Team Gold Final Report on the 2024 Olympic Men's Volleyball Data

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How Do We Help Team USA Win at the Next Olympic Games?

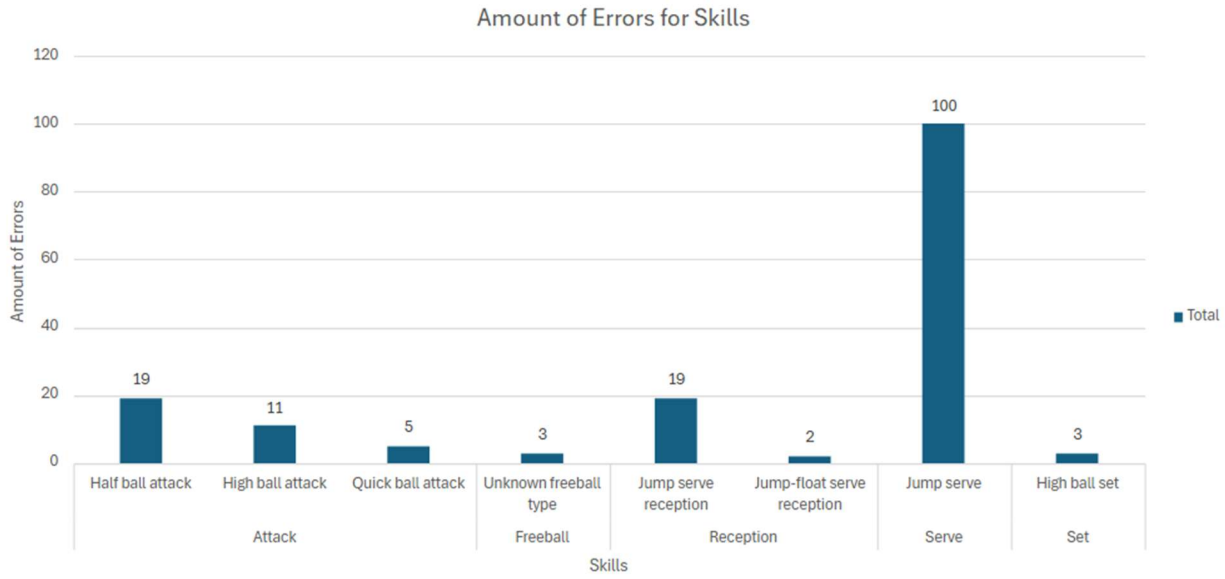
We set out to assist the United States Men's Volleyball Team in competing for gold in the 2028 Olympic Games hosted in the United States, by providing analysis based on data from the 2024 Olympic Games. The United States is tied with Brazil and the Soviet Union with six total medals in Men's Olympic Volleyball. We aim to provide actionable analysis for Team USA to help our country become first in medals for this incredible sport on home soil. To do this we sought to answer the following questions:

- What skill did Team USA make the highest number of errors in?
- When Team USA had a winning attack, which skill type caused that the most?
- Determined by a specially developed player rating system, which player on Team USA performed the best throughout the tournament?
- Which players should we put in when Team USA is behind?
- Which winning attack best predicts a team's placement in the tournament?
- Which errors best predict a team's placement in the tournament?

Additionally, to solve this overarching problem we used the 2024 Men's Olympic Volleyball Games Play-by-Play data set. The following report is the summary of the analysis we compiled and sorted through weeks of work.

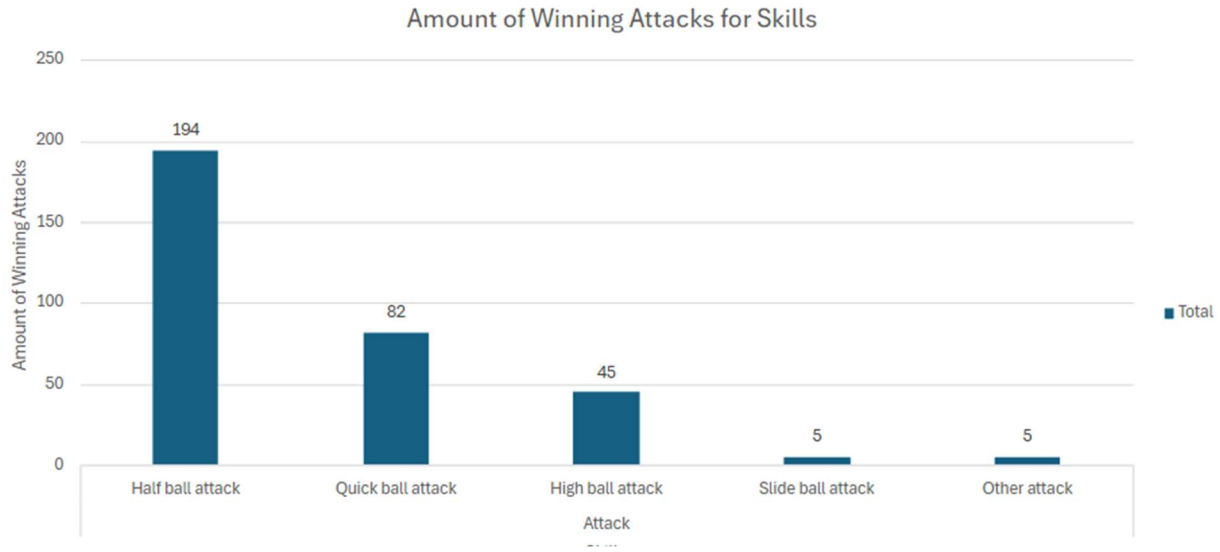
Question 1 [Descriptive, Estimated Completion Time: 1 Hour]: <u>What skill did Team USA make the highest number of errors in</u>?

Team USA made the most errors with jump serves. We discovered this by sorting the play evaluations to include only errors and counting how many errors of each skill was made. Intentional focus on jump serves in training sessions may be advised in the lead up to the next 2028 Olympic Games to avoid unnecessary lost points.



Question 2 [Descriptive, Estimated Completion Time: 1 Hour]: <u>When Team USA had a winning attack, which skill type caused that the most</u>?

The high ball attack caused a won point most out of all the skill types for Team USA. We discovered this by sorting the play evaluations to include winning attacks then sorted by attack skills. Due to this clear strength for Team USA in high ball attacks, considering it caused more than double the count of winning attacks than the second-best winning attack skill, further training may be done to develop a strategy for optimizing the use of this clear strength.

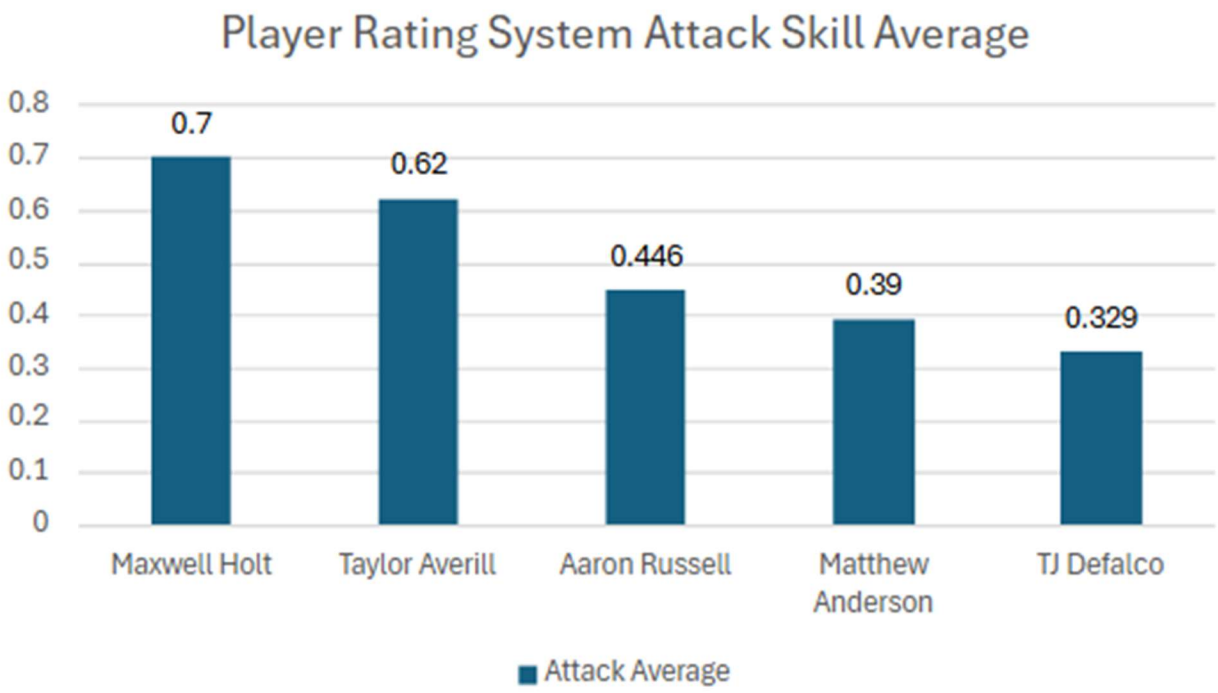


Question 3 [Descriptive, Estimated Completion Time: 6 Hours]: Determined by a specially developed player rating system, which player on Team USA performed the best throughout the tournament?

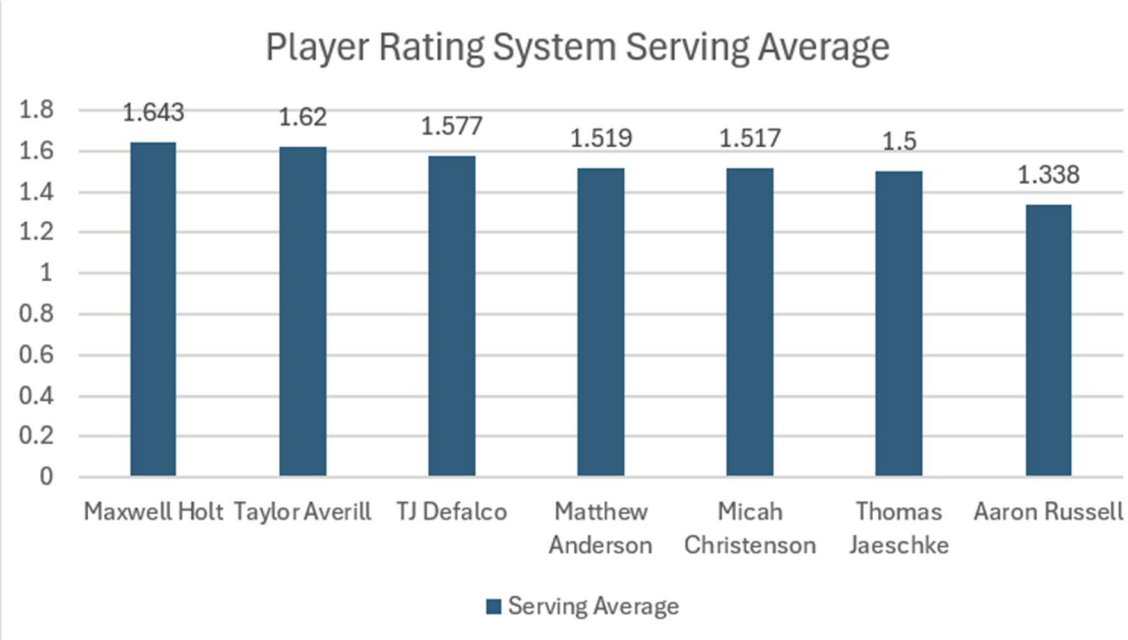
Maxwell Holt was the best performing player for Team USA at the 2024 Olympic Games, having the best performance in 2 out of the 3 player performance categories of Attacks, Serves, and Blocks. This was determined by setting up a point system for each skill based on play evaluation. Maxwell Holt was determined to be the best Attacker and Server for the team and the second-best Blocker behind Taylor Averill.

Below are the data and ranking for the Attack, Serve, and Block skills:

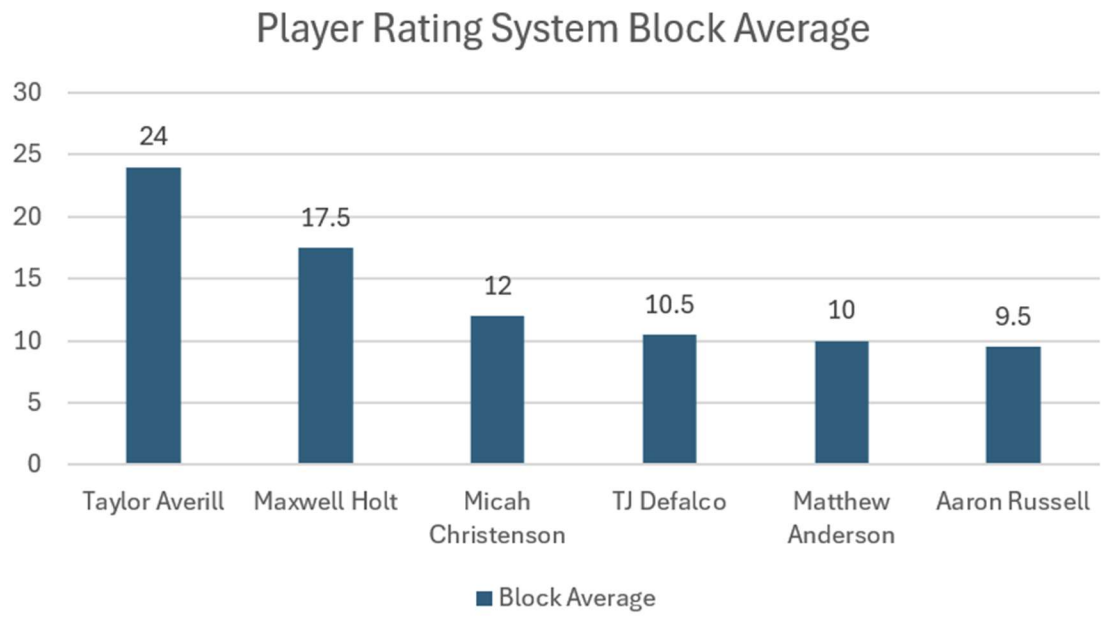
Attack Ratings:



Serving Ratings:

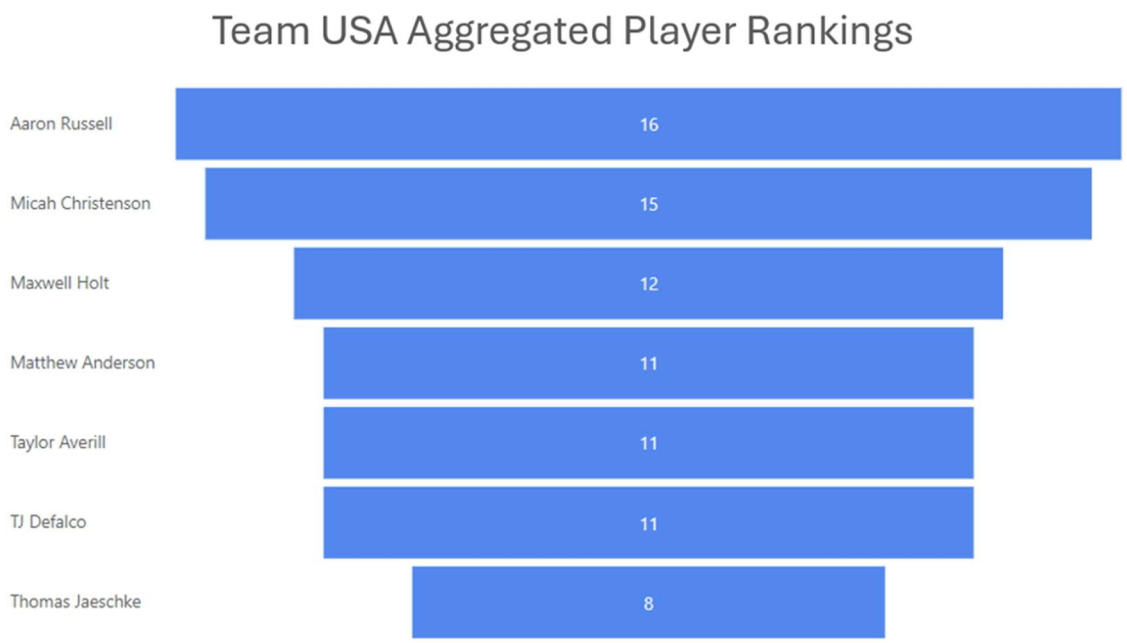


Block Ratings:



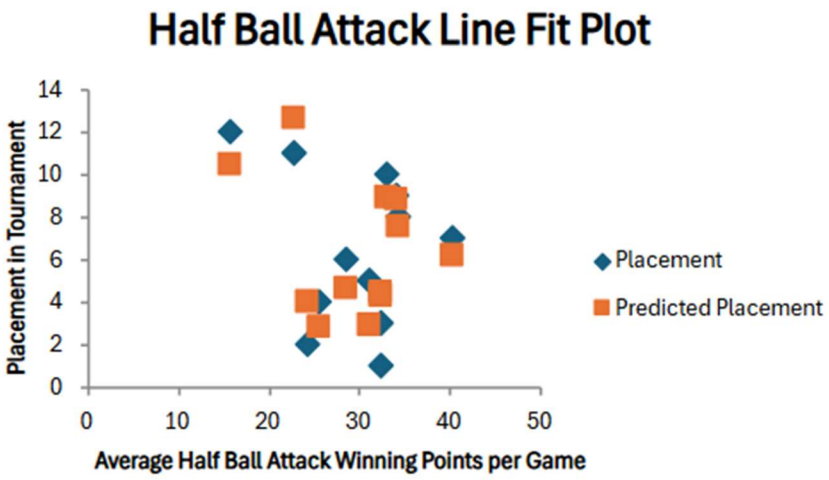
Question 4 [Descriptive, Estimated Completion Time: 2 Hours]: <u>Which players should we put in when Team USA is behind</u>?

We should put in Thomas Jaeschke when Team USA is behind. To come to this conclusion, we ranked each player in the Attack, Serve, and Block categories using the same system from Question 3 and sorted based on when the team was losing in points. The player with the lowest aggregated ranking was the best in sets we lost. When we lost a set Thomas Jaeschke performed better than the other players.



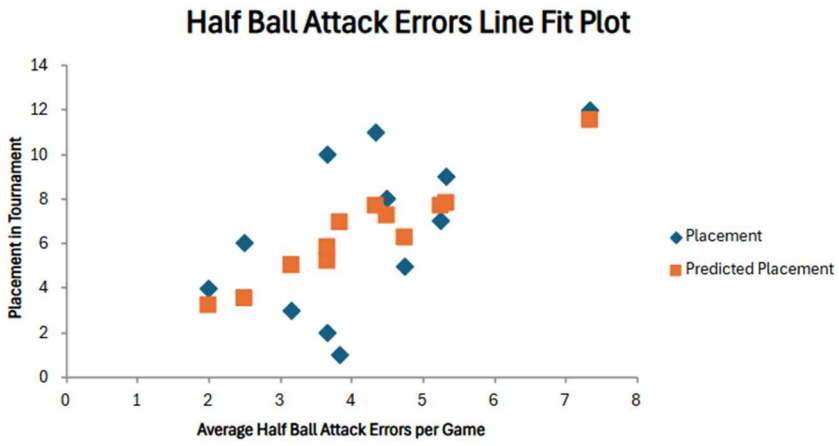
Question 5 [Predictive, Estimated Completion Time: 3 Hours]: <u>Which winning attack best predicts a team's placement in the tournament</u>?

Half Ball Attacks are the biggest predictor in whether a team wins a game. We determined this by utilizing a regression analysis to predict tournament placement from count of winning skill types of half ball attacks, quick ball attacks, and high ball attacks. We ended up discovering that none of these skills were statistically significant predictors for tournament placement based on our alpha of 0.05. With an Adjusted R-Squared of 0.423 and a p-score of 0.213, Half Ball Attacks were shown to have the highest significance. The line fit plot for Half Ball Attacks shows us the trend of this variable with tournament placement. Ultimately, however, the Half Ball Attack, while being the most significant individual skill for predicting tournament placement, the predictive ability is statistically insignificant. More data may be needed from previous Olympics or other tournaments to create an analysis that can effectively predict tournament placement. Alternatively, winning skills by skill groups may not be a significant factor at all; possibly instead having to do with individual player performance or another similar metric.



Question 6 [Predictive, Estimated Completion Time: 2 Hours]: <u>Which errors best predicts a team's placement in the tournament</u>?

Half Ball Attacks are the biggest predictor of whether a team loses a game. After completing a regression analysis on error counts per game in jump serves, half ball attacks, and high ball attacks to our tournament placement we found the number of errors per game in all those skills to be statistically insignificant. The model predicted the p values for all three skills were far above our alpha of 0.05. With an Adjusted R-Squared of 0.147 and with a p-score of 0.618, Half Ball Attacks were shown to be the most significant predictor. The line fit plot for Half Ball Attack Errors shows us the trend of this variable with tournament placement. Ultimately, however, Half Ball Attack Errors, while being the most significant variable for predicting tournament placement, the predictive ability is highly statistically insignificant. More data may be needed from previous Olympics or other tournaments to create an analysis that can effectively predict tournament placement. Alternatively, errors in skill groups simply may not be a significant factor in determining this at all; possibly instead having to do with errors by specific player or some other similar metric.



Conclusion

Overall, with the data we've collected and sorted throughout the course of the project we have determined some very interesting conclusions. We've learned much of what the 2024 Men's Volleyball Olympic Team performs well and poorly in, which players are the strongest and perform best under the threat of losing, and which skills are the most impactful when determining our chances of winning and losing. Though we had a wealth of data available to us, more accurate conclusions could be drawn from additional data sources such as specific player data from past performances internationally and at club level, historical team data from past Olympics and other international tournaments, and additional data on enemy teams we can gather. Despite this, much of the analysis we have compiled should be of great use to any coach striving to win the 2028 Olympic Men's Volleyball Tournament.