

ARE GENDER DIFFERENCES REAL? GENDER & INTERSECTIONALITY IN STEM EDUCATION

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A father and his son were involved in a car accident in which the father was killed and the son was seriously injured. The father was pronounced dead at the scene of the accident and his body was taken to a local mortuary. The son was taken by ambulance to a hospital and was immediately wheeled into an operating room. A surgeon was called. Upon seeing the patient, the attending surgeon exclaimed, "Oh my God, it's my son!"



GENDER STEREOTYPES

- Are learned
- Can operate at an automatic, implicit level
- Are an expression of *gender essentialism*

- Everyone is at least a little bit sexist.
 - *But we don't have to be.*



OVERVIEW

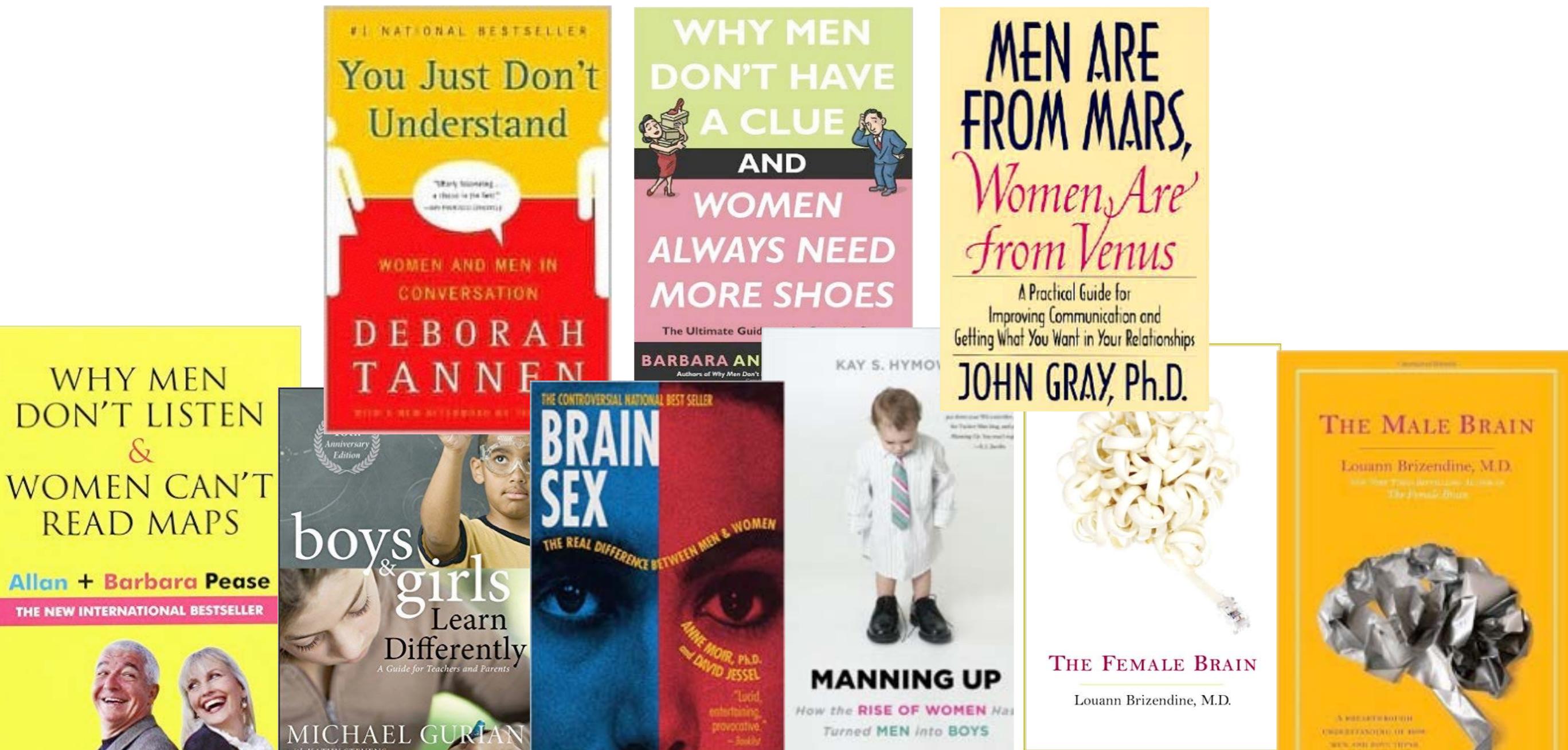
- Gender essentialism
- Gender & intersectionality
- Gender similarities hypothesis
- Responding with data
- Where do we go from here?



**Oh, so that explains the
difference in our salaries!**

GENDER ESSENTIALISM

- Gender differences are large, meaningful, and “hard-wired”
- Gender essentialism is a barrier to gender equality



GENDER 101

- Freud was wrong.
- Sex vs. gender
- Gender identity - *what is my gender?*
- Gender binary - *a system of two opposing categories*
- Gender role - *performing gender, doing gender*



HOW DO WE CONSTRUCT GENDER?



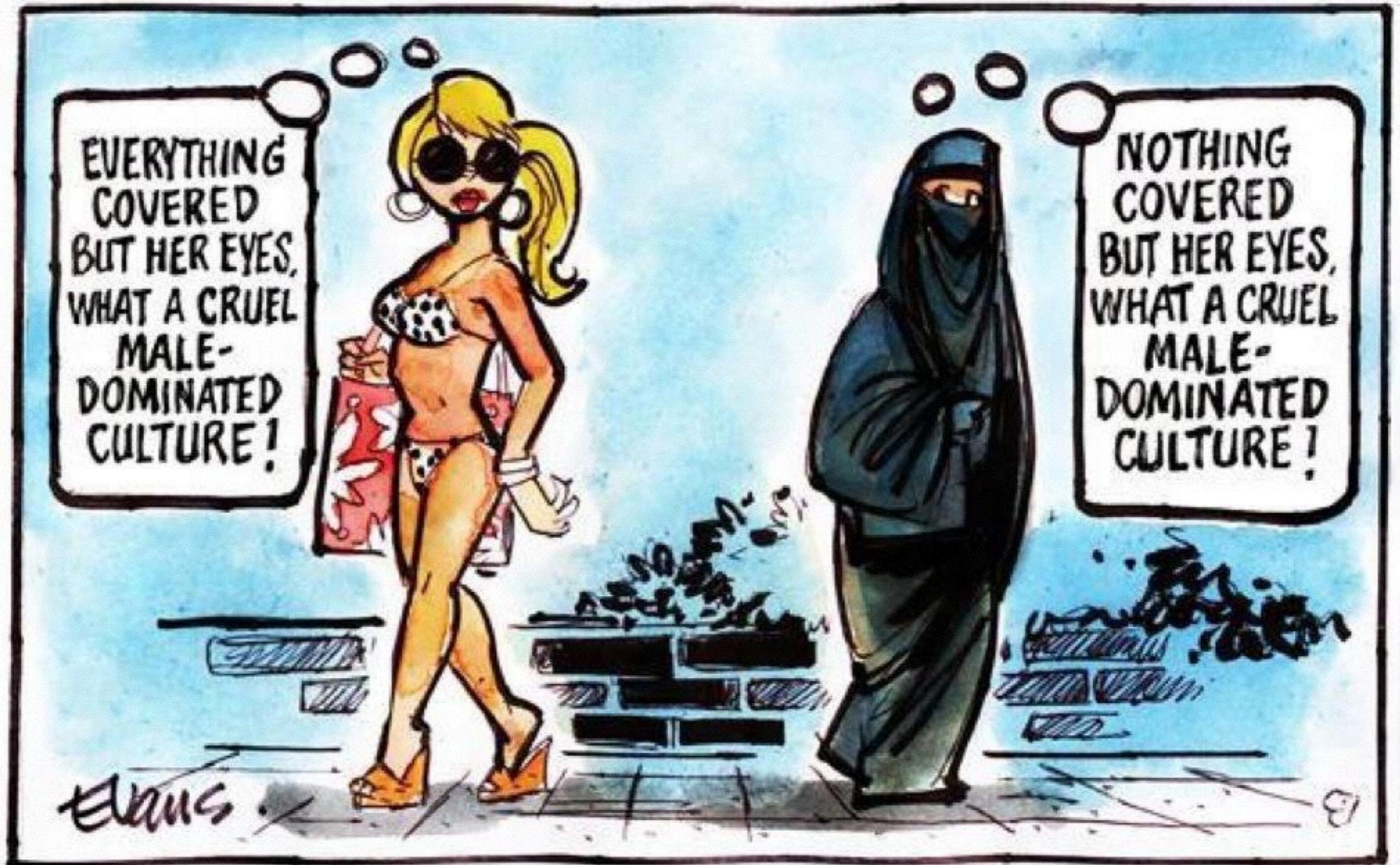
WHICH WOMEN? WHICH MEN?

- It isn't just gender. Other social categories play a role *simultaneously*.
- Intersectionality
 - The experience and meaning of gender is tied to the experience and meaning of race/ethnicity, sexual orientation, age, etc.
 - Privilege and disadvantage

(Cole, 2009; Crenshaw, 1991; Else-Quest & Hyde, 2016)



GENDER AND...



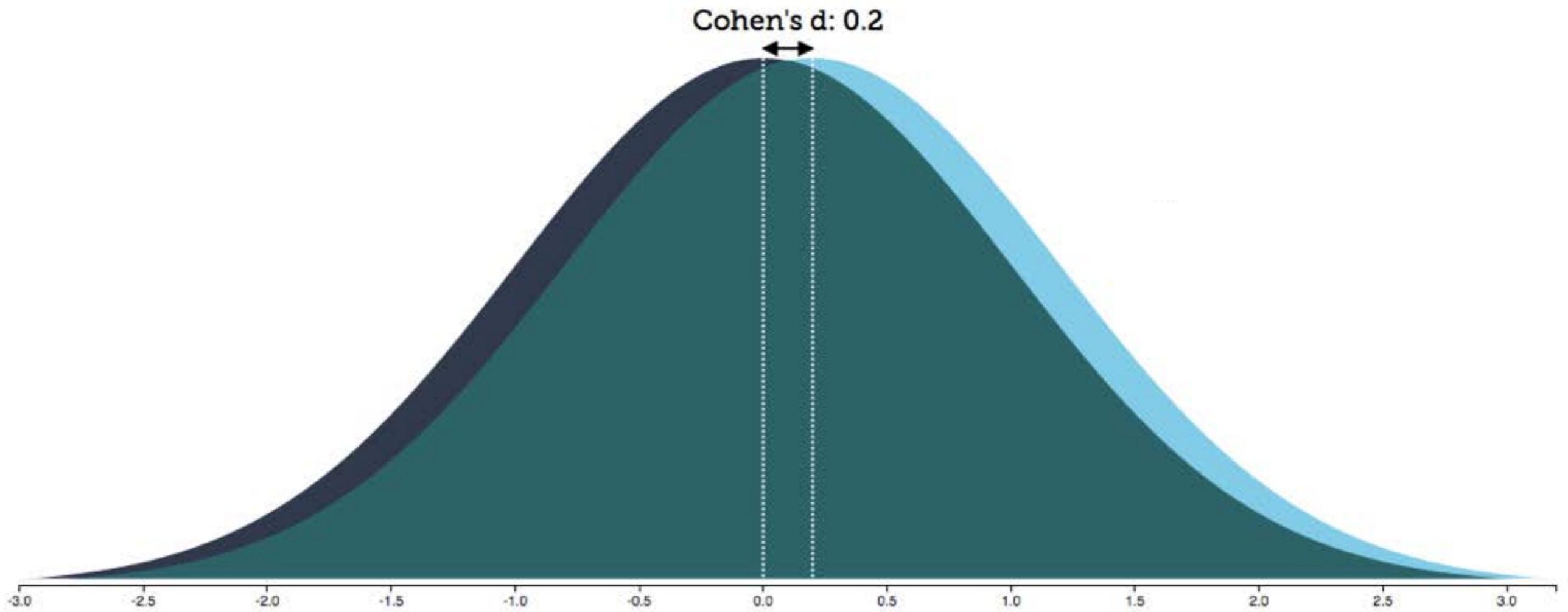
THE GENDER SIMILARITIES HYPOTHESIS

- Most but not all psychological gender differences are small (Hyde, 2005)
- Men and women are far more similar than they are different
- How do we know this?
 - Effect sizes

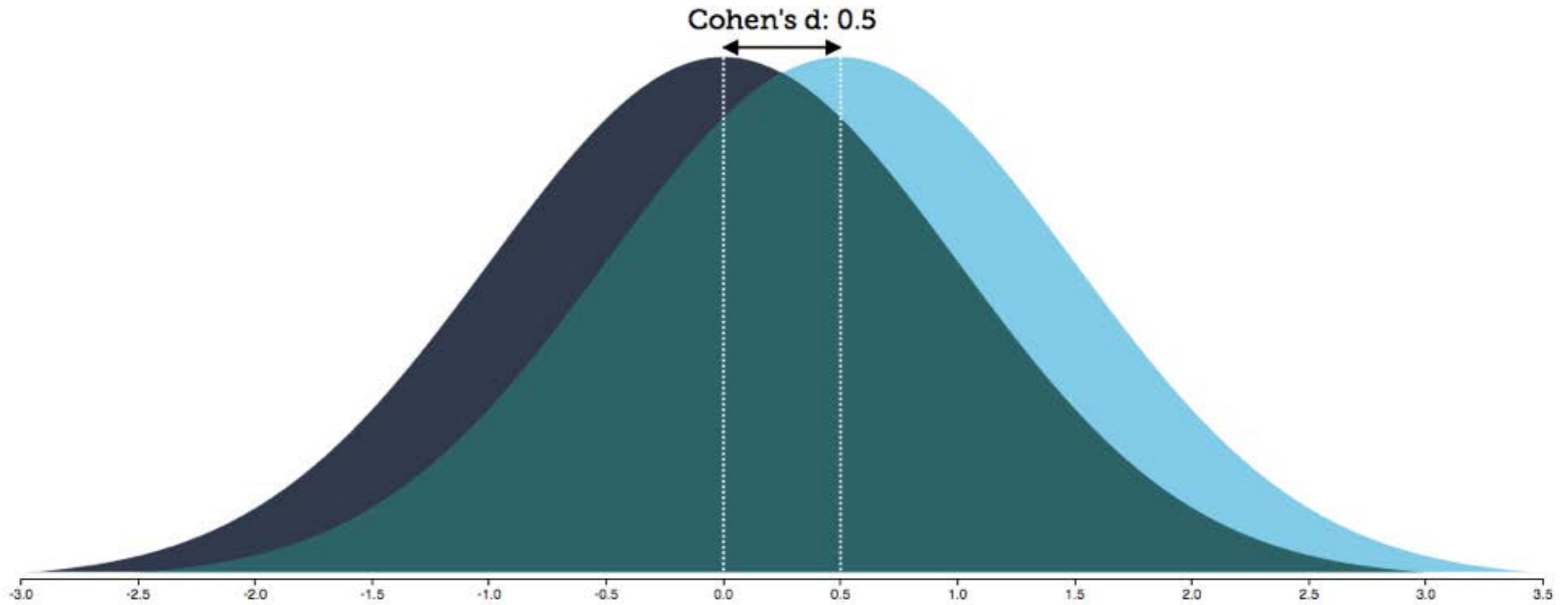
$$\text{Cohen's } d = \frac{\text{Mean}_{\text{male}} - \text{Mean}_{\text{female}}}{\text{Standard deviation}_{\text{pooled}}}$$



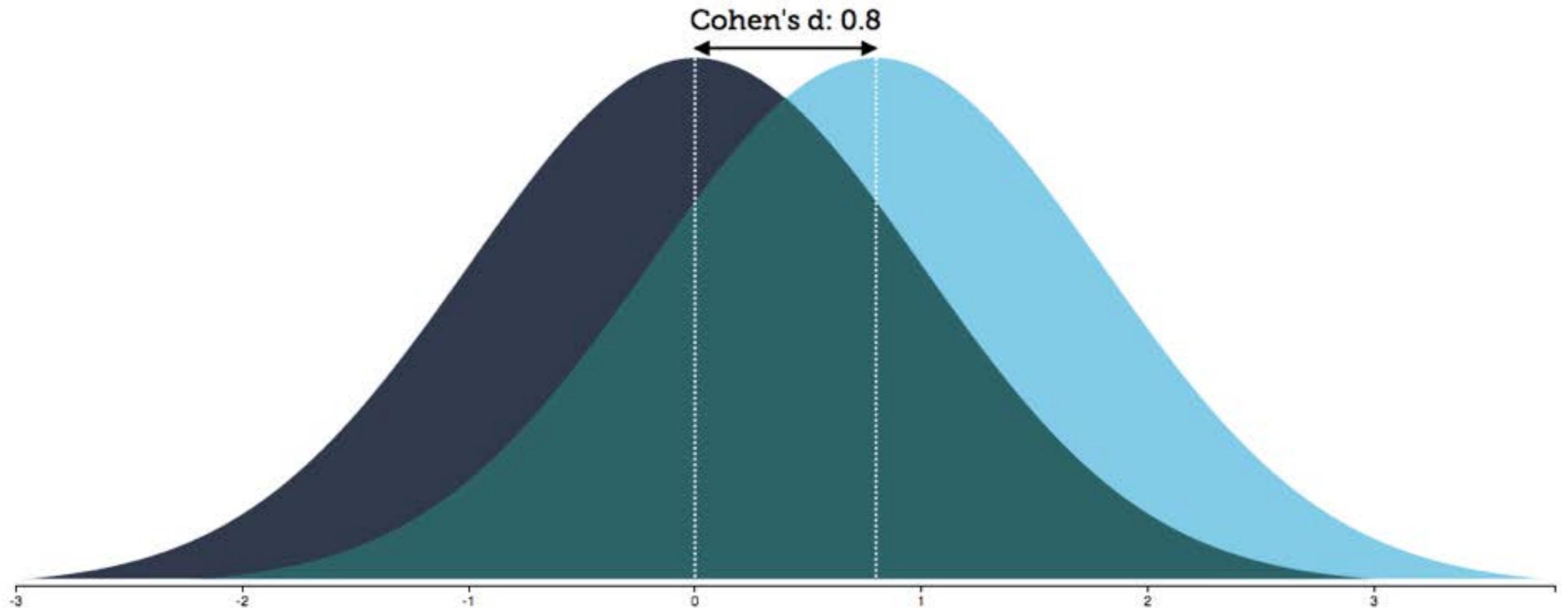
SMALL EFFECT, 85–92% OVERLAP



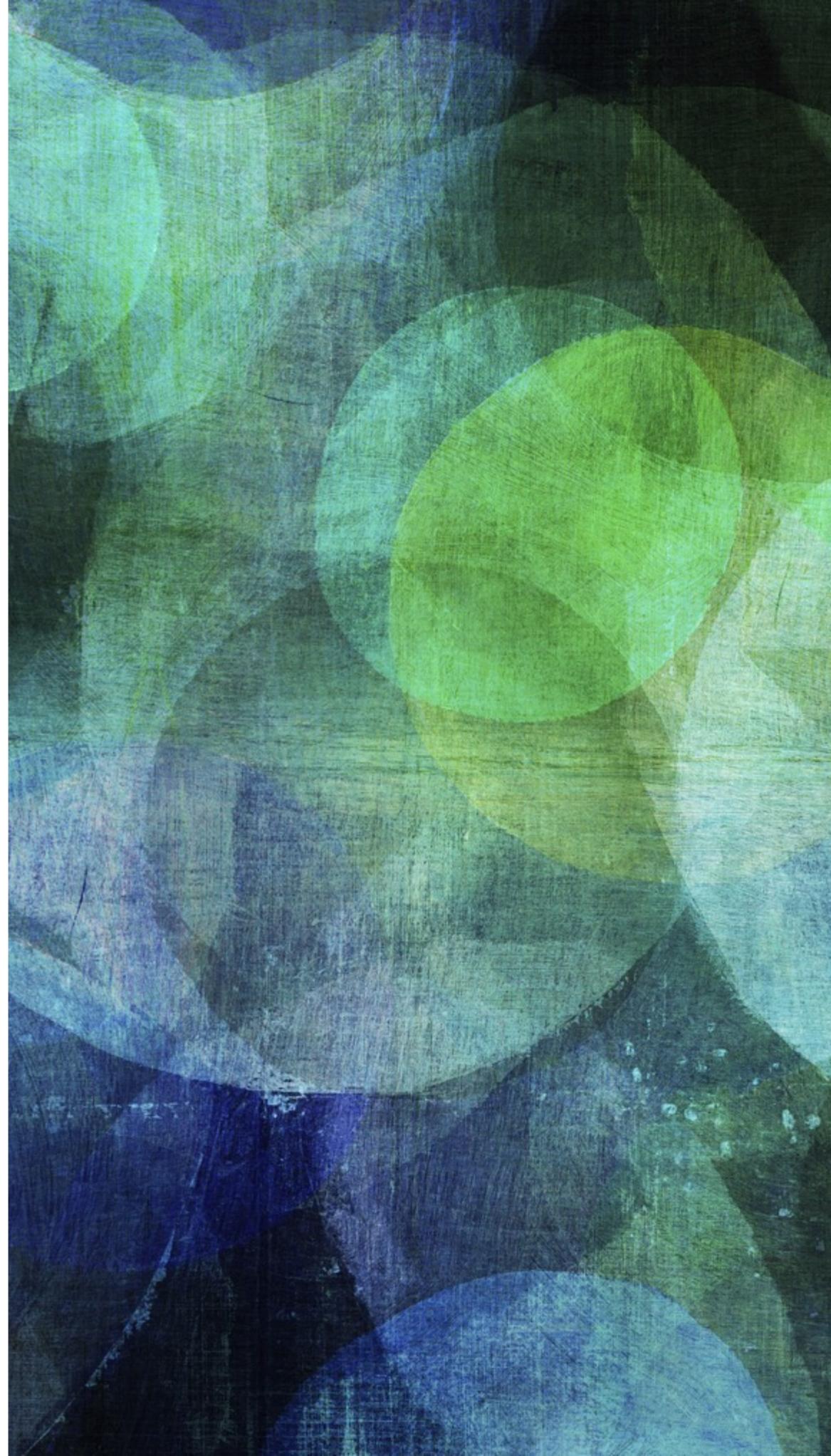
MEDIUM EFFECT, 67-80% OVERLAP



LARGE EFFECT, 53-69% OVERLAP



*“Women are less
confident”*



“WOMEN ARE LESS CONFIDENT”

- In childhood & adolescence...
 - Self-esteem: $d = .16$ to $.33$
 - Self-confidence in math: $d = .15$
 - Self-efficacy in math: $d = .33$
 - Fearfulness: $d = -.11$
 - Emotionality: $d = .00$
 - Math anxiety: $d = -.28$

(Else-Quest et al., 2006; Else-Quest et al., 2010; Else-Quest, 2012; Kling et al., 1999)



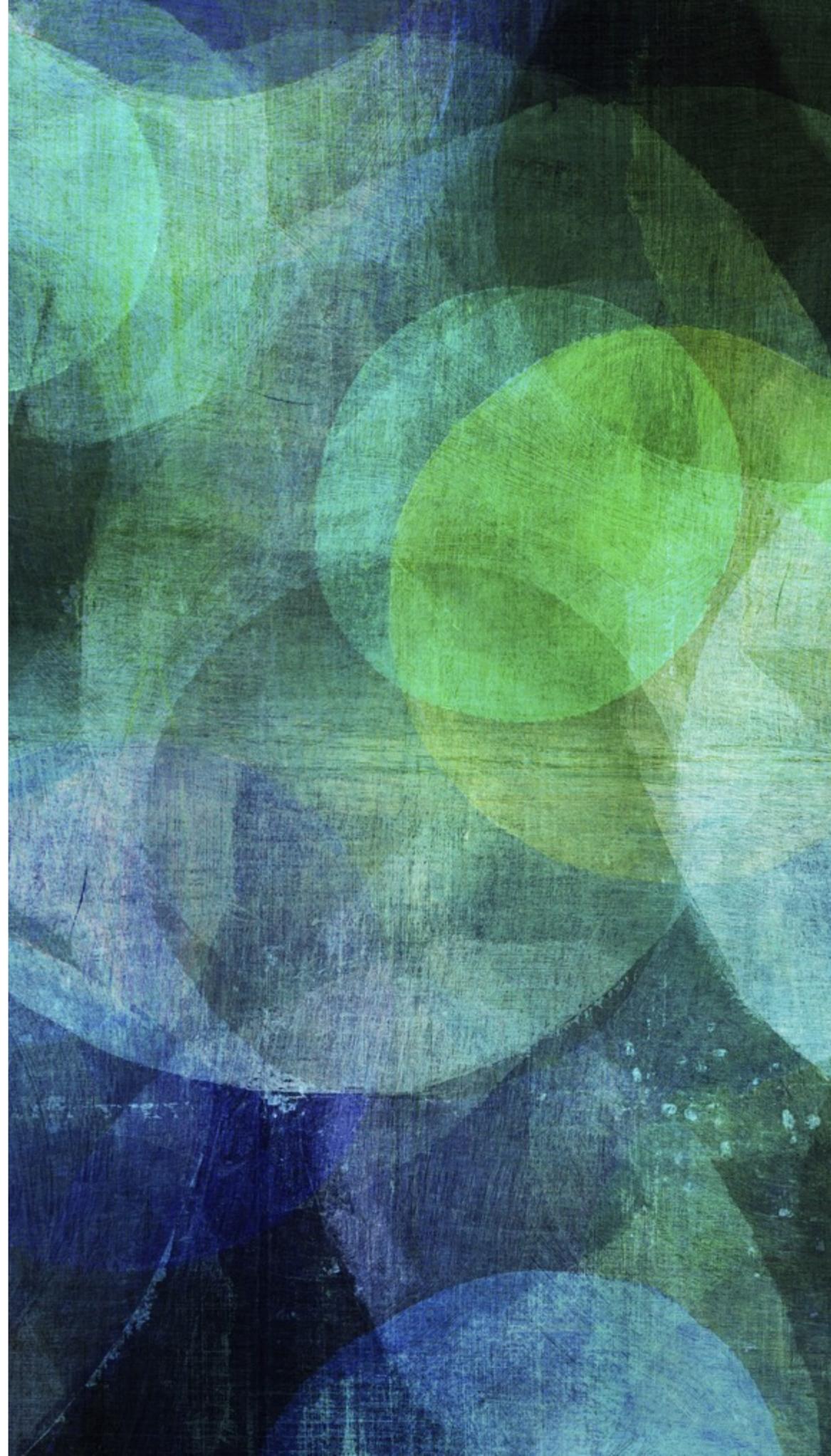
“WOMEN ARE LESS CONFIDENT”

- In adulthood
 - Self-esteem: $d = .10$
 - White people ($d = .20$) vs. Black people ($d = -.04$)
 - Pride: $d = -.01$
 - Self-confidence in appearance: $d = .35$

(Else-Quest et al., 2012; Gentile et al., 2009; Kling et al., 1999)



*“Men are more
logical &
quantitative”*



“MEN ARE MORE LOGICAL & QUANTITATIVE”

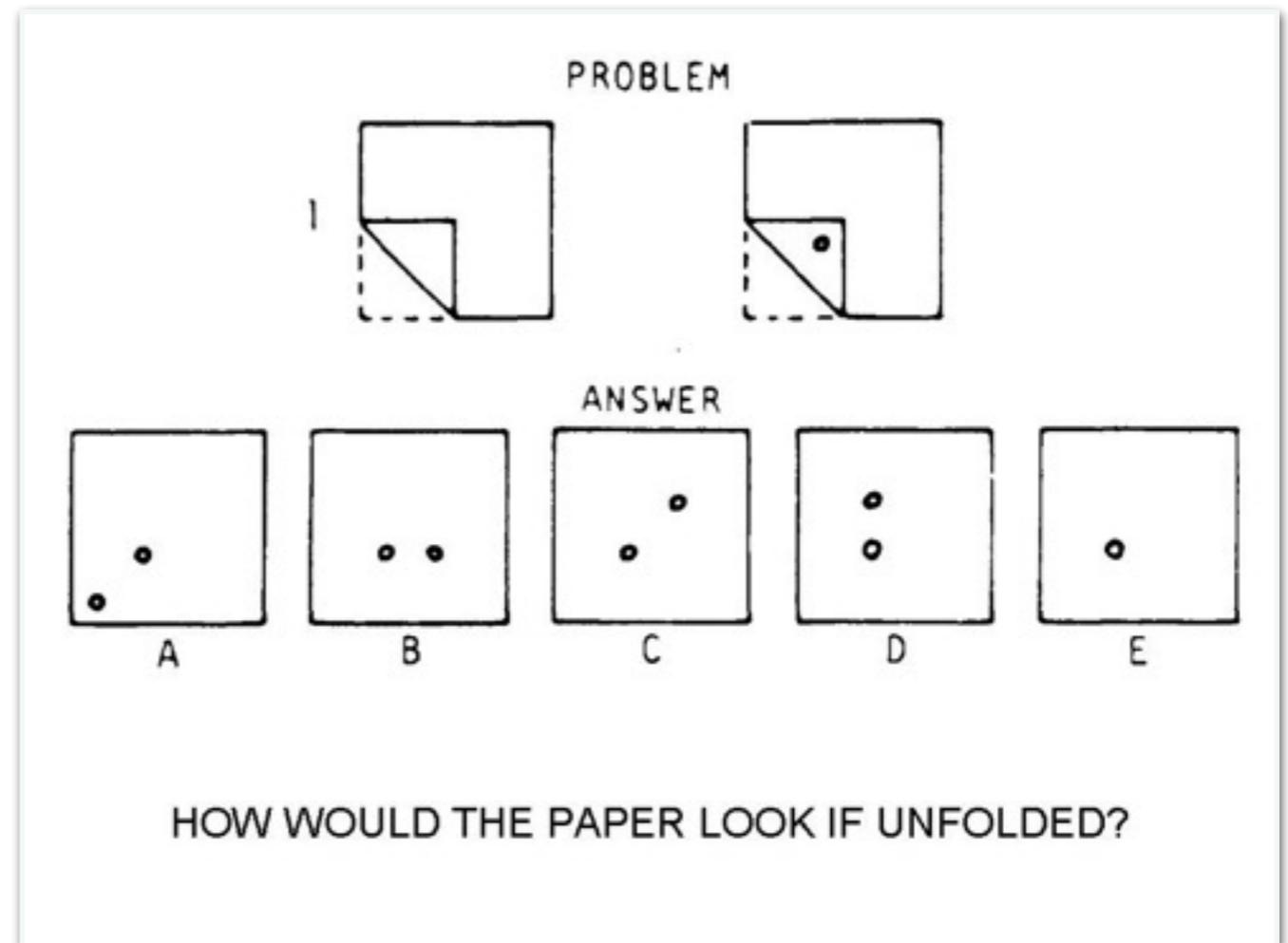
- Quantitative or mathematical ability
 - In the US: $d = .0065$ across grades 2-11
 - Intersectional analysis from one study with low-income urban schools:
 - White ($d = .25$) vs. Asian ($d = .15$) vs. Black ($d = .10$) vs. Latinx ($d = -.24$) 10th graders
 - Worldwide: $d = -.01$ to $.11$
 - Larger in countries where girls attend school at lower rates, women have smaller share of R&D jobs

(Else-Quest et al., 2010; Else-Quest et al., 2013; Hyde et al., 2008)



“MEN ARE MORE LOGICAL & QUANTITATIVE”

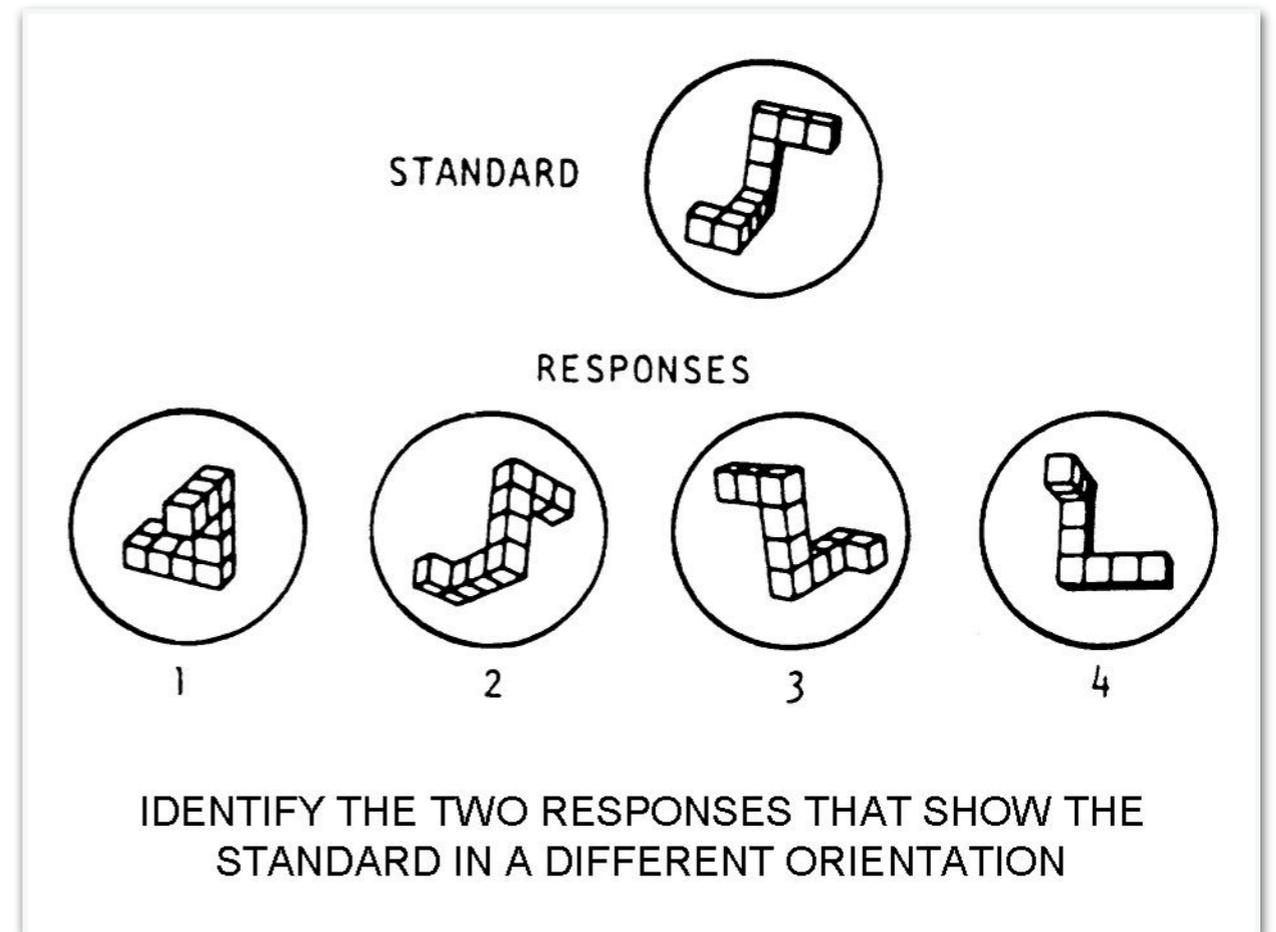
- Spatial abilities
 - Spatial visualization
 - $d = .13$



(Linn & Petersen, 1985)

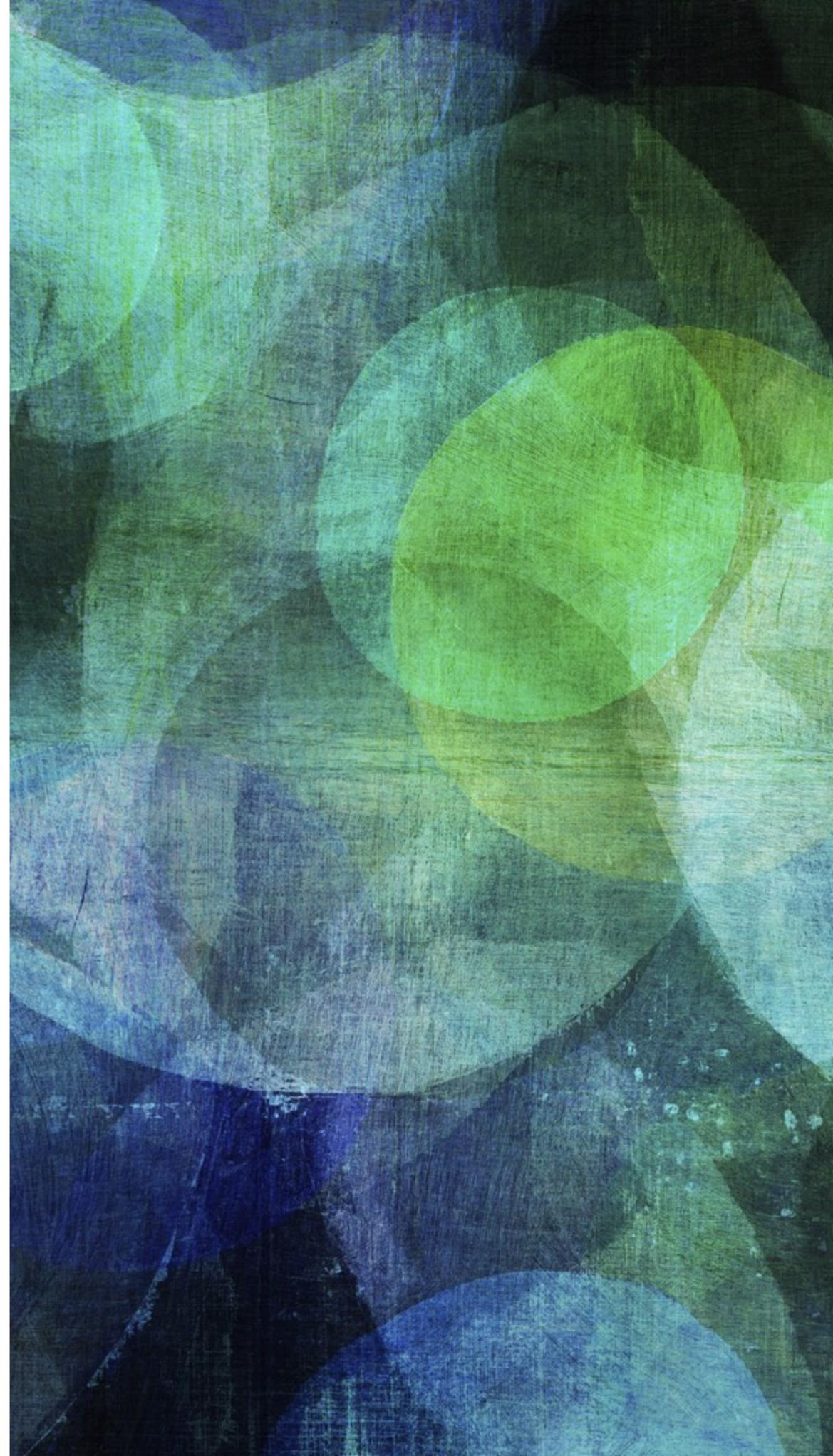
“MEN ARE MORE LOGICAL & QUANTITATIVE”

- Spatial abilities
 - Mental rotation
 - $d = .57$
 - Timing & training can eliminate the gender gap



(Maeda & Yoon, 2013)

*“Women are
more verbal”*



“WOMEN ARE MORE VERBAL”

- Verbal abilities
 - Vocabulary: $d = -.02$
 - Reading comprehension
 - US: $d = .02$
 - Worldwide: $d = -.26$



(Hyde & Linn, 1988; Hedges & Nowell, 1995; Reilly, 2012)

CONCLUSIONS

- Data indicate that psychological gender differences are
 - inconsistent with stereotypes
 - generally small
 - nuanced and variable
 - shaped by social context



BUT GENDER MATTERS!

- In the US, children think that math is for boys and that scientists are White men
- Fewer than 1 in 5 undergraduate computer science degrees are earned by women
- Women comprise only 4.6% of the CEOs in S&P 500 companies
- Women earn about 80 cents for every dollar men earn
 - Even less if they have children or are women of color

(Carli et al., 2016; Catalyist, 2016; Cvencek et al., 2011; Else-Quest & Hyde, in press; National Science Foundation, 2017; US Census Bureau, 2016; Wenner, 2003)



WHEN CONFRONTED WITH GENDER ESSENTIALISM...

- Ask:
 - Which women? Which men?
 - What about the intersectionality of gender?
 - How large are those differences anyway?
 - What creates those differences?





THANK YOU

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