

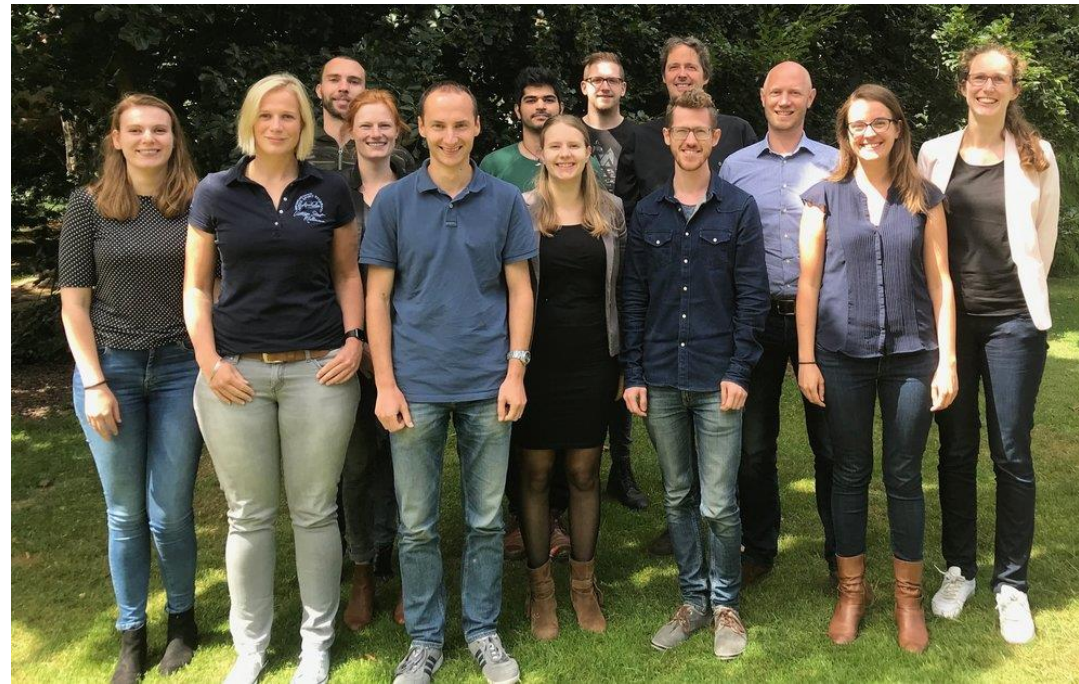


Registered Replication Report: Stereotype Threat

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Who am I

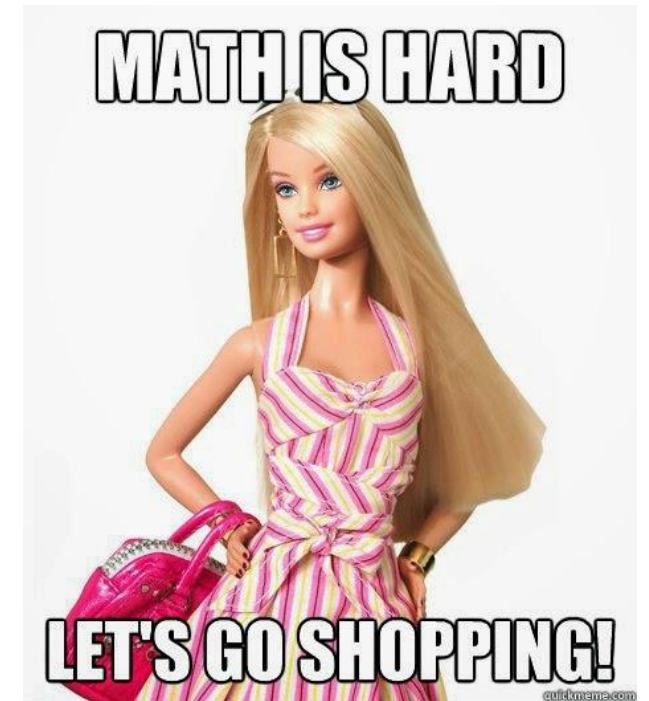
- PhD-student at Tilburg University
- Meta-research center
 - <https://metaresearch.nl/>



Stereotype threat

Men perform better in mathematics than women?

→ Pressure of stereotype leads to worse scores for women



Stereotype threat

- Prominent theory to explain ethnicity- and gender difference in academic performance
- Applied outside academia
 - Ferguson et al. (2016); Fisher v. University of Texas (2012); Spencer et al. (2016)
- Meta-analytic effect sizes: $d = 0.21 - d = 0.29$
 - Doyle & Voyer (2016); Nguyen & Ryan (2008)

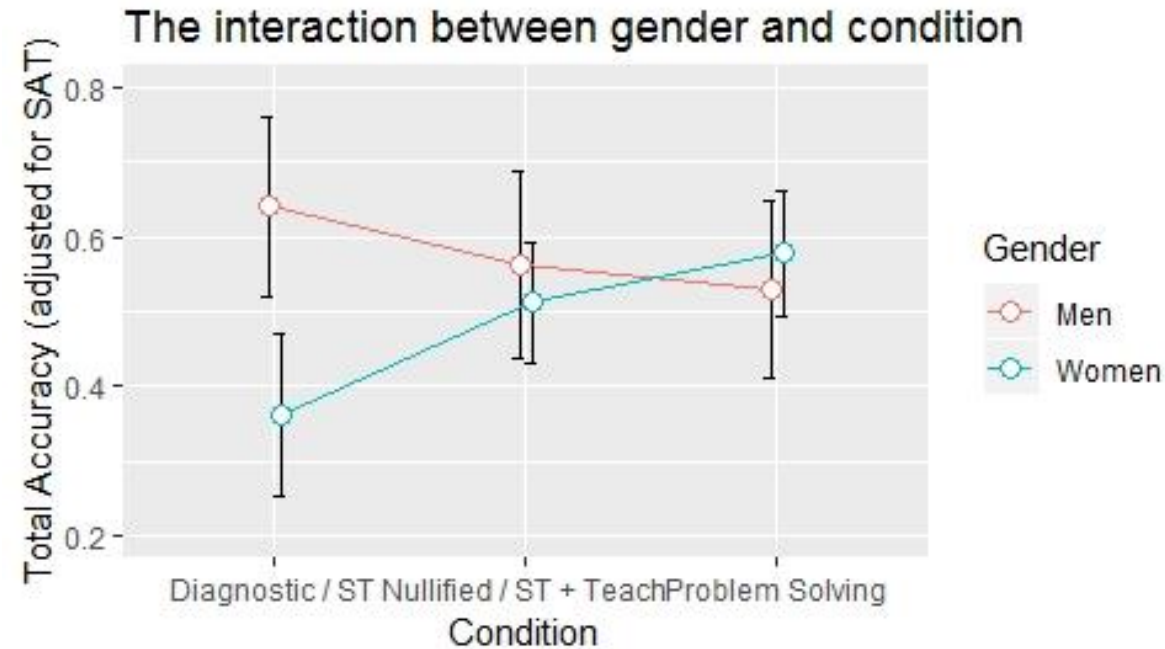
Why a RRR?

- Assess cross-cultural robustness
 - Nosek et al. (2009); Picho et al. (2013)
 - Unbiased estimate of true effect size
 - Flore & Wicherts (2015); Gibson et al. (2014); Moon & Roeder (2014); Zigerell (2017)
 - Assess accuracy of commonly used analysis/design methods
 - Brown & Josephs (1999); Jussim et al. (2016); Sackett et al. (2004); Yzerbyt et al. (2004); Wicherts (2005)
- Replication of Johns, Schmader, and Martens (2005)



Johns et al. (2005)

- Seminal study, representative of others in the field
- 2 * 3 between-subjects design
 - Gender: Male/female
 - Condition: Stereotype threat and two control conditions



Participants and Design

Participants were 144 introductory statistics students who volunteered for extra credit. We randomly assigned participants to one of three conditions in a 2 (gender) \times 3 (test description: problem solving, math test, or teaching intervention) factorial design. We analyzed the performance of White participants only because of evidence that gender differences in math performance exist only among Caucasian students (Hyde, Fennema, & Lamon, 1990). This led to the exclusion of 27 participants, leaving a final sample of 75 women and 42 men.¹

Materials and Procedure

Sessions were run in mixed-gender groups by a male or female experimenter.² The experimenter played an audio-recorded description of the study ostensibly delivered by a male researcher. In the *problem-solving condition*, the researcher informed participants that they would be asked to complete a problem-solving exercise for a study of general aspects of cognitive processes. In the *math-test condition*, participants were told that they would be completing a standardized test for a study of gender differences in mathematics performance. In the *teaching-intervention condition*, participants were given the same instructions as in the math-test condition. In addition, the researcher described stereotype threat and suggested to women that “it’s important to keep in mind that if you are feeling anxious while taking this test, this anxiety could be the result of these negative stereotypes that are widely known in society and have nothing to do with your actual ability to do well on the test.”

Participants were given 20 minutes to work on 30 multiple-choice word problems taken from the Graduate Record Examination

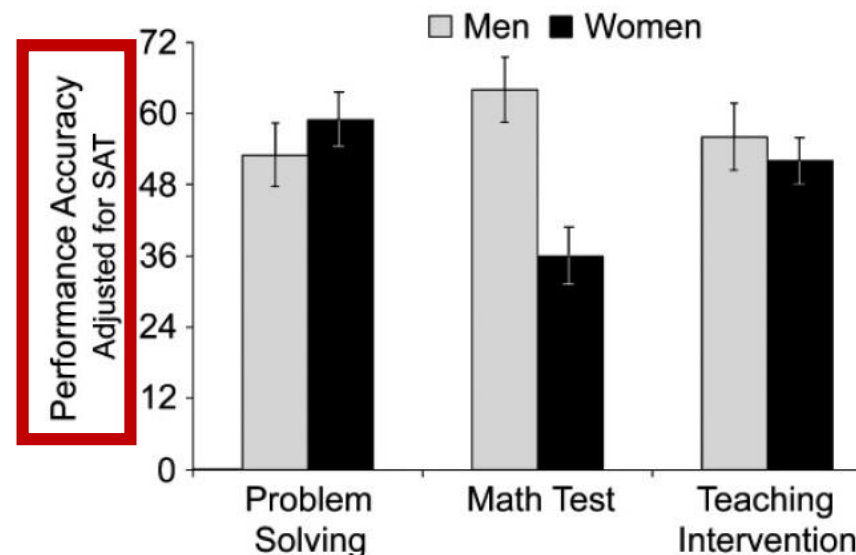


Fig. 1. Women's and men's accuracy scores (adjusted for quantitative Scholastic Assessment Test, or SAT, scores) on the math test as a function of the test description. Error bars represent standard errors.

Additional Challenges

- Application of original materials in a different sample
- Change in experimental set-up?
- Alternative for the SAT covariate?
- Difficulty of the mathematics items
 - Important moderator of ST effect



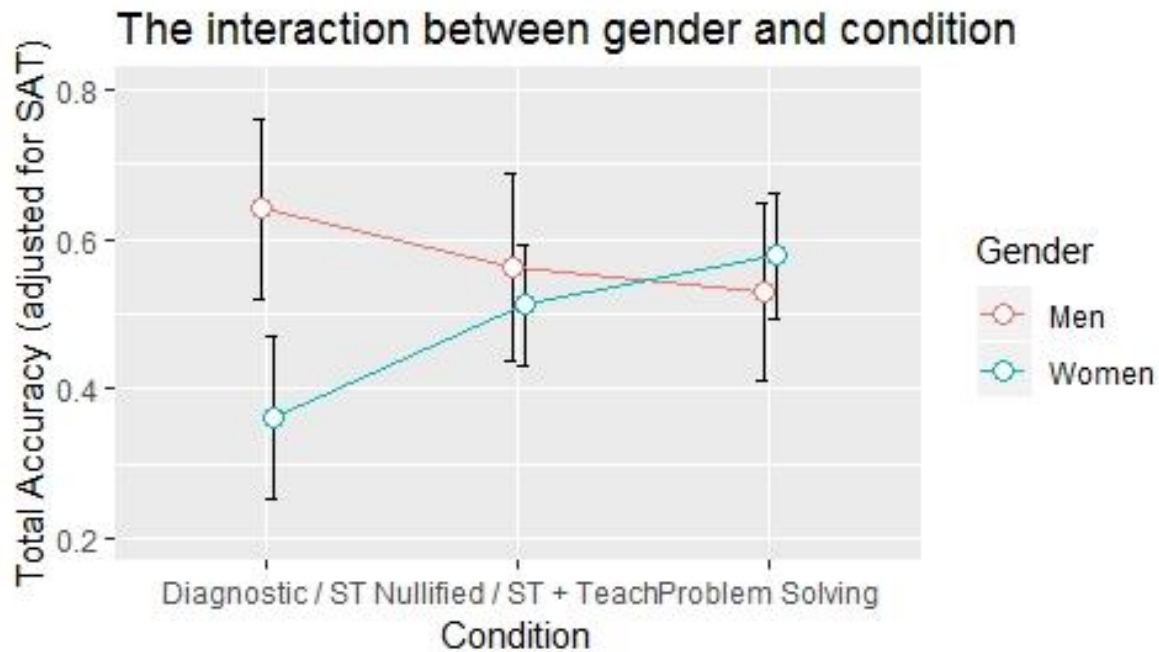
Pilot study

- To test research materials
 - Difficulty of mathematics items
 - Test of alternative setting
- Design:
 - 291 participants (108 included in analyses)
 - 72 women, 36 men
 - 3 conditions: stereotype threat ($n = 38$) and two control ($n = 38$, $n = 32$)
 - Individual, computer-based testing
 - 40 math questions, divided over 2 sessions

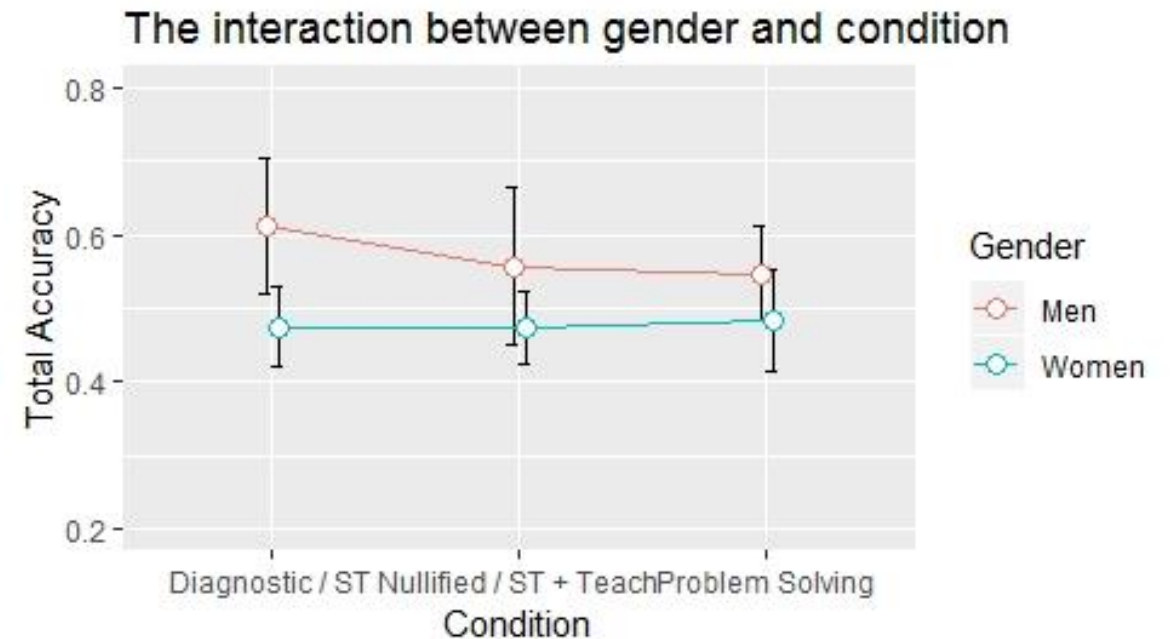


Pilot: Results mathematics performance

Johns et al.



Pilot



Current protocol

- Mathematics items work
- Setting cannot be changed → Stay with format of Johns et al.
- New challenges:
 - Multilevel analyses rather than ANCOVA
 - Preregistration of entire manuscript
 - Find collaborators

Thank you!

- Interested or know someone who is?
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