
Race And Gender In Chess In The United States

Introduction

'Chess is a two-player strategy board game played on a chessboard, and this game

is played by millions of people worldwide' (cited from Wikipedia). To begin with, I wish to introduce the biggest and most important chess organization in the world because it plays an essential role in chess. 'The Fédération Internationale des Échecs (FIDE) or World Chess Federation is an international organization that connects the various national chess federations around the world and acts as the governing body of international chess competition' (cited from Wikipedia).

In addition, I need to introduce the definition of rating in chess. 'A chess rating system is a system used in chess to calculate an estimate of the strength of the player, based on his or her performance versus other players. The Elo system was invented by Arpad Elo and is the most common rating system. It is used by FIDE and other organizations' (cited from Wikipedia). In other words, the rating is the most direct and effective approach to measure how strong a chess player is. There are several rating systems in chess, and they are used by different organizations. But all ratings that I mention in this project are Elo rating for convenience.

What is more, there are roughly three basic types of chess. They are standard, rapid, and blitz chess. Pranav Narhire states that 'according to FIDE rules, the difference between rapid chess and blitz chess is as follows. In Rapid Chess Competitions, the players get 15 minutes and +10 seconds (extra time) for each move. In Blitz Chess Competitions, the player gets only 3 minutes and +2 seconds (extra time) for each move'. Standard chess is a chess game that players have a longer time than rapid chess and blitz chess. 'FIDE has a single, classical time control for most of its major events: 90 minutes for the first 40 moves, followed by 30 minutes for the rest of the game, with an addition of 30 seconds per move starting from move one' (cited from Wikipedia). Also, standard time control games count towards player's standard rating, not his bullet or blitz rating. In this project, I am talking about standard rating only.

There are two main research questions in the project. Question 1: Do white chess players have better performance than African American chess players in the U.S.? Question 2: Do male chess players have a better performance than female chess players in the world? To put it another way, I would like to know what is the relationship between race and chess performance as well as what is the relationship between gender and chess performance.

Motivation and Background

I am interested in studying race and gender in chess because chess is currently dominated by males and some nations/ races. Male players usually are considered to have better performance than female players, as well as whites and Asians seem to have more top players than other races. This is similar to the stereotype about math and computer science, people often think that Asians and white males have outstanding performance in the fields of mathematics and computer science. However, chess is an intelligential sport instead of a

physical sport, men are supposed to have more advantages than women.

For the project, I will address Invisible Man, and I will converse with the themes of race and gender. In Invisible Man, the society is dominated by white males, and African Americans are invisible as well as they experience discrimination. What is more, there are solely several female characters in Invisible Man. Females are unimportant in the book, and there is a inequality between men and women. Thus, I wish to figure out whether race and gender have an impact on chess performance, which are my research questions in part one. Also, I would like to know will the current condition of African American chess players and female chess players agree with the situation described in Invisible Man or disagree with it.

Dataset Visualization

First, I want to illustrate titles of master in chess, and there are four master titles in total. They are Grandmaster, International Master, FIDE Master, and Candidate Master in decreasing order. Men's titles and women's titles are separated because women and men often compete separately. Nevertheless, women are allowed to play men's tournaments. For example, Yifan Hou earned her title of male grandmaster in 2008 when she was 14 years old

It is notable that being a female chess master is easier than being a male chess master. As I stated early, the rating is the most common way to measure a chess player's performance. Hence, we can see that female grandmaster and male FIDE master are on the same level, as well as female international master and male candidate master are on the same level.

I define that advanced players in men as players who have a rating between 2000 and 2200. Also, I define club player and amateur in both males and females as players whose rating is between 2000 and 1700, and between 1700 and 1000, respectively. Furthermore, in terms of the strongest male grandmasters, Magnus Carlsen has a peak rating 2882 and Garry Kasparov has a peak rating 2851. When it comes to the strongest female grandmasters, Judit Polgar has a peak rating 2735 and Yifan Hou has a peak rating 2735 (data from <https://www.sparkchess.com/chess-players-titles-and-ratings-in-2019.html>).

I divide seven levels of rating into two categories to obtain. To be more specific, I combine four levels of master into one category of master. Besides, I combine the remaining three levels as the other category, that is non-master. The reason I decided to combine levels is to get a better understanding of the data in a more practical view, and indeed we would not lose too much information.

Boxplot consists of five major components, they are maximum, minimum, Q1, Q3, and median. The maximum of the data is the top line, and the minimum of the data is the bottom line. The first quartile (Q1) is defined as the middle number between the smallest number and the median of the data set, which is the bottom of the box. The third quartile (Q3) is the middle value between the median and the highest value of the data set, which is the top of the box. The second quartile (Q2) is the median of the data, which is the line in bold within the box.

Methodology (Statistical Analysis)

I will use similar techniques to answer both the first question and the second question. The

approaches I will use in this project include odds ratio, Wald confidence interval, two sample test, and Boxplot. For odds ratio, my null hypotheses are that gender and being master are independent as well as race and being master are independent. My alternative hypotheses are that gender and being master are not independent/ dependent as well as race and being master are not independent/ dependent. More precisely, one alternative hypothesis is that males are easier to become master than females or male chess players have a higher rating than female chess players on average. Besides, the other is that whites are easier to become master than African Americans or African American chess players have a lower rating than white chess players on average.

Discussions and Conclusions

Personally, as a chess amateur, I know a few white American grandmaster while I never hear any African American grandmaster before doing this project. So this is similar with the situation in *Invisible Man*, African American chess players seem to be invisible to the public. We can see that 47.6% (10/21) of male grandmasters are white in America while only 9.5% (2/21) of them are African American. In addition, white Americans occupy 25% (3/12) in the group of female grandmasters, but there is no African American female grandmaster at all. Thus, whites do have better performance than African American although top chess players are not dominated by whites

There is no specific data about the number of white chess players and the number of African American chess players. However, playing chess is actually popular for African Americans. Shabazz (2016) states that African American chess players can be seen at tournaments around the world and are enthusiastic about competition. Likewise, Ellis (2017) says that chess is one of very common board games amongst African Americans although it is quite regional. Ellis (2017) writes that plenty of black people who are top chess players and lots of other folks who are passionate about the game in some highly urban areas, particularly New York, Chicago, Baltimore, and Washington DC. Even if many African Americans play chess, the number of African American grandmaster is largely less than the number of white grandmaster, and solely a few African American chess players are famous.

Shabazz (2016) states that 'Race is always a controversial subject when discussing merit-based activities like chess. There has been no empirical research conducted to show that systematic racism has prevented Black players from excelling in chess. American players like Walter Harris was certainly excluded from certain opportunities in the 60s '. Therefore, discrimination for African American players in chess did exist, which agrees with the situation of African Americans in *Invisible Man*.

There are several possible reasons why there are only a few African American grandmasters. First of all, Shabazz (2016) indicates that the majority of the top Black chess masters are either not active or playing quite little rated games. Financial issue could be the biggest of challenge for Black players because earning the required norms for FIDE titles. More specifically, Shabazz (2016) points out that There is the high costs associated with training and traveling for African Americans even if they live in the U.S. and 'Blacks tend to face greater financial hardship (on average) for a multitude of socioeconomic and historical reasons'.

In addition, Shabazz (2016) writes that the coaching is not always available and most African

American chess players are self-taught and do not have any formal coaching. Furthermore, Ellis (2017) that the chess boards at the public parks in some aforementioned cities like New York are appropriate places to play, learn and converse chess. But many other neighborhoods may not have such convenient access for African American to play chess.

I calculate that odds ratio is approximately 0.607. It means that the estimated odds of a success are 0.607 times as large as in group of male chess players than in group of female chess players. In other words, the estimated odds of a success are 1.647 times as large as in group of female chess players than in group of male chess players. Here odds of a success is the probability that a chess player become a master. Then I compute 95% Wald confidence interval for odds ratio. With 95% confidence, the odds of a success is between 0.585 and 0.629 times as large for male chess players than female chess players. Since my 95% confidence interval does not contain 1, I believe that female chess players are easier to become master than male chess players worldwide.

Likewise, I also conduct two sample test of proportions to confirm my conclusion. I get 95% confidence interval between -0.053 and -0.046, which does not contain 0. Therefore, the probability that a male player become male chess master and the probability that a female player become female chess master are different. However, we must note that requirements of being a male chess master and requirements of being a female chess master. Next, I will compare current rating of top 100 male grandmasters and rating of top 100 female masters (actively only) in America.

The average rating of top 100 male grandmasters (actively only) in the U.S. is 2493.79, and the standard derivation is about 95.49. Additionally, we can see three small circles in the figure, and they are considered as outlier in statistics. In this case, it means that the top 3 male grandmaster are much stronger than others among top 100 male chess players in the United States. The average rating of top 100 female masters (actively only) in America is 1925.38, and the standard derivation is approximately 206.28. Compared with males, it is clear that the average rating of top 100 female masters in America is reduced by about 570, which is a huge difference. Moreover, the standard derivation of rating top 100 female masters is doubled compared with the counterpart in males.

Howard (2014) indicates that 'chess talent may consist of a mix of ability and personality traits at which males on average may excel or there may be more males at the top extreme due to greater male variability. Stars in chess and in physical sports often have the famed "killer instinct", the desire to win at all costs'. However, there is no theory to confirm that an offensive chess players have a higher chance to win. Meanwhile, Howard (2014) finds that 'women typically play many fewer FIDE-rated games than males, only about one third of the number on average. Most players who persist to 900 rated games become grandmasters , but women tend to drop out much earlier '.

Various explanations have been proposed for the female under-representation at the top in chess and in science and technology areas. There are two main theories to explain male predominance at the apex of intellectual achievement: some attribute it to some innate evolutionary ability differences, others to social factors of present-day society.

Some researchers say that it is all due to social factors. There are no ability or personality differences between the sexes. Instead, social pressures discourage women from being

competitive and from outdoing men, women face stereotype threats, which downplay female achievement and limit female opportunity.

Howard (2014) concludes that 'the male predominance in chess parallels that in domains such as mathematics, physics and engineering, which may tap some similar abilities and propensities. Males on average may have some innate advantages in developing chess skill due to previous differing evolutionary pressures on the sexes. However, Females may have greater talent on average in other domains'. Therefore, the situation in chess agrees with the condition in Invisible Man, inequality does exist between women and men since male chess players' performance is better than female chess players' performance in general.

Reflections and Suggestions

From this project, I refresh my memory about statistical knowledge and more importantly I use the knowledge in real life. First of all, I use the statistical procedure in categorical data analysis. In addition, I carefully collect data, choose appropriate research methods. Lastly, I produce informative plots and tables, and communicates the results with the readers clearly. Research questions seem to be easy, but I encounter more unexpected challenges when I really do the project. I spent around 20 hours totally on the project, the most challenging part for me is data collection.

Data are valuable, finding useful and reliable data is difficult. I cannot find the data about chess players in the 20th century and statistics about chess players in different races in America. Otherwise, I can make a comparison between current situation about chess players in the United States and past condition to see how things are changed. Moreover, I could conduct a time series analysis for potential future improvement if I am able to find data in consecutive years. Seeking advice from the instructor or TA is helpful since it guarantees a good start, and comments from peer view should also help me to develop the project.

Next, I wish to provide some suggestions about how to ameliorate the current situation in the world of chess, and in America in particular. First, the government, schools, and society ought to encourage more females and minorities such as African American to play chess. Resources are the key in education, and they are also quite important in learning chess. The government and the communities could invite qualified volunteers to teach free chess lessons locally, and I believe that many masters and coaches are willing to help. For example, Aaron Ellis points out that 'Chess is best learned when one has a good teacher. Many of the great black players like Maurice Ashley tend to stay in their neighborhood and teach the next generation, like Joshua Colas'. It is also a good idea to set up some special foundations so that they can cover travelling expenses and accommodation fee, etc for chess players who are talented but not wealthy.

Furthermore, it should be helpful to establish more organizations for female chess players and players from minorities. For instance, The Women's Commission for Chess (WOM) is a part of the World Chess Federation (FIDE). 'It was formed to represent women's interests in chess, their goals include generating positive publicity and recognition for women in chess and women's chess events, helping increase certified female organizers, arbiters and coaches, and supporting talented young female players as much as possible' (cited from <http://womenchess.fide.com/>). In addition, we ought to pay more attention to train talented girls and gifted minorities.

References

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