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The Statistician, Vol. 48, No. 2 (1999), 247-256.

Stable URL:
http://links.jstor.org/sici?sici=0039-0526%281999%2948%3A2%3C247%3AOTAOSF%3E2.0.CO%3B2-G

The Statistician is currently published by Royal Statistical Society.

The Statistician (1999)
48, *Part* 2, *pp.* 247–256

On the advantage of serving first in a tennis set: four years at Wimbledon

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[Received March 1998. Revised December 1998]

Summary. We investigate four often-heard hypotheses relating to the service in tennis. They are as follows: in the men's singles the service dominance is greater than in the women's singles, a player is as good as his or her second service, there is a psychological advantage to serve first in a set and few breaks occur during the first few games in a match. Moreover, we show the effect of changing the rules of tennis by allowing for only one instead of two services. All items are investigated by using almost 90 000 points at Wimbledon.

Keywords: Service; Tennis; Wimbledon

1. Introduction

Many people have ideas about tennis. In particular, most commentators hold strong ideas about, for instance, the advantage of serving first in a set, the advantage of serving with new balls and the special ability of top players to perform well at important points. On the basis of data from Wimbledon we shall investigate three hypotheses relating to the service,

(a) in the men's singles the dominance of service is greater than in the women's singles,
(b) a player is as good as his or her second service,
(c) there is a psychological advantage to serve first in a set,

and one hypothesis relating to breaks,

(d) few breaks occur during the first few games in a match.

Many other hypotheses are considered in Magnus and Klaassen (1998a, b, 1999a, b).

The literature on the service in tennis concentrates on the first–second-service strategy. Gillman (1985) concluded that 'missing more serves may win more points'; see also Gale (1971), George (1973), Hannan (1976) and Norman (1985). Borghans (1995) analysed the 1995 Wimbledon final between Sampras and Becker and showed that Becker could have performed much better if he had put more power into his second service.

The literature on the statistical analysis of tennis is hampered by an almost complete lack of data. The data that are available are either point-to-point data for one match, as in Borghans (1995), or match results (6–4, 6–3, 6–3, say). Most papers, however, are theoretical and contain no data at all. In contrast, the current paper uses point-to-point data on 481 matches resulting in 88 883 observations.

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 0039–0526/99/48247

In Section 2 we describe the Wimbledon data. In Section 3 we present some general characteristics of the service and test our first two hypotheses. Serving first in a set is the subject of Section 4, while Section 5 concentrates on the first set, and in particular the first games. Section 6 concludes.

2. The data: 88 883 points played at Wimbledon

We have data on 481 matches played in the men's singles and women's singles championships at Wimbledon from 1992 to 1995. This accounts for almost half of all singles matches played during these four years. For each of these matches we know the exact sequence of points. We also know at each point whether the first or the second service was in and whether the point was decided through an ace or a double fault. Table 1 provides a summary of the data.

We have slightly more matches for men than for women, but of course many more sets, games and points for the men's singles than for the women's singles, because the men play for three sets won and the women for two. The men play fewer points per game than the women, because the dominance of their service is greater, as we shall show below. But the women play fewer games per set on average—scores like 6–0 and 6–1 are more common in the women's singles than in the men's singles—because the difference between the 16 seeded and the 112 non-seeded players is much greater; see Magnus and Klaassen (1999b) for empirical evidence. This also leads to fewer tie-breaks in non-final sets for women. (By 'final set' we mean the fifth set in the men's singles and the third set in the women's singles. At Wimbledon there is no tie-break in the final set.) Both men and women play about 60 points per set. The men play on average 230.5 points per match, the women 131.9, and hence a match in the men's singles takes on average 1.75 times as long as a match in the women's singles.

All matches in our data set are played on one of the five 'show courts': the centre court and courts 1, 2, 13 and 14. Usually matches involving top players are scheduled on these courts. This causes an under-representation in the data set of matches involving non-seeded players. To account for this selection problem, we shall always weigh the matches when computing statistics. To avoid too much averaging, we shall usually distinguish between the 16 seeded and the 112 non-seeded players.

Table 1. Number of matches, sets, games, tie-breaks and points in the data set

Observation	*Results for the following competitions:*	
	Men's singles	*Women's singles*
Matches	258	223
Non-final sets	899	446
Final sets	51	57
Games	9367	4486
Tie-breaks	177	37
Points	59 466	29 417
Sets in match	3.7	2.3
Games in non-final set	9.8	8.9
Games in final set	11.1	9.2
Tie-breaks in non-final set	0.2	0.1
Points in match	230.5	131.9
Points in game	6.1	6.5
Points in tie-break	12.1	11.8

3. The service

The service is one of the most important aspects of tennis, particularly on fast surfaces such as the grass courts at Wimbledon. In Table 2 we provide some of its characteristics. In these and subsequent tables, Sd–NSd indicates a match of a seeded against a non-seeded player, where the first player (Sd) is serving and the second player (NSd) receiving. Sd–Sd, NSd–Sd and NSd–NSd are similarly defined. Standard errors are given in parentheses. To obtain the standard errors, we have treated all points as independent. This is not quite true—see Klaassen and Magnus (1998)—but it is sufficient as a first-order approximation for our purpose.

Table 2. Service characteristics

Characteristic	*% of the characteristics for the following matches:*				*Total (%)*
	Sd–Sd	*Sd–NSd*	*NSd–Sd*	*NSd–NSd*	
(a) Men's singles					
Aces	11.7	11.0	7.7	7.0	8.2
	(0.4)	(0.2)	(0.2)	(0.2)	(0.1)
Double faults	5.1	5.1	5.8	5.6	5.5
	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)
Points won on service	67.0	69.3	61.1	63.7	64.4
	(0.6)	(0.4)	(0.4)	(0.4)	(0.2)
1st services in	58.7	59.6	59.4	59.5	59.4
	(0.6)	(0.4)	(0.4)	(0.4)	(0.2)
2nd services in	87.8	87.3	85.6	86.2	86.4
	(0.6)	(0.4)	(0.4)	(0.4)	(0.2)
Points won if 1st service in	77.7	78.1	70.2	72.4	73.3
	(0.7)	(0.4)	(0.4)	(0.5)	(0.2)
Points won if 2nd service in	59.0	64.5	55.6	59.2	59.4
	(1.0)	(0.6)	(0.6)	(0.6)	(0.3)
Points won on 1st service	45.6	46.5	41.7	43.1	43.6
	(0.6)	(0.4)	(0.4)	(0.4)	(0.2)
Points won on 2nd service	51.8	56.3	47.6	51.0	51.4
	(0.9)	(0.6)	(0.6)	(0.6)	(0.3)
Games won on service	86.0	88.9	74.1	79.7	80.8
	(1.1)	(0.6)	(0.8)	(0.8)	(0.4)
(b) Women's singles					
Aces	3.3	4.2	2.5	2.9	3.1
	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)
Double faults	3.9	4.2	5.8	6.0	5.5
	(0.3)	(0.2)	(0.2)	(0.3)	(0.1)
Points won on service	56.9	62.9	50.1	55.8	56.1
	(0.8)	(0.5)	(0.5)	(0.7)	(0.3)
1st services in	65.6	61.5	60.5	60.2	60.8
	(0.7)	(0.5)	(0.5)	(0.7)	(0.3)
2nd services in	88.8	89.1	85.2	85.1	86.0
	(0.8)	(0.5)	(0.6)	(0.8)	(0.3)
Points won if 1st service in	62.5	69.6	56.4	61.7	62.2
	(0.9)	(0.6)	(0.6)	(0.8)	(0.4)
Points won if 2nd service in	51.8	58.6	47.4	55.2	54.1
	(1.4)	(0.9)	(0.9)	(1.1)	(0.5)
Points won on 1st service	41.0	42.8	34.1	37.1	37.8
	(0.8)	(0.5)	(0.5)	(0.6)	(0.3)
Points won on 2nd service	46.0	52.2	40.4	47.0	46.6
	(1.3)	(0.8)	(0.8)	(1.1)	(0.5)
Games won on service	66.5	77.8	49.4	62.8	63.4
	(1.9)	(1.1)	(1.3)	(1.6)	(0.7)

We see that, at Wimbledon, the men serve almost three times as many aces as the women but serve the same number of double faults. (The percentage of aces is defined as the ratio of the number of aces (first or second service) to the number of points served, rather than to the number of services.)

In understanding the other service characteristics in Table 2, the distinction between 'points won if 1st (2nd) service in' and 'points won on 1st (2nd) service' is important. In the men's singles, when two seeded players play against each other, the first service is in 58.7% of the time. If the first service is in, the probability of winning the point is 77.7%. Therefore, in the men's singles the probability of winning the point on the first service is $58.7\% \times 77.7\% = 45.6\%$; see the second column of Table 2, part (a). Hence,

$$\%\text{ points won on 1st service} = (\%\text{ points won if 1st service in}) \times (\%\text{ 1st services in}) \quad (1)$$

and, of course, the same for the second service. Combining the data for the first and second services, we can derive the percentage of points won on service. A player can win a point on service in two ways: on the first or on the second service. However, the second possibility only becomes relevant when the first serve is faulted. This leads to the expression

$$\%\text{ points won on service} = \%\text{ points won on 1st service} + (\%\text{ 1st service not in}) \times (\%\text{ points won on 2nd service}). \quad (2)$$

For example, from the second column of Table 2, part (a), $67.0\% = 45.6\% + (100 - 58.7)\% \times 51.8\%$. Formulae (1) and (2) are helpful to test our first hypothesis.

3.1. *Hypothesis 1: in the men's singles the dominance of service is greater than in the women's singles*

We all believe that the dominance of service is greater in the men's than in the women's singles, but how should we measure service dominance? It is a combination of the dominance of the first service and the dominance of the second service. So, how do we measure the dominance of the first service?: clearly not by the percentage of first services in, because this tells us nothing about the difficulty of the service; nor by the percentage of points won if the first service is in, because this tells us nothing about how often the service is in. The most appropriate measure for the dominance of the first service is a combination of the two, i.e. the percentage of points won on first service as given in equation (1). Similarly, the dominance of the second service should be measured by the percentage of points won on the second service, which also follows from equation (1) after replacing first by second. Ironically, television broadcasts inform us about the percentage of first (or second) services in and sometimes about the percentage of points won if the first (or second) service is in, but seldom about the percentage of points won on the first (or second) service.

To arrive at a measure for the (total) dominance of service, we must combine the dominance of the first service with that of the second service. The appropriate way to combine the two is given by equation (2). This measure enables us to answer hypothesis 1.

Table 2 shows that the probability of winning a point on service is 64.4% (for men) and 56.1% (for women). The difference is 8.3 percentage points with a standard error of 0.4%. The dominance of the service is thus significantly larger in the men's singles than in the women's singles, where 'significant' means that the estimate is more than 2 standard errors away from its target. Hence, hypothesis 1 is true (more formally—its alternative can be rejected), just as we would have expected.

The service advantage for men over women is brought out even stronger when we calculate the

probability of winning a service *game*, which is 80.8% (for men) and 63.4% (for women). This is what Alefeld (1984) called the *Verstärkungseffekt*: any advantage at point level is amplified at game level. Hence, the dominance of service at game level is 17.4 percentage points (0.8%) larger in the men's singles than in the women's singles. This significant difference makes the men's singles a very different game from the women's singles.

The percentages of first and second services in are remarkably similar for the men and the women: 59.4% (for men) *versus* 60.8% (for women) for the first service and 86.4% (for men) *versus* 86.0% (for women) for the second service. However, the 1.4 percentage point (0.4%) difference of first services in between men and women is significant, whereas the 0.4 percentage point (0.4%) difference of second services in is not. Since the percentage of services in is something that the player can control (he or she could serve 100% first services in, but of course the quality of the first service would suffer), the question can be raised whether the observed percentages reflect the best strategy. If a player knows the optimal percentages of valid services against a particular opponent, he or she could try to achieve these during the match. This question is not discussed further in the current paper.

Another question of interest, and one which can be answered with the available data, is what would happen if the rules were changed and only one service was allowed rather than two? This suggestion is one of many currently under discussion, all of which aim at decreasing the dominance of the service, thereby, it is hoped, making tennis more attractive for spectators. If a player has only one service, this will be his or her current second service. After all, a player having only one service can be seen as equivalent to a player having two services who has missed his or her first service. In the language of game theory, the current situation (two services) has an equilibrium which is 'subgame perfect' (Selten (1975), p. 33) and the new situation (one service) is a subgame of the current situation. Hence, the proposed change to one service amounts to abolishing the first service. The probability of winning a point thus becomes 51.4% (for men) and 46.6% (for women). The consequence of this change of rule would thus be that the dominance of service becomes very much smaller. In addition, in the women's singles the service advantage would turn into a service disadvantage!

A note of caution is, however, appropriate. We have abstracted from selection effects that are caused by the overrepresentation of players with a risky first service or players that are having a bad day. We have also abstracted from training effects: under the new rule of one service only, the players will only have to train on one service. This will eventually lead to a better service than the current second service. Under the new rule of one service only, if a player decides always to use his or her old first (rather than second) service, the probability of winning a point on service would be only 43.6% (for men) and 37.8% (for women).

3.2. Hypothesis 2: a player is as good as his or her second service

As shown above, the most appropriate measure for the quality of the second service is the percentage of points won on the second service, not the percentage of second services in, nor the percentage of points won if the second service is in. In the men's singles, let us compare the matches Sd–Sd and NSd–NSd; see the second and fifth columns in Table 2, part (a). With some simplification, the players in these matches can be considered to have the same strength: they are either both good (NSd–NSd) or both very good (Sd–Sd). We see that the seeded players win significantly more points on their first service than do the non-seeded players ($45.6\% > 43.1\%$), but that the estimated probabilities of winning points on the second service are not significantly different. Hence a seeded player distinguishes himself from a non-seeded player by having a better first service, not by having a better second service. Therefore, hypothesis 2 is not supported by the

Wimbledon data: 'a player is as good as his or her *first* service' is a more realistic statement. The same is true in the women's singles as can be verified from part (b) of Table 2.

There is, however, one important difference between the men's singles and the women's singles and this relates to the quality of the first service. Referring to equation (1), the quality of the first service is made up from two components: the percentage of points won if the first service is in and the percentage of first services in. In the men's singles the difference in the quality of the first service between seeded and non-seeded players is determined primarily by the percentage of points won if the first service is in (77.7% is significantly larger than 72.4%), whereas the difference in the percentage of first services in is not significant. In the women's singles the difference is determined primarily by the percentage of first services in (65.6% is significantly larger than 60.2%), whereas the difference in the percentage of points won if the first service is in is insignificant.

The conclusion that a player is as good as his or her first service leads to another implication of the change of rules examined earlier. If only one service were allowed rather than two, not only would the probability of winning a point on service decrease for all players but also the difference between seeded and non-seeded players would become smaller. After all, seeded players distinguish themselves by having a better first service than non-seeded players, and it is the first service that is abolished by the change of rules. Therefore, matches would become more even, which would make tennis more attractive for spectators. In this sense, allowing for only one service is a good idea which is easy to implement.

4. Serving first

Most players, when winning the toss, elect to serve. Is this a wise strategy? This depends on whether or not you believe our third hypothesis.

4.1. Hypothesis 3: there is a psychological advantage to serving first in a set

The reason for the advantage of serving first, if it exists, would be that the player who receives in the first game is usually one game behind and that this would create extra stress. Kingston (1976) and Anderson (1977) showed that

> 'whether service is alternated or whether the server of one game has the privilege of serving the next, the initial server will have the same probability of winning N games before his opponent does'.

Given the rules of tennis there is no theoretical advantage in serving first in a set. Hence, any advantage (if proved) is psychological. Let us investigate whether there is any truth in this *idée reçue*.

Our first calculations seem to indicate that hypothesis 3 must be wrong. Overall only 48.2% of the sets played in the men's singles are won by the player who begins to serve in the set. In the women's singles the percentage is 50.1%. The standard errors of the two estimates are 1.6% and 2.2% respectively. Therefore, neither of the two percentages is significantly different from 50%. If we look at the sets separately, then we see that this finding (starting to serve provides no advantage) seems to be true in every set, except perhaps the first. In the men's singles the estimated probability of winning a set when starting to serve is 55.4% (3.1%) in the first set and 44.3% (3.1%), 43.5% (3.1%), 51.0% (4.5%) and 48.8% (7.0%) in the second to fifth sets respectively. In the second and third sets serving first may even be a disadvantage.

Exactly the same occurs in the women's singles. There the probability that the player who starts to serve also wins the set is estimated to be 56.6% (3.3%) in the first set, 44.0% (3.3%) in the

second set and 47.8% (6.6%) in the third set. Therefore, hypothesis 3 seems to be true only in the first set.

However, in analysing this hypothesis, we need to realize that the player who starts to serve in a set, if it is not the first set, is usually the weaker player. (Such an effect is absent in the first set, since in matches between seeded and non-seeded players both groups start serving almost equally often in the first set, as we would expect.) This is so, because of a combination of two factors. First, it is likely that the stronger of the two players has won the previous set. Secondly, it is likely that the last game of the previous set has been won by the server of that game. In this case the loser of the set begins to serve in the next set. Combining both factors we see that usually the weaker player starts serving in a new set. Hence, in all sets except the first, the above percentages are less than 50% not because there is a disadvantage for the player who serves first in a set but because the server in the first game is usually the weaker player. A proper analysis of hypothesis 3 should take this into account. Hence, in part (a) of Table 3 we consider a player in the men's singles *who has won the previous set* and compare the estimated probability that he wins the current set when starting to serve with the estimated probability that he wins the current set when starting to receive. For example, if a seeded (Sd) player has won the first set against a non-seeded (NSd) player, then his probability of winning the second set is estimated as 82.1% when he (the seeded player) begins to serve and as 78.8% when his opponent begins to serve. Of course, there is no set before the first and hence the probabilities in the first row are simply the (unconditional) probabilities of winning the first set. The same probabilities, estimated for the women's singles, are provided in part (b) of Table 3.

Let us consider the first three sets in the men's singles and the first two sets in the women's singles, because the other sets have relatively few observations and hence large standard errors.

Table 3. Estimated probabilities of winning a set after winning the previous set†

Set	*Probabilities (%) for the following matches:*									
	Sd–Sd		*Sd–NSd*		*NSd–Sd*		*NSd–NSd*		*Total*	
	S	*R*	*S*	*R*	*S*	*R*	*S*	*R*	*S*	*R*
(a) Men's singles										
1	46.8	53.2	80.6	78.9	21.1	19.4	56.9	43.1	55.4	44.6
	(9.8)	(9.8)	(4.2)	(4.9)	(4.9)	(4.2)	(5.8)	(5.8)	(3.1)	(3.1)
2	61.0	52.6	82.1	78.8	19.3	30.8	72.1	70.0	72.5	68.0
	(21.8)	(10.9)	(6.0)	(4.4)	(16.1)	(9.1)	(9.0)	(6.6)	(5.1)	(3.5)
3	79.5	75.2	73.5	76.7	64.2	40.5	75.0	73.6	73.9	72.1
	(12.8)	(10.8)	(6.7)	(4.7)	(13.8)	(10.5)	(9.2)	(6.1)	(4.7)	(3.4)
4	19.5	50.0	74.4	69.8	26.2	34.3	75.9	68.8	62.9	60.2
	(17.7)	(14.4)	(11.3)	(10.3)	(10.1)	(10.4)	(10.4)	(11.6)	(6.5)	(5.9)
5	0.0	11.9	70.5	86.1	24.8	37.1	52.8	60.6	48.3	51.0
	(0.0)	(11.5)	(26.3)	(13.1)	(21.6)	(13.4)	(17.7)	(18.5)	(12.5)	(8.5)
(b) Women's singles										
1	62.4	37.6	72.4	84.0	16.0	27.6	64.3	35.7	56.6	43.4
	(9.0)	(9.0)	(5.1)	(4.3)	(4.3)	(5.1)	(7.4)	(7.4)	(3.3)	(3.3)
2	64.3	72.6	89.5	90.3	27.2	31.9	69.5	74.3	72.0	75.2
	(14.5)	(10.5)	(4.3)	(3.6)	(12.3)	(10.2)	(10.3)	(9.3)	(4.6)	(3.8)
3	40.4	25.0	67.5	85.9	0.0	15.0	92.9	60.8	63.5	60.1
	(21.9)	(21.7)	(14.8)	(9.7)	(0.0)	(13.5)	(12.9)	(17.3)	(9.6)	(8.9)

†S, starts serving; R, starts receiving.

(Moreover, in sets 4 and 5 in the men's singles and set 3 in the women's singles we would expect the players to be more equally matched than in the earlier sets. This is reflected in Table 3. A comparison between sets 1–3 and sets 4 and 5 in the men's singles, and also between sets 1 and 2 and set 3 in the women's singles, is complicated by this selection effect.) There is some indication that in the men's singles there is an advantage in serving first: the overall probability of winning a set after winning the previous set is higher for the player who begins to serve than for the player who begins to receive. The difference is 10.8 percentage points (6.2%) in the first set, 4.5 percentage points (6.2%) in the second set and 1.8 percentage points (5.8%) in the third set. However, these results are not significant and the differences are not positive for all four subcategories (Sd–Sd, Sd–NSd, etc.). We conclude that the support for hypothesis 3 is insufficient, except perhaps in the first set.

In the women's singles the first set indeed appears to be special, as we have already found. The probability of winning the first set is significantly higher for the player who begins to serve than for the player who begins to receive (the difference is 13.2 percentage points with a standard error of 6.6%). The probability of winning the second set after winning the first is lower, although not significantly, for the player who begins to serve than for the player who begins to receive (the difference is 3.2 percentage points with a standard error of 6.0%). Hence in the women's singles hypothesis 3 is only true for the first set. This implies that electing to serve after winning the toss is generally better than electing to receive.

5. The first game

There is only one result in the previous section that is reasonably robust and that is that in the first set of a match there is an advantage in serving first. But why should the first set be different from other sets? Maybe this is because fewer breaks occur in the first few games of a match.

5.1. Hypothesis 4: few breaks occur during the first few games in a match

The idea behind this hypothesis is the following. Suppose that your opponent begins to serve. In the first game you are not under much pressure to break your opponent's service. Instead you use this game (and possibly his or her second service game as well) to read your opponent's strategy, to judge his or her strengths and weaknesses and to settle down. This may be a good strategy. But is it? Hypothesis 4 can be examined by using Table 4.

The estimated probability of winning a service game if it is not in the first set is 80.1% (0.5%) in the men's singles and 62.0% (0.7%) in the women's singles. The probability of winning a service game in the first set (including the first two games) is significantly higher, namely 82.4% (0.8%) in the men's singles and 65.2% (1.1%) in the women's singles. The reason why the probability in the first set is higher is entirely due to the effect of the first game in the match. The probability that the server wins this first game is 87.7% (2.0%) in the men's singles and 74.3% (2.9%) in the women's singles. It is only the very first game that is special. In the second game the percentages of winning a service game are not significantly different from those concerning the first set excluding the first two games. This holds for both men and women. Hypothesis 4 thus appears to be true, but only for the very first game. This conclusion is in contrast with the idea that some people have. They argue that it is wise to elect to *receive* when you win the toss, because it would be easier to break your opponent in the first game of the match than in later games. In the first game, they believe, the server is not yet playing his or her best tennis. If this is true, however, then it must be that the receiver is performing even worse in the first game, as we clearly find that breaks in the first game occur less often. Therefore, it is wise to elect to *serve* when you win the toss.

Table 4. Estimated probabilities of winning a service game

	Probabilities (%) for the following matches:				*Total (%)*
	Sd–Sd	*Sd–NSd*	*NSd–Sd*	*NSd–NSd*	
(a) Men's singles					
1st game in match	96.3	92.3	73.8	89.2	87.7
	(3.7)	(2.8)	(5.3)	(3.6)	(2.0)
2nd game in match	80.1	87.0	72.8	85.6	82.9
	(7.8)	(4.0)	(4.7)	(4.1)	(2.3)
1st set except games 1 and 2	90.5	90.3	73.7	80.4	81.6
	(2.0)	(1.2)	(1.8)	(1.7)	(0.9)
Match except 1st set	84.5	88.4	74.3	78.9	80.1
	(1.3)	(0.7)	(1.0)	(0.9)	(0.5)
(b) Women's singles					
1st game in match	72.1	83.4	55.5	77.6	74.3
	(8.3)	(4.2)	(5.8)	(6.4)	(2.9)
2nd game in match	61.8	72.0	50.2	56.5	58.5
	(9.0)	(5.2)	(5.7)	(7.7)	(3.3)
1st set except games 1 and 2	68.7	77.1	50.6	65.0	64.8
	(3.1)	(1.8)	(2.2)	(2.8)	(1.2)
Match except 1st set	65.0	78.3	48.0	60.9	62.0
	(2.6)	(1.4)	(1.8)	(2.2)	(1.0)

6. Conclusion

In this paper we have investigated four hypotheses relating to the service in tennis. Many television commentators believe in them, but are they true? We have used almost 90 000 points at Wimbledon to analyse them.

The first is indeed true: in the men's singles the dominance of service is larger than in the women's singles. However, a player is not as good as his or her second service. Actually, it is the first service that makes the difference.

Both conclusions have important implications for the question whether the rules of the game should be changed by allowing for only one instead of two services. This suggestion is often heard as a means to decrease the dominance of service, thereby, it is hoped, making tennis more attractive for spectators. Not surprisingly, we indeed find a lower dominance of service. Additionally, tennis-matches would become more even, which makes tennis even more attractive.

It is also commonly believed that serving first in a set provides an advantage. This is not true, except in the first set. The reason for this advantage in the first set can be completely accounted for by the 'first-game effect': fewer breaks occur in the very first game of the match. Because of the first-game effect it is advisable for most players to elect to serve when they win the toss, not to receive.

Acknowledgements

We thank IBM UK and the All England Club at Wimbledon for their kindness in providing the data. We also thank Eveline de Jong, Martin Dufwenberg, Arthur van Soest and the referees for useful comments.

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