


Men's doubles professional tennis on hard courts: Game structure and point ending characteristics

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ABSTRACT

Despite the great tradition and importance of the doubles game in professional tennis, no literature has analysed to date the performance of professional players. Therefore, the information on the characteristics of the game, or the tactics related to how the points are won in doubles play is scarce. The objective of this study has been to describe the basic characteristics of the structure of the doubles game, and to establish how the points finish in doubles professional tennis played on hard courts. Thirty-four ATP doubles matches played in 2018 were analysed, which included a total of 40 professional players. As per the game structure, the results showed that, in comparison to the singles matches, the number of points per match, the number of sets per match, the number of points per game, and the number of strokes per point, are lower in the doubles matches. However, the number of games per set is higher in doubles than in singles. Winning shots and winning serves are the most frequent patterns to finish the point in doubles. These data show the great importance of the serve in doubles, as well as the relevance of using offensive tactics. **Keywords:** Doubles; Tactics; Professional players; Performance analysis.

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INTRODUCTION

There is no doubt of the importance of the doubles game in professional men's tennis. The competition schedules of both the Association of Tennis Professionals (ATP) (Association of Tennis Professionals, 2019) and the International Tennis Federation (ITF) (International Tennis Federation, 2019) include doubles events in almost all tournaments. Throughout the history of tennis, there have always been players and doubles specialists, recognised for their extraordinary performance in this discipline (Breznik, 2015).

In addition, some top singles players also play doubles, since, even for those who are not specialists, the doubles game has several benefits, such as the relevance to the final result in team competitions (i.e. the Davis Cup), the additional prize money, the access to the tournament main draw, or the improvement in confidence that facilitates a better performance in the singles game (Crespo & Miley, 1998).

On the other hand, the doubles game has some obvious differences to the singles. One of them is the scoring system, the doubles ATP matches are played to the best of two tie-break sets and a "match tie-break", and the "no-ad" rule is applied (when reaching deuce, the winning pair of the next point is the winner of the game). Furthermore, the fact of playing together with a partner and the difference in the court dimensions, affect the positions of the players, their movements, the tactics used, the training systems implemented, and even their strokes (Black, 2012; Crespo & Miley, 1998). In addition, it is a game in constant evolution, where the power of the shots, the tactics used or the positions on the court of today's teams are very different from those used in the past (Black & Van de Braam, 2012).

Some coaching literature has specifically dealt with doubles tactics (Brabenec, 1997; Braden & Burns, 1996; Cayer, 2004; Perlstein, 1995; Singleton, 1989; Talbert & Old, 1957) but, generally, with no mention to the specific statistics of the game. Other scientific research has covered several characteristics of the doubles game such as: sex differences (Anderson, 1982), implicit coordination (Blickensderfer, Reynolds, Salas, & Cannon-Bowers, 2010), ratings (Clarke, 2011), and scoring systems (Pollard, Barnett, Brown & Pollard, 2007), but no performance analysis variables.

Knowing the structure of a sport is one of the essential aspects needed by coaches in order to design training routines in a proper and specific manner (Torres-Luque et al., 2014). Therefore, it is essential to conduct research using notational analysis that will provide the relevant information about these characteristics in a consistent and reliable way, by analysing the actions of the game through objective records during the competition (Gillet, Leroy, Thouwarecq, & Stein, 2009; Hughes & Barlett, 2007). However, as explained below, despite the great tradition and importance of the doubles game, no specific research has been found that analyses the performance of doubles and provides as essential information as the characteristics of the game or the basic tactics on how players win points. To date, there has been a growing interest in understanding the influence of different aspects on the performance of professional tennis players. Several performance analysis research have studied aspects such as: the structure of the game (Fernández, Méndez-Villanueva, & Pluim, 2006; Torres-Luque, Sánchez-Pay, Fernández-García, & Palao, 2014), movement profiles (Hughes & Meyers, 2005; Martínez-Gallego, Guzmán, Crespo, Ramón-Llin, & Vučković, 2018; Martínez-Gallego et al., 2013) or tactical aspects (Martínez-Gallego et al., 2018, 2013; Martin-Lorente, Campos, & Crespo, 2017; O'Donoghue & Ingram, 2001; Reid, Morgan, & Whiteside, 2016; Takahashi et al., 2006). However, all these studies have focused on the singles game, being virtually no previous specific research that analyse the demands of the doubles game. With regards to the structure of the singles game, some of the features that have attracted the interested of researchers are, among others, the duration of the point (O'Donoghue & Ingram, 2001; Takahashi et al., 2006), and the number of strokes (Johnson, 2006; Takahashi et al., 2006)

which undoubtedly are very relevant to understand the physical and physiological demands of the game. Data such as the number of points, games or sets, have been much less relevant in previous studies, although they may be of great interest, not only from a physical or physiological point of view, but also from a strategic and even psychological perspective.

As per the studies related to the doubles game, there is only evidence of a previous research which compared the efficiency of the service between male and female teams in different surfaces (Carboch, 2017). The results showed that men won 10% more serves than women, and that they needed to win more service points to win the match. Surface differences found that on fast courts the service had a greater advantage, both for men and women, and on clay courts the efficiency of the service was lower for both genders. Due to this lack of essential information and the differences between the singles and the doubles game, it is necessary to provide objective data for a better understanding of the doubles game. Therefore, the goal of this study has been to describe the basic characteristics to understand the doubles game structure, and to establish how the points are finished in doubles professional tennis played on fast courts.

MATERIAL AND METHODS

Participants

The sample consisted of 4188 points of 34 full doubles tennis matches played at ATP Finals, ATP World Tour Masters 1000, ATP World Tour 500 series and ATP World Tour 250 series events, all of which were played on fast courts in 2018. Twenty teams with a total of 40 players, mean age 31.85 ± 5.11 , took part. The specific player rankings were: 10 players ranked between 1- 10, 9 ranked between 11 - 20, 11 ranked between 21- 30, and 10 ranked between 31 - 50.

Procedure

All matches were viewed through the Tennistv.com website, which includes complete matches of ATP tournaments. Data capture of matches was done using a registration system created with Microsoft Excel version 16.16.7 (Microsoft, Redmond, USA). Specific information of the matches included: tournament name, round, players name, ranking and age. In addition, the following variables were also recorded for each point played:

- Serving team;
- Point played with 1st or 2nd serve;
- Result of the serve (ace, winner or point continues);
- Result of the last shot of the point (winner, forced error or unforced error);
- Point winning team;
- Score (sets, games and points) after the point.

Following the input of the information of each game, the system immediately calculated the indicators of interest for the study. For the calculation of the variables related to the number of games per match, games per set and points per set, the "match tie-break" was not considered, since the scoring system is totally different. Furthermore, it is important to emphasise that, in order to analyse how the points finished, to situations were identified:

- Serve situation, when the point ended with 1 or 2 shots.
- Game situation, when the point ended with 3 or more shots.

Reliability analysis

An inter-observer reliability analysis was carried out to analyse the reliability of the recorded data. In this analysis, two trained observers recorded the information of a full match of the study sample to later verify the reliability of the records from both observers through the Kappa test (Table 1). The values obtained in this test showed a very good reliability for all measurements (alphas between 0.82 and 1), except for the serve result variable, in which the reliability was good (alpha = 0.75) (Altman, 1990, p. 404).

Table 1. Reliability of outcome data (kappa).

Measure	Reliability
Serving team	1
First or second service	0.92
Result of the serve	0.75
Result of the last shot	0.82
Shots per point	0.94
Winning team	0.97

Statistical analysis

Data obtained through the registration system were exported to the programme SPSS version 24 (SPSS Inc., Chicago, Illinois, USA). First, the Kolmogorov-Smirnov test was applied to verify the normality of the data in each of the variables. All variables obtained deviations from normality, atypical values and differences in variance. Therefore, non-parametric statistical and descriptive tests were used. Chi-square test was used to calculate the differences in the point ending variable, with significant differences established at a level of significance lower or equal to 0.05.

RESULTS

Descriptive variables of the game

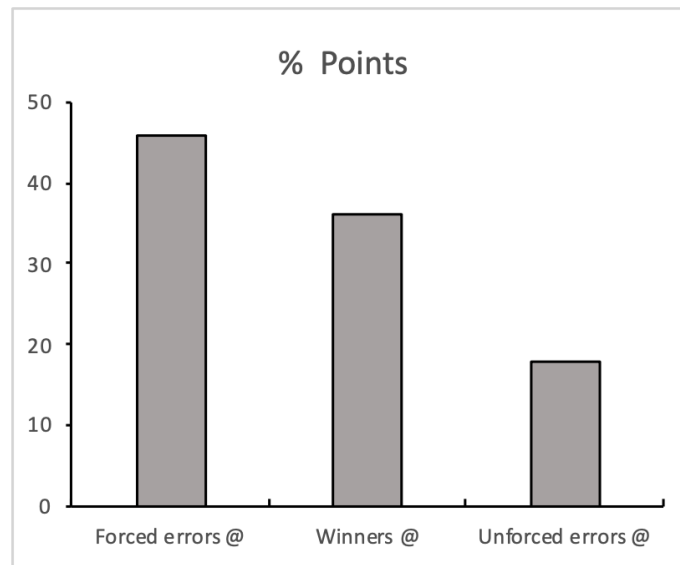
Table 2 shows the results of the variables describing the structure characteristics of the doubles matches. The average of sets, games and points played by match was 2.44, 21.65 and 123.18 respectively. In addition, the average tie breaks per match was 0.53, while the match tie breaks was 0.44. As per the number of games and points per set, the average was 10.51 and 57.94 respectively. Finally, the average points per game was 5.51, and the number of strokes per point was 3.41.

Table 2. Descriptive variables of doubles professional tennis matches.

Variables	M	Mn	SD	Range	Min	Max
Sets (match)	2.44	2	0.50	1	2	3
Games (match)	21.65	22	2.37	3.25	16	26
Points (match)	123.18	126.50	18.66	22.5	82	158
Tie breaks (match)	0.53	0.50	0.56	1	0	2
Match tie breaks (match)	0.44	0	0.50	1	0	1
Games (set)	10.51	10	1.89	4	7	13
Points (set)	57.94	54.50	12.95	21.5	34	83
Points (game)	5.51	5	1.50	2	4	16
Shots (point)	3.41	3	2.27	2	1	18

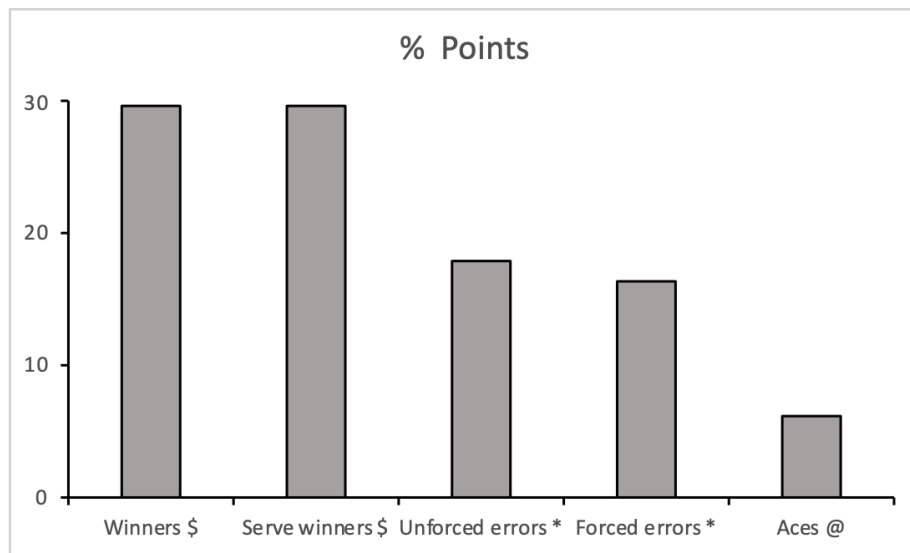
Point ending

Figure 1 shows the percentage of points ending with winner shots, forced errors and unforced errors. The percentage of points that ended with forced errors was significantly higher than that of winners ($\chi^2 = 51.37$; $P < .001$) and unforced errors ($\chi^2 = 250.78$; $P < .001$). The percentage of unforced errors was significantly lower than that of winners ($\chi^2 = 513.22$; $P < .001$).



@ Significant differences with the rest of categories ($P < .001$).

Figure 1. Point ending.



@ Significant differences with the other categories ($P < .001$). \$ Significant differences with unforced errors, forced errors and aces ($p < .001$). * Significant differences with winners, serve winners and aces ($P < .001$).

Figure 2. Point ending in serve and game situations.

Figure 2 distinguishes between winners and forced errors during a game situation or a serve situation. The percentage of points ending with a winner in a match situation or with winning serves (no aces) were significantly higher than for the rest of situations. On the other hand, the percentage of points ending with direct serves was significantly lower than in the other situations.

DISCUSSION

As already mentioned in the introduction to this article, to date there are very few studies that have analysed the performance indicators, the game structure, or the tactics used by professional doubles tennis teams. It is then difficult to discuss the results obtained in this work with previous studies, therefore, in this section we will refer to previous research in singles tennis.

Descriptive variables of the game

As per the variables related to the complete match, the number of points per match ($M = 123.18$) was very similar to that of Carboch & Kočib (2016) ($M = 123.3$). However, the values found in our study are lower than those obtained in previous research that have analysed singles matches. Kovalchik & Reid (2017) obtained a median of 216 points in the Australian Open singles matches, which is much higher than our results ($M_n = 126.50$). This difference seems reasonable if we consider that singles matches are played to the best of 5 sets, while doubles matches are played to the best of 3 sets, with a match tie-break as the final set. When comparing our results with those of studies that have analysed best of 3 sets singles matches, such as the one carried out by Kovacs (2004), it is still found that the number of points per game in singles is greater ($M = 177$ points) than that in our doubles study ($M = 123.18$ points).

On the other hand, only one study has been found that provide us with information on the number of average sets that are played in singles matches (Cross & Pollard, 2009), in which the sample are matches of different Grand Slams, so obviously, when playing to the best of 5 sets, the average between 3.55 and 3.85 obtained is higher than the 2.44 found in our study.

Regarding the number of games per set, on the contrary that happened with the variables related to the complete match, Cross & Pollard (2009) found average values between 9.5 and 9.8 games per set, which are lower than those obtained in our study for the doubles game, where the average was 10.51. We can conclude that in the doubles matches the sets played were closer than in the singles matches, therefore, it was necessary to play more games to decide the winner. When comparing the mean of points per game in singles and doubles matches, a mean of 6.2 points was played in singles (Cross & Pollard, 2009), while a mean of 5.51 points per game was played in doubles according to our findings.

Finally, as per the number of strokes played per point, in a previous study on individual matches on hard courts, Takahashi et al. (2006) found that the average number of strokes was 4.5, a value which is clearly higher to that of 3.41 obtained for the doubles game in our research.

The comparison between singles and doubles results suggests that rule and regulation differences between the two disciplines lead to fewer sets per match, points per match, and points per game in doubles play. The fact that the number of games per set is greater and the number of strokes per point is smaller than in the singles game, suggests a greater importance of the serve in the doubles game. Therefore, the serving team has more options to win the games, with a shorter duration of the points than in the singles matches. It would be interesting for future research to analyse in greater depth the performance indicators related to the serve

and the return of serve, that would provide more information on these variables and could confirm these initial conclusions.

Point ending

One of the most relevant aspects of the results obtained was the low percentage of points that ended with unforced errors. It is thought that this may be mainly due to the study sample, made up of some of the top doubles professional teams, which could reduce the number of errors considerably compared to lower level players, as Brody (2006) also pointed out. In addition, when comparing the percentage of points ending with unforced errors found in our study (18%) with those of previous studies of singles matches played on fast surfaces: 30.35%-24.08% (Carboch, 2017); 24.81% (Tudor, Zečić, & Matković, 2014), it is shown that the percentage of unforced errors in the doubles game was lower than in singles. Another relevant aspect is that most of the points ending with forced errors were mainly caused by the serve. Therefore, although the percentage of aces was very low, the serve was very important to cause the error of the opponents. In addition, when comparing our findings to previous studies such as the one by O'Donoghue & Ingram (2001), who analysed singles matches on fast courts, it can be observed that in the doubles game the percentage of errors caused by the service is higher. Therefore, as stated above, this confirms that the serve in doubles may even have a greater relevance than in the singles game.

Finally, it was observed that, although the percentage of winning shots was lower than that of forced errors, these showed a special importance during the game, being the most frequent situation of ending the points, together with the errors forced by the serve. In comparison with the results obtained with the singles game (Carboch, 2017; Tudor et al., 2014), although in these studies both aces and winning strokes were included during the game, the values obtained were similar or even lower than those obtained in our study in which aces were not considered. This could be due to the fact that, in addition to the top level of the players participating in our study, in the doubles game players have more options to move into offensive positions and use attacking tactics, which can facilitate a greater number of winning shots. Future studies could analyse the positions and the strokes that assist in generating winning shots.

CONCLUSIONS

It can be concluded that in the doubles matches of the present study:

- The points per game were very similar to those found in previous studies of the doubles game played on the same surface.
- Fewer sets, points per match, and points per game were played in the doubles matches than in the individual matches of other studies, possibly due to the difference in the scoring system.
- More games per set and fewer points per game were played in the doubles matches than in the individual matches of other studies. This result shows the great importance of the serve in the doubles game, which provides a considerable advantage to the serving team, causing the points to be shorter than in singles play.
- Players made very few unforced errors, possibly due to their high level of play.
- The serve was the most important shot to cause the error of the opposing team, which confirms the importance of this shot in the doubles game.
- The most common pattern to finish the points was with a winning shot, which highlights the importance of using offensive tactics in doubles play.

PRACTICAL APPLICATION

Data obtained in this study suggest that coaches should consider the structure differences between singles and doubles play. Therefore, when designing doubles training sessions, variables such as the number of strokes per point, points per game, games per set and sets per match, should be considered, so that the workloads and the work / rest ratio are as specific as possible to the real doubles match situations. In addition, special attention must be paid to the serve and the attacking game, since they have been shown essential to winning points in the doubles game.

STUDY LIMITATIONS

In this article, being the first to study the doubles discipline from the point of view of the notational analysis, only results related to the structure of the game and the finishing of the points are presented. It would be interesting to know in more detail the tactics used by the players that influence the results obtained in this study, in terms of the structure and points ending. For example, analyse performance indicators related to the service and the return or to the points played in the net.

DISCLOSURE STATEMENT

The authors report no conflict of interest.

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