

How the court surface is affecting the serve-and-volley

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1. Introduction

The modern version of the game (official name of Lawn Tennis) as we recognize it today was designed and patented by Major Walter Clopton Wingfield in 1873. Two years later in 1875, the official rules of the game were drawn up by Marylebone Cricket Club, and two years later in 1877, Wimbledon began on a grass surface as the first official championships. All four grand slam events have been played on a grass surface. Wimbledon is the only grand slam event played on a grass court today and has always been played on a grass court surface. The French Open began in 1891 on a grass surface and remained on grass until 1928 when the surface was changed to clay. The US Open began in 1881 on a grass surface; until it was changed to clay from 1975-1977 and from 1978 has been played on a hard court surface. Finally, the Australian Open began in 1905 on a grass surface and remained on grass until 1988 when the surface was changed to a hard court.

There has been a change in the proportion of tournaments played on different court surfaces from 1877 to 2010. Firstly, for the first 14 years of the game, all tournaments (grand slam and non grand slam) were played on grass. Secondly, for the first 101 years of the game all tournaments were played on the natural surfaces of grass and clay. Thirdly, according to the ITF, until the early 1970's, the majority of tournaments were played on grass including three out of the four grand slams. Has this change in the proportion of tournaments played on different court surfaces from 1877 to 2010 had an impact on the game of tennis?

Barnett and Pollard (2007) show that players' performances are affected by the court surface, such that players that perform best on the faster surfaces can be considered to be disadvantaged on the tour due to the lack of grass court tournaments available. It is also shown that the decrease in the number of grass court tournaments may have led to an increase in the number of player injuries. According to Wikipedia, "a grass-court specialist is a tennis player who excels on grass courts but does not perform to the same standard on hard courts, clay courts or other surfaces. The term is generally only applied to professional players on the ATP and WTA tours, rather than to average players. A common feature of grass court specialists is their ability to serve and volley. A serve and volley player is at a distinct advantage on a grass court because his or her service is quickened enough to force the receiver to handle it quite defensively rather than aggressively, as can be the case on a slower surface. Their effectiveness at the net is therefore greatly improved. Grass court specialists are in direct contrast to clay court specialists, and the two differing styles (and players) generally do poorly on the other surface".

Using data analysis, this paper will verify the following four hypotheses:

- 1) Serve and volley players are most likely to have their best surface on grass
- 2) Players are more likely to serve and volley on grass courts than on any other surface
- 3) Serve and volley players are disadvantaged on the tour due to the lack of grass court tournaments available
- 4) One way to increase the serve and volley is to increase the number of grass court tournaments on the tour

2. Analysis

2.1 Tournaments played on different surfaces

Table 1 gives the number of tournaments played on different surfaces for the 2010 ATP and WTA tours. Since a player can only compete at one tournament at a time, these figures are reduced and represented in brackets in the table. For example for the 2010 ATP tour, six tournaments were played on grass, and any one man could have competed in only four tournaments. In comparison, in 1978 seven tournaments were played on grass, and any one man could have competed in all seven tournaments. If all surfaces are equally important to the game, the lack of grass tournaments now available on the tour could be considered unfair to the players who are best suited to the faster courts (Barnett and Pollard, 2007).

	Grass	Hard Court	Clay
ATP	6 (4)	36 (22)	22 (16)
WTA	4 (3)	32 (22)	19 (12)

Table 1: Number of tournaments played on different surfaces for the 2010 ATP and WTA tours

2.2 Match Statistics

Tables 2 and 3 represent the average net approaches and net approaches won for men and women respectively at the grand slam events in 2009, where * represents as a proportion of total points played. The tables indicate that both men and women are approaching the net more often at Wimbledon 2009 compared to the other three grand slam events. The tables indicate that both men and women are winning more often at the net at Wimbledon 2009 (one exception) compared to the other three grand slam events. These results agree with Barnett and Pollard (2007), where they showed that the speed of the court surface used at the various grand slam tournaments has an influence on various match statistics.

	Wimbledon 2009	US Open 2009	Australian Open 2009	French Open 2009
Net approaches * (%)	15.0	13.4	14.1	11.5
Net approaches won (%)	66.1	65.4	64.3	62.4

Table 2: Average net approaches and net approaches won for men at the grand slam events in 2009

	Wimbledon 2009	US Open 2009	Australian Open 2009	French Open 2009
Net approaches * (%)	11.3	9.8	9.6	8.3
Net approaches won (%)	66.9	67.5	66.1	62.2

Table 3: Average net approaches and net approaches won for women at the grand slam events in 2009

2.3 Tournament wins on different surfaces

Table 4 gives the percentage of matches won and tournament wins at grand slam events for a selection of recognised serve and volley players, where the players are given by Wikipedia. It shows that every player (except for McEnroe and Edberg) is winning their highest percentage of matches at Wimbledon (which has always been played on grass) and that every player (except for Rafter and McEnroe) is winning more or the same number of tournaments at Wimbledon. The table also shows that 7 out of the 11 players recorded their lowest percentage of matches won at the French Open (which has always been played on clay for the selected players). Note that the Australian Open was played on grass prior to 1988, which provides some justification as to why 5 out of the 11 players in table 4 have recorded higher percentage of matches won at the Australian Open than at the US Open.

Player	Wimbledon	US Open	Australian Open	French Open
Stefan Edberg	80.3% (2)	78.2% (2)	84.5% (2)	69.8% (0)
Patrick Rafter	76.3% (0)	74.1% (2)	62.5% (0)	60.0% (0)
Richard Krajicek	74.4% (1)	66.7% (0)	69.6% (0)	68.8% (0)
Boris Becker	85.5% (3)	78.7% (1)	76.3% (2)	74.3% (0)
Goran Ivanisevic	77.8% (1)	61.8% (0)	63.3% (0)	63.6% (0)
John McEnroe	84.3% (3)	84.6% (4)	78.3% (0)	71.4% (0)
Tim Henman	75.0% (0)	60.6% (0)	64.3% (0)	57.1% (0)
Pete Sampras	90.0% (7)	88.8% (5)	83.3% (2)	64.9% (0)
Martina Navratilova	89.6% (9)	84.0% (4)	86.8% (3)	82.3% (2)
Jana Novotna	79.4% (1)	74.5% (0)	71.9%(0)	73.1%(0)
Nathalie Tauziat	71.4% (0)	62.8% (0)	57.1% (0)	62.5% (0)

Table 4: The percentage of matches won and tournament wins at grand slam events for a selection of recognised serve and volley players

3. Results

The following four hypotheses are given:

1. Serve and volley players are most likely to have their best surface on grass

Wikipedia states that a serve and volley player is at a distinct advantage on a grass court because his or her service is quickened enough to force the receiver to handle it quite defensively rather than aggressively, as can be the case on a slower surface. The analysis from

table 4 also gives justification to verify that serve and volley players are most likely to have their best surface on grass.

2. Players are more likely to serve and volley on grass courts than on any other surface

Tables 2 and 3 show that a player is most likely to have the highest success win rate at the net on grass courts. This provides some justification that players are more likely to serve and volley on grass courts than on any other surface.

3. Serve and volley players are disadvantaged on the tour due to the lack of grass court tournaments available

According to the ITF, until the early 1970's, the majority of tournaments were played on grass including three out of the four grand slams. As given in section 2.1, in 1978 seven ATP tournaments were played on grass, and any one man could have competed in all seven tournaments and in 2010, six ATP tournaments were played on grass, and any one man could have competed in only four tournaments. This is evidence to show that there is a lack of grass court tournaments available on the tour. Barnett and Pollard (2007) show that players' performances are affected by the court surface, such that players that perform best on the faster surfaces can be considered to be disadvantaged on the tour due to the lack of grass court tournaments available. From hypothesis 1., there was evidence to show that serve and volley players are most likely to have their best surface on grass. This provides some justification to show that serve and volley players are disadvantaged on the tour due to the lack of grass court tournaments available.

4. One way to increase the serve and volley is to increase the number of grass court tournaments on the tour

From hypothesis 2., there was evidence to show that players are more likely to serve and volley on grass courts than on any other surface. This provides some justification to show that a way to increase the serve and volley is to increase the number of grass court tournaments on the tour.

4. Conclusions

This paper has shown that the change in the proportion of tournaments played on different court surfaces from 1877 to 2010 has made an impact on the game of tennis. Results were given to show that serve and volley players are disadvantaged on the tour due to the lack of grass court tournaments now available. The results also verify that serve and volley players are most likely to have their best surface on grass and that players are more likely to serve and volley on grass courts than on any other surface. A method to increase the serve and volley is to increase the number of grass court tournaments on the tour.

References

Barnett T and Pollard G (2007). How the tennis court surface affects player performance and injuries. *Medicine and Science in Tennis*. 12 (1), 34-37.

Wikipedia: http://en.wikipedia.org/wiki/Serve_and_volley