

Chess Survey (#72300)

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1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

Do women/girls face more barriers in chess (e.g., less investment)? Are these barriers in part explained by stronger endorsement of the belief that to be successful in chess requires innate brilliance (i.e., field-specific ability beliefs, FAB) and beliefs that men are inherently more "brilliant" at chess (i.e. gender chess brilliance, GCB)?

We hypothesize that participants high in brilliance beliefs (FAB) and/or who think that men are more likely to be innately brilliant at chess than women (GCB) will (1) have lower evaluations of female (vs. male) chess players in their lives, (2) report less investment in female (vs. male) chess players in their lives, and (3) show more bias against a female (vs. male) chess player in their evaluations of hypothetical players. In the analyses below, these predictions can manifest as interactions between FAB or GCB and target gender and/or a three way interaction between FAB, GCB, and target gender. Either two-way interactions or three-way interaction in the directionality as outlined above would support our predictions. We remain agnostic about which interactions specifically will be observed in the data.

3) Describe the key dependent variable(s) specifying how they will be measured.

1. Evaluations of real chess players. Participants who are parents or mentors of chess players will evaluate those players' current and future potential. We will ask participants to think of up to three (for parents) and/or up to three (for mentors) chess players in their lives and rate their (1) potential USCF rating (in the long term), (2) inherent ability, (3) inherent interest, (4) environment (supportive vs. not), and (5) reasons for stopping playing competitively: (5a) lack of interest, (5b) low ability, and (5c) unsupportive environment. We will also ask participants to provide demographic information (most importantly, gender) about the chess players they are evaluating.

2. Investment in real chess players. Participants who are parents or mentors of chess players will report their own investment in those players' chess skills. Parents will be asked questions about (1) what types of paid/unpaid lessons they acquired for their children, (2) how much they pay for paid, private lessons (if applicable), (3) how often paid/unpaid private lessons occur, (4) how much they would hypothetically be willing to pay for 1 hr weekly lessons, (5) how often they travel for tournaments, and (6) how often they would hypothetically be willing to travel for tournaments. Mentors will be asked questions about (1) whether they have provided extra (unpaid) mentorship outside of designated lesson times, (2) if they encourage their mentee to participate in tournaments, (3) if they suggest additional chess resources, (4) how often they present challenging chess questions to their mentee, (5) how invested they are in their mentee, (6) how proud they are of their mentee, and (7) whether they think their mentee has the potential to outgrow them.

3. Evaluations of hypothetical chess players (two boys, one girl). All participants will evaluate three hypothetical players. The only information provided about these players will be their first names (which will suggest a gender), that they are youth players (i.e. under 21), and a chart with their US Chess rating over time. Participants will rate these players for their (1) inherent ability and (2) inherent interest in chess. If the participant is a mentor, they will also be asked whether they would mentor the hypothetical player at 70% of their typical rate.

4. Individual differences in beliefs about chess. All participants will report (1) how much they personally agree and (2) how much they think the chess community at large agrees with two constructs: (1) the idea that you need to be brilliant to succeed in chess (i.e. field-specific ability beliefs, FAB; 4 items) and (2) the stereotype that men are more innately predisposed to being good at chess than are women (i.e. gender chess brilliance, GCB; 8 items). Participants will respond to all items on a 7-point scale ranging from "strongly disagree" to "strongly agree."

4) How many and which conditions will participants be assigned to?

Everyone will see the same information and questions with one exception: in the section where we ask participants about hypothetical chess players, we will randomly assign one of two charts to a male or female player so that (across participants) the female and male player are associated with the same stimuli. This will allow us to arrive at a causal estimate of gender bias in the hypothetical scenarios.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

MEASURE CONSTRUCTION

Evaluation of real players: We will examine the measures of evaluation separately.

Investment in real players: We will conduct a factor analysis (and/or PCA) to examine the underlying dimensionality of the investment items and will combine items depending on what these analyses suggest. We will then follow up these analyses with Cronbach's alpha to verify that the groups of items identified by the factor analysis/PCA are internally consistent at $\alpha \geq .70$. We will analyze separately any items/measures that do not fit into the

coherent group(s) identified by the factor analysis/PCA.

Hypothetical players: We will analyze the measures separately.

Beliefs about chess: We will assess whether the FAB and GCB scales are internally consistent by calculating Cronbach's alpha, separately for the "personal" and "community" versions of each scale. We may drop items that push the alpha below .70 for each of these four separate scales ("personal" and "community" versions of FAB and GCB). Depending on what the results of the Cronbach's alpha analysis suggest, we will average the FAB items into a "personal" and a "community" composite; same for the GCB items. We will then calculate the correlation between the "personal" and "community" versions of the FAB and (separately) GCB scales. If the correlation is above .50, we will average the "personal" and "community" scores into a single composite for each of the FAB and GCB scales.

MAIN ANALYSES

Evaluation of real players: We will conduct separate multilevel models (one per DV) with the evaluations being predicted by target/player gender, participant FAB, participant GCB, and all interactions, with a random intercept for participant ID. We will run the model without covariates and also with the following covariates: participant and target's age, participant gender, and participant and target USCF rating. We will conduct separate models for parents and mentors.

Investment in real players: Same as for evaluation, except the dependent variables will be the composite measure(s) of investment in real chess players as informed by the factor analysis/PCA. As above, we will conduct analyses separately for parents and mentors.

Hypothetical players: We will only include evaluations of Boy 1 and Girl (Boy 2 is a decoy). To examine whether participants evaluate the hypothetical boy more positively than the hypothetical girl, we will conduct separate multilevel models (one per DV) with target gender (within subjects), participant FAB, participant GCB, and all interactions as predictors, and with a random intercept for participant ID. We will run the model without covariates and also with the following covariates: participant's age, gender, and USCF rating.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

On the first screen, we ask participants to indicate their relationship to chess and the US Chess Federation. We will include all (and only) participants who indicate that they are or have been at least one of the following: a US Chess member, a parent/guardian of a US Chess member, parent guardian of a chess player (not US Chess affiliated), mentor of a US Chess member, and/or mentor of a chess player (not US Chess affiliated).

We will only include participants who complete at least 50% of the items on the following measures: evaluations of hypothetical chess players, FAB, and GCB.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will include any respondents who meet our criteria above that we can recruit on the basis of two mailings sent out by the US Chess Federation. If the resulting sample is below 1,000 participants, we will continue recruitment via other chess organizations and clubs until we reach 1,000 participants.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We will also collect information about parents' children who do not play chess (if applicable), including their gender, age, and why they do not play chess (no interest, low ability, too young, other). We predict that participants with high chess brilliance beliefs (FAB) and who think that men are more brilliant at chess than women (GCB) might be particularly likely to have girls who do not play chess. To test this prediction, we will conduct a mixed effects logistic regression with non-chess-playing child gender (1 = girl, 0 = boy) being predicted by participant's FAB, GCB, and their interaction, with a random intercept for participant ID. We will run the model without covariates and also with the following covariates: number of daughter chess players (0-3), number of son chess players (0-3), participant age, participant gender, and participant USCF rating.

We will also collect additional demographic information (age, gender, race, ethnicity, country of residence, sexual orientation, political orientation, education level, yearly income) and may check for relationships between these variables and other variables of interest detailed in sections 3 and 5.

We may also examine interactions between participant gender and the DVs in the models outlined in section 5.