

Summarizing tennis data to enhance elite performance

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Abstract

This article provides a classification of online and commercially available data for the men's and women's singles professional tennis circuit. The various data sources are categorized by data type (e.g. ratings, point-by-point data, match statistics), tournament type (e.g. grand slam, Olympics, ITF Circuit) and the year commencing. The results could be used in building decision support tools allowing for accessible data information for coaches in preparation for an upcoming match.

Keywords: match statistics, point-by-point data, ratings, decision support

1. Introduction

The men's professional circuit has undergone several structural changes since the Open Era in 1968. The Association of Tennis Professionals or ATP was formed in September 1972. Since 1990, the association has organized the worldwide tennis tour for men and linked the title of the tour with the organization's name. In 1990 the organization was called the ATP Tour, which was renamed in 2001 as just ATP and the tour being called ATP Tour. In 2009 the name was changed again and is now known as the ATP World Tour. It is an evolution of the tour competitions previously known as Grand Prix tennis tournaments (1970 to 1989) and World Championship Tennis (1968 to 1990). The International Series (known before 2000 as the ATP World Series) and the International Series Gold were a series of professional tennis tournaments held internationally as part of the ATP from 1990 until 2008. The current structure being the ATP World Tour comprises a series of tournaments from ATP World Tour Finals, ATP World Tour Masters 1000, ATP World Tour 500 series, ATP World Tour 250 series and ATP Challenger Tour. Note that the ATP World Tour Masters 1000 had emerged from 1990; originally known as the ATP Championship Series Singles Week (1990-1993), Mercedes-Benz Super 9 (1993-1999), Tennis Masters Series (2000-2003), ATP Masters Series (2004-2008), and the present name of ATP World Tour Masters 1000 took effect in 2009. Note also that the ATP World Tour Finals was known as the ATP Tour World Championship (1990-1999) and the Tennis Masters Cup (2000-2008). The ITF Men's Circuit is a series of professional tennis tournaments held around the world that are organized by the International Tennis Federation. Originally, the ITF Men's Circuit consisted of Satellite tournaments, each of which took place over four weeks. However, in 1998, the ITF introduced Futures tournaments, allowing for greater flexibility in the organization of the tournaments for national associations, and participation in tournaments for players. Over time, the ratio of Futures tournaments to satellites increased until 2007, when satellites were eliminated entirely.

Similar tournament structural changes have occurred on the women's professional circuit since the Open Era in 1968. The Women's Tennis Association (WTA), founded in 1973 by Billie Jean King, is the principal organizing body of women's professional tennis. Since 1983, the association has organized the worldwide tennis tour for women. Formed in 1970, the Virginia Slims Circuit eventually became the basis for the later named WTA Tour. The WTA Tier I, II, III and IV structure were a series of professional tennis tournaments held internationally as part of the WTA tour from 1988 until 2008. The current tournament structure of the WTA Tour was introduced in 2009 and comprises a series of tournaments from WTA Tour Championships, Premier, International and Challenger events. Note that the Premier tournaments consist of Premier Mandatory, Premier Five and Premier. The ITF Women's Circuit is a series of professional tennis tournaments run by the International Tennis Federation for female professional tennis players.

A vast amount of data is collected and stored in tennis either directly online or through various commercial software providers. This includes the typical set-by-set score line. For example Novak Djokovic defeated Andy Murray in the 2013 Australian Open final 6-7, 7-6, 6-3, 6-2. Match statistics may also be available after the completion of matches; particularly for grand slam events. However point-by-point data or match statistics (broken down by each set) are not as commonly available as the former. This article will outline for various data sources the coverage (by tournament type) and year commencing for each data type. To simplify the analysis the initialization of data for men’s tennis will be from 1990; with the International Series tournament structure. Similarly for women’s tennis the initialization of data will be from 1988; with the Tiered Series tournament structure. Summarizing data in this fashion could be useful for building decision support tools to enhance elite performance (Bedford et al, 2010). For example a coach may be interested in knowing a player’s career average of points won on serve at a grand slam level as well as at an ATP World Tour Masters 1000 level. Whilst the focus is on the men’s and women’s professional singles circuit, similar methodology could be constructed for the men’s and women’s professional doubles circuits.

2. Method

2.1 Tournament classification

Table 1 provides the current tournament structure for the men’s singles tour with the corresponding commencement year (with an initialization of 1990), number of tournaments played and winner’s rating points in 2012. Note how the ATP World 500 series replaced the International Series Gold in 2009, and similar replacements occurred for the ATP World 250 series and ATP Challenger in 2009. Similarly, table 2 provides the current tournament structure for the women’s singles tour with the corresponding commencement year (using an initialization of 1988), number of tournaments played and winner’s rating points in 2012. Table 3 provides a comparison of tournament structures between the men’s and women’s professional tennis circuits. Note how the tournament structure from table 2 for the women’s circuit is slightly modified to align with the men’s professional circuit. This consists of splitting the ITF circuit between tournaments where the prize money for the tournament is 10K and >10K, combining Premier Mandatory and Premier 5 events, including the WTA Tournament of Champions in International events, and combining Challenger WTA 125s and ITF>10K events. The information from table 3 in tournament classification is used below in classifying data.

Category	Year	Number of Tournaments (2012)	Winner’s Rating Points (2012)
Grand Slams	1990 onwards	4	2000
ATP World Tour Finals	1990 onwards	1	1100-1500
ATP World Tour Masters 1000	1990 onwards	9	1000
Olympic Games	1990 onwards	1 (every 4 years)	750
ATP World Tour 500 series International Series Gold	2009 onwards 1990-2008	11	500
ATP World Tour 250 series ATP International Series ATP World Series	2009 onwards 2000-2008 1990-1999	40	250
ATP Challenger Tour ATP Challenger Series	2009 onwards 1990-2008	148	80-125
Futures Satellites	1998 onwards 1990-2006	582	18-35

Table 1: Tournament structure for men’s singles tour

Category	Year	Number of Tournaments (2012)	Winner's Rating Points (2012)
Grand Slams	1988 onwards	4	2000
WTA Tour Championships	1988 onwards	1	1050-1370
Premier Mandatory Tier I	2009 onwards 1988-2008	4	1000
Premier 5 Tier I	2009 onwards 1988-2008	6	900
Olympics	1988 onwards	1 (every 4 years)	685
Premier Tier II	2009 onwards 1988-2008	11	470
WTA Tournament of Champions	1998 onwards	1	366-435
International Tier III/Tier IV	2009 onwards 1988-2008	29	280
Challenger WTA 125s	2012 onwards	3	160
ITF Circuit	1988 onwards	487	12-150

Table 2: Tournament structure for women's singles tour

Category		Number of Tournaments (2012)		Winner's Rating Points (2012)	
Men	Women	Men	Women	Men	Women
Grand Slams	Grand Slams	4	4	2000	2000
ATP World Tour Finals	WTA Tour Championships	1	1	1100-1500	1050-1370
ATP World Tour Masters 1000	Premier Mandatory/Premier 5	9	10	1000	900-1000
Olympic Games	Olympics Games	1	1	750	685
ATP World Tour 500	Premier	11	11	500	470
ATP World Tour 250	International/WTA Tournament of Champions	40	30	250	280-435
ATP Challenger Tour	ITF>10K/Challenger WTA 125s	148	197	80-125	50-160
Futures	ITF 10K	582	293	18-35	12

Table 3: Comparison of tournament structures between the men's and women's tour

2.2 Data classification

Table 4 outlines data availability for the men's professional circuit. OnCourt¹ and Tennis Navigator² are commercially available software packages. The tennis ratings are given on a weekly basis for OnCourt (since 2003) and Tennis Navigator (since 2007). The Rating Tour refers to all the tournament types outlined in table 1. The Main Tour refers to tournaments in table 1 with the exclusion of the ATP Challenger Tour and Futures. OnCourt, Tennis Navigator and the ATP World Tour³ provide set-by-set (incl. game score) score lines. However the ATP World Tour provides this information for all tournament types since 1990. OnCourt provides game-by-game score lines for the Main Tour from 2007 and provides point-by-point score lines for the Main Tour as well as the ATP Challenger Tour. Match statistics are provided for both OnCourt and Tennis Navigator. However Tennis Navigator provides match statistics broken down by each set for Grand Slam matches since 2003. The various Grand Slam sites also provide match statistics broken down by each set at the completion of matches. However the Grand Slam sites are more detailed than the standard match statistics given in Tennis Navigator (and OnCourt). For example Rally Stats are given for each set consisting of Approach Shots, Drop Shots, Ground Strokes, Lobs, Overhead Shots, Passing Shots and Volleys; and each shot categorized as a Forehand or Backhand Winner, a Forehand or Backhand Forced Error, or a Forehand or Backhand Unforced Error. Table

5 gives the Rally Statistics for the 1st Set of the 2013 Australian Open final between Novak Djokovic and Andy Murray. Table 6 is given similarly to table 4 for the women’s professional circuit.

Type	Type Breakdown	Source	Coverage	Year Commencing
Ratings	Weekly	OnCourt	Rating Tour	2003
Ratings	Weekly	Tennis Navigator	Rating Tour	2007
Score line	Set-by-Set (incl. game score)	OnCourt	Main Tour ATP Challenger Tour Futures	1990 1998 2004
Score line	Set-by-Set (incl. game score)	Tennis Navigator	Main Tour ATP Challenger Tour	1980 2005
Score line	Set-by-Set (incl. game score)	ATP World Tour ³	Main Tour ATP Challenger Tour Futures	1990 1990 1998
Score line	Game-by-Game	OnCourt	Main Tour	2007
Score line	Point-by-Point	OnCourt	Grand Slams Finals Masters 1000 Olympic Games 500 series 250 series ATP Challenger Tour	2009 2009 2009 2012 2010 2010 2012
Match Statistics	Match	OnCourt	Grand Slams Finals Masters 1000 Olympic Games 500 series 250 series ATP Challenger Tour	2004 2006 2006 2012 2007 2007 2011
Match Statistics	Match	Tennis Navigator	Grand Slams* Finals Masters 1000 500 series 250 series	2003 2009 2009 2010 2010
Match Statistics	Set	Tennis Navigator	Grand Slams*	2003
Match Statistics	Set	Grand Slam sites	Grand Slams^	
Match Statistics	Set (incl. serve stats) (incl. return stats) (incl. rally stats) (incl. dir serve stats)	Grand Slam sites	Grand Slams*^	

Table 4: Data availability for men’s professional circuit

* excludes qualifying matches

^ data available online for approximately one year

	Novak Djokovic						Andy Murray					
	Winners		Forced Errors		Unforced Errors		Winners		Forced Errors		Unforced Errors	
	FH	BH	FH	BH	FH	BH	FH	BH	FH	BH	FH	BH
Approach Shots	-	1	-	-	-	-	-	-	-	-	-	-
Drop Shots	-	1	-	-	-	-	-	-	-	-	-	1
Ground Strokes	1	2	2	3	11	10	4	-	1	2	3	7
Lobs	-	-	-	-	-	-	-	-	-	2	-	-
Overhead Shots	4	-	-	-	-	-	1	-	-	-	-	-
Passing Shots	1	1	-	-	-	-	-	-	2	1	-	-
Volleys	-	-	-	1	1	-	2	-	-	-	-	-

Table 5: Rally Statistics for the 1st Set of the 2013 Australian Open final between Novak Djokovic and Andy Murray

Type	Type Breakdown	Source	Coverage	Year Commencing
Ratings	Weekly	OnCourt	Rating Tour	2003
Ratings	Weekly	Tennis Navigator	Rating Tour	2004
Score line	Set-by-Set (incl. game score)	OnCourt	Main Tour Challenger (125s)/ITF>10K ITF 10K	1997 2002 2005
Score line	Set-by-Set (incl. game score)	Tennis Navigator	Main Tour	1995
Score line	Set-by-Set (incl. game score)	WTA ⁴	Main Tour	1988
Score line	Game-by-Game	OnCourt	Main Tour	2007
Score line	Point-by-Point	OnCourt	Main Tour	2010
Match Statistics	Match	OnCourt	Grand Slams WTA Tour Championships Premier Mandatory/5 Olympics Premier International/ WTA Tournament of Champions	2004 2005 2006 2012 2006 2007
Match Statistics	Match	Tennis Navigator	Grand Slams*	2003
Match Statistics	Set	Tennis Navigator	Grand Slams*	2003
Match Statistics	Set	Grand Slam sites	Grand Slams [^]	
Match Statistics	Set (incl. serve stats) (incl. return stats) (incl. rally stats) (incl. dir serve stats)	Grand Slam sites	Grand Slams* [^]	

Table 6: Data availability for women's professional circuit

* excludes qualifying matches

[^] data available online for approximately one year

Conclusions

Data availability for the women's and men's singles professional tennis circuits are given in concise tables by categorizing for the various data sources the coverage (tournament type) and year commencing. The results could be used in building decision support tools allowing for accessible data information for coaches in preparation for an upcoming match. Whilst the focus is on the men's and women's professional singles circuit, similar methodology could be constructed for the men's and women's professional doubles circuits.

References

Bedford A, Barnett T, Pollard GH and Pollard GN (2010). How the interpretation of match statistics affects player performance. *Journal of Medicine and Science in Tennis* 15(2), 23-27.

¹OnCourt - www.oncourt.info

²Tennis Navigator - www.tennisnavigator.com

³ATP World Tour - www.atpworldtour.com/Scores/Archive-Event-Calendar.aspx

⁴WTA - www.wtatennis.com/tournament-archive