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Match statistics significant to win the initial and intense rounds of a tennis tournament

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Abstract

This paper analyses the initial and intense rounds of the 2020 Australian Open Men's Singles matches on 14 match statistics. The findings show that the statistics which are important to winning in the initial rounds are not the same as those for winning in the intense rounds. In the initial rounds, the match winner performed better than the loser on receiving points won, second serve to win, first serve to win, breakpoints won, net points won, winners, total points won, unforced errors, aces, double faults, fastest serve speed, and average first-serve speed. However, to win the intense rounds, the winner performed better than the loser on first serve to win, receiving points won and net points won. The findings help the player and the coach to develop skills and techniques to devise a player strategy during the initial rounds and the intense rounds to win the tournament.

KEYWORDS: Australian Open, tennis, player's strategy.

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Introduction

Today, the game of tennis is played on a scale where millions are participating from 200+ nations affiliated to the International Tennis Federation (ITF) [23]. The game has evolved from its inception, with its roots buried deep in history. Tennis has been inscribed on the wall of Egyptian temples which date back to 1500 B.C. It was adopted by the Europeans when Moors invaded Europe and brought the game along with them. The game traveled with Christian monks who spread it in European monasteries and by the 18th century, it became a game played by aristocrats and royals. Tennis was then called 'real' tennis or 'royal' tennis. The first court for tennis was developed by King Henry VIII in the 19th century and in 1877, the All England Croquet and Lawn Tennis Club in Wimbledon organized the first lawn tennis tournament [9].

Over the years it was found that for a sport like tennis it is important to build and maintain self-confidence. Players having high self-confidence, experience lower anxiety and stress levels, which helps them maintain their concentration and focus which in turn results in better performance [3]. The progress of a tournament also increases fan attendance, ticket prices, and player rankings, with the level of the game having a positive effect on each other. From an economic point of view, it can be compared to the Louis-Schmelling Paradox which states that when there is the uncertainty of outcome in a tournament and the quality of the game portrayed is high, the resultant profits to be made on such events increases as it creates a doubt in the minds of spectators about the outcome [18].

In the four most competitive tournaments which constitute the Grand Slam, there are 32 top-seeded players. The seed order is based on a formula that considers the player's performance on that court surface and player rankings which indirectly influences the quality of the match.

Further, the prize money, points, and prestige associated with the tournament create a very high incentive for players to perform at their best [6]. In recent times, the top rankings are dominated by Rafael Nadal, Novak Djokovic, and Roger Federer. In 2019, Rafael Nadal won the French Open and the US Open, Novak Djokovic won the Australian Open and the Wimbledon. Novak Djokovic defended the Australian Open title in 2020. The competitive nature of the sport coupled with large overall benefits and returns makes every player dream of winning all four tournaments of the Grand Slam.

It was earlier thought that good service is the hallmark of a winner. However, it is not necessary that the serve alone can make a player win a match [15]. A player is likely to lose more points through errors and lose the match than by the points won by the match winners [2]. An experienced player is not always the winner when they face young players as young players have greater energy levels thus reducing the probability of winning [14].

Many studies have been conducted on what makes a player win a match or the tournament. To win a match, players must keep their first and second serves in, win on their services, and breakpoints [19]. Winners had lower double faults and unforced errors, were aggressive, approached the net, had a higher percentage of points won, and were capable of portraying a higher game level for the entire match [8]. To win a Grand Slam tournament, the player must be better at creating and winning breakpoints, winning on serve, applying higher serve speed, netplay, and reduce the number of errors [7]. In the French Open and Wimbledon tournaments, match winners were better on a percentage of points won on the opponent's service, percentage of points won on their own first and second serve, percentage of winning breakpoints, percentage of winning net points, and serving aces and number of winners [12].

Tennis, like other competitive sports, is as much about the mind as the body, with 95% being a matter of the mind [21]. Many players are affected by pressure, being unable to convert their advantage into a win, exhibit slippages, a behavior of giving up when they are behind or being unable to perform in crucial situations, and make unpredictable errors which can often be in the nature of blunders [13]. Players with low self-confidence buckled under pressure due to heightened anxiety and stress while those with high self-confidence displayed lower levels of anxiety and stress, enabling them to concentrate and focus on the game to produce better performance [3]. A player could become aggressive when he is close to losing the match due to the high anxiety situation. Uncertainty of match outcome is highest when the scores are tied and can result in an unforced error (if the player is balanced), a forced error (if the anxiety level is high), or in a win (if the self-confidence is high) [20].

Aim of Study

Previous studies drew inferences based on match performance for the entire tournament [3, 8, 19, 20]. Some researchers have analyzed the performance of players across tournaments over varying periods [7, 12, 13, 14]. The aim of this study was to ascertain which match statistics are more relevant to determine the outcome of a tennis match during the initial rounds (rounds 1-4) and the intense rounds (quarters, semis, and finals) of a tournament.

Material and Methods

The Men's singles matches of the 2020 Australian Open were chosen for analysis, being the most recent Grand Slam tournament. It consisted of 128 players and 127 matches. Data on 14 popularly quoted match statistics were accessed from the Australian Open website [22]. The 14 match statistics are the number of aces, winners, double faults, and unforced errors, percentage of the first serve in, first serve to win, second serve to win, breakpoints won, net points won, and receiving points won, number of total points won, and the fastest serve speed, average first-serve speed, and average second serve speed. The match statistics are defined in Table 1.

Table 1. Definition of match statistics

Match statistic	Meaning
1	2
Ace	A point won on serve, where the receiver is not able to touch the ball
Winner	An outstanding point where the receiver is unable to return
Double fault	When a player commits fault on both serve chances
Unforced error	An error made on part of the player which forces him to lose a point
Break point won (%)	The point before when a player wins the game on the opponent's serve
Receiving point won (%)	When a player wins a point on the opponent's serve
Net points won (%)	A point played from near the net
Total points won	Total points won by a player for the entire match
First serve in (%)	The total points played on the first serve
First serve to win (%)	The total points won on the first serve

1	2
Second serve to win (%)	The total points won on the second serve
Fastest serve	The speed of the fastest serve in a match
Average first serve	The average speed of the first serve in a match
Average second serve	The average speed of the second serve in a match

Source: [24]

The match statistics for the entire tournament, for the initial rounds, and the intense rounds were analyzed using IBM SPSS Statistics 24. Significance of match statistics for the entire tournament, initial rounds, and intense rounds was found through Mann–Whitney U test. The value of significance was ranked from smallest to largest to determine the importance of match statistics at various stages of the tournament. Significant match statistics for the intense rounds were analyzed using values of match statistics for the respective matches.

The top 32 seeds of the tournament had a World Ranking from 1 to 35 [1], while of the 8 players who qualified for the intense rounds, the World Ranking was 1, 2, 3, 5, 7, 15, 35, and 100. This reflects the competitive nature of the tournament of the intense rounds. The results were then analyzed and discussed for the intense rounds to infer what it takes to win the tournament.

Results

The mean and standard deviation values of each of the 14 match statistics along with the significance values derived using the Mann–Whitney U test are shown in Table 2. The results show that for the overall tournament, 12 match statistics of aces, winners, double faults, unforced errors, first serve to win, second serve to win, net points won, breakpoints won, receiving points won, total points won, fastest service, and average first serve were significant ($p < 0.05$) while 2 match statistics of the first serve in and average second serve were not significant ($p > 0.05$). Further, 10 match statistics of aces, winners, double faults, unforced errors, first serve to win, second serve to win, breakpoints won, net points won, receiving points won and total points won were also significant at 99% ($p < 0.01$).

For the initial rounds, 12 match statistics of aces, winners, double faults, unforced errors, first serve to win, second serve to win, net points won, breakpoints won, receiving points won and total points won, fastest service, and average first serve were significant ($p < 0.05$) while 2 match statistics of the first serve in and average second serve were not significant ($p > 0.05$). These results are consistent with the significance of the overall tournament match statistics. Further, 10 match statistics of aces, winners, double faults, unforced errors, first serve to win, second serve to win, breakpoints won, net

Table 2. Significant values of match statistics

Match statistics	Entire tournament		Initial rounds		Intense rounds	
	Mean ± SD	Significance	Mean ± SD	Significance	Mean ± SD	Significance
First serve to win (%)	0.717 ± 0.112	0.000	0.716 ± 0.114	0.000	0.735 ± 0.055	0.025
Receiving point won (%)	0.318 ± 0.088	0.000	0.318 ± 0.090	0.000	0.321 ± 0.034	0.028
Net points won (%)	0.667 ± 0.139	0.000	0.664 ± 0.139	0.000	0.736 ± 0.112	0.041
Number of aces	10.071 ± 7.368	0.001	9.950 ± 7.428	0.000	12.143 ± 6.100	0.073
Number of double faults	3.472 ± 2.616	0.002	3.471 ± 2.664	0.006	3.500 ± 1.653	0.100
Number of winners	38.012 ± 16.635	0.000	37.563 ± 16.760	0.000	45.714 ± 12.375	0.125
First serve in (%)	0.638 ± 0.087	0.172	0.636 ± 0.088	0.212	0.673 ± 0.070	0.401
Total points won	112.075 ± 37.081	0.000	111.029 ± 37.458	0.000	130.000 ± 24.457	0.443
Average first serve speed (kmph)	182.512 ± 18.849	0.037	182.042 ± 19.208	0.039	190.571 ± 7.583	0.607
Second serve to win (%)	0.508 ± 0.114	0.000	0.510 ± 0.116	0.000	0.476 ± 0.047	0.701
Number of unforced errors	37.295 ± 16.256	0.000	37.138 ± 16.386	0.000	40.000 ± 14.077	0.701
Fastest serve speed (kmph)	202.614 ± 20.779	0.015	202.279 ± 21.214	0.010	208.357 ± 9.572	0.796
Break points won (%)	0.372 ± 0.228	0.000	0.375 ± 0.232	0.000	0.326 ± 0.142	0.898
Average second serve speed (kmph)	151.799 ± 17.220	0.078	151.488 ± 17.570	0.057	157.143 ± 7.941	1.000

points won, receiving points won and total points won were also significant at 99% ($p < 0.01$). These results are also consistent with the significance of the overall tournament match statistics.

The results also show that of the 14 match statistics, two of them, viz., first service in and average second serve were not significant for the entire tournament, the initial rounds, and the intense rounds.

For the intense rounds, 3 match statistics: the first serve to win, receiving points won and net points won were significant ($p < 0.05$) − but not significant at 99% ($p < 0.01$) − while 11 match statistics of aces, winners, double faults, unforced errors, first serve in, second serve to win, breakpoints won and total points won, fastest service, and average first serve and average second serve were not significant ($p > 0.05$). The results show that the performance of the players in the initial rounds is also a reflection of the overall tournament performance. However, in the intense rounds, only three match statistics were important for winning as compared to 12 match statistics in the earlier rounds. This shows that while the match outcome is a function of many performance measures in the initial rounds, in the intense rounds, only a few performance measures are significant. The lower-ranked players get eliminated as the rounds progress, creating competitively balanced matches. For competitively balanced matches the critical match statistics that decide the outcome are winning on the first serve, winning more receiving points, and winning the net points.

Discussion

Match statistics that can help a player reach intense rounds of a tournament are aces, winners, double faults, unforced errors, first serve to win (%), second serve to win (%), breakpoints won, net points won, receiving points won, total points won, fastest serve speed and average first-serve speed. Analyzing the significance of match statistics, it was found that players must focus on the match statistics of receiving points won, second serve to win, first serve to win, breakpoints won, net points won, winners, total points won, unforced errors, aces, double faults, fastest serve speed and average first-serve speed in decreasing order of importance to win in the initial rounds (see Table 3 which ranks the match statistics on the significance values). In the intense rounds, the match statistics like first serve to win, receiving points won, and net points won in decreasing order of importance help winning the match. An important point to note is that winning on the second serve and the number of breakpoints won which were in the top 5 significant match statistics in the initial rounds were not significant in the intense rounds. This is due to the higher competitive balance of the match in the intense rounds. However, in the intense rounds, the relevance of serving aces, having fewer double faults, and getting the first serve in is more important than in the initial rounds.

Players' performance in the initial and intense rounds can be explained by their profiles [13] where many players are good at some aspect or match statistic of the game but not on many of them. Kovalchik and Ingram [13] classified players as 'The Field' which represent the largest number of players and who are most vulnerable to pressure situations, 'Tiebreak Specialists' and 'Tight' players who excel only in a critical situation, distinctive players who have a strong service or can face pressure situations and 'Score Keepers' whose play varies with the performance on the earlier point. In the initial rounds, such players demonstrate short bursts of excellence or are good on a few of the match statistics. The outcome depends on which of the two players performs better on the 12 significant match statistics. Further, tournament winners are 'Champions' and 'Opportunity Makers' who perform consistently across the match statistics. In the initial rounds when the competitive balance tends to be low, the player who is better across a variety of match

Table 3. Ranks of significant values

Match statistics	Entire tournament	Initial rounds	Intense rounds
First serve to win (%)	2*	3*	1*
Receiving point won (%)	1*	1*	2*
Net points won (%)	5*	5*	3*
Number of aces	9*	9*	4
Number of double faults	10*	10*	5
Number of winners	7*	6*	6
First serve in (%)	14	14	7
Total points won	6*	7*	8
Average first serve speed	12*	12*	9
Second serve to win (%)	3*	2*	10
Number of unforced errors	8*	8*	11
Fastest serve speed	11*	11*	12
Break points won (%)	4*	4*	13
Average second serve speed	13	13	14

* $p \leq 0.05$

Table 4. Significant match statistics during intense rounds

Round	Match	Player name	W/L	First serve to win (%)	Net points won (%)	Receiving points won (%)
Finals	1	Novak Djokovic	W	76%	83%	36%
		Dominic Thiem	L	69%	74%	29%
Semis	2	Dominic Thiem	W	77%	85%	33%
		Alexander Zverev	L	68%	71%	33%
Semis	3	Novak Djokovic	W	73%	92%	39%
		Roger Federer	L	66%	67%	31%
Quarters	4	Rafael Nadal	L	69%	62%	31%
		Dominic Thiem	W	78%	76%	34%
Quarters	5	Alexander Zverev	W	76%	69%	33%
		Stan Wawrinka	L	69%	70%	30%
Quarters	6	Roger Federer	W	71%	67%	29%
		Tennys Sandgren	L	79%	72%	33%
Quarters	7	Novak Djokovic	W	86%	91%	34%
		Milos Raonic	L	72%	51%	25%

statistics is likely to win the match. However, when 'Champions' and 'Opportunity Makers' play against each other, since the competitive balance is high as the players are evenly matched, the three match statistics found to be significant in the intense rounds become the differentiators. This substantiates the finding that in the initial rounds 12 match statistics are significant to determine the outcome of the match while only 3 in the intense rounds.

An examination of the top 5 significant match statistics in the initial rounds (Table 3) shows that the strategy of the winners is to win on their serve whether by aces or by rallies, try and break the opponent's serve, and to play aggressively at the net. Hence, winners have an attacking strategy that forces the opponent to commit errors, which is also confirmed by Matinez-Gallego et al. [17]. Losers would have greater errors in total including unforced errors and double faults, implying that winners are efficient in winning points [7]. Further, the higher-ranked players have greater self-confidence in the initial rounds as the opponent tends to be relatively weaker. This also results in lower player anxiety and stress levels, higher concentration levels, and maintain focus which helps to increase performance [3].

In the intense rounds, the players face increasing levels of stress and anxiety due to greater competitive balance [3]. The level of stress increase as the event progresses and creates demands on a person [4]. Similarly, anxiety is a situation when a person is threatened by the outcome of an event [11, 16]. As competitive balance increases in the intense rounds, there is a greater expectation from spectators' consequent to the uncertainty of an outcome of the match [18]. With increasing stakes, players often face increasing pressures which reduces performance [5].

An examination of the top 5 match statistics in the intense rounds (Table 3) shows the player's strategy is to ensure they win on their services and also win on the opponent's serve. This confirms the views of Djurovic, Lozovina, and Pavicic [7], Furlong [10], and O'Donoghue [19].

Each match of the intense rounds was analyzed on the three significant match statistics for these rounds. It was found that in 5 of the 7 matches, the winners were better than the losers on each of the three match statistics (see Table 4, Matches 1, 2, 3, 4, 7). In other words, winners of the 5 matches were better in first serve wins, receiving points won and net points won as compared to the losers. For the remaining 2 matches, it was found that in 1 match (Match 5 in Table 4) the winner was better on 2 match statistics and the loser was marginally better on the third match statistic while in the remaining match (Match 6 in Table 4) the loser was better on all 3 match statistics as compared to the winner.

In Match 5 between Alexander Zverev (World Ranking 7) and Stanislas Wawrinka (World Ranking 15), Zverev

won the match with the score: 1-6, 6-3, 6-4, 6-2 [22]. The match statistic where the loser was better than the winner was net points won. Observing the match statistic closely, we have found that the winner converted 22 points from 32 opportunities that were created while the loser converted 16 points from 23 opportunities.

In Match 6 between Roger Federer (World Ranking 3) and Tennys Sandgren (World Ranking 100), Federer won the match with the score: 6-3, 2-6, 2-6, 7(10)-6(8), 6-3 [22] even though the loser was better than him in each of the three discussed match statistics. Katić et al. found that winners do not always need to perform better than the loser on each match statistic [12]. The fourth set was the turning point where the pressure levels increased for both players; for a player ranked 100 potentially winning against a player ranked 3 and for a player ranked 3 potentially losing against a player ranked 100. The match statistics strongly suggest that the loser should have won the match. However, the winner turned the tables and the match in the fourth set due to his profile being that of a Champion [13] wherein players exhibit the mentality of a champion and are strong in serves, are tiebreak specialists, are less affected by the state of the point, can create break point opportunities and have the ability to deliver during crucial situations. The loser appeared to have 'The Field' profile wherein players show a drop in performance when there is pressure on the service and are negatively affected when they are set down or facing important points such as tie-breaks or breakpoints.

This study will help players improve their game strategy and coaches train their players to improve their game. The players and coaches can use the findings of the initial rounds (Table 3) and work on improving the player's performance on the match statistics in reverse order of significance. The reverse order would enable them to train to improve the game using a strategic approach in a graded manner. They could begin by focusing on improving the service in terms of speed (ranks 11 and 12) and reducing double faults (rank 10). They can then focus on serving aces (rank 9), reduce unforced errors (rank 8), and focus on the total points won (rank 7). Thereafter, they can focus on ball placement to generate winners (rank 6), become aggressive by playing at the net (rank 5) followed by training to win breakpoints (rank 4). The final training would concentrate on winning the first and second serves (ranks 2 and 3) and winning points on the opponent's serve (rank 1).

After the player starts winning and qualifies for the intense rounds, the training should focus on the findings of the intense rounds. The player and the coach should focus on the ability to serve aces, having fewer double faults, and getting the first serve in as their relative rank is higher than in the initial rounds. Thereafter, the training could focus on becoming aggressive in playing at the net (rank 3), on winning points on the opponent's serve (rank 2), and on winning the first serve (rank 1).

Conclusions

In the initial rounds of a Grand Slam tournament, 12 match statistics out of 14 were found to be significant for winning a match viz., receiving points won, second serve to win, first serve to win, breakpoints won, net points won, winners, total points won, unforced errors, aces, double faults, fastest serve speed and average first-serve speed. As the tournament progresses and the lower-ranked players get eliminated, matches in the intense rounds are competitively balanced. This also requires the player to develop the qualities of a 'Champion' or an 'Opportunity Maker'. In the intense rounds, only 3 match statistics viz., winning on the first serve, winning more receiving points, and winning the net points were found to be significant for winning a match. These insights would help players improve their game and coaches to train their players to win important matches and tournaments.

Conflicts of Interest

The authors declare no conflict of interest.

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