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## **Data files associated with “Stereotype Threat, Gender and Mathematics Attainment: A Replication of Stricker & Ward”**

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REPOSITORY RECORD

O'Hagan, Steven, and Matthew Inglis. 2022. “Data Files Associated with “stereotype Threat, Gender and Mathematics Attainment: A Replication of Stricker & Ward””. Loughborough University.  
<https://doi.org/10.17028/rd.lboro.12017007.v1>.

# Monte Carlo Simulation Results

Shiny App developed by Daniël Lakens and Aaron Caldwell

July 09, 2021

Below are the results from a power analysis using a Monte Carlo simulation of a factorial design wherein the data are sampled from a multivariate normal distribution. If you encounter any problems please visit our GitHub page (<https://github.com/arcaldwell49/Superpower>) to raise the issue.

## Study Design

### Model Formula

$y \sim \text{GENDER} * \text{CONDITION} + \text{Error}(1 \mid \text{subject})$

The sample size was **370, 349, 216, 234** *per cell*.

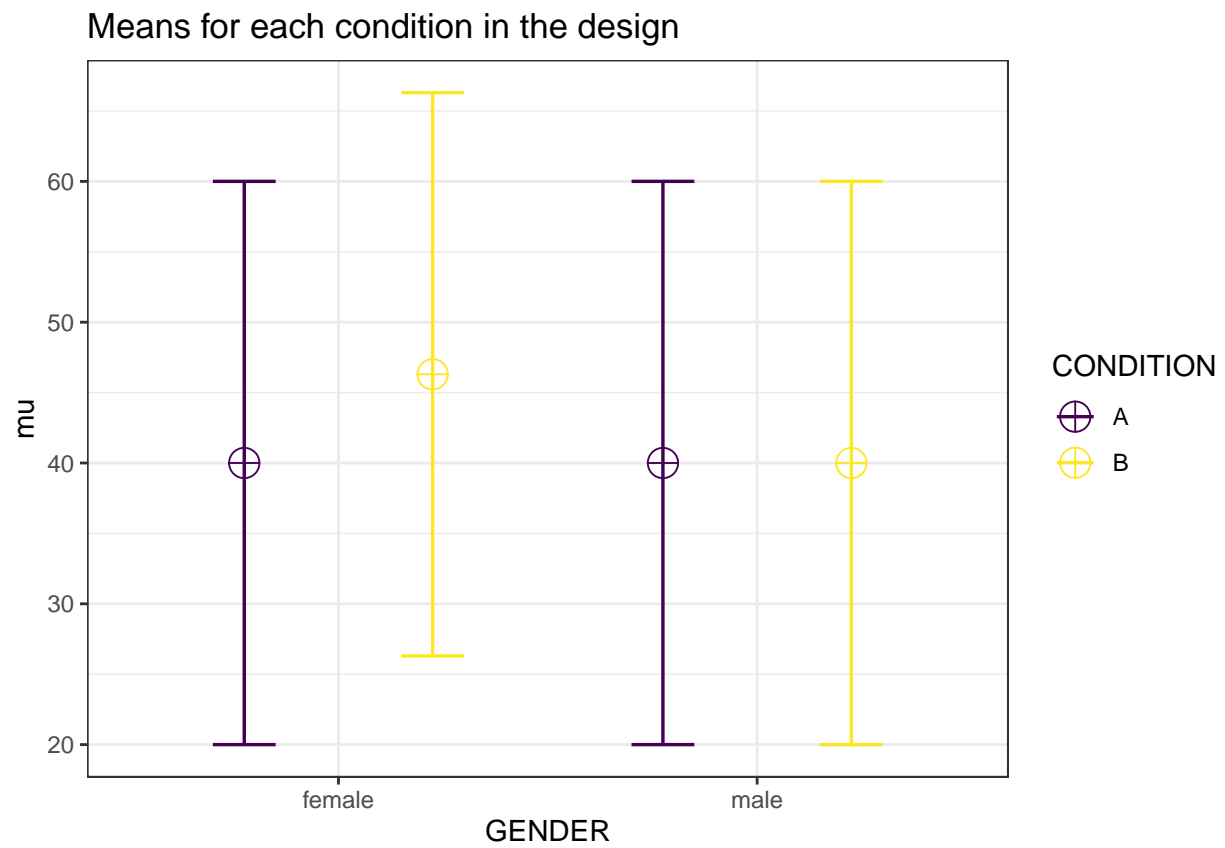
### Correlation Matrix

|          | female_A | female_B | male_A | male_B |
|----------|----------|----------|--------|--------|
| female_A | 1.0      | 0.0      | 0      | 0      |
| female_B | 0.0      | 1.0      | 0      | 0      |
| male_A   | 0.5      | 0.0      | 1      | 0      |
| male_B   | 0.0      | 0.5      | 0      | 1      |

### Variance-Covariance Matrix

|          | female_A | female_B | male_A | male_B |
|----------|----------|----------|--------|--------|
| female_A | 400      | 0        | 0      | 0      |
| female_B | 0        | 400      | 0      | 0      |
| male_A   | 200      | 0        | 400    | 0      |
| male_B   | 0        | 200      | 0      | 400    |

Plot of the individual data points with mean and standard deviation.



The results of the Monte Carlo simulation are included below. This simulation assumed an alpha of **0.05**, a sphericity correction of **none**, a **none** adjustment for multiple comparisons. A total of **2000** iterations were included in this simulation.

#### ANOVA Power (%) and Effect Sizes (Partial Eta Squared)

|                        | power | effect_size |
|------------------------|-------|-------------|
| anova_GENDER           | 78.70 | 0.0062739   |
| anova_CONDITION        | 71.45 | 0.0070773   |
| anova_GENDER:CONDITION | 80.45 | 0.0064963   |

#### Estimated Marginal Means Power (%) and Effect Sizes (Cohen's *f*)

*Only included if the estimated marginal means were selected.*

#### Power for MANOVA Results

*Only included if there is a within-subject factor.*

#### Multiple Comparisons, *t*-tests, Power (%) and Effect Sizes (Cohen's *d<sub>z</sub>*)

|   | power | effect_size |
|---|-------|-------------|
| p_GENDER_female_CONDITION_A_GENDER_female_CONDITION_B | 99.15 | 0.3180927   |
| p_GENDER_female_CONDITION_A_GENDER_male_CONDITION_A   | 4.00  | 0.0022469   |
| p_GENDER_female_CONDITION_A_GENDER_male_CONDITION_B   | 4.65  | 0.0027326   |
| p_GENDER_female_CONDITION_B_GENDER_male_CONDITION_A   | 95.15 | -0.3150590  |
| p_GENDER_female_CONDITION_B_GENDER_male_CONDITION_B   | 99.05 | -0.2235204  |
| p_GENDER_male_CONDITION_A_GENDER_male_CONDITION_B     | 4.85  | -0.0004126  |