



TRIAMUDOMSUKSAPATTANAKARN SCHOOL

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DOES SEX MATTER?

Gender Factor on Chess Performance

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Preface

It is essential to remember that science, like the game of chess, knows no boundaries, no barriers, and recognizes no gender. This preface serves as a celebration of diversity and inclusivity, integrating the captivating world of chess into the pursuit of scientific understanding and inviting all genders to embark on this unifying journey of strategic brilliance.

Scientific inquiry thrives when it is inclusive, drawing upon a wide range of perspectives and insights. Just as the chessboard comes alive with diverse pieces working in harmony, our scientific community flourishes when individuals of all genders contribute their unique strengths to the pursuit of knowledge. As researchers, we commit ourselves to the principles of inclusivity, openness, and respect.

Acknowledgement

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Abstract

Various studies have investigated gender differences in chess performance by analyzing data from international tournaments, online platforms, and chess clubs. The findings consistently indicate that, on average, men tend to achieve higher Elo ratings and tournament success compared to women.

Biological and neurological differences between genders may play a role in shaping individual cognitive styles, but these differences are often overshadowed by socio-cultural factors. Historically, chess has been predominantly male dominated, leading to fewer female role models and opportunities for skill development in women. This gender disparity also affects confidence, motivation, and the willingness to compete at higher levels.

In our research, we locally investigated the chess game performance of male and female students in our school. We had 40 beginner players using the online app to play the chess game. We also surveyed their perception on gender discrimination about chess games. In performance, we measured their scores based on Elo and rate them according to the USCF rating categories. In perception on gender discrimination, we designed a survey questionnaire using the five-point Likert Scale.

Chapter 1

Introduction

To perform good in chess, you need many things, such as strategies, knowledge, and adaptiveness. However, we don't certainly know whether sex affects how someone performs in chess. Most people say that males are better due to their way of thinking, how their brain functions, and so on, although women have proved to be better than men in some cases.

Most Chess tournaments are unisex, and anyone could join. On some occasions, there are Chess tournaments that are exclusively for females (Ex. Women's World Chess Championship), and on some occasions, there are also some male-only Chess competitions.

There are several reasons for why men may perform better than women. A post online on ResearchGate on the 18th of November by Dragan Radovanović says that women tend to score lower than men on both aggressiveness and dominance, since mental fatigue occurs earlier in women. He supports this by stating that women tend to have lower glycogen content, caused by hormone issues, which hinders their ability to meet the demands for fast energy. Additionally, women may have less confidence in their abilities.

Another suggestion is that tradition plays a role. Chess is usually a game played by men, and when women started to play, they were not as skilled as male players. However, it could also be that women have other priorities and better things to do compared to playing chess.

To understand this, we decided to conduct research to see whether sex affects chess performance.

Objective of the Study:

To investigate if sex/gender is a factor on chess performance. To find out the perception of male and female students (the chess players) on their perception of chess game.

Hypothesis

We hypothesize that sex or biological reasons does not affect chess performance. Male plays better in general due to social/behavioral/physiological factors and not necessarily biological.

Scope & Limitation:

The study is done in 5 days, 4 games per day among the ages of 12-15, 50 players in the English Program of Triamudomsuksa Pattanakarn School, on the Month of July.

Definitions:

1. Performance – the score of the players based on the Elo rating system.
2. Sex - either of the two main categories (male and female) into which humans and most other living things are divided based on their reproductive functions.
3. Gender - the behavioral, cultural, or psychological traits typically associated with one sex.
4. Rapid Tournament – in chess game, it is a type of fast chess or speed chess game where each player has 15 minutes plus 10 seconds additional time per move starting from move.

Chapter 2

Review of Related Literature

1. Information about “Chess”

Chess, one of the oldest and most popular board games, is played by two opponents on a checkered board with different pieces of contrasting colors, commonly white and black. White moves first, after which the players alternate turns in accordance with fixed rules, each player attempting to force the opponent’s principal piece, the King, into checkmate—a position where it is unable to avoid capture.

Chess first appeared in India about the 6th century CE. By the 10th century it had spread from Asia to the Middle East and Europe. Some regard the game chaturanga to be the precursor of modern chess because of the different piece abilities and the win condition being the capture of a singular piece (king).

2. Information about “Elo”

The Elo rating system is a method for calculating the relative skill levels of players in zero-sum games such as chess. It is named after its creator Arpad Elo, a Hungarian-American physics professor. A player's Elo rating is represented by a number which may change depending on the outcome of rated games played. After every game, the winning player takes points from the losing one. The difference between the ratings of the winner and loser determines the total number of points gained or lost after a game. If the higher-rated player wins, then only a few rating points will be taken from the lower-rated player. However, if the lower-rated player scores an upset win, many rating points will be transferred. The lower-rated player will also gain a few points from the higher rated player in the event of a draw. This means that this rating system is self-correct. Players whose ratings are too low or too high should, in the long run, do better or worse correspondingly than the rating system predicts and thus gain or lose rating points until the ratings reflect their true playing strength.

3. Information about “Why Chess is divided with sex.”

Some people suggest that it is because there are fewer female chess players (which is true), but if they were just as strong as male players then you would expect those female players to be evenly distributed amongst the global rankings. But they are not - they rarely crack into the top levels of the global rankings.

Males dominate the chess scene in rankings and population, but not because they are more intelligent. Instead, the influences that affect the imbalance in chess demographics can be attributed to biological, psychological, social, economic, and cultural factors.

According to Philip Keegan, G Austria, there is no reason other than tradition. For a long time, chess was a predominantly male activity and players achieved ratings by playing in all male tournaments. When women started to play, they were at a much lower level and so all female tournaments started to get organized, which resulted in women achieving 'female' ratings. The term WGM, women's Grandmaster, is still used for women who reach the grandmaster level by playing against other women. But there are no law barring women from playing in 'men's' tournaments, as the Hungarian player Judit Polgar has been doing since she was about 14. She became a full grandmaster at the age of 15 (at the time it was a world record for youngest ever grandmaster) by beating the socks off a lot of well-established male chess players, who I would imagine were pretty cheesed off about it.

Sarah (Moscow, Russia) also said, that might be because women have better things to do than move wooden pieces around a checkered board all day in the name of "intellectualism."

4. Information about “Sex VS Gender”

The words sex and gender have a long and intertwined history. In the 15th century gender expanded from its use as a term for a grammatical subclass to join sex in referring to either of the two primary biological forms of a species, a meaning sex has had since the 14th century; phrases like "the male sex" and "the female gender" are both grounded in uses established for more than five centuries. In the 20th century sex and gender each acquired new uses. Sex developed its "sexual intercourse"

meaning in the early part of the century (now it's more common meaning), and a few decades later gender gained a meaning referring to the behavioral, cultural, or psychological traits typically associated with one sex, as in "gender roles." Later in the century, gender also came to have application in two closely related compound terms: gender identity refers to a person's internal sense of being male, female, some combination of male and female, or neither male nor female; gender expression refers to the physical and behavioral manifestations of one's gender identity. By the end of the century gender itself was being used as a synonym of gender identity.

Among those who study gender and sexuality, a clear delineation between sex and gender is typically prescribed, with sex as the preferred term for biological forms, and gender limited to its meanings involving behavioral, cultural, and psychological traits. In this dichotomy, the terms male and female relate only to biological forms (sex), while the terms masculine/masculinity, feminine/femininity, woman/girl, and man/boy relate only to psychological and sociocultural traits (gender). This delineation also tends to be observed in technical and medical contexts, with the term sex referring to biological forms in such phrases as sex hormones, sex organs, and biological sex. But in nonmedical and nontechnical contexts, there is no clear delineation, and the status of the words remains complicated. Often when comparisons explicitly between male and female people are made, we see the term gender employed, with that term dominating in such collocations as gender differences, gender gap, gender equality, gender bias, and gender relations. It is likely that gender is applied in such contexts because of its psychological and sociocultural meanings, the word's duality making it dually useful. The fact remains that it is often applied in such cases against the prescribed use.

Usage of sex and gender is by no means settled. For example, while discrimination was far more often paired with sex from the 1960s through the 20th century and into the 21st, the phrase gender discrimination has been steadily increasing in use since the 1980s and is on track to become the dominant collocation. Currently both terms are sometimes employed with their intended synonymy made explicit: sex/gender discrimination, gender (sex) discrimination.

Chapter 3

Research Methodology

This part includes the description of research design, the materials, and procedures used in the research. This part also includes basic statistical treatment of data.

Research Design:

In this study, we used descriptive design. The research variables are the following below:

- Independent Variable: Sex/Gender (Male, Female)
- Dependent Variable: Chess Elo Score and Likert Scale Gender Discrimination Questionnaire
- Controlled Variables: Number of rapid tournament games, online app tool, beginner players, number of days playing, age, education, location.

Demographic Profile:
Age of Players, Skills in Chess, Time
in Playing, Education, Location

Sex/Gender
(Male &
Female)

Performance
(Elo Score)

Perception
(Likert
Scale)

Process:

1. 40 participants were selected (20 males, 20 females) who are new or beginners in chess.
2. Participants were instructed to sign up or create an account in chess.com app using their phones or tablets.
3. They were instructed to follow the rules on how to use the app (see appendix 1 for CHESS GAME INSTRUCTION)
4. They played 4 rapid tournament games per day, for 5 days.
5. Players were informed to take a photo (screen shot) of their Elo Score on the first day after the 4th round and send it to the researchers.
6. On the 5th day, players were also informed to take another photo (screen shot) of their Elo Score and send it to the researchers.
7. After the game, a survey form 'Gender Discrimination Questionnaires' (see appendix 3) was given to the players to answer.
8. Results of chess scores of male and female were obtained and analyzed using the Elo Score rating categories based on USCF (see appendix 2).
9. Results of survey perception on chess game gender discrimination were obtained and analyzed using the five-point Likert Scale (see below).

Equipment:

- Google Survey forms
- Chess.com app
- Electronic Devices (E.g., Smartphones, Tablets)

Statistical Treatment of the Data:

The following data results that measure the gender perception of chess players will be analyzed by getting its mean or average. The qualitative measurement will be analyzed using the Likert Scale.

The Five-point Likert Scale

Scale	Numerical Value	Verbal Interpretation
5	4.21-5.00	Strongly Agree
4	3.41-4.20	Agree
3	2.61-3.40	Neutral
2	1.81-2.60	Disagree
1	1.00-1.80	Strongly Disagree

Chapter 4

RESULTS AND DISCUSSION

This chapter presents the results of the calculated analysis undertaken as well as the corresponding interpretation of the results.

Socio Demographic Profile

Along socio-demographic profile, it was noted that the chess players/participants have an equal distribution in terms of gender. There were 50% male and 50% female, frequencies of 20 male and 20 female (See Table 1). In terms of age, 35% were 12 years old, 40% were 13, 12.5% were 14, and 12.5% were 15 years old (See Table 2).

Table 1. Distribution of Student Chess Players According to Sex/Gender

Gender	Frequency	Percent
Male	20	50%
Female	20	50%
Total	40	100%

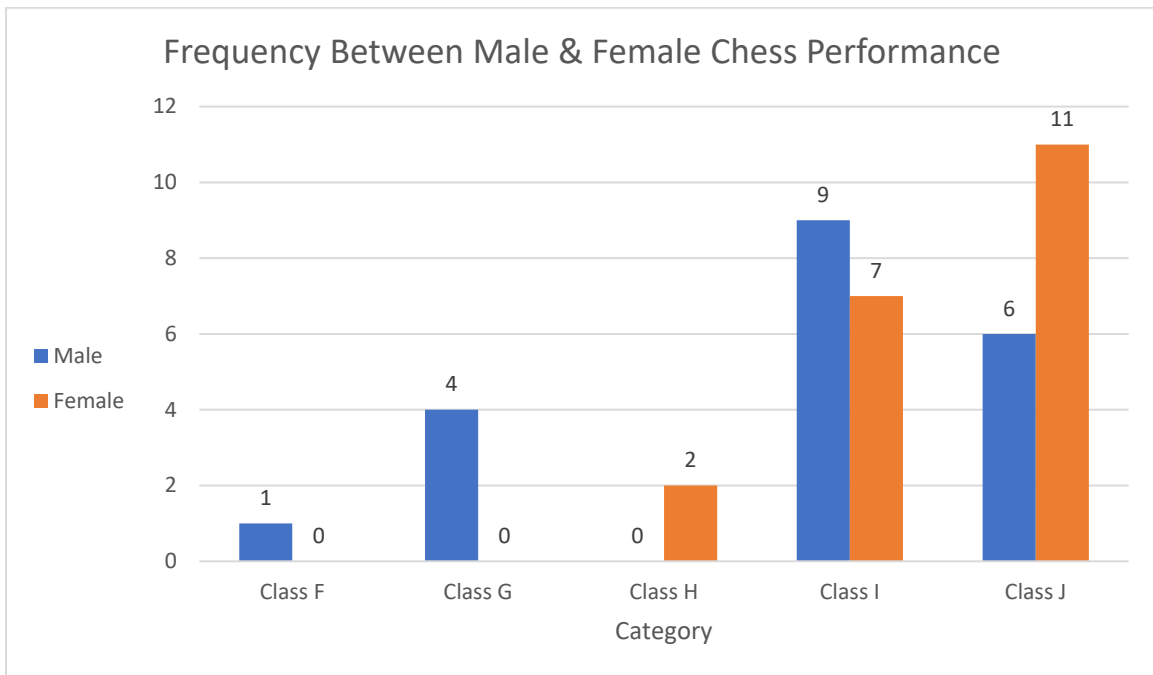
Table 2. Distribution of Student Chess Players According to Age

Age	Frequency	Percent
12	14	35%
13	16	40%
14	5	12.5%
15	5	12.5%

Table 3. Frequency between male and female Chess Performance Elo Score Rating Based on USCF

Category	Frequency	
	Male	Female
Class F	1	0
Class G	4	0
Class H	0	2
Class I	9	7
Class J	6	11

Graph 1. Frequency Between Male & Female Chess Performance based on Elo Score using USCF Rating Categories



Based on table 3 and graph 1, the results shows that there was 1 male chess player who made it into category Class F which is the highest among the 5 categories from J to F. Next there were 4 males who made it into category G which is second to F, and there are no male players who made into class H, but 2 females. In Class I, there were 9 males and 7 females, and in the last category, the lowest one, there were 6 males and 11 females. Please see appendix 2 for the exact rating score of the categories.

Table 4.1 Frequency of Survey Results on Gender Discrimination in Chess Game

Survey Questions	SD	D	N	A	SA
1. Do you feel that there is gender discrimination in chess games?	22	4	6	8	0
2. Do you think that male is better than female in playing chess?	12	4	14	4	6
3. Have you ever lost a chess game because of your gender?	22	4	12	0	2
4. Do you think that female cannot be as competitive as male in playing chess?	28	4	4	4	0
5. Do you think a chess game should be a unisex (gender-for-all) competition?	10	0	2	6	22
6. Do you think your gender is the reason why you are interested or not interested in playing the chess game?	14	4	12	6	4

Table 4.2 Weighted Mean and Verbal Interpretation on Gender Discrimination in Chess Game

Survey Questions	Fx1	Fx2	fx3	Fx4	Fx5	Total	Weighted Mean	Verbal Interpretation
1.	22	8	18	32	0	80	2.00	Disagree
2.	12	8	42	16	30	108	2.70	Neutral
3.	22	8	36	0	10	76	1.90	Disagree
4.	28	8	12	16	0	64	1.60	Strongly Disagree
5.	10	0	6	24	110	150	3.75	Agree
6.	14	8	36	24	30	112	2.80	Neutral

Here is the following analysis based on the results of Table 4.1-2.

For survey question number 1: The results show a weighted mean of 2.00 which means that they disagree that there is gender discrimination in chess games.

For survey question number 2: The results show a weighted mean of 2.70 which means that they are neutral that male is better than female in playing chess.

For survey question number 3: The results show a weighted mean of 1.90 which means that they disagree that they lost a chess game because of their gender.

For survey question number 4: The results show a weighted mean of 1.60 which means that they strongly disagree that female cannot be as competitive as male in playing chess.

For survey question number 5: The results show a weighted mean of 3.75 which means that they agree that a chess game should be a unisex (gender-for-all) competition.

For survey question number 6: The results show a weighted mean of 2.80 which means that they are neutral, that gender is the reason why they are interested or not interested in playing the chess game.

Chapter 5

Conclusion

For chess performance between male and female beginner players, the scores range only from class J to F which is reasonable for all beginners playing within 5 days only, and 20 games. The overall analysis of the performance results between male and female chess players, shows that male still has the highest score, and more females in general got the lowest score.

For students' perception on gender discrimination, they disagree on the idea that there is gender discrimination in chess games and strongly disagree that female cannot be as competitive as male in playing chess. We may not know what the accurate reasons are behind, but this could lead to other hypothesis that in the 21st century, inclusivity and gender equality becomes a norm, and the new generation could not feel that pressure or discrimination. Another angle could be, it's probably due to the game set-up which is done online not face-to-face or classical. So, the chess players probably don't feel the gender discrimination specially the female who played anonymous to random players online.

Other results are neutral, such as on the idea that male is better than female in playing chess and on the idea that gender is the reason why they are interested or not interested in playing the chess game. However, they agree on the idea that a chess game should be a unisex competition. Which both male and female gender support on this.

In conclusion, our hypothesis for chess performance was not accepted since male still got more higher score than female chess players. For social factors, it is complicated to arrive at a conclusion based on our survey. However, there is a positive indicator that chess games should be open to all.

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APPENDIX 1:

CHESS GAME INSTRUCTION

1. Sign up at chess.com as new to chess or a beginner.
2. Use anonymous profile without showing your sex (male or female). Examples: dog's name or avatar
3. After signing up as new in chess or beginners, the app will give you an initial score of 400.
4. Navigate the app and get familiar with it, without playing the tournaments yet.
5. Once you are set and ready to play, you can start the game on the first day.
6. Using Rapid Tournament, play four times each day.
7. The time of the day and game intervals depend on you.
8. Play randomly based on the app and avoid playing with your friends or school mates.
9. After the 4th game, do not forget to take a screenshot of your score and send it to the researchers via LINE app.
10. During the 5 days' timeframe, you can have chess lessons on your own. Using the app or other resources. It is up to you to do that.
11. On the last day of the rapid tournament, take another screenshot of your score after playing the 20th game and send it to the researchers via LINE app.

APPENDIX 2:

USCF (United States Chess Federation)
Rating Categories

Category	Rating range
Senior master	2400 and up
National master	2200–2399
Expert	2000–2199
Class A	1800–1999
Class B	1600–1799
Class C	1400–1599
Class D	1200–1399
Class E	1000–1199
Class F	800–999
Class G	600–799
Class H	400–599
Class I	200–399
Class J	100–199

APPENDIX 3:

Likert Scale Questionnaire on Gender Discrimination

Please read the following statements and choose the responses (from 1= strongly disagree to 5= strongly agree and that apply most accurately to you by ticking the relevant columns.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Questions	1	2	3	4	5
1	Do you feel that there is gender discrimination in chess games?					
2	Do you think that male is better than female in playing chess?					
3	Have you ever lost a chess game because of your gender?					
4*	Do you think that female can be as competitive as male in playing chess?					

5	Do you think a chess game should be a unisex (gender-for-all) competition?					
6*	Do you think your gender is the reason why you are interested or not interested in playing the chess game?					

APPENDIX 4

Chess Game Elo Score in Rapid Tournament using chess.com.

