No stereotype threat in international chess

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Across 6,706,843 games of chess, no evidence of FIDE-rated women players under-performing when playing men

Introduction

Official rating of chess players’ ability using the Elo system gives us a precise quantitative handle on expected outcome when two players meet.

Chess is highly male dominated, although relative male dominance varies somewhat by nation.

We use data from every game of tournament chess between FIDE rated players over a 7 year period.

Previous research (Chabris & Glickman, 2006) has looked at why chess is male dominated, examining possibilities like greater variation in male ability, or higher female drop out. We replicate and extend this using an international sample.

Stereotype threat is where heightened awareness of one’s membership of a stereotyped group causes, via anxiety or other mechanisms, your performance to align with that stereotype. Recently the experimental replicability of stereotype threat has come under question (e.g. Flore & Wicherts, 2015). Here we consider the robustness of the phenomenon by looking for its existence in a large real-world data set in which it is reasonable to expect gender stereotypes might affect performance.

The Data

There are 461,637 FIDE rated players, of which 56,474 (12%) are women.

Of these, 176,583 were active during a 92 month period (2008-2015).

These players, their game and tournament details compiled by Jeff Sonas as the “Sonas92” data set.

Conclusions

No evidence that relative dominance of male players across countries affects women’s rates of drop out, performance, or rate of learning.

Contrary to previous reports, we find no evidence of stereotype threat.

Though this analysis contradicts one specific mechanism whereby gender stereotype may influence players, the persistent differences between male and female players suggests that systematic factors do exist and remain to be uncovered.

Stereotype Threat

Does the stereotype that women aren’t as good at chess affect female players when they are under pressure?

The difference in rating between players allows a quantitative expectation of game outcome.

Shown here: observed outcome for different relative ratings, for the highest, middle and lowest 20% rated pairings:

If the differences are normed against a baseline (in this case the middle 20%)

National Context effects

Men are 88% of rated players, but we compare each nation by proportion of female players (y-axis).

Dropout rate
(mean duration active males - female)

Ability
(mean rating of males -females)

Learning rate
(mean slope of rating over time, males -females)

Chabris & Glickman (2006) speculated that, within the US, zip codes with more female chess players may see diminished negative effects of the male-dominance of chess on young female players. Replicating their analysis across nations, and including analysis of learning rates as well as drop-out and difference in ability, we find no evidence for this.

Open Science

All analysis code is available via the Open Science Framework https://osf.io/aeksv

Sample data is available, but full data set not yet available for commercial reasons.

Key analysis viewable via an Jupyter notebook at https://github.com/tomstafford/FIDEchess/blob/master/no_ST_in_chess.ipynb