



The Skills of Tennis Champions

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Purpose

- To use data from the most prestigious tennis tournaments to uncover specific traits and patterns of the most skilled players
- To identify key differences or similarities between male and female athletes
- To help new players grow their own set of skills.



Background

- Data provided by the University of California Irvine machine learning repository.
- Authors: Shruti Jauhari, Aniket Morankar, Ernest Fokoue
- Provides tournament information from the:

US Open 2013 Male and Female Division

French Open 2013 Male and Female Division

Australia Open 2013 Male and Female Division

Wimbledon 2013 Male and Female Division

- Over 900 total rows and 42 columns of data



Net Points and Their Significance

Net Point: Points that are won or lost approaching the net

A good player will use net points to apply pressure and confuse to opponents

Champion skill #1:

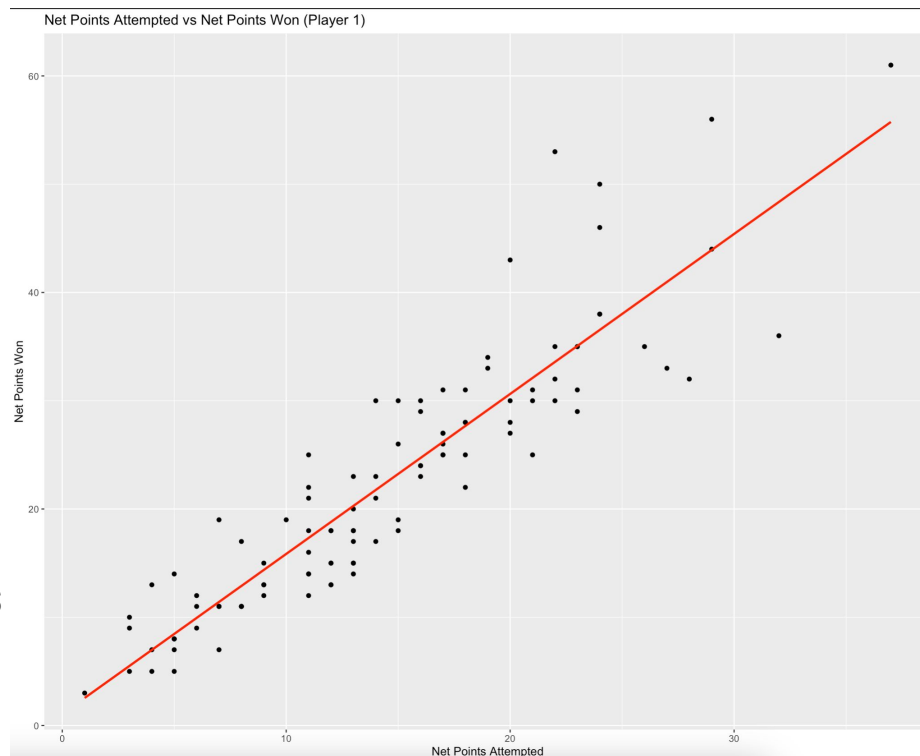
- They know the right time to play aggressively



Net Points and Their Significance

Example from the 2013 Men's Australian Open:

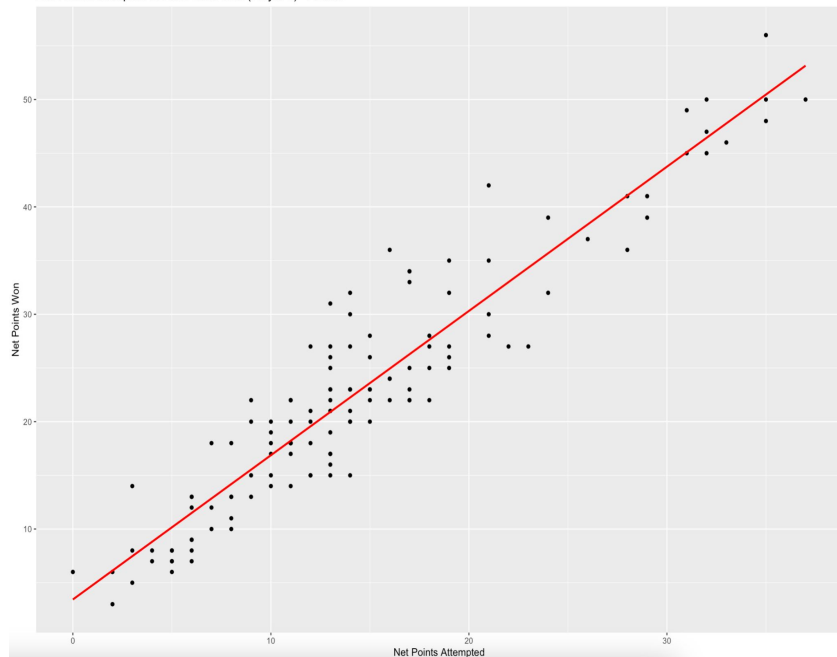
- Most players who attempt more net points always receive a positive outcome
- Reinforced by a correlation coefficient of .91
- Net points are risky for both sides but can create an advantage



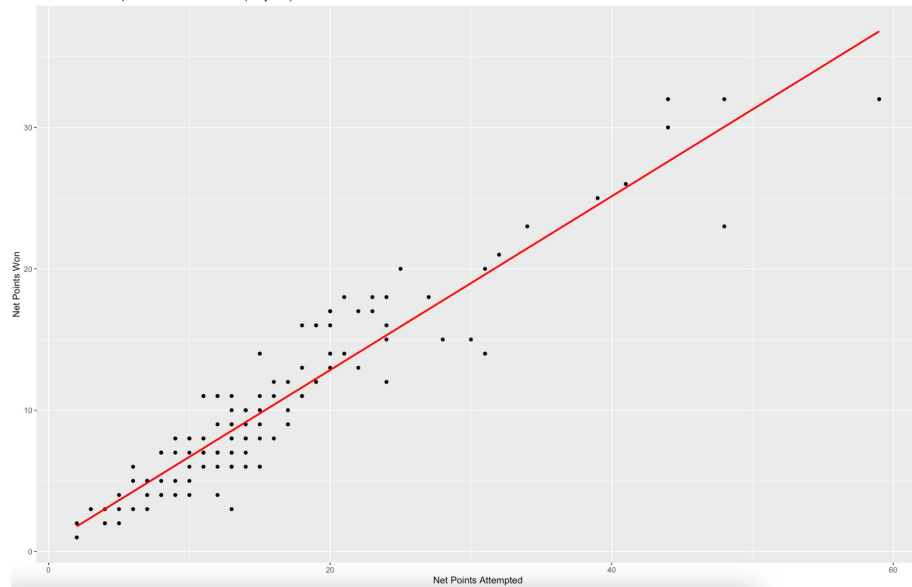
Net Points and Their Significance

Same technique in different tournaments:

Net Points Attempted vs Net Points Won (Player 1) - France



Net Points Attempted vs Net Points Won (Player 1) - Wimbledon Womens



Owning the court

A good player will do their best to keep their advantage.

Winning breakpoints gives players one of the best opportunities to gain that advantage because winning returning games is rare.

Champion Skill #2

- They do their best to stay in control



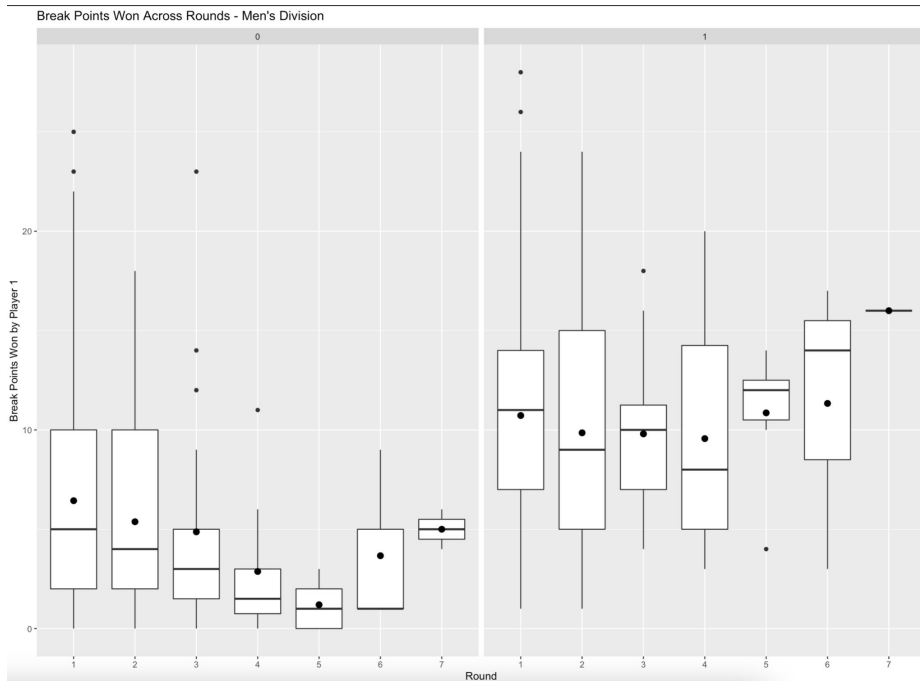
Owning the court

Winning breakpoints is a critical skill that helps players win

This graph:

- Facet "0" tracks breakpoints won by player 1 but lost the match
- Facet "1" tracks breakpoints won by player 1 and won the match
- On average, 50% of the break points won by the losing side are not within range of 75% of break points won by the winner.

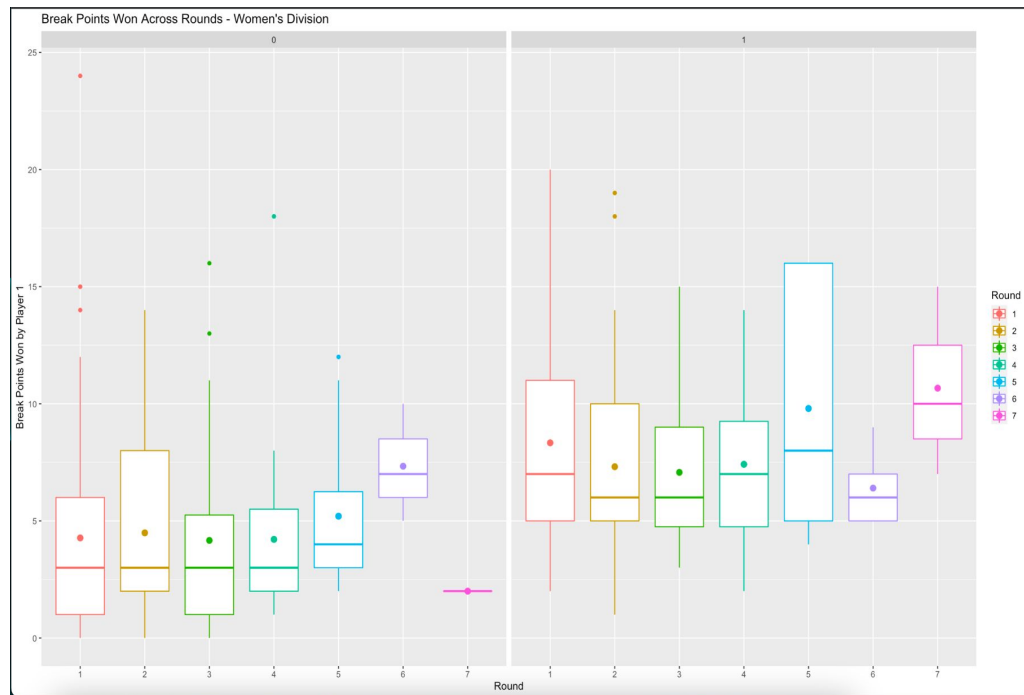
*Limited data is provided for game 7 since most tennis sets last 6 games.



Owning the Court

This holds true for the women's division as well.

- Facet 1 shows on average, 50% of the break points won by the losing side are not within range of 75% of break points won by the winner.



Going the Extra Mile

Players in these high level tournaments are already known to be some of the greatest. So what makes a winner stand out?

A winner will always put in extra work, in the form of training, to ensure a competitive advantage.

Measuring Aces across matches can help determine the overall stamina of a player since those points rely on intense accuracy and sustained levels of physical activity.

Champion skill #3: A champion can hold peak performance across their matches

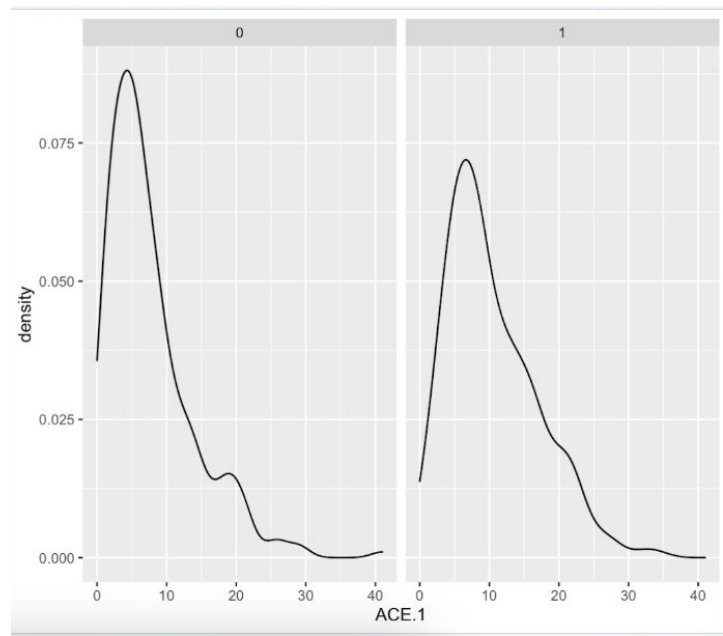


Going the Extra Mile

Consistent ace's show consistent stamina

This graph:

- Measures the overall aces of players who lost (0), and players who won(1)
- ACE.1 is the total aces for player 1
- Facet 1 shows players that win tend to score more aces for the duration of their matches
- Players that lose tend to have a narrower distribution of aces across their matches.

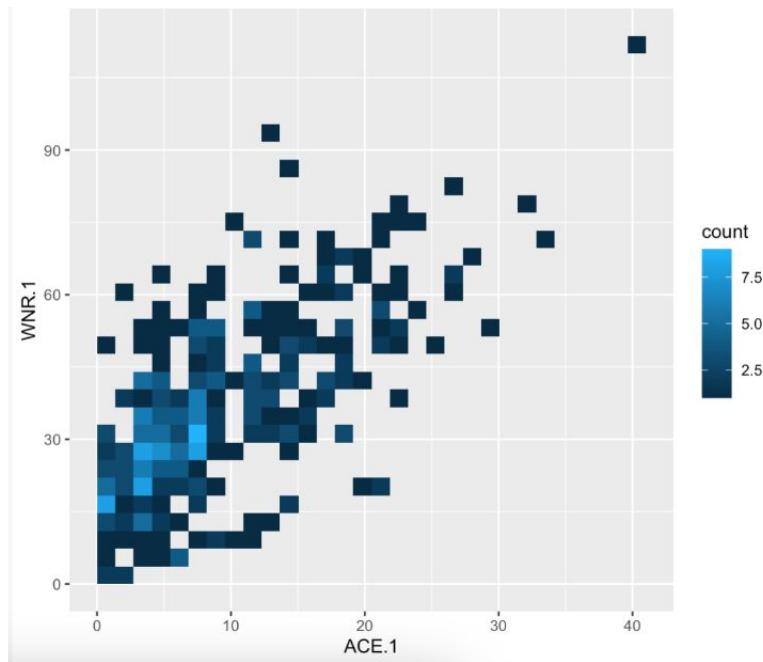


Going the Extra Mile

A different perspective:

This graph:

- Compares number of aces and total wins for player 1
- Athletes with less wins tend to only score around 10 aces per match
- Winning more requires the player to manage their stamina to score more aces.



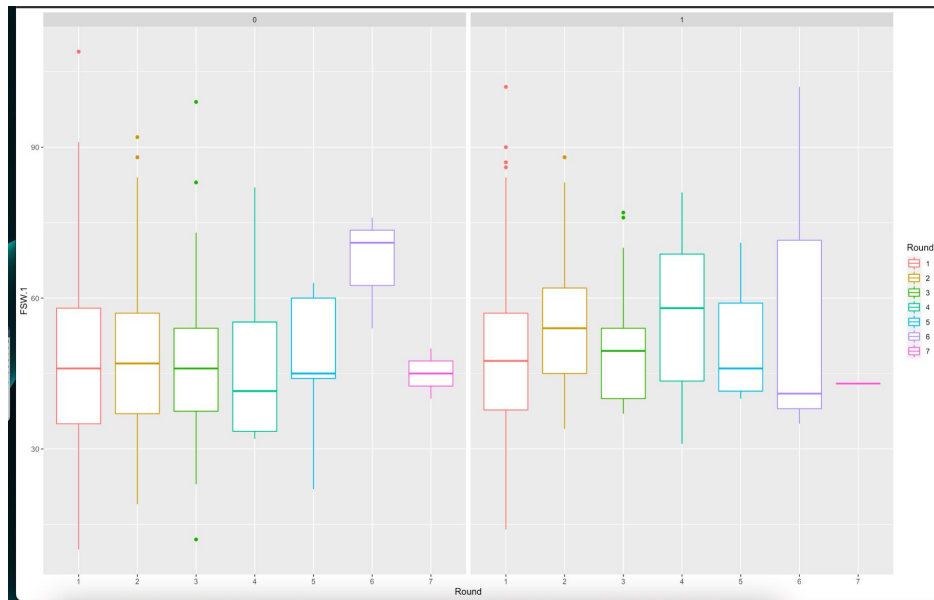
Going the Extra Mile

Another way of measuring a player's stamina is through their First Serve Won (FSW.1) statistic.

This variable measures an athlete's ability to score on their first try. Consistently scoring on the first serve even after the exhaustion of previous rounds is a testament to strong stamina.

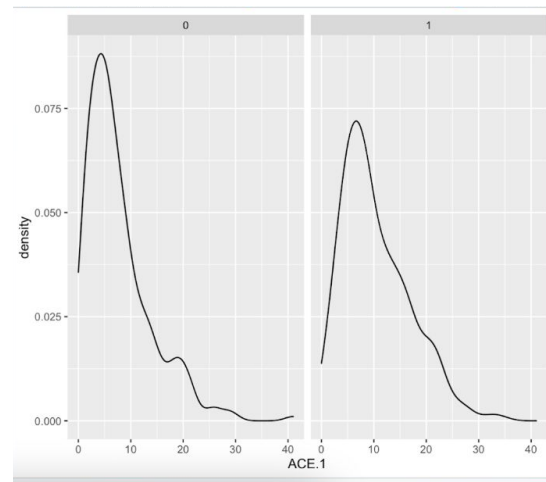
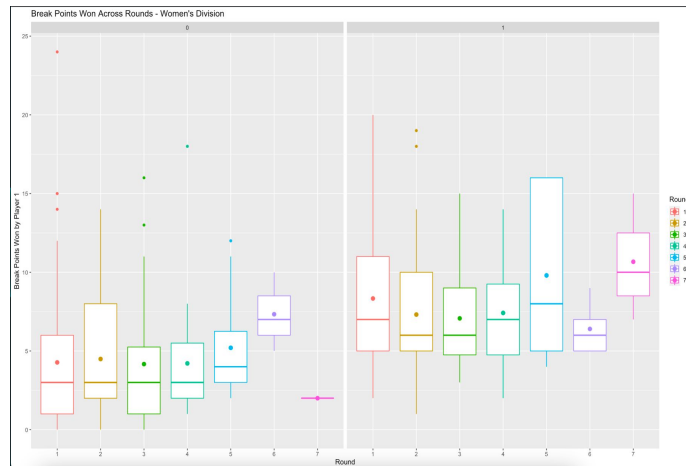
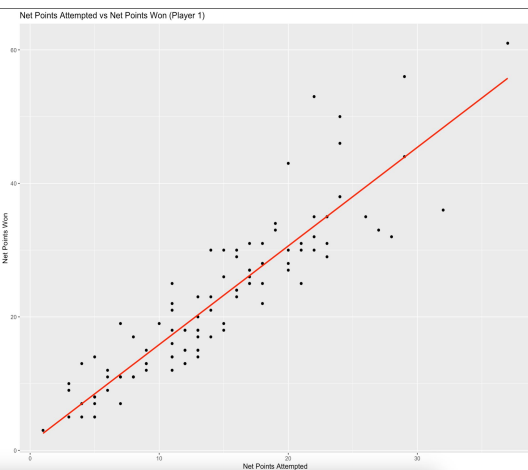
This graph:

- On average, 50% of top winners are able to outcompete 50% of top players who lose
- Differences are slight
- These slight differences show that champions win by training to be better than top competition.



What Makes a Tennis Champion?

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Aggression

Winners are more aggressive in their playstyle. The more a player pushes for net points, the more points he or she scores.

Controlling the Game's Flow - Breakpoints

Getting a breakpoint is one of the best ways to gain a lead over your opponent. To score a breakpoint, the player has to have superior adaptability and control. Winners(on right) earn more breakpoints.

Going the Extra Mile

Scoring aces consistently requires great stamina and practice. Winners(on the right) score more aces whereas most losers score less than 10 aces.