International Tennis Federation

COACHING & SPORT SCIENCE REVIEW

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Contents Issue 53

International Tennis Federation

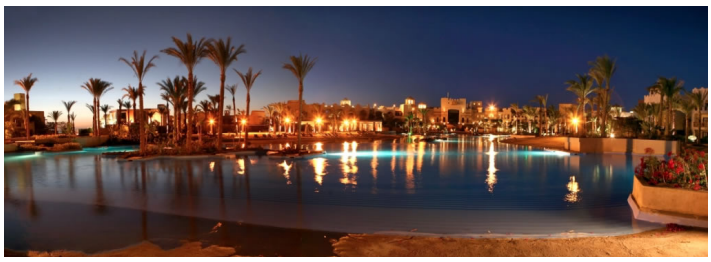
COACHING & SPORT SCIENCE REVIEW

The Official Coaching and Sport Science Publication of the International Tennis Federation

Editorial

Welcome to issue 53 of ITF Coaching and Sport Science Review, the first edition of 2011. This issue includes articles on a range of topics including statistical analysis from the Grand Slams, psychological skills training for coaches, an introduction to tactical periodisation and hydration and recovery in tennis.

The ITF is pleased to announce that the 17th ITF Worldwide Coaches Conference 2011 will take place at the Port Ghalib Red Sea Resort, Egypt from Sunday 20th to Thursday 24th November 2011. The event will be organised by the ITF in conjunction with the Egyptian Tennis Federation. It is the first time the event has been held in Egypt.



The theme of this years Conference is 'The Progressive Development of a High Performance Player'. The Conference will have presentations related to four distinct ages of Player Development: 10 and under (Building phase), 11-14 years (Development phase), 15-18 years (Junior phase) and 19-23 years (Transition to Professional Phase).

Confirmed speakers for the Conference include:

- Nick Bollettieri
- Wayne Black
- Patrick McEnroe
- Rohan Goetzke

Information on the Conference can be found on the dedicated conference website which is now online. Here you will be kept up to date on travel information, accommodation packages, programme announcements, confirmed speakers and other important information coming up to the conference.

Furthermore, the ITF is calling for the submission of abstracts to be presented as either workshop presentations or poster presentations. Submission of these abstracts can be done through the conference website. Workshop presentations will be either 20 or 30 minutes in duration including time for questions. Poster presentations will allow for digital or traditional display of research or projects. For more information on the call for papers, and instructions for authors please visit the 'Call for Papers' section of the site. The conference site is available at: http://www.itfcoachesconference.com

Next month sees the exciting launch of the new and improved Tennis iCoach website. The Tennis iCoach is the world's premier digital coach education resource. In addition to the great new look and usability of the site, the content continues to grow with new presentations from conferences worldwide. The latest additions include the 2010 ITF Regional Workshop presentations, as well as the Tennis Europe Symposium in Moscow, Russia.

Finally, we hope you enjoy reading and expanding your coaching knowledge through the wide variety of articles on offer in this 53rd edition of ITF Coaching and Sport Science Review.

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Grand Slam men's singles tennis 1995-2009 Part 2: Points, games and sets

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ABSTRACT

Data from Grand Slam men's singles matches is presented for the period 1995 to 2009 showing how set score distributions have varied with time and across the four events. The relative number of tie-break sets provides a good indication of court speed, and so does the number of 6-0 or 6-4 sets. We show (a) how serve point probabilities vary between match winners and losers, (b) that match winners win about 9 out of 10 service games on average, while losers win about 7 out of 10 service games, (c) about 1/3 of all points are won by a player hitting a winner, (d) about 78% of match winners win the first set and (e) a player who wins the first set 7-6 is 2.5 times more likely to win the match than his opponent.

Key words: Statistics, points, games, set scores

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INTRODUCTION

In Cross and Pollard (2009), we presented data on each of the four Grand Slam events over the period 1991 to 2009. The data were related primarily to serve speeds, aces, double faults and tiebreak sets. In the present paper we present additional data for the same events concerning the manner in which points, games and sets are won, and the probabilities of winning points including the all-important break point conversions.

SERVE POINT PROBABILITIES

A fundamental parameter in the statistical analysis of tennis matches is the probability, p, of a player winning a point on serve, commonly known as the serve point probability. Some of those points are won on the first serve and some on the second serve, but the combined result is easily calculated for both match winners (pA) and match losers (pB) from data published on the web during each tournament. Results can be calculated for each set, but we focus attention on the total number of serve points won by each opponent during a complete 3, 4 or 5-set match. Results are presented only for completed matches. During a whole tournament, it is common for five or six of the nominal 127 matches to terminate before completion due to an injury to one of the players.

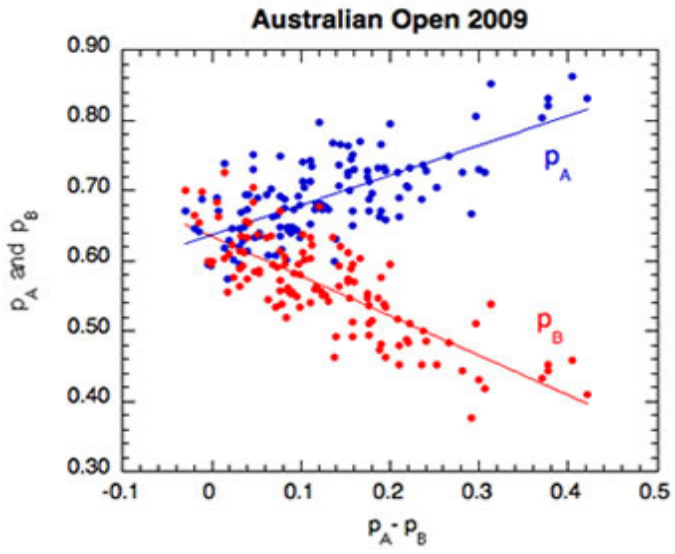

Figure 1. Serve point probabilities pA (blue dots) and pB (red dots) for each of the 123 completed matches at the 2009 Australian Open men's singles event, as a function of the pA - pB difference for each

In Fig. 1. we show the point probabilities for each player (one winner, one loser) for each of the 123 completed matches at the 2009 Australian Open, as a function of the pA - pB difference in each match. The usual result is that the match winner has a larger p value than the loser. If pA is close to pB then the match commonly takes 4 or 5 sets to determine a winner. Point probabilities depend on both the serving ability of the server and the returning ability of his opponent, and do not remain constant for any given player during a tournament or even from one set to the next in any given match. It is clear from Fig. 1 that pA depends on pB and vice-versa, with the result that pA can exceed 0.8 and pB can be as low as 0.4 when a strong player is pitted against a weak opponent.

Results similar to those in Fig. 1 were found for all four Grand Slam events, with small differences as summarised in Table 1. The main difference is that pA and pB (averaged over all players) are slightly higher at Wimbledon than at the other three events. No significant difference in average pA or pB values was found from the first round to later rounds in any of the four events. One might expect an increase in pA and pB from the first round to the later rounds, but the better players in the later rounds face stronger opponents, with the result that there is no significant change in pA or pB.

EVENT	AUST 2009		FRENCH 2009		WIMB 2009		US 2008	
	PA	PB	PA	PB	PA	PB	PA	PB
N	123	123	121	121	120	120	120	120
Mean	0.691	0.563	0.700	0.570	0.721	0.611	0.695	0.591
SD	0.059	0.069	0.062	0.063	0.063	0.069	0.059	0.058

Table 1. Serve point probabilities averaged over N match winners and N match losers in each Grand Slam event in 2008 or 2009.

Serve point probabilities are closely related to the total number of points won during a match, as shown in Fig. 2. The probability of the match winner winning a point on serve is pA, so the probability that his opponent wins the point is 1 - pA. When his opponent is serving, the probability that the match winner wins a point is 1 - pB. Let R = the total number of points won by the winner of the match divided by the total number of points won by the loser. Each data point in Fig. 2 represents a single match, where the pA - pB difference is plotted on the horizontal axis, and the corresponding value of R is plotted on the vertical axis. When the players are evenly matched, with a small pA - pB difference, R is close to 1.

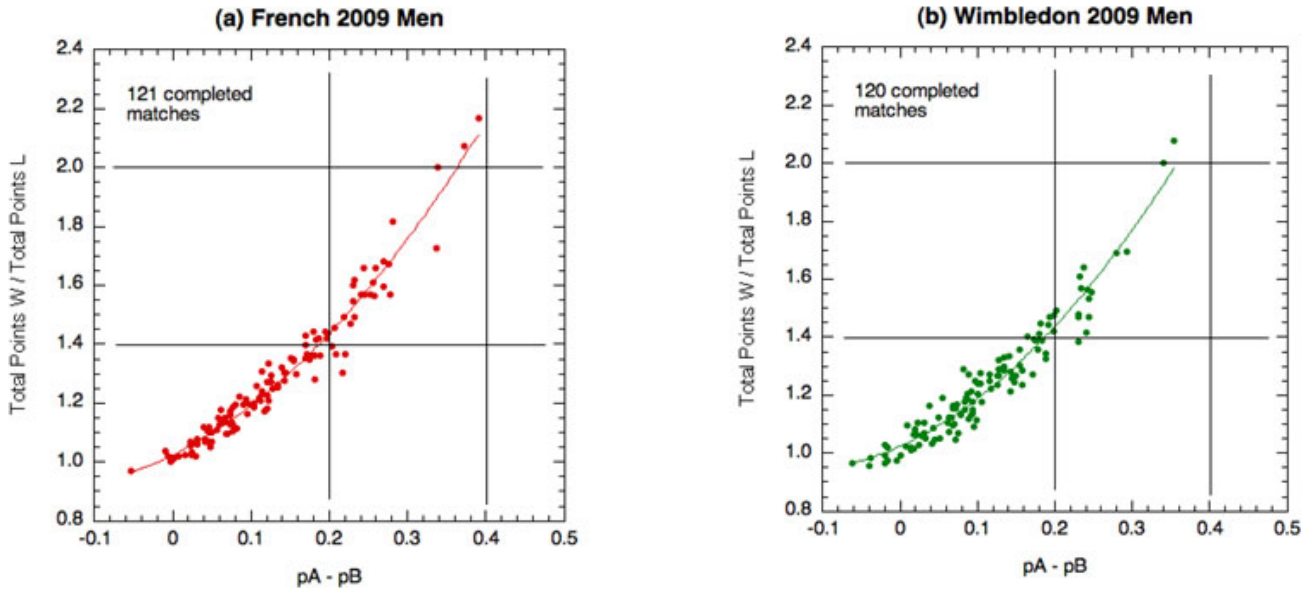

Figure 2. R vs (pA - pB) for all completed men's singles matches played at (a) the French Open and (b) Wimbledon, in 2009. The curved lines are quadratic fits to the data points, with $R = 1.025 + 1.301x + 3.799x^2$ for the French data and $R = 1.025 + 1.226x + 4.167x^2$ for the Wimbledon data, where x = pA - pB.

If the winner and loser each served the same number of times during a match, then R = 1 + (pA - pB) / 1 - (pA - pB)

In practice, winners and losers serve a different number of times, which accounts for the scatter in the data points shown in Fig. 2. Nevertheless, it is clear from the data in Fig. 2 that in a match where pA - pB = 0.2, for example, the match winner will win about 40% more points in total than the match loser, regardless of the actual values of pA and pB, and regardless of the particular court surface. Similarly, if pA - pB = 0.4 then the match winner will win more than twice as many points as the match loser. It is clearly important for a player to win more points than his opponent if he wants to win the match. The data used to construct Fig. 2 showed that only one match out of 121 was won at the French Open when R < 1, and only 8 matches out of 120 were won at Wimbledon when R < 1.

Despite the increase in serve speed, the increase in the number of aces, and the decrease in the number of double faults, serve point probabilities have not changed much over the years, as shown in Table 2. No data were collected for the 2000 Australian Open or the 2001 US Open. The main change has been an increase in pA at the French Open, associated with the increase in first serve speed, with the result that pA at the French Open is now about the same as that at the other three events. These results imply that the return of serve has improved over the years.

YEAR	AUST OPEN		FRENCH OPEN		WIMBLEDON		US OPEN	
	pA	pB	pA	pB	pA	pB	pA	pB
1999	0.685	0.580	0.641	0.554	0.717	0.581	0.680	0.561
2000			0.657	0.552	0.702	0.605	0.699	0.606
2001	0.678	0.575	0.658	0.550	0.713	0.612		
2008	0.690	0.571	0.685	0.556	0.716	0.618	0.695	0.591
2009	0.691	0.563	0.700	0.570	0.721	0.611		

Table 2. Serve point probabilities averaged over match winners and match losers in each men's singles Grand Slam event from 1999 to 2009.

BREAK POINT CONVERSIONS

Given the dominance of the men's serve in modern tennis, or the difficulty of breaking an opponent's serve, the opportunity of breaking serve is a significant event in the men's game. Analysis of break point conversion data for the 508 matches played at the four most recent events during 2008-2009 shows that if a match winner has a serve point probability pA > 0.82 then that player will not lose a single serve during the whole match, and if pA < 0.68 then the match winner will lose at least one of his service games during the match. The same pA limits (within ± 0.01) apply to all four events.

Table 3 shows the number of break point opportunities at each of the four most recent men's singles events (2008-2009), and the number of those opportunities converted to a service break. Data are shown only for completed matches. A count of the number of games won by each player (excluding tiebreak games) and the number of such games won as a result of break point conversions yields the fraction fW of service games won by match winners, and the fraction fL of service games won by match losers, averaged over all completed matches. Averaged over all four events, match winners win about 9 out of 10 of their service games, while match losers win about 7 out of 10 service games, both fractions being highest at Wimbledon and lowest at the Australian Open (in 2009). On average, match winners gain about twice as many opportunities to break serve as their opponents, and convert about 2.5 times as many games.

	AUST 2009	FRENCH 2009	WIMB 2009	US 2008
Matches	123	121	120	120
Games	4318	4235	4599	4444
BPO(W)	1600	1492	1244	1428
BPO(L)	815	789	703	805
CBP(W)	705	660	549	615
CBP(L)	269	247	216	255
fW	0.885	0.892	0.912	0.894
fL	0.636	0.654	0.729	0.700

Table 3. Data on total number of break point opportunities and conversions at each men's singles Grand Slam event in 2008 or 2009. BPO = break point opportunities, CBP = converted break points, W = match winner, L = match loser.

METHODS OF WINNING A POINT

There are five main methods of winning a point in tennis. A player can win the point himself by serving an ace or by hitting a clean winner. Alternatively, a player wins the point if his opponent serves a double fault, or makes an unforced or a forced error. The first four methods are listed as event statistics during each tournament. The number of forced errors for each player can be deduced from the total number of points won by each player during the match. The difference between a forced and an unforced error is a somewhat subjective judgement, but clear guidelines are given to those involved in recording the data. The number of clean winners struck by each player includes "service winners" which are defined as unplayable serves, in the sense that the player gets his racquet to the ball but the ball does not reach the net. An alternative description of a service winner would be a forced error, or even an ace, but that is not the way that it is recorded.

There is a wide variation between players in the methods or tactics used to win a point. One of the interesting facts that emerge from the statistics is that some players adopt safe tactics, hitting fewer winners and making fewer unforced errors than their opponents, while others adopt more risky tactics, hitting many more winners and making many more errors than their opponents. There is no guarantee that either tactic works best. Both methods have an approximately equal chance of success or failure. About 75% of matches are won by the winner hitting more clean winners than the loser. In those cases where the winner hits fewer clean winners than his opponent, the winner normally has fewer unforced errors.

The five methods of winning a point are shown in Table 4, as a percentage of all points won by match winners and losers, averaged over completed matches at each tournament. The sample size, N, at each event was limited by the fact that unforced errors and clean winners were not recorded for every match. Aces count for about 9% of points won, on average, although this figure can be around 25% for some players and less than 4% for others. About 1/3 of all points are won by a player hitting a clean winner, and about 1/3 are won by the opponent making an unforced error. Some players win more than half of their total points by hitting winners, while some can still win matches by winning less than 20% of their points as clean winners.

EVENT	AUST 2009		FRENCH 2009		WIMB 2009		US 2008	
	W	L	W	L	W	L	W	L
N	82	82	118	118	119	119	25	25
A%	8.7	6.4	7.1	5.2	11.1	8.4	9.1	8.5
W%	35.6	33.2	35.1	32.0	37.0	33.8	35.9	36.3
D%	3.3	3.2	2.7	2.4	3.7	3.6	3.6	3.0
U%	33.7	33.5	28.0	29.6	23.3	22.8	31.5	30.7
F%	18.7	23.7	27.1	30.8	24.9	31.4	19.9	21.5
Total%	100	100	100	100	100	100	100	100

Table 4. Percentage of total points won by match winners (W) and losers (L) averaged over N matches in each Grand Slam event in 2008 or 2009. A% = Aces, W% = winners, D% = double faults, U% = unforced errors, F% = forced errors.

SET SCORE DISTRIBUTIONS

The set score distribution for all completed matches at each event, over the period 1995 to 2009, is summarised in Table 5. In order to compare all 3, 4 and 5-set matches on a similar basis, only the first 3 sets of each match were included in the summary, and only completed matches were included. The total number of sets for each possible set score was calculated for two separate periods, 1995 to 2004 and 2005 to 2009. The results were then normalised to a total of 1000 sets in each of the two periods. That is, the total of each column in Table 5 is 1000. The scores are listed in the usual manner, with the match winner listed first. A 3-6 score, for example, indicates that the match winner lost at least one of the first three sets 3-6.

The most common set score at each event, in each period, is 6-4. The next most common is 6-3. The third most common score is 6-2, except at Wimbledon where 7-6 is the third most common score. Tiebreak sets or 6-6 results are commonly used to monitor the speed of the court and the speed of the game itself. In that respect, we note from the set score distributions that (a) Wimbledon provides the fastest court, while the clay courts at the French Open are the slowest, and (b) the number of 6-0 results also provides an indication of court speed, as do the number of 6-4 results. The number of 6-1 or 6-2 sets also differs on each surface, but the differences or the trends are not entirely consistent with those indicated by the number of 7-6 sets.

SET SCORE	AUST OPEN		FRENCH OPEN		WIMBLEDON		US OPEN	
	95-04	05-09	95-04	05-09	95-04	05-09	95-04	05-08
6-0	31.2	43.6	34.2	34.6	13.5	15.9	22.8	28.7
6-1	81.3	86.1	86.8	107.3	71.1	59.3	76.5	85.4
6-2	142.7	161.2	147.9	143.6	114.0	117.0	132.6	132.5
6-3	176.4	162.3	171.7	175.5	188.6	180.1	192.0	170.1
6-4	183.0	169.9	182.1	183.2	201.8	218.6	195.3	187.8
7-5	61.3	73.0	68.5	69.3	62.2	71.9	65.5	71.7
7-6	112.0	105.1	86.5	101.8	144.2	147.7	112.2	122.3
6-7	40.5	38.1	40.3	39.0	50.4	54.4	39.9	56.0
5-7	20.3	31.6	23.0	19.2	19.9	19.2	17.3	19.1
4-6	54.5	47.4	58.3	42.3	54.2	50.0	52.3	49.9
3-6	52.9	45.7	54.0	47.3	48.2	47.8	48.9	50.5
2-6	24.9	20.2	25.7	20.3	19.7	11.5	23.4	19.1
1-6	17.0	13.6	16.2	14.3	10.2	4.9	18.1	6.8
0-6	1.9	2.2	4.6	2.2	1.9	1.6	3.3	0.0

Table 5. Set score distribution at each men's singles event for the periods 1995-2004 and 2005-2009, normalised to 1000 sets at each event and in each time period.

The results in Table 5 include all 3, 4 and 5-set matches and therefore represent the combined set score distributions of the three separate outcomes. Each outcome has a separate distribution of set scores. For example, there are no 3-6 or 4-6 results in a 3-set match and there is a larger proportion of 6-3 or 6-4 results in a 3-set match than in a 4-set or a 5-set match. Further details of the 1995-2004 data are described in Pollard, Cross & Meyer (2006).

The results in Table 5 provide useful guidelines in terms of analysing the progress of any given match. For example, suppose that a player loses the first set 0-6. What chance does he then have of winning the match? In Table 5, we see that there are about two 0-6 matches (in 1000) for every thirty 6-0 matches. A player who wins the first set 6-0 is therefore about 15 times more likely to win the match than his opponent.

Suppose that a player loses the first set 6-7. Such a result indicates that the two opponents are fairly evenly matched and suggests that both players might have about the same chance of winning the match. In fact, Table 5 shows that a player who wins the first set 7-6 is about 2.5 times more likely to win the match than his opponent. Why is this? The player who wins the first set needs to win only two more sets to win the match, but the player who loses the first set needs to win three more sets. If the players are evenly matched, then it is more likely that one player will win two of the next three or four sets rather than three of them.

About 22% of match winners lose the first set. The other 78% win the first set. During the 2005-2009 period, 63.6% of match winners won the first two sets, 3.9% of match winners lost the first two sets, 14.5% of match winners won the first set then lost the second set, and 17.9% of match winners lost the first set then won the second set. A similar

result was found for the 1995-2004 period. Even though a match can be evenly balanced at the end of two sets, each player winning one set, the most likely match winner is the player who won the second set. The explanation can be found by analysing the set score distributions in Table 5 in finer detail. It was found that match winners tend to perform better as the match progresses (Pollard, Cross & Meyer, 2006). The effect is summarised in Table 6, for the 2005-2009 period, where we show the percentage of sets lost by match winners in sets 1, 2 and 3 for all completed matches. At each of the four events, match winners are much more likely to win the first set than to lose it, but if they do lose a set during the match then it is more likely that they will lose the first set rather than the second or the third set. At the Australian Open for example, 23% of match winners lost the first set, but only 17.8% of match winners lost the third set.

	AUST OPEN	FRENCH OPEN	WIMBLEDON	USOPEN
Set1	23.0%	20.1%	22.1%	22.3%
Set2	18.8%	18.1%	17.6%	19.3%
Set3	17.8%	17.2%	17.1%	18.8%

Table 6. Percentage of sets lost by match winners in sets 1, 2 and 3, for the 2005-2009 period.

CONCLUSIONS

In this study, and Cross & Pollard (2009), a considerable amount of data on the Grand Slam tournaments has been put together, summarized and interrelated. Some of the main conclusions of this paper are that;

(a) With the exception of the French Open, service probabilities have not changed much since 1999. For the French Open, the service probabilities are now much closer to those for the other tournaments.

(b) Regarding break point conversions, at present match winners average about twice as many opportunities as their opponents, and convert two and a half times as many games.

(c) At present about one-third of points are won by one player hitting a 'clean winner', and about one-third are won by the opponent making an unforced error. Aces account for about 9% of all points won.

(d) The most common set score is 6-4, and the next most common is 6-3. The third most common is 6-2, except at Wimbledon, where it is the score 7-6. Thus, the score 7-6 is commonly used to monitor the speed of the court and indeed the game itself.

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The usefulness of externally-directed instructions for teaching technique and tactics

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ABSTRACT

This article outlines research findings that demonstrate the superior benefits to motor-skill learning of using externally as opposed to internally directed instructions. This is illustrated with examples and then some implications and suggestions for coaching practice are made.

Key words: technique, instructions, feedback, attentional focus

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INTRODUCTION

Among coaches, there are a variety of different styles and methods of improving players (see Crespo & Miley, 2005 for a description of a variety of these). Styles are based on coaches' own individual experiences of playing, teaching and coach education. While there is a strong scientific consensus on many of the most effective coaching styles and techniques, sport science research can only point the way and seldom offers definitive answers on the most singularly effective methods in every aspect of training. In other words, there is no one way that defeats all others. This is of course also true due to the vast array of ages and abilities that are encountered by coaches in their everyday work- different people require tailored approaches to help them reach their potential.

There is however one area of skill acquisition research that has offered consistently positive results in its effectiveness as an instructional tool for a broad range of abilities. It has not been specifically addressed in any detail in this publication and despite having never encountered it on a coach education curriculum, it has many useful applications for a coach. The technique in question is the directing of a learner's attention to an external point of focus as opposed to an internal one. For instance, when trying to change the path of a player's swing, the coach is faced with many possible choices, one of them being to direct the player's attention to the movement of the arm (an internal point of focus), or to the movement of the racket (an external point of focus).

THE CONSTRAINED-ACTION HYPOTHESIS

Research into the direction of a player's attention during skill-learning has shown that an external point of focus is generally more beneficial than an internal point of focus (Wulf & Prinz, 2001). This result has been repeatedly found in many laboratory studies by Gabriele Wulf and her colleagues, as well as in field research in tennis (Maddox et al., 1999) and golf (Wulf et al., 1999). The theory behind this effect is the constrained-action hypothesis, which states that an internal point of focus disrupts the flow of movements that function more efficiently without the self-conscious attention promoted by an instruction to manipulate a specific part of the body.

Many coaches may already be familiar with this principle, as it is commensurate with the philosophy of Gallwey (1974) and the "inner" game of tennis. It will also ring true with anecdotal evidence of "paralysis by analysis" and experiences many will have had of how "thinking too much" can disrupt smooth execution. Incidentally, while excessive augmented (verbal) feedback has been found to degrade the learning process for motor skills, this pattern seems to hold only when the feedback is internally directed. Externally directed feedback has not been shown to negatively affect learning in larger volumes (Wulf & Shea, 2004). Much research suggests that complex movements are largely self-organised in novices as well as experts (Davids, Button & Bennett, 2008), and that these can be harmed by too much conscious attention. There is now also physiological evidence of this phenomenon from muscular electromyography (EMG) data from research that found basketball players' arm muscles to work more smoothly in executing a free-throw when their attention was directed externally as opposed to internally (Zachry et al., 2005). The externally focused players threw more accurately and with less EMG activity in their biceps and triceps, indicating more efficient movement.

Further to the apparent benefits of an external point of focus when compared to an internal one, learning also seems to be affected by the proximity to the body of the point of focus itself. In tennis, a player's movements have direct effects on the environment, most notably on the racket and the ball. It can be said that the effects on the racket are more proximal (closer) to the player's body, while the effects on the ball and its ensuing movement are more distal (further away). In a laboratory balancing task, McNevin et al. (2003) consistently found that the further away from the body their participants' point of focus, the more beneficial it was to their learning. More importantly, this finding was replicated in a study of learning a backhand drive in tennis (Maddox et al., 1999). In this experiment, players' learning was enhanced when their attention was directed to the intended effect of their movements on the ball, when compared to the effect of their movements on the racket. In the case of tennis at least, it seems that using instructions that direct learners' attention to their body are generally less beneficial than directing attention to the racket, which is in turn less beneficial than directing attention to the intended effect on the ball.

PROPOSALS

This principle has some obvious implications for coaching and instruction. When teaching a novice a basic groundstroke swing, many coaches will be familiar with directing a player's attention to the finishing position of the elbow and perhaps a turning of the wrist. In applying the theory described above, coaches are encouraged to think of where the racket (external) will finish after a desired swing instead of the elbow (internal), or how the wrist (internal) manipulates the racket-face (external). For instance, instructions that emphasise an external focus on a forehand drive might include; "Finish with the racket around your shoulder"; "Point the butt of the racket forwards at the end of the stroke" and "Finish the stroke with the racket strings facing the side-fence". Better still, depending on the intended tactical outcome, the coach can start by directing the player's attention to desired effects on the ball itself. Starting basic instructions with the words, "Make the ball…" will effectively direct a player's attention to the intended ball control and keep the learning at an optimal level. After some initial attempts, this will also inform the coach as to whether it is necessary to direct the player's attention to their racket because of a technical limitation that will not allow the player to achieve the desired ball control and subsequent tactical goal. A similar effect might be

achieved with an instruction to a player to transfer their bodyweight. Instead of directing attention to the foot on to which weight should be transferred, a coach could use the directional instruction of "toward the net" for example when encouraging a player to get her weight on to a specific foot.

There are many further possibilities for taking standard technical goals for players and turning the typical, internally directed instruction into an externally directed one. One inspired coach who wanted to help his young players with opening the outside hip in preparation for a groundstroke used eye-shaped stickers and stuck them to his players' knees. The instruction to his players to then make the "eye" look in a certain direction when positioned behind the ball helped them open the appropriate hip effectively before their shots, perhaps due to the way he took a very internally-focused technical goal and innovatively made it more external to facilitate learning. This sort of strategy is effective with young players and could be adapted easily to any part of the body. Even without the aid of stickers, an imaginary eye or arrow could easily be used to guide players' movements as a skill-focused imagery exercise for increased learning. The mental picture of something outside the body that is affected by movement could be said to act as an external point of focus and keep players from disrupting smooth movement execution.

CONCLUSION

The message of this article is not that internally directed instructions to focus on moving specific parts of the body are redundant. There is always a place for a simple instruction of this nature as an opportunity to improve technique, especially when dealing with players who want specific technical information and learn best with instructions on how to use their limbs and body. The message is to experiment with externally directed instructions as a starting point for teaching movement skills. The philosophy behind keeping an external point of focus is part of a broader "top-down" approach to coaching in sport that is reflected in games-based coaching styles, constraints-led approaches to skill acquisition (Davids et al., 2008), implicit learning (Masters, 2000) and perceptual-cognitive frameworks like decision training (Vickers et al., 1999). Underlying these approaches is a de-emphasis on the role of explicit verbal instructions as a means of teaching, especially when communication is directed toward the manipulation of specific body parts. These styles are well-supported by research evidence on their effectiveness and signpost the move away from the older school of "bottom-up" coaching where one-size-fits-all techniques were micro-managed through high volumes of verbal instructions in tactically redundant and repetitive basket-drills.

The external focus of attention effect when performing a skill is one of the most robust phenomena in skill acquisition research and it is intended that the reader gain some insight into why something coaches are likely already doing works well for their players. Also it is hoped that some new ideas are inspired so that the reader can optimise his or her learning environment by adapting instructions where possible.

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Orange to green: The step to the big court

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ABSTRACT

The following article forms the second part of a two article series, on the importance and challenges within Tennis 10s transitions. This second article focuses specifically on the move from orange to green tennis. Suggestions are given for coaches to encourage children and parents, at such a challenging transition.

Key words: Tennis 10s, transition, orange, green

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INTRODUCTION

The recent article entitled 'red to orange…….what does it really mean?' (Tennant, 2010) discussed the issues which coaches should consider when moving players from red to orange courts. The article started by stating that being a really good Tennis 10s coach is one of the toughest jobs in tennis and that the quality of the player you see on the orange court is largely down to the quality of the work done on the red court. Moving players from red to orange is one of the most important decisions you can make, and you have to get it right. This article takes us to the next level, discussing the issues and considerations when players are being moved from orange to green courts.

STOP AND THINK AGAIN

Conventional guidelines by the ITF and the increasing number of nations using the red, orange and green system dictate that players who are progressing well (assuming that they started at somewhere between 4 and 6 years old) are ready to move from the orange to the green court by the age of 10 years old. At this age, children are very different from the ones who are moving from the red to the orange court. Of course they are bigger, stronger and probably faster, and the game should be technically and tactically stronger. Other changes have taken place too: we can expect players to be more mature, more patient, more reflective, better able to make simple decisions and able to choose and implement a simple plan. These criteria combined show a player who is starting to take on many of the characteristics of a professional tennis player in miniature. In the previous article, I suggested that average physical height in relation to bounce height is a key consideration. At age 9, average height for boys and girls is approximately 133cms (WHO, 2010) with bounce height of 110-115cms. By age 10, the average height of girls averages 1cm more than for boys (139cms to 138cms) with the bounce of a green ball ranging from 118-132cms. In summary, age, court size and ball bounce height should increase in parallel between the ages of 4 and 10 years old from the red court to the green court.

COURT WIDTH

Court width increases from 6.5 to 8.23m (ITF, 2011), meaning that players have to cover an extra 86.5cms on each side. We should expect that players progressing from the orange to the green court are more dynamic and coordinated in their lateral movement, are able to cover greater distances more easily due to improved anticipation and reception, greater stride length and stronger leg drive from the split step, so the increased demands of the increase in court width should again be proportionate to age, size and experience. However, the faster green ball presents additional problems due to speed through the air and off the bounce, meaning that fast balls hit at angles away from the court present new challenges to green players. We should also expect players at green to have greater racket head speed and greater use of topspin, both of which lend themselves to more effective attacking shots when used correctly. It is therefore important that coaches progressing players from orange and green pay particular attention to lateral diagonal movements, the ability to hit from wide and sometimes under pressure from out wide, and the importance of effective recovery from wide positions.

COURT LENGTH

An increase in court length from 18m to 23.78m means that the court is 2.89m longer at each end. In many respects this is a very significant increase, since it impacts dramatically on where players play a large number of their groundstrokes. Think about it logically:

1. Players should be hitting harder and with more spin. The extra court length means that they will also on occasions hit higher to achieve greater depth from the baseline. These factors combined with the greater pressure of the green ball compared to the orange one mean that bounce height, speed and distance of the green ball increase markedly.

2. Our green players are only 10 years old, and have not typically developed the ability to take the ball early or on the rise. Higher bounces and greater depth result in baseliners being pushed back more behind the baseline than before.

3. It is therefore very common to see more rallies played from deeper positions on the green court than at orange and red, giving the impression that our players have almost regressed in their abilities. This is usually a temporary observation, typical perhaps of the first 3-6 months of the transition to the green court, and players should be helped to deal with these challenges.

4. A longer court and a deeper average hitting position behind the baseline means more court to cover when looking to approach; in addition, the distance to the net is further. Players will need to be more selective when choosing the ball to approach on, because many will either be too deep or too fast, or will need to be played from too

deep. Identification of the slower or shorter ball and opportunities to approach become key abilities.

5. Players who are commonly deep behind the baseline leave large spaces in the front of the court, so leaving themselves open to drop shots and approaches by the opponent.

6. Greater distance to cover makes it virtually impossible to get close to the net for a first volley. A phased approach consisting of an attacking groundstroke followed by a mid court (high or low) volley and a further move forwards to close down the net is quite common, especially at early green. The timing, position and quality of the approach is also important, because a longer court means a bigger target into which the opponent can neutralise with a dipping ball and more space over which to lob! Likewise a wider court gives more scope for passing shots.

7. If we now reverse the situation to consider our player facing an approaching opponent, the ability to play offensive lobs, passing shots and dipping neutralising or two-shot pass balls become key qualities, and can be trained at green level.

Typical solutions include learning to take the ball on the rise (a new skill for this age), and the acceptance that many balls (rallying and neutralising balls) will have to be played further behind the baseline because the ball characteristics still often dominate over the physical abilities of the player. At early green it is not realistic in many cases to train players to play closer to the baseline, so the solution in many cases is to teach them to defend well and to recover quickly to the baseline (just inside or just behind) depending on the quality of their response.

THE BALL

An ITF approved green ball is the same size as a yellow ball, with approximately 25% less compression. We can expect a bounce height range of 118-132cms. This increase in compression from the orange ball is hugely significant in a number of respects when considered alongside the increases in court dimension. In the previous article, it was explained that the progression from the red to the orange resulted in a wider range of contact points. This is even more so when moving to the green ball, due to greater bounce height and ball speed. Remember too that as our players develop better athleticism, faster racket head speed and a more expansive game, so we can expect the same of opponents. Smart players can use the faster and higher bouncing ball on the larger green court to their advantage by controlling time and space. Do your players have the ability to read the faster incoming ball, and do they have the ability to move and prepare quickly? Two additional challenges are:

1. The ability to vary the length of the swing, shortening or lengthening the take back on the swing according to time and situation and the depth and speed of the oncoming ball; is this something you teach your players when returning first serves and aggressive groundstrokes, or when finishing from the mid court?

2. The ability to take and control balls at a higher contact point (correct semi western grips and contact points are key here), which allows a more offensive game and lets the player play closer to the baseline and further up the court.

THE SERVE

As explained in the red to orange article in the previous issue, the rules require a lower 80cm net on an orange court to allow the player to serve offensively. Coaches who ignore this effectively force a different trajectory, since the first priority for the server is to clear the net. An 80cm net, coupled with taller players and better serving technique should allow offensive serves, probably starting with the wide serve using a chopper grip, but eventually including the flat serve down the middle. As we progress to the green court, several things change for the server:

1. The baseline is further away from the net.

2. The net is higher.

These factors combined make the offensive serve more challenging unless good fluid technique has been developed through red and orange. However, players will be taller on the green court than on the orange one, and they should have better technique (better and more efficient use of the coordination chain), so offensive serves are still possible.

DON'T FORGET THE PLAYER

It's a commonly known phrase that good learner-centered coaching is about progressing at the pace of the player. Players need to believe that they can not only cope but continue to develop (and hopefully even excel) as they progress from one court size to another. In the authors experience, it is common for a player's game to appear to stop developing, or even to appear to get worse, as they progress from the orange to the green court. This is especially common in the first 3 months at green. If you think about it, it's understandable; the playing environment has changed (again) quite significantly. This is where coaching skills are really important; make sure that you work hard with the player and the parents to explain:

1. That it is normal to find it difficult to adjust to a bigger court and a faster ball. Many young players experience it.

2. That any challenges that the players face are temporary and quite normal.

3. That performance is more important than results during this period, and that good quality practice, focus on good basic technique and time will ensure that the player will soon adapt.

CONCLUSION

With the knowledge here behind you, the most important factor remaining is that the coach be positive, encouraging and supportive. These elements combined, will foster a positive environment for players making the transition, allowing your players to come through it with success.

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The Tennis Coach's Toolkit: Identification, analysis and intervention for psychological skills issues

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ABSTRACT

Working with the mental side of a player's game is often seen as an area that is challenging, warrants caution, and is perhaps even a daunting task when compared with making technical or tactical changes. This article outlines how a coach can approach such issues with confidence and competence, using the method adopted from the 'Tennis Coach's Toolkit' mental skills development resource. Using the three pillars of effective coaching, Create Environment (CE), Effective Working Relationships (EWR) and Steepening The Learning Curve (SLC), this article outlines the process by which a coach can maximise not only their player's potential, but also their own potential.

Key words: Psychology, effective coaching, coaching tools

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INTRODUCTION

There is an ever growing trend in athletic development to seek out specialist assistance from sport science support teams in order for an athlete to achieve maximum potential. In the context of psychological development of athletes, practising sport psychologists are almost synonymous with modern day athletic development. To call on the expertise of accredited sport psychologists with relation to mental components of the game is now an accepted norm. However, we have to be careful in modern day high performance sport that the coach does not become marginalised and impotent as a result of the input from sport scientists. We would also imagine that 99% of the tennis programmes in the world do not use a sport psychologist due to either availability or cost. It is important, therefore, that we believe that a knowledgeable coach can and should develop the vast majority of psychological skills that a player needs.

Mental fitness of players should be, and is often perfected through effective day to day coaching on the court, which requires the practical application of good mental skills development strategies from the coach. The present article reflects how the methods behind the Tennis Coach's Toolkit, can increase the accessibility of coaching psychology strategies and interventions for all levels of coaches all over the world.

METHODOLOGY

In an effort to illustrate the methodology, the article will work through a very short story….

The story

A coach is teaching a group of players on two courts, in which one of the players is becoming despondent because of not winning enough points in the practice. In particular he has lost his focus and willingness to run for the ball. The player has a tendency to 'get down' and can become negative quickly and then struggles to 'get out of it'. This particular player does not believe he moves very well and is not very agile. These attitudes contrast sharply with his behavior when he is off the court or at the beginning or end of season 'get- togethers' where he is the life and soul of the group. When the coach directs his attention toward the player either through eye contact, verbally or by moving closer to him the player's attitude becomes even more distracted and uncooperative. The player's unhealthy attitude is starting to have a harmful effect on other players in the group.

Your review

The purpose of this part of the process is for you to make the first attempt to analyze, identify and then provide possible solutions to the issues in the story.

Our review

We review the story highlighting the areas we find most relevant and indicate which of our three pillars of effective coaching we think they relate to;

- Create Environment (CE)
- Effective Working Relationships (EWR)
- Steepening The Learning Curve (SLC)

ANALYSIS

The player's despondency and tendency to 'get down' (CE/EWR/SLC) appears to be linked to having an outcome based approach, with his inability to win points in the practice over shadowing his willingness to investigate the causative factors for his low points tally. A person's behavior is influenced by his emotions which is in turn a result of the nature of his thoughts. The players' inability to control his emotions can be linked to his perception of achievement and success. This 'motivational climate' can be significantly influenced by the coach in this story. If the coach can think of exercises that encourage the player to be more proficient at understanding and then executing performance and process goals the outcomes will be more satisfactory.

The player 'does not believe he moves well and is not very agile' (SLC): This harmful belief may be the result of a negative self-fulfilling prophecy by the coach. This self-fulfilling prophecy occurs when coaches' expectations become reality. A coach will sometimes develop an expectation for the player that predicts the level of performance and type of behavior that the player will show. These expectations may influence his treatment of the player. So, the coach's behavior toward our player in the group may differ to that of the others in the group according to the coach's belief concerning the player's competence.

The way in which the coach treats our player will affect the player's performance and rate of learning. Also, different communication to different players tells each player how competent the coach thinks he is. This information affects the player's self-confidence, motivation and level of aspiration, all of which are influential to the steepness of the learning curve of the player.

The player's behavior and performance then conform to the coach's expectations of him. This behavioral conformity reinforces the original expectation of the player by the coach, and the process continues. Now imagine the impact that the player's own self-fulfilling prophecy will have on his treatment of himself! The player will begin to have what is called a 'negative filter' and notice only those behaviors in himself which reinforce his own beliefs that he moves poorly.

Feedback by the coach can therefore raise or lower the level of self-expectation of the player and influence subsequent behavior. For example, after the player has not made an effort to chase down a ball, the coach might say "Tom. That's unlike you, not to chase that ball down." Or "Tom, with your improving speed and determination, that's unlike you not to chase that ball down", resulting in the player chasing down subsequent balls in similar situations.

Another way of raising the aspirational level of the player is by showing your high level of expectation by apologising to the player for not working him hard enough and so not being appropriately demanding of him e.g. "Ahh! Sorry Tom I let you down then…I'm sorry. That last feed was probably too easy… what do you think?"

Here is another example in this short story when working hard to understand and accept would be very relevant to the coach. When the coach directs his attention toward the player either through eye contact, verbally or by moving closer to him the player's attitude becomes even more distracted and uncooperative, (CE/EWR).

This probably requires the coach to look inside himself and reflect upon his role in the development of a healthy working alliance with the player, in other words how to form a more effective working relationship. The coach's presence seems to have triggered a negative change in performance/behavior of the player. There may be something about the approach of the coach that the player feels is negatively parental, punitive, demanding, or having expectations. Even though the coach may want him to get better, the 'want' could be an expectation and an expectation is a hidden demand - not just "I want", "you should". Taking a 'want' and making it a 'should' is what creates an expectational pressure.

The player's unhealthy attitude is starting to have a harmful effect on other players in the group, (CE/EWR): An important role of the coach within a group or squad situation is to nurture effective working relationships between players. Players may need help to be aware of their important role in supporting each other, as this security is a key factor in people making changes and sticking to them. For example, in the above part of the story if players had accepted that it is their responsibility to 'look after' the standards of the whole group in the session and they may have offered support for this player 'in trouble' at the very first sign of his mental struggle. If a player acknowledges their role for the group then they may choose to respond differently when not playing well because they understood that the health of the on-court environment is about us not me.

COACHING TOOLS

The coaching tools of the Toolkit are split into three categories.

A. On court activities, drills and games

B. Off -court activities and tasks

C. Super coaching

On court activities, drills and games

WAR AND LAR

WAR (Winner Assesses the Rally) and LAR (Loser Assesses the Rally) drills help encourage the player to review their performance and not just the outcome (win or lose) of the point. After a rally, starting with or without serving, either the winner or the loser awards points to the actual player who won the rally on the following scale:

+ 3 points = very good tennis

+ 2 points = good tennis

+ 1 point = ok tennis

0 points = average or below average tennis

EFFORT-PERFORMANCE-EFFORT TALK

Before each point the player gives three separate scores out of ten, one for how hard they tried on the last point, another for their performance and finally another score out of ten for the effort they are just about to give in the point about to be played.

TENNIS TOUGH

The player and coach agree on a specified number of times that the player will be 'tennis tough' during point play. The player has to show good emotional control during the period he has chosen to be 'tennis tough'. This pre-decided period may be for a certain length of time or number of points or games. When this time has elapsed the player may resume as normal.

Off -court activities and tasks

Learning opportunity is not confined to the tennis court and lessons only. These 'off-court' and often 'off-lesson' tasks provide coaches with additional and alternative ways to help players learn outside of the tennis court and help the player to grow and develop self-responsibility as well as enabling the coach to explore player motivation.

• 'I PLAY MY BEST TENNIS WHEN…'

The player is asked to write a short story (no more than one side of A4) about one of the following titles: 'I play my best tennis when…'

'How I would help a young player who sometimes gets down on himself in practice and matches'

Super coaching

The last category we have included in coaching tools is 'Super Coaching'.

Super Coaching is occurring when the players' "light bulbs" are flashing on repeatedly or helping to get that 'penny to drop' in record short time.

USING ANALOGIES

Analogies, because they are descriptions and examples of events and experiences similar but not identical to the ones directly being addressed by the pupil and coach, ask the pupil to make a leap of imagination and reasoning, the equivalent of mental gymnastic training. The effort involved in arriving at the conclusions helps retention of the lesson; before we directly tackle the story let's have a look at a relatively simple analogy and which would be an example of

'Super Coaching'.

Coach: "You play football don't you?"

Pupil: "Yes"

Coach: "If I tell you that if you become very good at swerving a free kick up and around the defensive wall you will develop a really great serve. Why could that be true?"

Pupil: "Because they both involve making the ball spin when you want."

Coach: "How?"

Pupil: "You need to strike the ball at one side so it spins and then curls around"

Coach: "I said you will have a huge serve one day!"

Within Super Coaching there is an understanding that the key lies not in providing players with just information, but in turning information into knowledge that cannot be ignored. Analogies can do this by passing information onto the player through an 'ah-ha' moment. For example the following analogies may be useful in our story and we ask you to think about the coach and player having these conversational themes:

• The importance of emotional control: Imagine an astronaut making a mistake on his spaceship and then 'hanging his head' while the others are trying to rescue the situation.

• Imagine what it would be like to be in one of the '8's' of the Oxford and Cambridge boat race and rowing out of synch with the rest of the team and causing chaos as the oars clatter into each other.

TRANSFERENCE OF SKILL – Challenging unused strengths

A creative search through the life experiences of the young player may well reveal an area they are successful in, which is closely related to what the coach wants to work on.

A conscientious school student will be familiar with the discipline required to switch off the television and begin revising, or a keen middle distance runner will understand how to cope with his own negative thinking when the race pace starts to hurt. Super coaches tap into these unused strengths, transferring confidence from another part of the player's life, so by-passing a potential 'road block'. This young player's attitude off court of being the 'life and soul of the group' can be used to help his on-court performance. I wonder how long it would take you to lead the player into becoming the 'life and soul of the tennis group'? And the others to be saying "we can't start Coach, without him being here!"…..a Super Coach!

CONCLUSION

The present article has offered just one example of a typical on-court issue that many coaches are likely to have faced throughout their careers. Through the presentation of a short story, the article then works through the problem in two stages. Firstly, it has analysed the issue using the three pillars of effective coaching. Secondly, it then presents on and off-court tools that a coach can use, to ensure they are securely on the pathway to super coaching. The regular adoption of this problem based, hands on approach to the mental side of player development, will ensure success of both player and coach on a regular basis.

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'Choking' revisited: A refreshing perspective on pressure

Janet Young (Victoria University, Australia)

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ABSTRACT

This article discusses literature surrounding the phenomenon known as "choking". The article highlights the importance of a players cognitive assessment of a pressure situation, and also the dangers of forward thinking within a match. A look at the conception of pressure as defined by Billie Jean King, then begins to shed light on a new appraisal of pressure, and practical guidelines are offered.

Key words: Pressure, choking, cognitive appraisal

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INTRODUCTION

"When it comes to choking, the bottom line is that everyone does it … 'choking' is a big part of every sport and a part of being a champion is being able to cope with it better than anyone else" (John McEnroe).

"We all choke … no matter who you are, we just feel pressure in the heat of the moment" (Pete Sampras).

"If I won that second set I was going to win the match. But the adrenaline was high and I felt the nerves. I got tight. I was choking, totally gagging … my second serve was usually one of my best and most reliable shot. When I choked my serve and forehand would go" (Pat Rafter).

Perception is all important. If a player believes he/she is a 'choker', then carrying this unflattering label can be a burden. Tennis is not the fun it could be, knowing that at critical times your game is likely to crumble under pressure. However, as the quotes above suggest, even champions are prone to 'choking'. This provides some comfort but is there more that can be done to address pressure situations to avoid 'choking'? In her recently published book, Billie Jean King (2008) suggests that adopting a fresh perspective on pressure itself may assist. Before reviewing this, let's first consider what is meant by 'choking' and why it occurs.

What is 'Choking'?

'Choking' is defined as "performance decrements under pressure circumstances" (Baumeister, 1984, p.610). It is a widely used term to denote those times when a player fails to play as they want, or is capable of doing, at key times in a match. Winning is often there for the taking only to disappear or evaporate through a player's own failings to perform as expected or able.

Nideffer (1992) provides an explanation of 'choking' in his exposé on concentration. In brief, Nideffer proposes that 'choking' occurs when a player becomes immersed in internal thoughts and feelings at critical times rather than being focused on relevant task cues. This lack of appropriate focus leads to a deterioration in performance as illustrated in Figure 1.

Nideffer's (1992) conceptualisation of 'choking' highlights the importance of a player's cognitive assessment of a situation. Does a player feel confident or does he feel pressured? The answer to this question is important because when confident, a player is more likely to appropriately focus on the task at hand, plan appropriate strategy and effectively execute it. When feeling pressured, a player's thoughts turn inward to irrelevant cues and anxiety increases. Under these circumstances a player is prone to 'choke'.

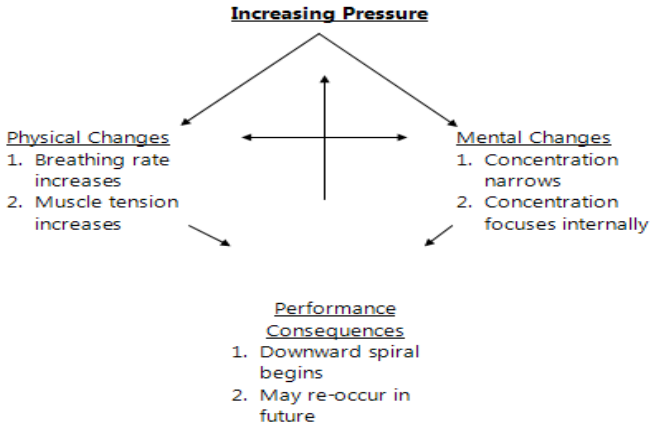

Figure 1. The Process of Choking (Nideffer, 1992. p10).

Gallway (1997) offers a similar explanation of 'choking' as provided by Nideffer (1992). According to Gallway, a player starts to feel pressured when they 'get ahead' of themselves, projecting what might happen in the future. For example, "What if I win this point, then I will lead by a set and service break and I only have to serve out the match. Or, "What if I lose this game then we have to go into a third set". This 'what if' theorising by a player can occur at any time in a match, and in instances when a player places particular importance on winning (or losing) a specific point, game or set, then 'choking' can occur.

BILLIE JEAN KING'S REFLECTIONS ON PRESSURE

Both Nideffer's (1992) and Gallway's (1997) explanations of 'choking' suggest that pressure is a debilitating factor in the 'choking' process. But what if pressure was deemed positive, would this make a difference? What if pressure was thought of as an opportunity to display one's skills and ability? What if pressure was considered a natural consequence of wanting to perform well at something that was important and meaningful to you? Would you be likely to 'choke' if you actually embraced pressure and considered pressure a privilege to experience? Well, these are certainly interesting themes and ones that Billie Jean King (2008) espouses in her book, Pressure is a Privilege.

According to King, the moments of great pressure in life ... are borne out of the importance of the situation. It is a privilege to have such opportunities and so the pressures that come with them must be seen as a privilege also. If you can see it that way, you can handle almost anything with calm and grace (p.113).

King's (2008) take on pressure was developed over many years. She recalls as a shy, young aspiring player being petrified of public speaking only to come to the realisation that to say a public 'thank you' after winning a tournament was the eventual outcome she wanted from her hard work. Indeed, the pressure of public speaking came with the privilege attached to winning! Recalling her feelings at the time of playing Bobby Riggs in the Battle of the Sexes in 1973, King (2008) described the pressure that threatened to overwhelm her. Adopting a similar attitude to the one she chose to deal with her earlier public speaking fear, King chose to embrace the pressure as "something I got to do instead of something I had to do" (p.107).

While promoting pressure as a privilege, King (2008) acknowledges that everyone handles pressure differently and it is important to "stay focused and keep from imploding" (p.109). She provides the following suggestions when individuals are faced with a stressful situation:

1. Choose to be positive and appreciate the opportunity and accompanying pressure. Remember nothing in life is easily achieved and often requires a struggle, setbacks and focused intense preparation

2. Face the pressure head-on. Ignoring pressure will not make it go away and things are rarely as bad as they first appear

3. Ask for help from a respected friend, mentor or coach if necessary. Building a team around you can help to achieve one's goals and deal with pressure more easily than doing it alone

4. Focus on the privilege that accompanies pressure rather than the pressure per se. This focus encourages you to appreciate how lucky you are to be in a particular situation (e.g., playing a finals competition) because not everyone gets the chance

5. Develop and use a routine or ritual (e.g., a player bounces the ball twice before serving). This helps you to stay 'in the moment' and focused

6. Attend to one's breathing taking long, slow breaths, breathing in for four counts (pushing one's stomach out) and breathing out for four counts (pulling one's stomach in). This helps to calm and relax you and possibly make you feel more secure

"CHOKING" REVISITED

So, are King's (2008) insights on pressure compatible with Nideffer's (1992) and Gallway's (1997) explanations of 'choking'? Yes they are because all authors identify the significance of a player's mental construct or interpretation of pressure. King further extends the discussion in proposing that individuals can make a choice to view pressure in a positive way. Pressure does not necessarily need to be a negative and debilitating factor but rather can be motivating, inspirational and something to be appreciated and expected.

When pressure is viewed in this light, then 'choking' is less likely to occur. No longer is a player distracted by pressure, but rather a player can put all of his/her attention on, and effort into, how to play the point at hand.

What strategy must be adopted to win the next point? How do I play this point? A player is 'in the moment', where a clear and calm mind allows he/she to focus on the point at hand and develop appropriate strategies. To this end, King provides a number of suggestions, as detailed above, for players, and others, to follow in stressful situations.

In concluding this section, it should be noted that King's (2008) advocacy of choice and pressure as a positive factor are not at odds with respected theoretical notions. Rather, these themes are compatible with theoretical underpinnings in Positive psychology (Seligman and Csikszentmihalyi, 2000) and Reversal theory (Kerr, 1993) for example.

CONCLUSION

If a player adopts a 'pressure is a privilege' approach, then pressure is no longer the fear that paralyses one's play. Rather, King (2008) argues pressure is a catalyst that motivates and provides an opportunity to display one's skills and abilities. It is a chance to show yourself, and others, what you are capable of, to make a difference and to learn what needs to be done to improve your game.

It could be argued that the ultimate challenge of playing the game is to be truly tested and to respond with your absolute best efforts and abilities (Gallway, 1997). Yes, it would be nice to win, but more importantly, knowing that under pressure you were able to execute and perform using all your skills, courage and concentration makes you a victor regardless of the score-line! As King (2008) suggests, the key is to embrace, thrive on, and even seek pressure. In doing so, tennis can be so rewarding and such good fun. It can be a game you play where 'choking' has little relevance because 'pressure is a privilege'.

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Tactical periodisation in tennis: An introduction

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ABSTRACT

The present article critically reviews the applications to tennis of both the traditional and the contemporary models of periodisation and introduces the concept of tactical periodisation taken from football. The definition and key elements of this new periodisation model are highlighted and adapted to tennis. The possibility of applying tactical periodisation to tennis is suggested.

Key words: Periodisation, tactics, planning

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INTRODUCTION

The importance and goals of periodisation in tennis have already been discussed in previous articles (for a review see Roetert, et al., 2005). The main factors that make it complicated to apply to tennis include: the lack of an official off season, the knock-out competition system, the roll on ranking system, and the unique nature of the game, constitute a serious challenge (Roetert & McEnroe, 2005).

Traditional models of periodisation (**simple** with 1-2 peaks by Matveiev, 1956; **alternating volumes** by Fidelius, 1971; **pendular structure** by Arosiev and Kalinin, 1971; **concentrated blocks** by Verkhoshanski, 1987) have tried to achieve the increase of performance based in adaptative processes around conditioning factors (power, speed, endurance) generally using track and field principles. These models are a consequence of the Western thinking paradigms based on rationalism and mechanicism. They are based on the study and analysis of isolated facets of the game as well as of the player. They are also centred on a biological approach to athlete development.

Contemporary models (**Integrated methods** [training of all elements of the game (conditional, co-ordinative and cognitive) with an emphasis on technique and tactics] by Bondarchuck, 1988; **ATR** [Accummulation – load, transformation – realisation] by Issurin and Kaverin, 1985; **Structured or Micro-structured methods** [weekly periodisation, concentrated blocks, prolonged state of form] by Tschiene, 1985; Seirul.lo, 1987; Bompa, 1999) have presented sound alternatives to periodisation in game sports including tennis.

In fact, due to the influence of these mechanicist theories applied to motor learning, some tennis coaches have used and abused analytical and partial teaching and training methods. Technique has been mostly trained using basket feeding; conditioning has been generally developed using training systems taken from track and field; mentality has been usually covered by pre-and-post match coach talks; and tactics were mostly improved through practice matches or, just not purposely trained.

In recent years, systemic theories applied to tennis training (for a general overview see Crespo, 2010) have created a radical change in the periodisation models. Multi-dimensionality across physical conditioning, technique, psychology and tactics, and the interactivity between these areas of the game are the key concepts. There has been an evolution from fragmentation of types of session e.g. a technical session in isolation, to a synergy and transversality to consider both the whole and the parts of the game (Landinger, 2009).

Tactical periodisation will imply an evolution from the integrated methods by emphasising the tactical element of the game as it will be described below.

TACTICAL PERIODISATION

Definition

Taken from the work of professor Vitor Frade from Porto University (Gomes, 2008) and successfully applied by football manager Jose Mourinho (Porto, Chelsea, Internazionale, Real Madrid), the main principle of tactical periodisation states that all types of practices, teaching methodologies, and training systems should be dependant on the game style-organisation-structure or "game model" that the coach wants the player to adopt. Game style or "game model" can be described as the way or type of game you as a coach want the player to play. Tactics would be at the core of periodisation. It is considered as a "supra-dimension" of the game. Tennis is tactical because any stroke, movement or behaviour is the consequence of a decision taken in a given game situation.

It is crucial that the player has a certain game style. This game style has to be grounded on several solid principles and sub-principles that the player has to understand well and needs to interpret appropriately, no matter who he will play against. This is also labelled as "game organisation". Each player should have a game style that is well known and effectively applied (Mourinho cited by Oliveira et al., 2006). The coach has to use his own personal convictions and ideas about the game, his players' characteristics (strengths and weaknesses) qualities and preferences, and a complete analysis of the game features now and in the future. Examples of "game feature" include the development of modern tennis as a more physically demanding sport, as well as the emergence of the hard court as the most predominantly used surface for competition, among others. The aforementioned factors combined are essential in order to develop a flexible but solid game style for the player. This game style should not be immutable, but should be adapted daily to the evolution and progression of the player. The design of the periodisation process should be structured around the needs of the player.

Is the end goal of tactical periodisation to develop an automatic – robot – like type of player? The answer is no. In fact, it is the contrary. The crucial statement of tactical periodisation is to create a "non-mechanic mechanism" based on solid tactical concepts, in order to aquire an

efficient game style by "knowing-how" and by "knowing about know how".

Tactical periodisation is a clear example of an integral, inter-connected or inter-related approach, in which all goals are centered around the tactical component of the game. It considers that the strategical-tactical organisation or structure of the game is more important than the physical condition of the player.

Key elements

The key elements of the tactical periodisation can be summarised as follows:

1. The game (tactics) as the origin of periodisation and a fundamental part of the practice. The tactics of the game define the way the coach should plan the training in all aspects: technical, tactical, physical and mental. The training sessions should be planned based on the tactical goals obtained from the analysis of the game style of the player. The game (the tactics) is the basis of the practice. Tactics should always be practised in all the drills. The "problems" to be solved during the training session should always be tactical. It is the logic of...training the game of tennis...starting from the game of tennis!

2. Interaction of all game factors. Due to the influence of systemic theories, all factors that affect the game are trained simultaneously. These factors should not and cannot be isolated since all should interact in order to achieve the maximum performance during the match. This is labelled as the "Principle of unyielding integrity of the game". All factors are associated to each other and amongst themselves. There is no integration because all factors are already united. This is a "fractal" statement taken from chaos theory: In each one of the training tasks all components should be present in order to be related to the game.

3. High specificity. Technique, power, speed or endurance should not be trained in isolation or out of the context of the game. All the factors affecting game performance are developed using adapted games or situations by altering the rules, the space, the time, and the equipment to resemble the game. Analytic/isolated drills are discouraged. The contents that are practised every day should have an impact in the matches.

4. Importance of concentration. Football practices using this method are no longer than 90 minutes, which is the actual duration of a football match. Longer practices produce a loss of quality due to a reduction in concentration. Players need to fully identify themselves with a game style; they need to cognitively manage their effort. Concentration (on meaningful cues and throughout the match) should be practiced with drills that make players think and be focused. Drills of increasing complexity will challenge the players to adequately concentrate. Intensity is measured by concentration effort.

5. Intensity, dynamism and creativity. Practices should be highly intensive. The real-training-time is very high, almost with no "dead" times. Practice = 100% intensity <-> 90 minutes <-> 100% concentration. The game style of the player should allow variations and adaptations that the player needs to create and apply. The concept of intensity also changes. Instead of being a physical parameter, it becomes a cognitive one. It is related to the specificity of the game of the player. The training is constantly evolving because the tactics are variable and can always improve.

6. New concept of training volume, load and recovery. The volume is considered as a group of exercises performed at maximal intensity. The physical load should also be considered as a stressing load. This is where we can also include the concept of "emotional exhaustion". There are no special peaks of volume in the training. The training load is very similar throughout the season. Professional players play the whole year round and the periodisation has to manage the balance between volume and intensity with slight oscillations between them. Recovery times are not only a need of the physical effort but of the mental one also. They should be varied and adapted to the specific training volume.

7. Physical training and the use of the gym. The physical component is generally over emphasised in the periodisation of games. In the past, the physical condition of the player was the pillar of the performance. Nowadays, it is not an issue of the player being physically well trained or not, they are all in very good shape. The key aspect is if the physical condition of the player is well adapted or not to his game style. The player has to be physically ready to cope with the type of physical effort that implies his game style. The speed, power or endurance should not be high but optimal. They need to be "functional" – adapted to the needs of the player and the game. In football, the gym and the machines are mostly used by the medical department in the rehabilitation of the players.

8. Adaptation, umpredictability and competition rhythm. The coach and the player should be aware that the game style of the player needs to be flexible and the periodisation of the game should adapt to the umpredictable events of competitive tennis play. The competition rhythm is a global issue in which all factors interlink. The game is always under construction!

9. No peaks but consistent level throughout the season. The key of periodisation is not to peak at different periods of the season, instead, the goal is to keep the player at his best competitive level throughout the season. There are no "special weeks". There should be a window of acceptable performance in order to avoid excessive up and downs. Again, it is not just a physical peak but a consistent individual performance level. Things do not happen on the court just by chance!

CONCLUSION

Does tactical periodisation sound familiar to tennis coaches aware of the game-based approach to teaching methodology? It Certainly does. Most of the principles included above related to tactical periodisation have clear parallels with the ones of the GFU (games for understanding) (Crespo & Cooke, 1999).

Tactical periodisation is not a magic formula that will allow the player to win all matches, but a model that will help the coach better assist the player in the training and competition process using the game of tennis as the starting process (Tamarit, 2007).

Most tennis coaches simply do not use periodisation or follow their experience and instinct when training with top professional tennis players. These could be called models with no data on training control or load organisation. In order to periodise training and competition with the appropriate goals (the game style of the player), coaches should be aware of the characteristics of the game (level of play, calendar, resources, etc.) and the results of a SWOT analysis of their player (player profile, history, etc.). Tactical periodisation could be a possible alternative to help coaches develop sessions that are more specific and close to the player and game needs.

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Tennis and society: the past and present of tennis practice in socially oriented clubs

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ABSTRACT

This article explores tennis practice from a Spanish perspective in clubs whose main objective is to provide a number of services to their members, above and beyond just tennis. The word 'elitist' is analysed in relation to tennis in general with the article focusing on the characteristics of certain clubs in particular, namely socially orientated 'elitist clubs'. In addition the role of the manager in these types of clubs is explored, with finally some strategies to promote tennis participation in light of the evident challenges.

Key words: Clubs, sociology, elitism, management, participation

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INTRODUCTION

"Tennis is an elitist sport"

The expression that tennis is an elitist sport has an external origin. It was coined from outside the tennis club arena, to describe the game of tennis viewed by those external to the club environment. Nowadays, this scenario has changed. Tennis is not solely restricted to being played in socially elite and/or costly urban clubs anymore. There are other facilities and centres available to a wider spectrum of society, typically the clubs located on the outskirts of cities or in small towns, where tennis is more accessible and thus played on a regular basis. In some of these municipal type clubs, it is possible to be a member by means of a reasonably priced 'seasonal fee' or "membership fee". These centres that are strictly speaking not 'clubs' in the traditional sense- but are referred to as such because of their facilities and courts- are typically local multi-sport or university sport centres, or private institutions that cater for the casual player. Consequently, through the development of these more accessible clubs and public sports facilities, tennis can no longer be considered an elitist sport, since people from all stratas of society have access to facilities and thus can participate in the game.

Reconsideration of tennis elitism - "some clubs are elite clubs"

Having refuted the statement that tennis is an 'elitist sport', there does however remain an aspect of elitist structure: namely clubs of early establishment, and ones that hold a long history, often dating back a hundred years or more. Thus, we have progressed from the statement that "tennis is an elite sport" to "some clubs are elite". The clubs that continue to uphold the latter statement, are usually the traditional clubs of the big provincial capitals; The Trading Club, the Agricultural Circle, the Tennis Club, the Race Track, the Sailing or Golf club- all have traditionally represented a sports meeting place for the most affluent. These clubs still boast characteristics of elitism, that they have never been able to get rid of, and perhaps not wanted to. These clubs offer for the most part elegant sports not requiring great fitness at a social level and lacking in physical contact with the opponent, representative of the typical physical activity for high social classes. Belonging to these established clubs has certain exclusive connotations which are deeply rooted in the society we live in. An example of this exclusivity is that not only is joining these clubs very costly, it also requires a "recommendation letter", an old trait of the formal "introduction into society" of the newcomer.

Apart from actual sport practice in clubs, there is also a very active social life, considered a core aspect. Getting together for lunch or dinner as well as for tea or coffee has always been part of the clubs´ activities with or without table games as an additional entertainment. Another concern has been to complement these activities with appropriate facilities for the kids to enjoy to the full: an area with amusements, a playroom and a TV set as well as gardens to add to its attraction and fun.

This multi-faceted club lifestyle leads to different social profiles within a club. A monochrome social mass with multicolour interests that little by little starts adhering to one area or another. The administration of the club starts becoming aware of the differences: 'tennis members', that is to say, members who only play tennis, 'restaurant members', 'season members' who only show up when the pool is open, 'kangaroo members', always with their children in the playing areas. These different members make up a huge social mass, which becomes even bigger due to normal demographic growth. Another consequence of this array of social profiles lies in the fact that 'tennis dominance' is only expressed in the name of the institution. 'Tennis' is just one more and not necessarily the most important activity of a club. That is why coaches and teaching professionals are not at the top of the chart in the club. These clubs only have a manager who is also in charge of public relations and to whom the sport staff reports. This manager is responsible for the economic and administration related aspects rather than the sport related ones. In cases where there is a Sport Director, he usually reports to the manager who is usually in charge of the implementation of the "global policy of the club".

The Sports Director in an 'elite club'

With such a huge variety of interests not related to tennis, often a top rated professional coach is lacking in clubs with a high social agenda. In some clubs, they don't even have a pro- so the manager, an excellent economic administrator, delegates certain sport competencies. These

are given to teaching pros with high levels of experience, but perhaps relatively low levels of continuous coach education and relatively low knowledge surrounding modern teaching methodologies. It must be highlighted that a sport director might not always be present in all clubs, however because of the wide diversity of the social mass of the club members, when a sports director is present, he/she will rarely give tennis a special precedence at the club.

The wide variety of agendas within one club can bring about problems when different sports or different activities overlap. Think how the organization of an Open tournament would impact on the social and kids' life, crowding the facilities with strangers to the institution, sometimes with the members looking down on the visitors because they are interfering with their routines. It is the task of the manager to cope with these different interests, and provide a balance that favours both parties.

CONLUSION

How to encourage tennis practice in 'elite clubs'?

The first question to be asked is if tennis practice is to be encouraged, that is to say if the idea is to lay emphasis on the athletic aspect of the tennis club rather than on its social aspect. This athletic aspect includes teaching, coaching, and tennis related activities as well as competitions, which in 'elite clubs' are practically neglected by members since their fees are mostly used to cover the social budget. The range of services offered by the club determines the monthly fees to be paid, regardless of the number of services each member uses. In those clubs that offer little more than tennis, only tennis players pay the fees, thus the tennis school becomes the cornerstone for the budget to such an extent, that the doors are open to non- member students as well. So, in general, this sport life does not compete with other activities that require different facilities.

But there are problems that occur when certain aspects of this coaching programme overlap with people sharing the same facilities. This is a tough conflict which can only be solved with a "club policy", usually designed by the Board of Directors and deployed by the manager. Often, the long hours of the tennis schools interfere with the life of those members who expect to have free tennis courts to play on. In other words, the kids get the benefits, whilst the adults who pay the fees do not.

This is not so much so when the adults who have no free courts to play are the parents of those children attending the tennis school. But this is not always the case. Unfortunately, restricted access to courts as a result of the coaching programme is often a reality in many of these 'elite' clubs. The good will of the managers cannot interfere with certain aspects that nobody dares to change. However, tennis always prevails. Our society has been able to provide a solution to this endless spiral. For different reasons, the training deficit in elite clubs has been compensated with entities and centres that bridge this gap. Not only are there many programmes for beginners developed by the town hall or small clubs that are always more open than those hermetic traditional clubs, there are also small academies that cater for elite tennis offering an alternative quality programme. This has contributed to the development of our sport in all areas, placing it in a privileged position in the world.

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Hydration, dehydration, and performance: A literature review

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ABSTRACT

Hydration at any level of competitive sport is crucial to optimal performance and recovery. The present article outlines how dehydration can affect bodily functioning and presents research outlining preferable hydration strategies and techniques. Practical applications include how to measure dehydration levels, and what appropriate fluids are available for consumption to optimise performance and recovery.

Key words: Hydration, recovery, sodium, cramp, sports drinks

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INTRODUCTION

At any competitive level, it is commonly understood that proper rehydration- the restoration of carbohydrate stores, along with fluid and electrolyte levels- after practice or competition is vital to performance, health and safety. However, specific guidelines or recommendations have not yet been well established in the literature for tennis. This is partly due to the fact that tournament tennis play is often varied in terms of matches per day, tournament length, and actual length of a match (ranging from 30 minutes, to over 11 hours).

SWEATING AND DEHYDRATION

Evaporative cooling (sweating) is the most effective method that humans use to limit the rise in core temperature(Kovacs, 2006). Sweating is maintained by intracellular water shifting to the extracellular space, which results in cell dehydration. The goal of adequate hydration is to limit fluid loss from sweat and respiration.

Effects of dehydration on cognitive and mental functioning

Researchers have studied the influence of limiting fluid volumes and human body function. Evidence is emerging that hyperthermia (increases in body temperature induced by dehydration) directly affects brain function by altering cerebral blood flow and metabolism, thereby decreasing the level of central cognitive or neuromuscular drive, which may in turn decrease muscle function, alter the perception of effort, or both (Cheung & Sleivert, 2004).

Dehydration has also been shown to manifest with clinical symptomatology similar to concussion, including fatigue, drowsiness, headaches, poor concentration and balance problems (Patel et al., 2007).

It is clear that more needs to be done to reduce the aforementioned effects, as research has shown that there is a high prevalence of junior players walking onto court already dehydrated (Bergeron, Waller & Marinik, 2006).

Effect of dehydration on muscle groups and muscle action

No specific muscle group or action appears more susceptible to hypohydration than others (Judelson et al., 2007), however muscular performance is reduced when athletes are dehydrated. This study found that high intensity muscular endurance, as measured during 30-120 seconds of repeated activity, is reduced by 10% when the athlete is dehydrated by 3-4%. Upper and lower body power which is crucial in tennis has also been shown to effected (Jones et al., 2008).

REHYDRATION

When discussing tennis recovery, specifically post-training or post-competition, one of the most important areas to consider is rehydration. As mentioned previously, many tennis players go into practice and/or competition already in varying states of dehydration. This increases the rehydration needs of the athletes relative to a euhydrated (normal) state before practice or competition.

Water vs Carbohydrate solutions

Shireffs et al. (2007) along with previous studies has shown that the ingestion of a carbohydrate-electrolyte beverage resulted in more effective rehydration than plain water (Gonzalez- Alonso, Heaps & Coyle, 1992); others have also observed a lower urine output with carbohydrate-electrolyte solution than with water- which will aid positive hydration status (Costell & Sparks, 1973).

Name	Carbohydrate Content	Carbohydrate (grams)	Protein (grams)	Calories	Sodium (mg)	Potassium (mg)	Caffiene (mg)	High Fructose Corn Syrup
Accelerade® RTD	6%	15	4	80	120	15	No	No
Amino Vital®	3%	8	<1	35	10	35	No	No
Bottled Water	0%	0	0	0	0	0	No	No
Cytomax®	5%	13	0	50	55	30	No	No
Gatorade®	6%	14	0	50	110	30	No	Yes
Gatorade® Endurance	6%	14	0	50	200	90	No	Yes
Gatorade G2®	3%	7	0	25	110	30	No	Yes
Life Water®	5%	13	0	50	120	20	No	No
Powerade®	7%	17	0	64	53	32	No	Yes
Propel® Fitness Water	1%	3	0	10	35	0	No	No
Soda, Cola	25%	25	0	100	30	?	Yes	Yes
Vitamin Water®	5%	13	0	50	0	70	0-75	Yes

Table 1. Comparison of popular sports drinks and beverages. Information adapted from Von Duvillard et al. (2008).

Sodium's role in hydration and rehydration for tennis

Research has shown that rehydration capabilities are improved for athletes who ingest sodium enriched fluids compared to plain water, and that many sports drinks do not contain enough sodium, albeit more than water. Shirreffs and Maughan (1998) have shown that athletes typically recover faster to adequate sodium and plasma volume levels with a 6% carbohydrate- electrolyte drink in comparison with water.

The right amount of sodium?

Excessive drinking of water alone, will not allow for adequate hydration after exercise. Shirreffs et al. (1996) demonstrated that even when a volume equal to twice the amount lost in sweat is ingested after exercise, subjects could not remain in positive fluid balance when a low sodium drink (23 mmol/L) was consumed. A positive fluid balance was eventually maintained when drinks containing 61 mmol/L of sodium were consumed in amounts > 1.5 times the loss of water.

However, if excessive sodium is added to the fluid it can make the liquid unpalatable, thereby reducing the total volume consumed (Wemple, Morocco & Mack, 1997). Therefore, the balance between palatability which effects consumption level, and actual sodium content must be achieved. A 6% carbohydrate-electrolyte drink will achieve a preferable balance. It is possible to make your own 6% drink by mixing five tablespoons of table sugar, and one-third teaspoon of salt per litre of water.

OTHER ELECTROLYTES – ARE THERE BENEFITS?

Potassium

Potassium is the major ion in the intracellular fluid, whereas sodium is the major ion in the extracellular fluid. Potassium is thought to be important in achieving rehydration by aiding the retention of water in the intracellular space. However, more research data is needed before conclusive evidence is able to show the benefits of potassium supplementation for rehydration.

The banana effect

It has previously been speculated that potassium may be a beneficial electrolyte for athletes in general since it is a major cation (positively charged ion or group of ions) in the intracellular space, and potassium supplementation could enhance the replacement of intracellular water after exercise and thus promote rehydration (Nadal, Mack & Nose, 1990). Experimental investigation has demonstrated that inclusion of potassium (25 mmol•l-1) may, in some situations, be as effective as sodium (60 mmol•l-1) in retaining water ingested after exercise-induced dehydration however it appears that there is no additive effect of including both ions (potassium and sodium).

CRAMPING

Muscle cramping during and after tennis play is an unwarranted aspect of high-level competitive tennis. Cramps typically occur with slight muscle fasciculations (Bergeron, 2007) or "twitches" that the athlete only notices between points or at the changeover. With respect to exercise-related muscle cramping, there are typically two forms of cramping that tennis players are most often confronted with:

1) Overworked muscle fibers

2) Muscle cramps related to extensive sweat losses and a sodium deficit, known as exertional heat cramps.

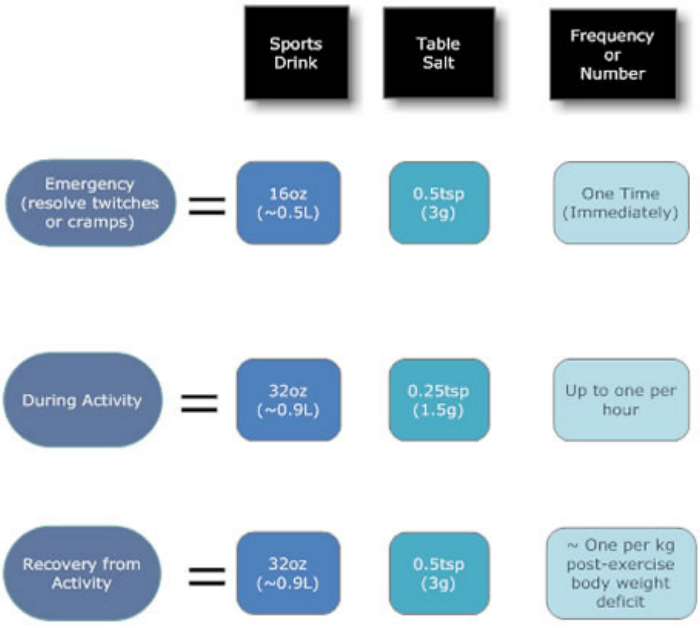

Figure 1. Suggested Fluid Mixtures for Exertional Heat Cramp-Prone Athletes Using Sports Drink and Table Salt (NaCl) (adapted from Bergeron, 2007).

PRACTICAL APPLICATIONS & TOOLS

Due to the fact that individual sweat rates are highly variable and the sweat sodium concentrations between athletes can range between 20-80 mmol/L (Verde et al., 1982), it would be an oversimplification to prescribe a universal drink formulation for all tennis players. This is why an individualized fluid program is suggested.

A practical tool for coaches and trainers to help athletes with their hydration monitoring is to utilize a urine color chart (Kovacs & Yorio, 2008). Figure 2. is a simple chart that can help athletes' awareness of their hydration status in a simple, non-invasive manner.

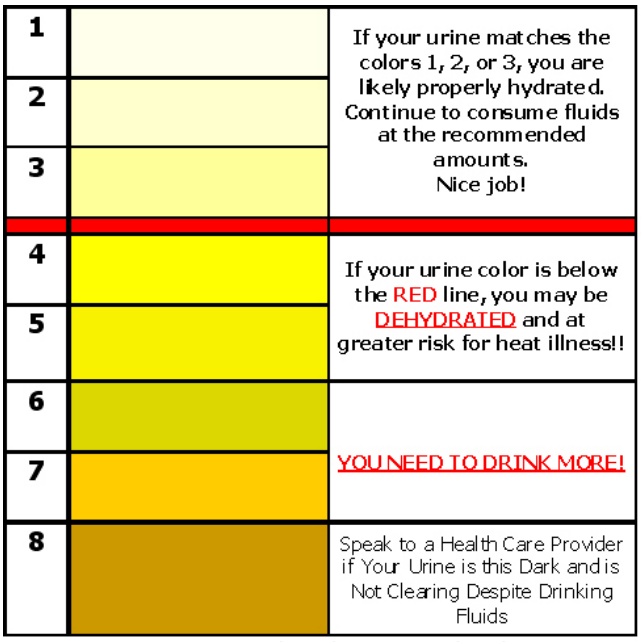

Figure 2. Am I Hydrated? – Urine Color Chart.

Post-practice or match hydration is not only important for immediate recovery, but also for subsequent performance during play in a subsequent session on the same or the following day. Rehydration post exercise has three major purposes:

1) Replace fluid volume to an equal or greater extent than the volume lost while sweating

2) Ingest liquid and/or solid carbohydrates to aid in glycogen resynthesis (Sherman, 1992)

3) Replace electrolytes lost during sweating

Water cannot be the only fluid consumed after tennis play, as the athlete is typically in a hypohydrated (dehydrated) state and an increase in plain water will dilute the lowered electrolyte concentration in the blood and plasma even further. This fall in plasma osmolality and Na+ (Sodium/Salt) concentration reduces the athlete's drive to drink and stimulates urine output, which could lead to adverse consequences such as excessive hypohydration and hyponatraemia. The addition of Salt (Na+) in post-exercise beverages has been supported by multiple position stands (Convertino et al., 1996).

CONCLUSIONS & PRACTICAL REHYDRATION GUIDELINES (WENDT ET AL., 2007)

• The use of sports drinks with 6-8% carbohydrate solution and sodium improves intestinal water absorption. In addition, flavoured, more palatable drinks lead to more fluid being consumed when compared with water.

• Water retention can be optimized by the ingestion of solutions containing at least 50mmol/L of sodium (~3 grams/L of table salt) in a volume of liquid 1-1.5 times the amount of sweat lost. It is possible

to make your own 6% drink by mixing five tablespoons of table sugar, and one-third teaspoon of salt per litre of water. Assistance from a professional nutritionist is advised.

• Rehydrating with water alone can have negative effects because this can result in a rapid fall in plasma osmolality and sodium concentration.

• Consumption of fluids during rehydration after exercise should exceed fluid lost (130-150%).

• It takes 20-30 min for ingested fluids to be evenly distributed throughout the body.

• Heart rate, core temperature and hydration do influence each other during and after exercise- keep on top of hydration.

PUBLICATION NOTE

This information has been reprinted in an adapted form with permission from: Kovacs, M. S., Ellenbecker, T. S., & Kibler, W. B. (Eds.). (2009). Tennis recovery: A comprehensive review of the research. Boca Raton, Florida: USTA.

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The many colours of match analysis in tennis

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ABSTRACT

This article introduces a new method of match analysis, which could serve as a useful and simple tool in learning to understand the game. The described method can be applied to all levels of players – from beginners to advanced.

Key words: match analysis, point tracking

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INTRODUCTION

A former top-ten Swedish player, Joachim 'Pim Pim' Johansson was often asked the same question: "Why, having one of the most effective serves in the game he wouldn't rush to the net behind it?"

What puzzled the others, was a logical choice for Johansson. He knew that his forehand was much better than his net game and preferred to take the ball early and on the bounce with his strongest groundstroke. In 2004, Johansson showed the best serve results on the ATP Tour- he won more games on his serve than any other ATP Tour player. The Swede's stats were even better than Pete Sampras's - a strong argument in favour of Johansson's serve tactics. Johansson followed his powerful delivery by a big forehand from mid-court to finish the point.

"All the players can play really good, it's a question of using the right tactics- insists Johansson- we have to teach them in the right way from a younger age, we need to talk about tactics so they understand the logics of the game and help them develop their own individual styles". This is what the game based approach to match analysis is all about. At beginner and intermediate levels, new teaching methodologies (the 'game based approach' or 'teaching for understanding') place a great emphasis on the importance of understanding the game (the strategic and tactical aspects) as opposed to simply hitting balls (Crespo & Reid 2010).

The major challenge the coach faces while guiding kids through that "discovery of tennis" is in the adaptation of what they teach, so that it is appropriate to the age, level and cognitive abilities of the learner. A coach's knowledge should be "relayed to players...such that they are not deterred by overcomplicated analysis" (Over & O'Donoghue, 2008). In other words, discussion of match strategy with a beginner should be a bit different from that you might have with a pro.

- With a beginner you might apply "five balls over the net" tactics.
- With advanced beginner it could be "long and high to the backhand"
- With an intermediate player you might use a combination of "one top-spin one slice to the same side".

To work out strategies on the pro level, players often need much more information. ITF, WTA and ATP tournaments provide a great number of useful match stats. There are also special firms and coaches who specialise in processing the match data and working out recommendations on how to play a certain player – what to expect and which strategy to apply.

Young aspiring players are often just as interested in their match performance as the professionals, if not more. And understandably they are very eager to listen and absorb anything the coach wants to share with them. This useful time period in a player's development, however short it could be, has to be used to the utmost.

THE POINT TRACKING METHOD

Score line: 3, 4, 0, 5, 5, 1

What is suggested here is a novel "match recording" (point tracking) method, adaptable for any level of play, that would help young players better understand the game and provide coaches with facts they can use in creating individual training plans for their students.

Here are the advantages of this particular "match recording" if compared to the many good match analysis techniques already in existence:

1. Simple to follow
2. Understandable and conveniently presented
3. Gives a good picture of the match flow, from start to finish
4. Provides data for match analysis and thus for practice planning
5. Keeps parents from being overstressed
6. Could be adjusted according to the needs of a specific player

The base for this "match recording" is keeping count of the number of shots hit in each rally. It is imperative to count only the shots that are in the court.

Thus, instead of :

15-0, 15-15, 15-30, 30-30, 40-30, game;

You will be getting:

3, 4, 0, 5, 5, 1.

What does this particular line of digits tell us?

1. Even though we don't see the regular score line, the score is followed very easily: an uneven number of shots indicates a winning point for the serving player, and an even number of shots indicates a winning point for the player returning the serve.

2. We can see that in the third point (at 15-15), the server made a double fault - «0».

3. We can also see that this double fault didn't discourage the player, but instead triggered his resistance level, and he won the next three points and took the game.

4. In the middle of the game we see the two longest points – this could be an indication of fierce fighting. Both of these went to the same player.

5. The game's shortest rally was on the game point. That can tell us that the return player was too discouraged or tired to offer better resistance.

6. To the credit of the losing player, we can say that his return was quite stable – he only missed it once. Unfortunately, this happened on the game point. As juniors seldom hit aces, we can guess that it was an unforced error and might think about planning special stress-related drills into training sessions.

There are numerous variations of how this data could be interpreted. It is important though to look for actual positive details, even in a lost match. Kids are smart, and if you just say "good effort" after a bad result, they won't believe you. But when looking at your notes, if you can specify with examples, there will be more weight behind your words:

- Look, you made him/her really fight for every game, you never lost on the first game-point and always stretched him/her to the longest rallies in that situation. Once, you went for 24 strokes and won that point!

Hearing that the junior will sense that you really cared, and be more trusting of the message you're getting across.

Some other useful data that can be deduced from our "match tracking" system is:

- Dynamics of important points (for example break or game points). Whether they were won easily or after a long struggle.

- Serve progression. At what stage of the match the serve (or return) was most effective, or in which square the receiving player always got the return in. This can be an indicator of two things: the weakness of serve in a particular square, or the strength of the returner's forehand or backhand.

By counting the occurrences of the number "1" as opposed to "2" for every player we can easily see what was more effective, serve or return. "1" indicates a point won on serve, "2" suggests a good return.

A near complete picture

The suggested match recording can expose not only technical and tactical level of the player but can give us some ideas about his mental and physical form.

Thus the player who was winning most of the long rallies could be applauded for his good physical shape. A game that goes 13, 2, 2, 4 and 6 might expose the server's lack of physical form. After winning the longest point of the game, he went on to lose two quick points and was able to get "back in the saddle" only towards the end of the game (where there was a 6-stroke point). On the other hand, it can be said to the server's credit that there were no double faults in that game, despite the server being obviously physically drained after the first point. That's an indication of a stable serve!

By paying attention to how the first point in every game was played we might get some information about a competitor's frame of mind. It can perhaps tell us something about his attitude, how charged he was to get into battle gear.

If a player starts each of his own service games with a double fault, it could be a sign of an inability to self-correct, or it might indicate too much dependence on the coach. The most basic self-correction on serve is this: when the ball keeps going into the net, think "chin up", as Terry Rocavert, a famous Australian coach used to say. If the ball sails long time after time, think "snap it down".

Of course the system can be further developed to include other aspects of the game the coach is interested in - by adding an apostrophe after the digit, we can mark a second serve. So 3' would mean that the point started with a second serve.

It's up for a user to adapt it to his needs.

CONCLUSION

The simplicity of this system allows not only a coach, but even an inexperienced parent or a fellow player to follow it, and its diversity fills post-match discussions with colour and meaning. Thus the score of the match becomes not a final sentence, but a step in the tennis learning process.

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Considerations on how to finish off 'key points'

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ABSTRACT

This article discusses how to finish off a point in a match. It provides examples of key points in a tennis match and describes the most common behaviour in tennis players. It also provides some brief psychological recommendations and behavioural patterns to address this issue in an efficient way.

Key words: finishing, pressure, behaviour

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CASE STUDIES

"Silvia is winning 6-0; 4-0. Everything is going smoothly. But, all of a sudden, she feels she is away. Her mind starts wandering away from the match. Her gaze gets lost among the seats in the stands. Then the score reaches 4-3..."

"Gabriel serves to win the third set tie-break. He has been hitting consistent groundstrokes during the whole match. But now, he starts serving and approaching the net..."

"Hugo and Diego were about to win the doubles match. They had three match points in a row. Because they did not take the initiative to win, their opponents made good use of the situation and they are now in the third set..."

PRESENTATION OF THE SITUATION

One of the main problems tennis players face is finishing off a point, a game or a match. For some players it is a pressure they find difficult to cope with.

Anecdotal evidence shows that it is the 'key situations' in which some players forget what they have to do. That is to say, they develop a certain strategy until they reach a certain turning point and at that time, they change their minds and use a different strategy. Sometimes, players get so anxious that they lose sight of the match. They act without thinking and do not know how to manage the pressure, and subsequently fail to plan the point adequately.

Other players, generally younger ones, show evidence of boredom at key points, generally when the score is favourable. Testimonials reveal that in these situations they feel urged to do something different to overcome this boredom, with a subsequent risk for the match outcome.

It is also common to see players, as Maure (2011) points out, who behave in an inhibitory or conservative way. By this the author means that players put off attacking at the right time and give their opponents the possibility of taking the initiative, instead of hitting the right stroke or developing the right strategy themselves.

At key times, some players feel burdened by pressure and neglect the relevant cues, that is, instead of focusing on planning the point, they constantly focus on performance.

Another example is what we call "now or never", a polarity that may bring about a catastrophic performance for the player in competition. It is important to stress the fact that this emphatic statement makes the player more likely to try to finish off the point prematurely, and also makes it more difficult to recover mentally following an unsuccessful point.

Professional practice shows evidence of players who having played the right shot, miss by just a few centimetres. In these cases, after exhibiting the right decisions, players get frustrated for having missed the shot because of the lack of the mental skills they needed to face this key situation with control.

HOW TO FACE 'KEY SITUATIONS' EFFICIENTLY?

It is a virtue of great players to know how to manage pressure at key times in an efficient way (Buceta, 1998). It is interesting to identify certain patterns and behaviours after analyzing great players.

1) First, it is important for the player to focus on the present, on what he or she has to do, by means of a task based excellence model, and not on an obsessive search for immediate results. There is a huge body of research evidence from sport psychology, supporting the importance of focusing on the task over the end result (see Roberts, 1992).

2) Second, mental skills training is fundamental, so that in competition, decisions can be made regardless of the result, and knowing how to differentiate good decision making from mistakes in performance, and how to avoid confusion between both. For a guide to practical mental skills for tennis, see Crespo, Reid & Quinn (2006).

Players who hold adequate mental skills, and have the ability to stay constantly in the present. They are typically players who project an image of confidence in these situations- which is conveyed to their opponents. They develop a flexible mindset which is far from rigid statements like "all or nothing", and are always striving to recover even from extreme situations. Likewise, they do not perceive or behave poorly in 'key situations', on the contrary, they take them as a great challenge they want to face. They strengthen their self- confidence at key times, relying on those strokes with which they are highly effective. That is, they are players who know how to make good use of their opportunities, doing what they have to do, controlling key situations as part of their everyday tasks, by means of practising key situations during their training sessions.

CONCLUSION

As a summary, we must remember that good management of extreme situations is a key skill that can be improved with mental skills training. However, it does not always involve winning, as Weinberg & Gould (1996) state, winning and losing does not depend only on what you do, because there are situations in tennis are not in your control.

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Recommended books and publications

RECOVERY IN TENNIS

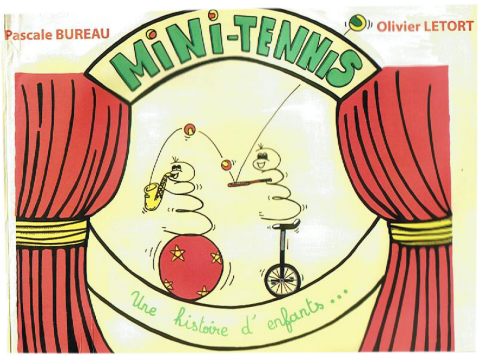
Author: USTA, 2010. **Language:** English. **Type:** 30 page ebooklet. **Level:** All levels.

'Recovery in Tennis' is a practical summary of an extensive literature review conducted by the United States Tennis Association. As more information is needed in the area of tennis specific recovery, the Sport Science Committee of the United States Tennis Association (USTA) sponsored an extensive evidence-based review of the available literature related to eight distinct areas of tennis-specific recovery. These eight areas are: Nutritional Aspects of Tennis Recovery, Heat and Hydration Aspects of Tennis Recovery, Psychological Aspects of Tennis Recovery, Recovery Aspects of Young Tennis Players, Physiological Aspects of Tennis Recovery, Musculoskeletal Injuries/ Orthopedic Aspects of Tennis Injury, General Medical Aspects of Recovery and Coaching Specific Aspects of Recovery. 'Recovery in Tennis' provides a practical summary of this literature review, and thus fills an important gap in applied and scientific knowledge. Both the complete recovery project, and e-booklet are available free at http://www.usta.com/tennisrecovery/

MINI-TENNIS: UNE HISTOIRE D'ENFANTS- A STORY FOR CHILDREN

Author: Pascale Bureau & Olivier Letort, 2010. **Language:** French. **Type:** 160 page book. **Level:** Beginner and intermediate

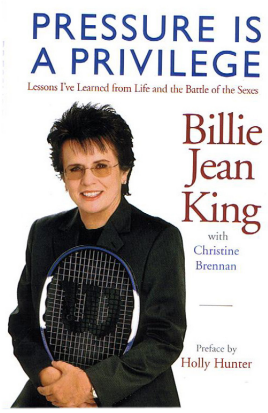
'Mini Tennis: Une histoire d'enfants' is a text that provides an essential guide to preparing young children's co-ordination, athletic abilities, and on-court tennis skills. Seriously put together, but without taking themselves seriously, Pascale Bureau and Olivier Letort provide development guidelines, safety and good humour to all aspects of the 52 drills designed specifically for progressive learning. This book will allow for coaches and parents to guide a child's sporting development through fun and relaxed play, and is a highly useful resource for those specialising in Tennis 10s development.



PRESSURE IS A PRIVILEGE

Author: Billie Jean King, 2008. **Language:** English. **Type:** 190 page book. **Level :** All levels

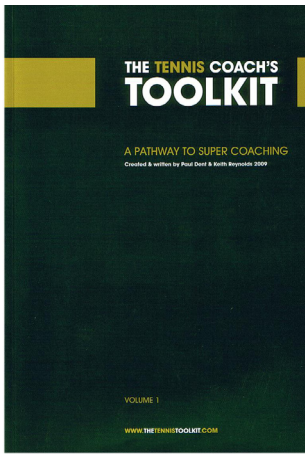
'Pressure is a Privilege' is a text that broadly approaches a well known subject matter within the field of competitive and elite sport, that is; how to deal with pressure with a positive frame of mind. The book is filled with positive psychology, interwoven amongst inspiring stories surrounding Billie Jean King's life and career. In particular, the book deals with the night of September 20, 1973, where King took on and defeated Bobby Riggs in the "Battle of the Sexes". The stories within the book also deal with key lessons for any type of player, including never underestimating your opponent, and that seeing and believing is half the battle to success. A must read for any sports fan or competitor, 'Pressure is a Privilege' will inspire those most who struggle to deal with pressure in competitive sport.



THE TENNIS COACH'S TOOLKIT

Auhors: Paul Dent & Keith Reynolds **Language:** English **Type:** 500 page book/ online resource. **Level:** Intermediate/ Advanced

The Tennis Coach's Toolkit is a unique mental skills development resource written by coaches for coaches. It has won excellent acclaim from reviewers, some of the world's best coaches, as well as internationally recognised coach educators. The Toolkit is a huge resource enabling the coach to fulfill their students' mental skill potential as well as their own coaching ability. In this 500 page book, you will find 8 coaching stories complete with a multitude of coaching interventions which are directed towards the story line. These interventions are then cross referenced to the enormous resource library where further practical knowledge and the remainder of the 800 coaching interventions is available on the whole spectrum of mental skills application. The Toolkit can also be accessed through The Tennis Coach's Toolkit website where these 800 coaching interventions are also available, as well as the 50 lesson plans outlined to help kickstart your confidence in delivering mental skills. The Tennis Toolkit is essential reading for any coach who is serious about himself, his players and his profession. See www.thetennistoolkit.com.



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TOPICS & SCOPE

ITF Coaching and Sport Science Review considers for publication original research, review papers, opinion pieces, short reports, technical notes, topical lectures and letters in the disciplines of medicine, physiotherapy, anthropometry, biomechanics and technique, conditioning, methodology, management and marketing, motor performance, nutrition, psychology, physiology, sociology, statistics, tactics, training systems, and others, having specific and practical applications to tennis coaching. The intended readership of the publication is directed to all those involved in, and interested in coaching methodology and sport sciences relating to tennis.

PERIODICITY

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FORMAT

Articles should be word-processed preferably using Microsoft Word, but other Microsoft compatible formats are accepted. The length of the article should be no more than 1,500 words, with a maximum of 4 photographs to be attached. Manuscripts should be typed, double spaced with wide margins for A4-size paper. All pages should be numbered. Papers should usually follow the conventional form: abstract, introduction, main part (methods and procedures, results, discussion / review of the literature, proposals-drills-exercises), conclusions and references. Diagrams should be done using Microsoft Power Point or any other Microsoft compatible software. Tables, figures and photos should be relevant to the paper and should have self explanatory captions. They should be inserted in the text. Papers should include between 5 and 15 references that should be included (author/s, year) where they occur in the text. At the end of the paper the whole reference should be listed alphabetically under the heading 'References' using the APA citation norms. Please refer to http://www.apastyle.org/ for guidelines and tutorials. Headings should be typed in bold and upper case. Acknowledgement should be made of any research grant source. Up to four keywords should also be given and the corresponding author contact details.

STYLE AND LANGUAGES OF SUBMISSION

Clarity of expression should be an objective of all authors. The whole emphasis of the paper should be on communication with a wide international coaching readership. Papers can be submitted in English, French and Spanish.

AUTHOR(S)

When submitting articles authors should indicate their name(s), nationality, academic qualification(s) and representation of an institution or organisation that they wish to appear in the paper.

SUBMISSION

Articles may be submitted at any time of the year for consideration for future publication. Articles should be sent by e-mail to Miguel Crespo ITF Development Research Officer to the following e-mail address: coaching@itftennis.com. In calling for papers, the Editors ask that contributors adhere strictly to the guidelines. Views expressed by contributors are their own and not necessarily those of the Editors or publisher.

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