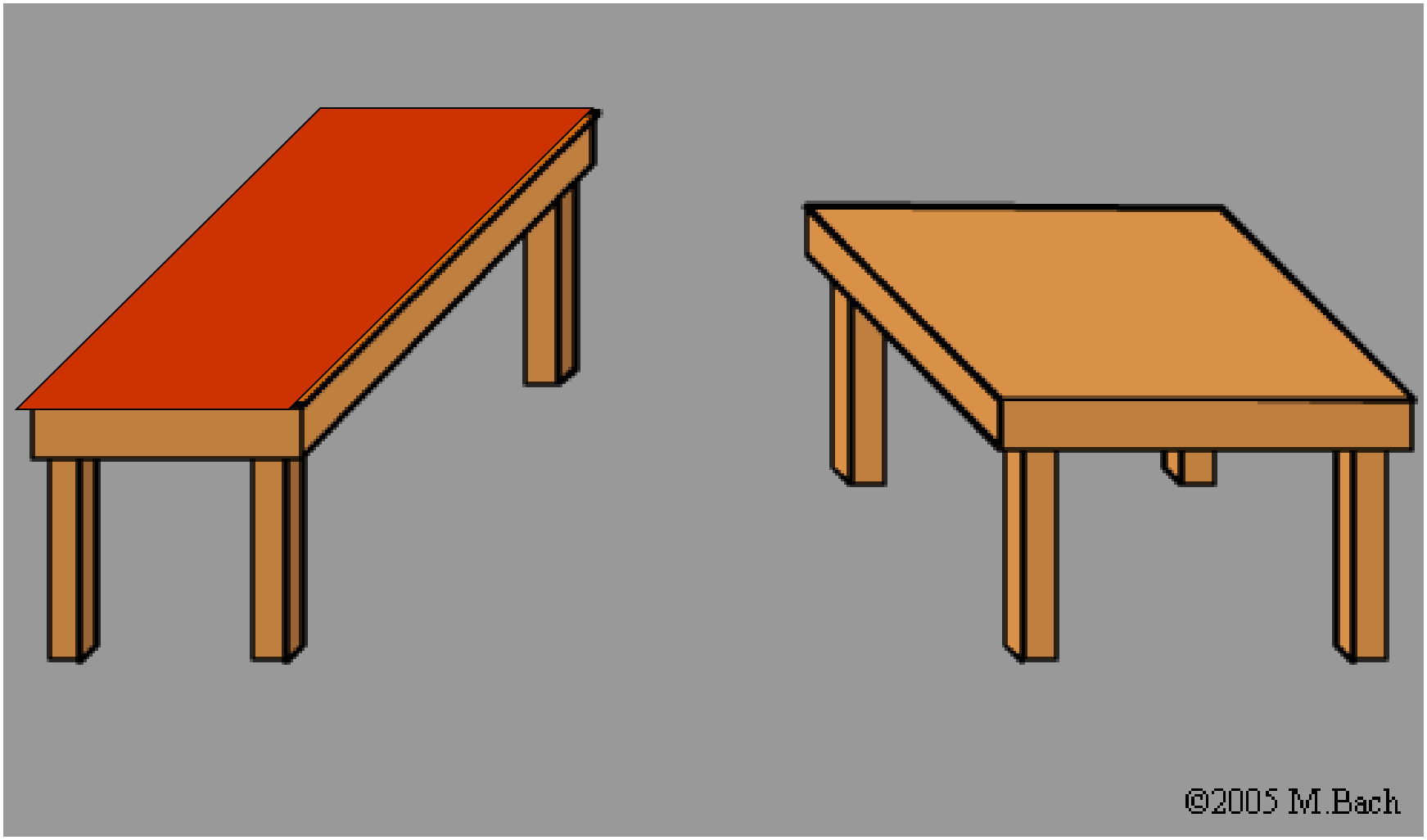
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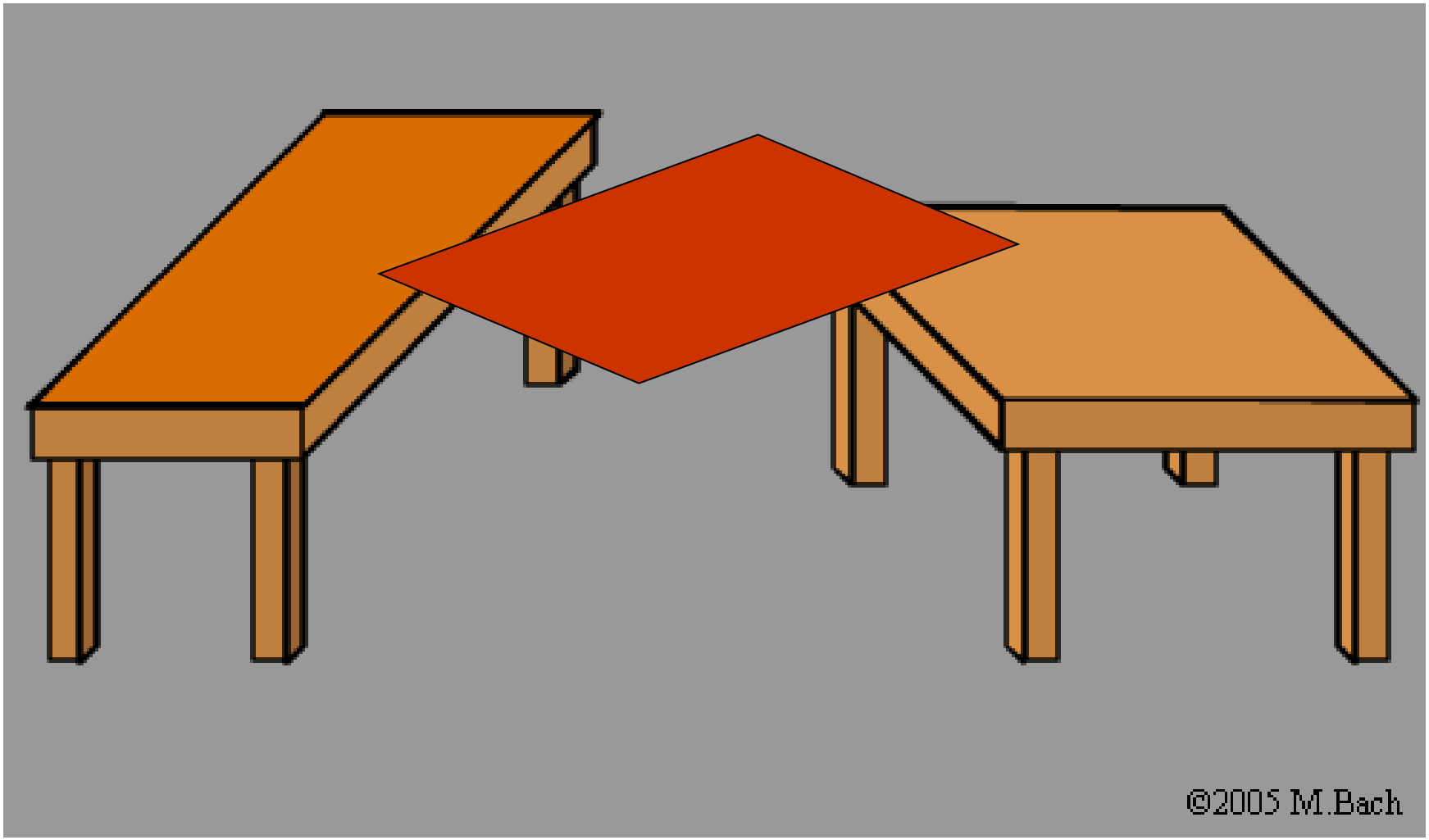
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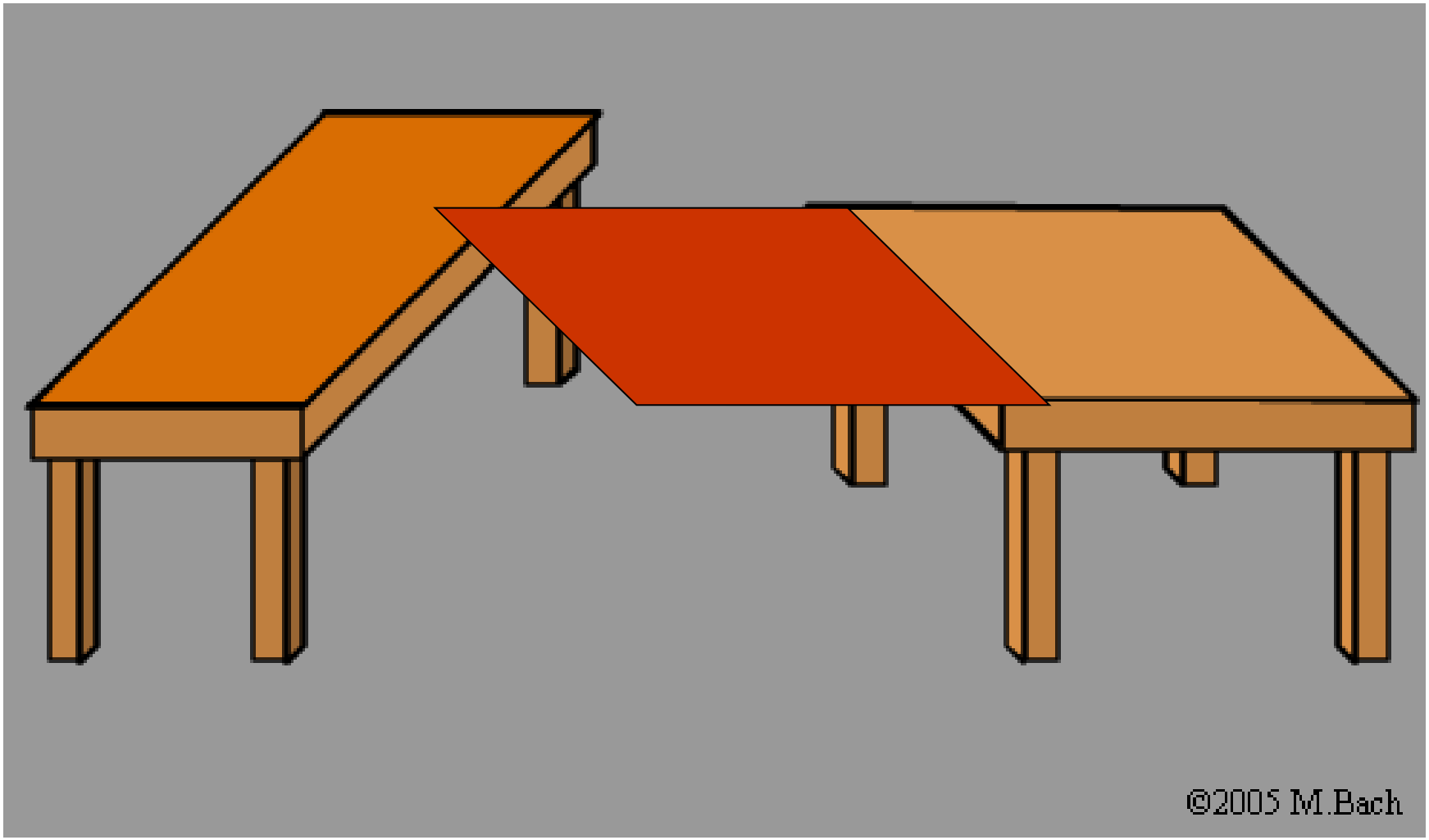
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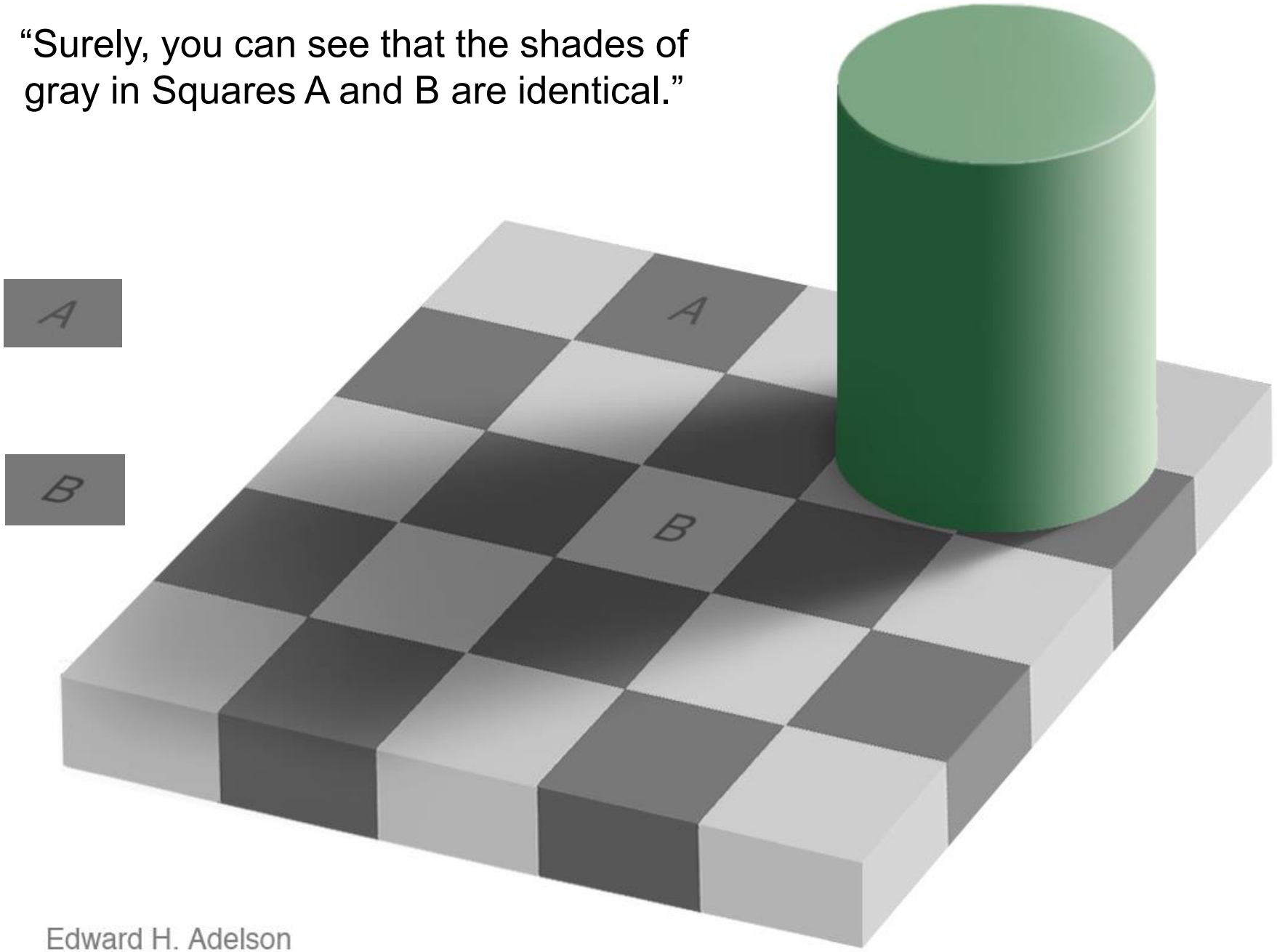
“Surely, you can see that the shades of gray in Squares A and B are identical.”



Edward H. Adelson

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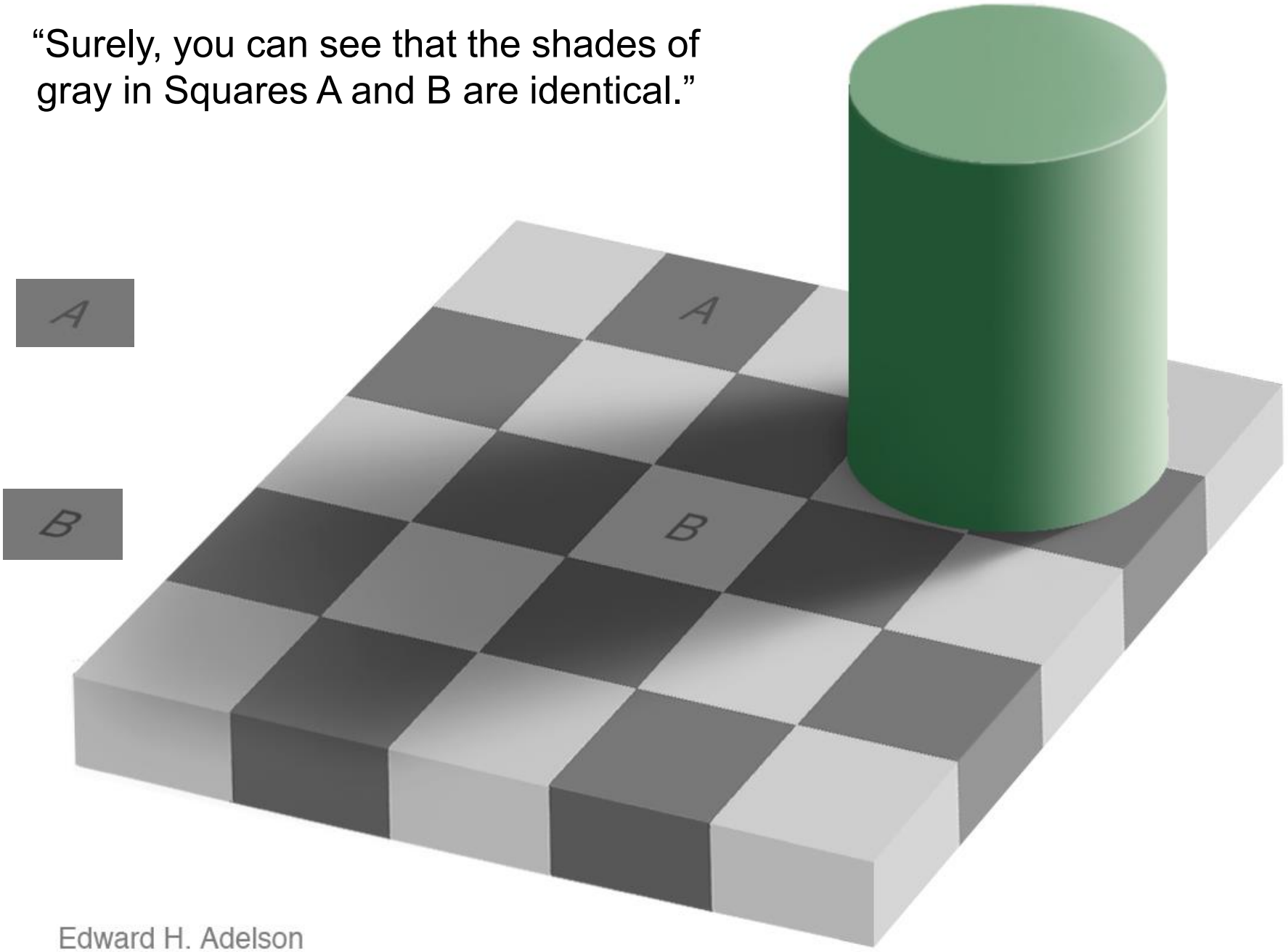

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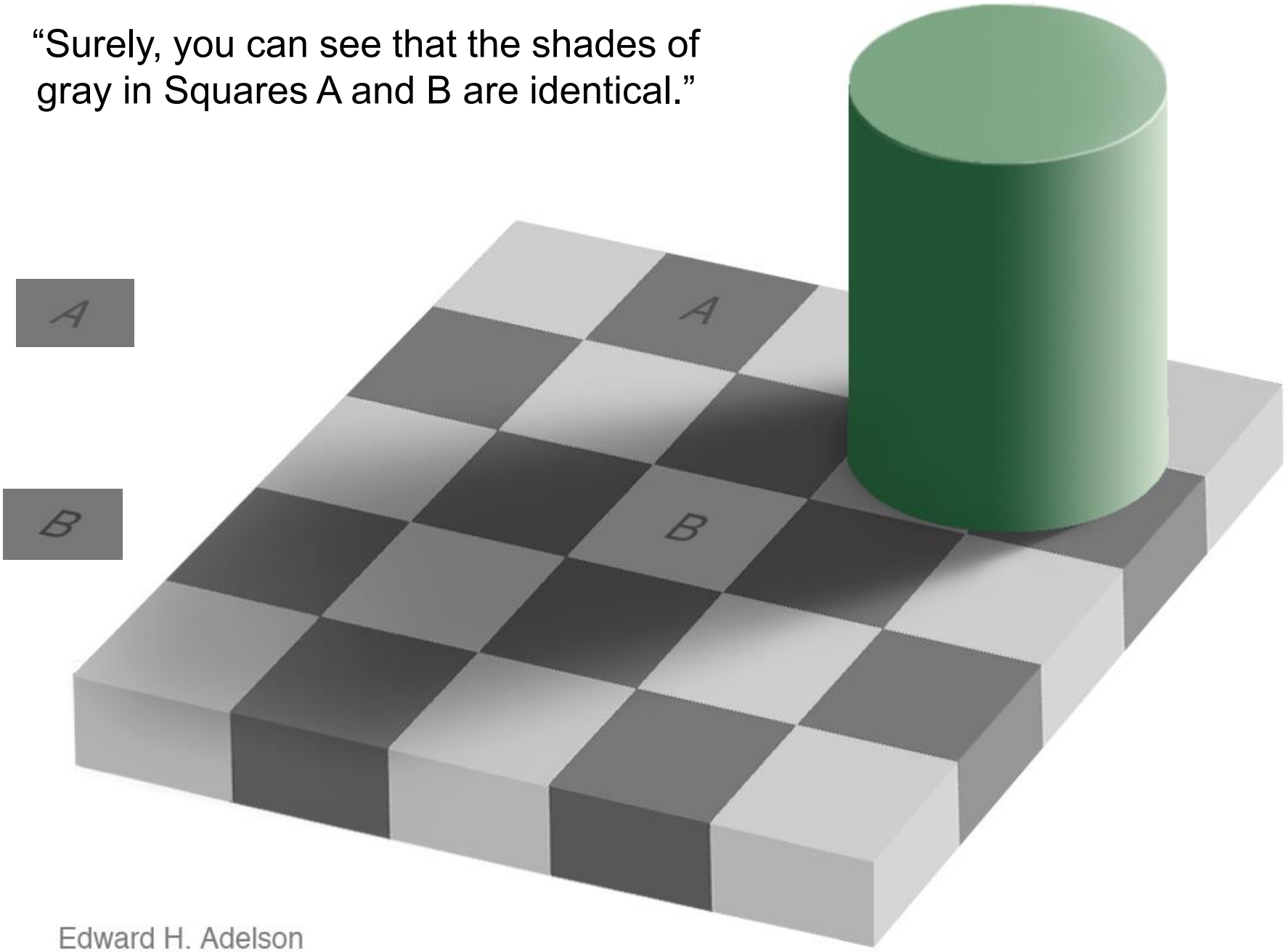

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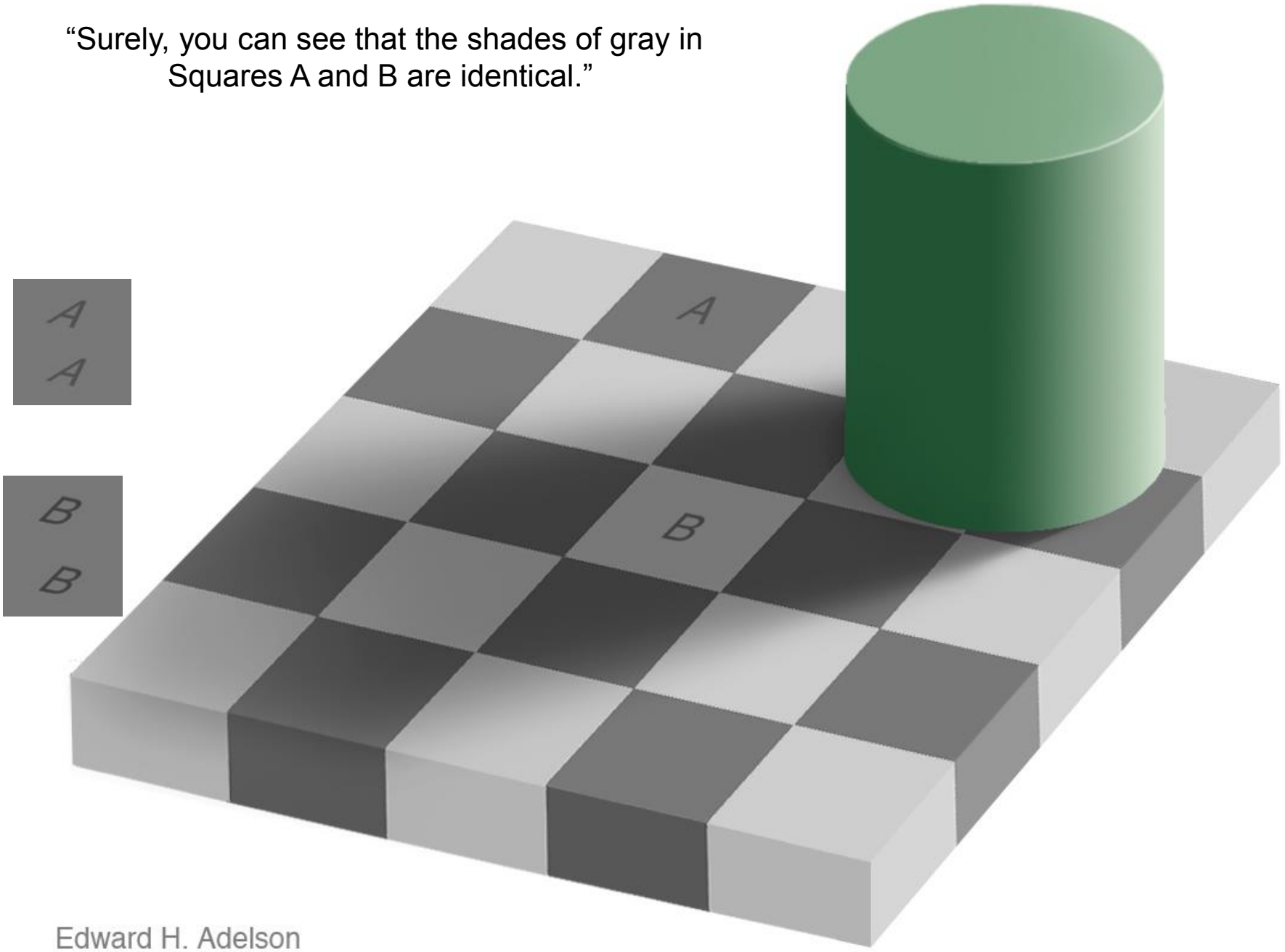

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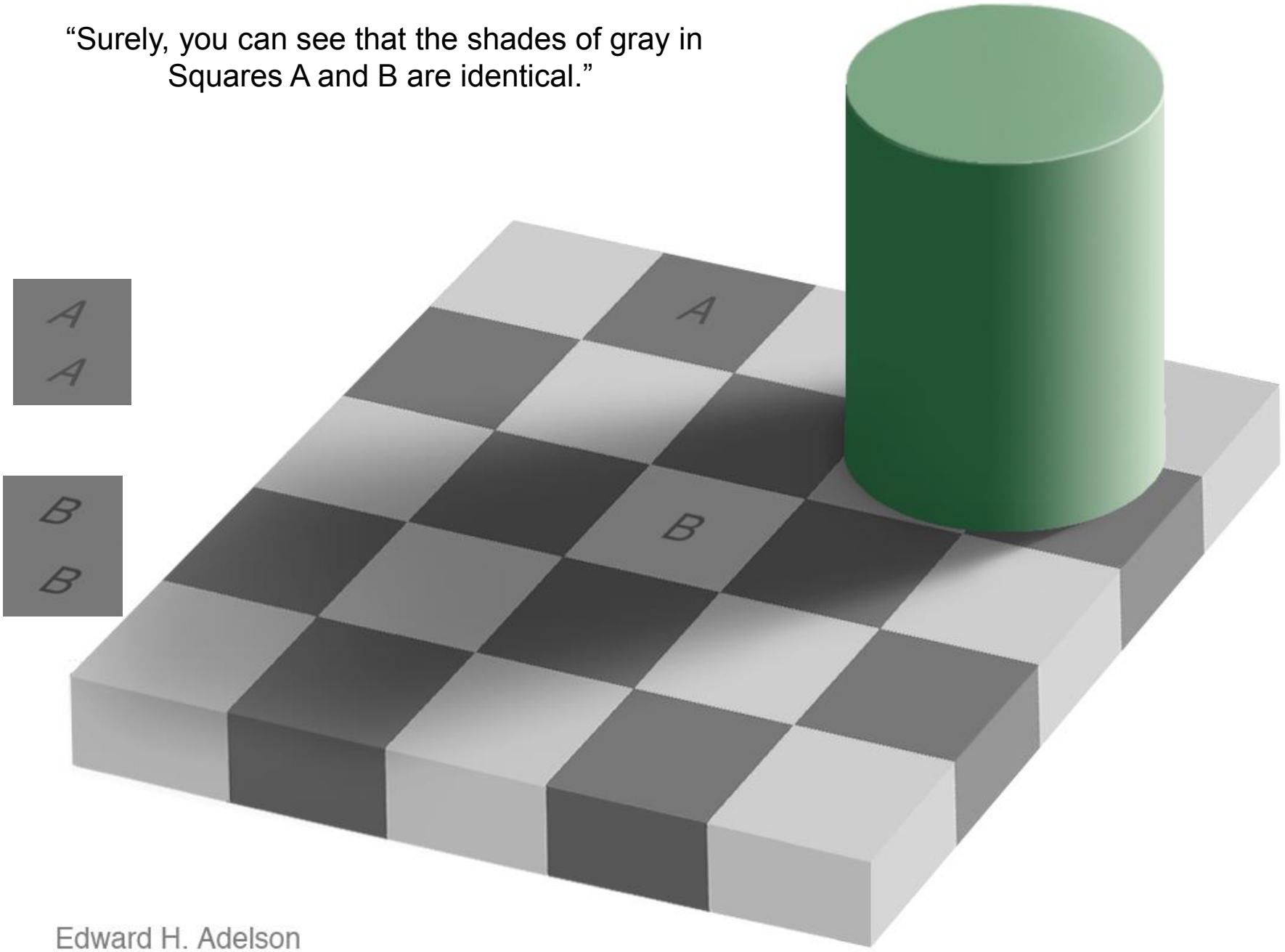

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Stroop Color Naming Task

Compatible Trials

RED

BLACK

BROWN

GREEN

YELLOW

BLUE

Incompatible (interference) Trials

RED

BLACK

BROWN

GREEN

YELLOW

BLUE

Discussion of the IAT

Logic of the IAT

- IAT measures strength of associations between categories such as “male and female” and attributes such as “leader and supporter” roles
- Strength of association reflected in the time it takes to respond to the stimuli while trying to respond rapidly
- Trial Types

Congruent Trials

Press “LEFT” key for

Leader

OR

Male name

Press “RIGHT” key for

Supporter

OR

Female name

Incongruent Trials

Press “LEFT” key for

Leader

OR

Female name

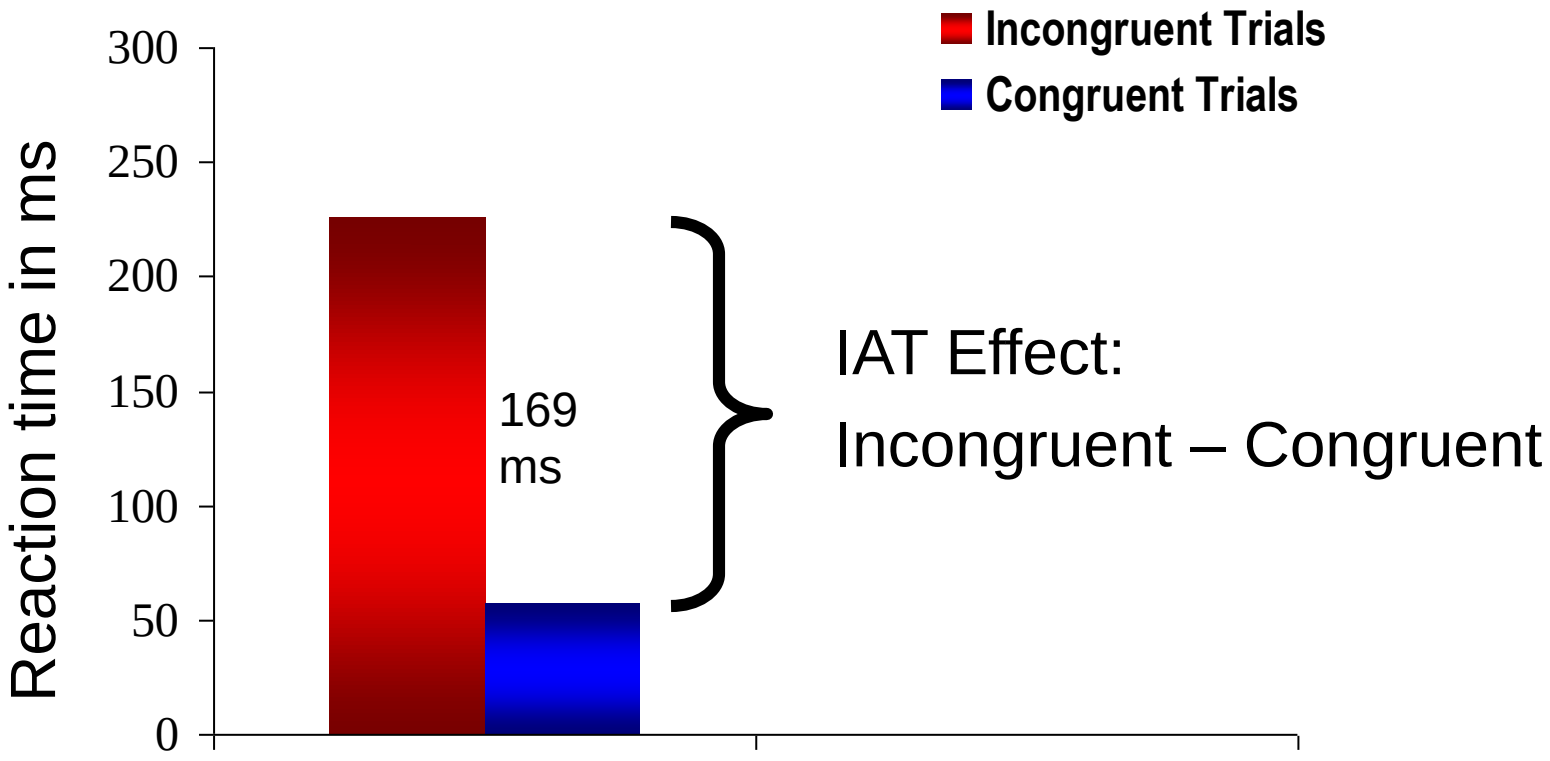
Press “RIGHT” key for

Supporter

OR

Male name

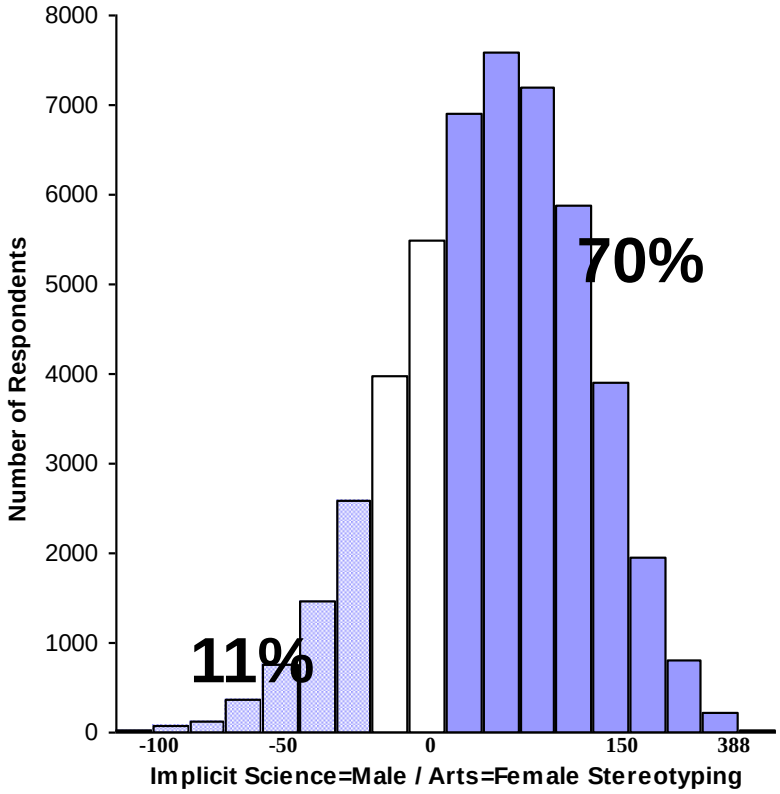
IAT Effect



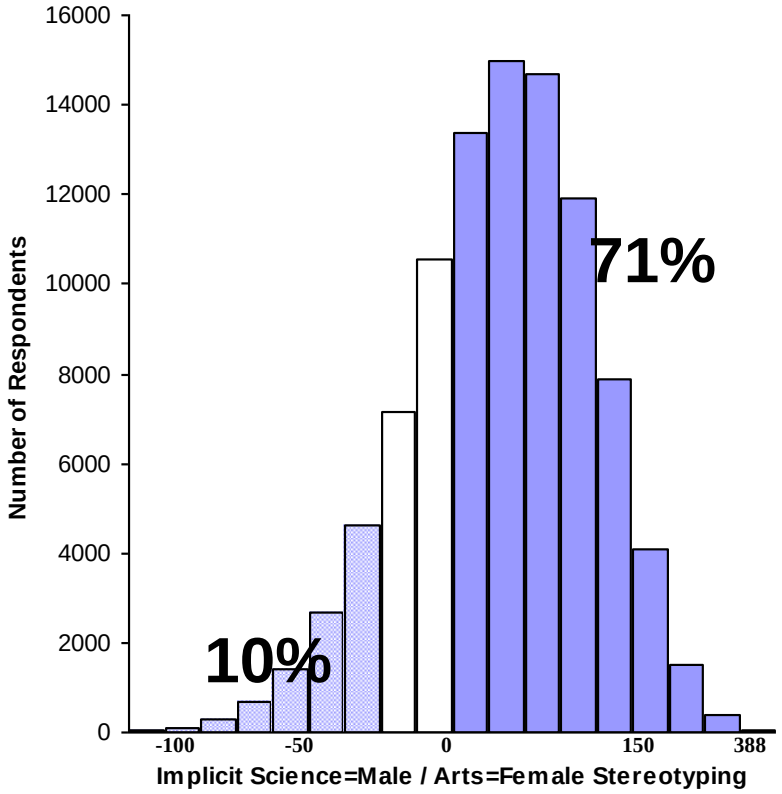
The larger the difference, the greater the bias in associating men with leader roles and women with supporter roles

Implicit Gender-Science Stereotypes

Male Respondents



Female Respondents



Nosek BA, Banaji MR & Greenwald AG, 2006

http://implicit.harvard.edu/

Module 2 – Bias literacy

- 6 bias constructs:
  - Expectancy bias
  - Prescriptive gender norms
  - Occupational role congruity
  - Reconstructing credentials
  - Stereotype priming
  - Stereotype threat
- Illustrate with experimental studies or real world examples
- Apply to cases as readers' theater

Module 3 – Personal Bias Reduction Strategies

- Stereotype Replacement
- Counter-Stereotypic Imaging
- Individuating
- Perspective-Taking
- Increase Opportunities for Contact

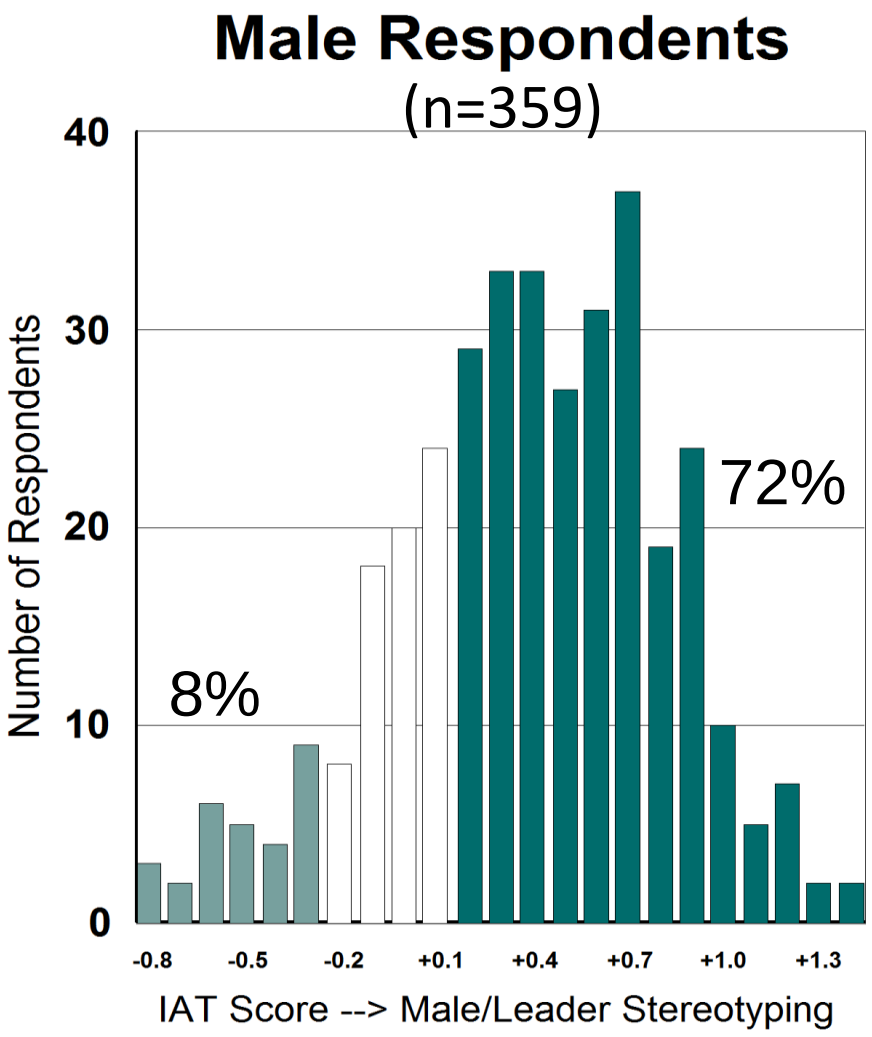
(e.g., Galinsky & Moskowitz J Pers Soc Psychol 2000; Monteith et al., Pers Soc Psychol Rev 1998; Blair et al., J Pers Soc Psychol 2001)

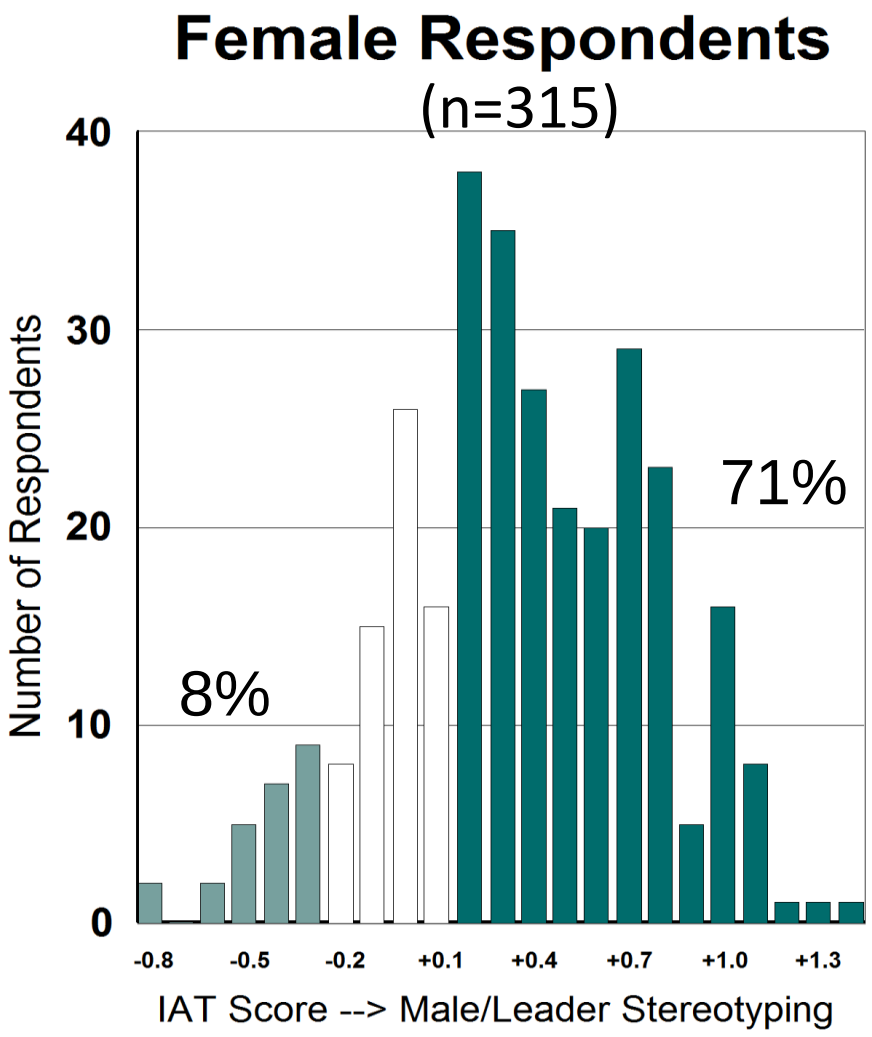
- Plus 2 that DON'T work:
  - Stereotype Suppression
  - Too Strong a Belief in One's Personal Objectivity

(e.g. Macrae et al. J Pers Soc Psychol 1994; Uhlmann & Cohen. Organ Behav Hum Decis Process 2007)

Study Departments – 2290 faculty

	46 Intervention N=1137	46 Control N=1153	
Size	5-107 (mean 31)	6-129 (mean 26)	NS
% attending workshop	31%	NA	NS
Dept chair attended	72%	NA	NS
% answered at least one time point	52%	49%	NS
% answered all three time points	15%	16%	NS
% tenure track	71%	72%	NS
% women	34%	31%	NS

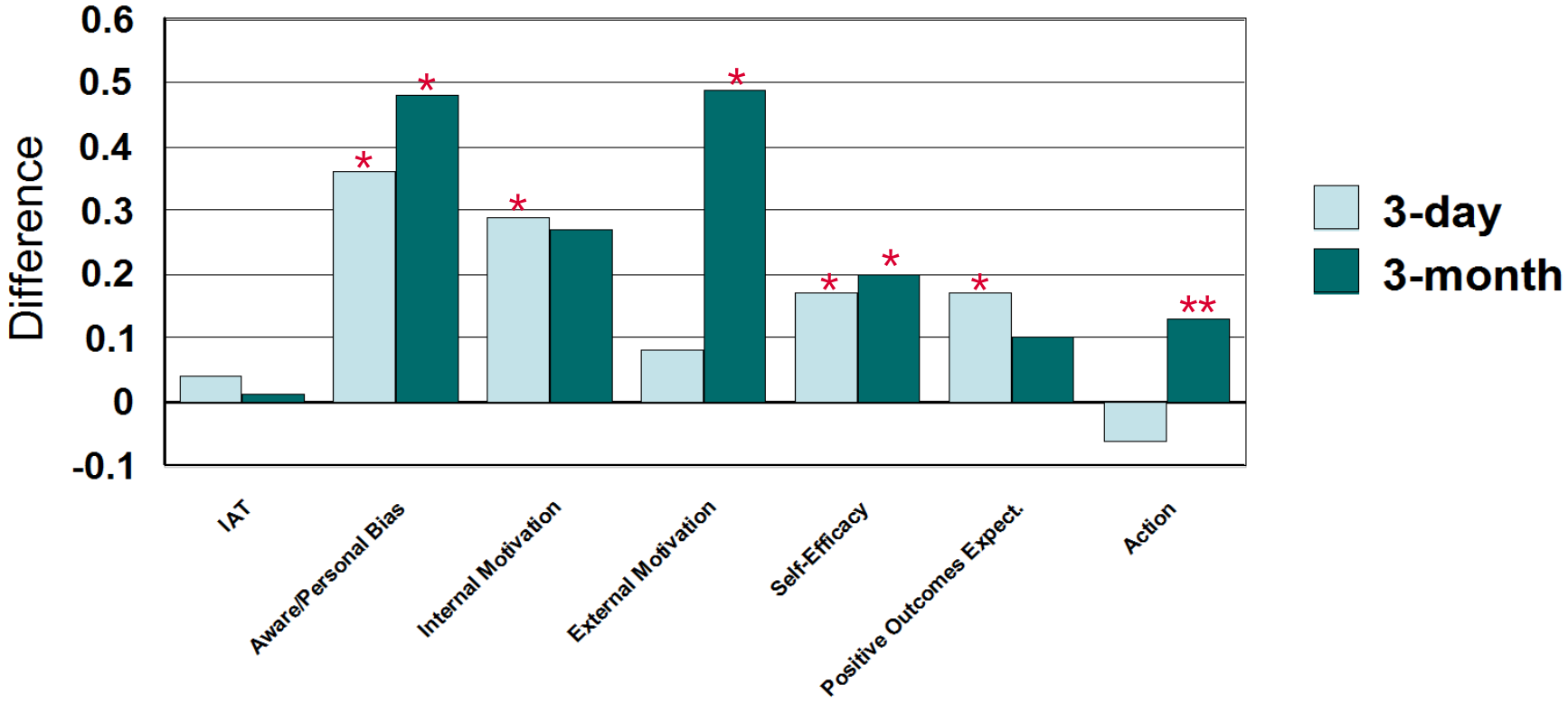




Gender and Leadership IAT Scores

Differences Between Experimental & Control Departments Compared With Differences at Baseline

3-day and 3-month



Notes:

N = 92 departments; 1154 faculty (50.4% response rate)

* Statistically significant difference of $p<0.05$ between experimental and control departments compared with differences at baseline

** Significant only for departments in which ≥25% of faculty attended the intervention workshop, $p<0.05$

Does changing behavior of faculty change academic culture?

Study of Faculty Worklife:

- Faculty (all tracks) in 92 depts. surveyed baseline and after completion of interventions; 671 responded both years (296 experimental, 375 control)
- Intervention vs. control improvements in:
  - Research valued
  - "Fit" in department
  - Comfort raising personal and family issues

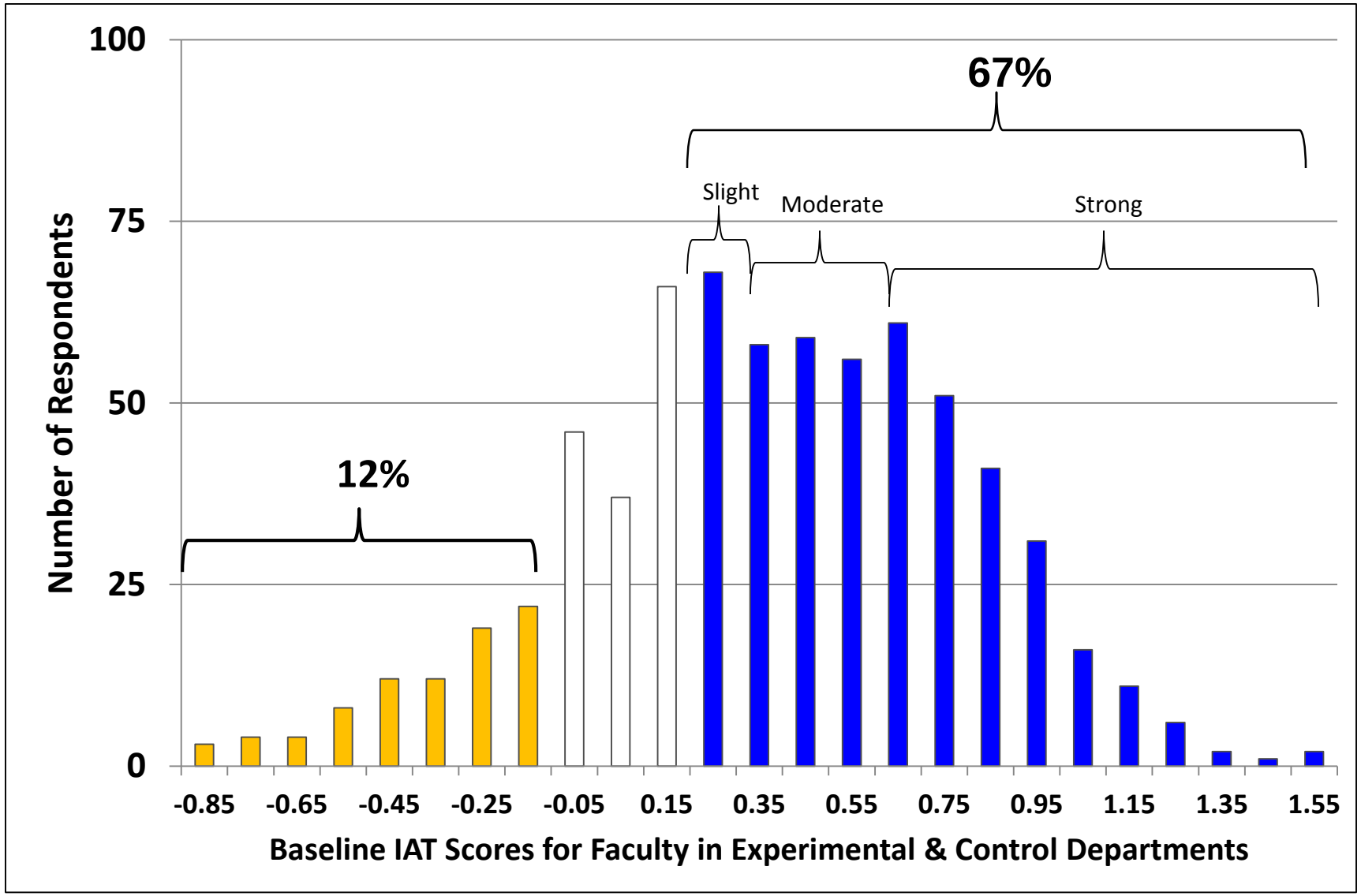
Conclusion

- Gender bias responds to interventions shown effective in breaking other behavioral habits
- When STEMM faculty break the bias habit, it appears to improve department climate for all faculty
- No reason to believe that similar approaches would not work in the context of race or disability

Questions?

UW-Climate Survey 2010-2012

Experimental Assignment	Control Departments (N=46 Depts.)	Intervention Departments (N=46 Depts.)	Total (N=92 Depts.)
Total Faculty	822	708	1530
Resp 2010 only	254	243	497
Resp 2012 only	193	169	362
Resp 2010 & 2012	375	296	671
Chair Att. Intvn.	-	N=33 Depts N=479 Faculty	
Total M vs. F	M=525, F=297	M=474, F=234	1530
Full Prof	339	321	660
Assoc. Prof	200	179	379
Asst. Prof	283	208	491


100
75
50
25
0
Number of Respondents
67%
Slight
Moderate
Strong
12%
-0.85
-0.65
-0.45
-0.25
-0.05
0.15
0.35
0.55
0.75
0.95
1.15
1.35
1.55
Baseline IAT Scores for Faculty in Experimental & Control Departments