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EDITORIAL

Welcome to Issue 58 of the ITF Coaching & Sport Science Review.

The articles in this issue cover a variety of topics including principles of natural justice for coaches, application of TRX training system to tennis, female tennis methodology and evolution, practice variability applied to tennis, among others.

This year has seen 5 successful BNP Paribas Regional Coaches Conferences taking place across the continents, showcasing the latest advances in tennis coaching, teaching methodology and tennis specific sports science research. The events were conducted in partnership with Olympic Solidarity and the Regional Associations (ATF, COSAT, COTECC, and CAT). We would like to thank the speakers, the host national and regional associations as well as Olympic Solidarity which helped to fund the conferences for helping us to make the events successful. Olympic Solidarity also funded the European Coaches Symposium which was held in Helsinki in October.

Progress with ITF resources throughout 2012 has seen the publication of 'Biomechanics for Advanced Tennis' in e-book format. Interested readers can go to:

<http://www.amazon.es/ITF-Biomechanics-Advanced-Tennis-ebook/dp/BooA79U7MK>.

The ITF tennis iCoach website remains at the forefront of online coach education, with up to date and current research available to coaches across the world. For just \$30 per year you can keep up to date with then most current tennis specific coaching information. Click on the following link. www.tenniscoach.com for a tour of the site.

The third Tennis Play and Stay seminar, held at the LTA's National Tennis Centre in London last week, concluded with the launch of Tennis Xpress, a new supporting programme of the ITF Tennis Play and Stay programme, to the 150 attending delegates. Representatives from the four Grand Slam nations, the ATP and WTA, and other members of the tennis industry were also present during the event. Tennis Xpress is an active and dynamic introduction for starter adult players and recommended by the ITF as the best way to learn the game. Designed as a nine-hour course over six weeks for clubs and tennis facilities, Tennis Xpress is centred on the use of slower Green balls (25% slower) and Orange balls (50% slower) to ensure that players quickly learn the rules of tennis, and the basic techniques and tactics of tennis, in an active way.

The three and a half day seminar featured 39 different expert speakers, presenting on topics including Tennis10s; tennis retailing; teenagers in sport; health benefits of tennis; the impact of tennis on disabled people and the importance of good club practice. With 50 of the ITF's member nations in attendance, speakers included Dan Burrows, Partnership Manager from Nike Inc., Access to Sport and Alex Balfour, New Media Manager from the London Organising Committee of the Olympic and Paralympic Games, among others. ITF Executive Director of Professional Tennis, Kris Dent, introduced World Tennis Day and addressed questions from the delegates regarding the event and their involvement.

The ITF is pleased to announce that the BNP Paribas ITF Worldwide Coaches Conference 2013 will take place in Cancun, Mexico, from 5 to 9 November 2013. The event is being organised by the ITF in conjunction with the Federación Mexicana de Tenis (FMT) and COTECC. Confirmed speakers include Nick Bollettieri (USA), Jim Loehr (USA), Bruce Elliott (AUS), Rohan Goetzke (AUS), and Sven Groeneveld (NED). More details will be available earlier next year.

We hope that you will find this 58th edition of the Coaching and Sport Science Review interesting and that it will allow coaches across the world to build on and develop their coaching knowledge and to be more effective in their work as coaches. We also hope that you will continue to make use of all the other coaching resources provided by the ITF which can be viewed on the weblet; (<http://www.itftennis.com/coaching/>).

We would like to announce that Tom Sutton is the new Assistant Research Officer. He has taken over Merlin van de Braam who is now in charge of Tennis iCoach.



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Fair go: The principle of natural justice for coaches

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ABSTRACT

This paper reviews the principle of natural justice (also known as procedural fairness or due process) in the coach setting. The significance of this principle in resolving complaints and ensuring fair treatment of players is discussed. Practical implications for coaches are highlighted.

Key words: Natural justice, procedural justice, due process, fair treatment, complaints

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INTRODUCTION

There is considerable attention focused on today's tennis coach to act legally and ethically at all times in the conduct of his/her coaching activities. This attention is not surprising in light of the key role a coach can play in developing players and contributing to the overall success of a team, club, association or local, regional, state or national program. What, however, should not be forgotten is that along with responsibilities, coaches also have rights. These rights include those to privacy, self-determination, personal liberty and natural justice (Healy, 2003). The purpose of this paper is to review the principle of natural justice for coaches, and specifically, (a) how it applies to coaches to ensure a fair resolution to complaints should they arise; and, (b) how it is applied by coaches in making ethical decisions and treating players fairly. To address these issues let's start by defining the term natural justice.

What is Natural Justice?

Natural justice (also known as procedural justice or due process) is defined as "rules of fair play" (Martin, 2003, p.325). According to Martin, there are two main rules:

- (a) Rule against bias - any decision, however fair it may seem, is invalid if made by a person with any known bias that may have affected his/her impartiality
- (b) Rule to hear the other side - a decision cannot stand unless the person directly affected by it was given a fair opportunity both to state his/her own case and to know and answer the other side's case

So what does this mean? Healy (2003) proposes that natural justice gives those accused of 'breaking the rules' the following basic rights:

1. They should know the nature of the allegation made and the circumstances in which the breach is said to have occurred
2. They must be given an opportunity to put their case
3. Those considering the matter should act in good faith

AVOIDING COMPLAINTS

Coaches can be bound, legally and/or ethically, to a range of rules, policies and codes of conduct (e.g. ITF Code of Ethics for Coaches) in relation to their coaching duties. Acting strictly in accord with these rules, policies and codes is the best insurance to avoid allegations of misconduct. However, this is not a 'fool-proof' strategy. Further, mistakes and errors of judgment are a part of life, even for coaches. In these circumstances, allegations of misconduct always remain a possibility.

Allegations, even if later dismissed, have the potential to leave a coach's reputation severely undermined and/or tainted (Healy, 2003). In the event allegations are upheld, coaches can expect disciplinary action to be taken. A range of possible sanctions or penalties that may be imposed are listed in Table 1.

DISCIPLINARY ACTIONS

- A verbal or written apology
- A letter of reprimand
- A fine or levy
- A referral to counselling
- The removal of certain privileges of membership or employment
- A demotion or pay cut
- A temporary suspension with or without pay
- The termination of employment or contract
- Deregistration as a qualified/certified coach

Table 1. Possible Disciplinary Actions for Coaches who Breach Relevant Policies, Rules and Codes of Conduct (Australian Sports Commission, 2009).

ENSURING A FAIR RESOLUTION AFTER A COMPLAINT

Let's assume a scenario where allegations have been made against a coach and a hearing (be it a tribunal or less formal forum) is scheduled. What should a coach do to ensure a fair complaint handling process? Critical considerations include:

- Know your rights – you are entitled to know the allegations against you, have sufficient time to prepare and present your case and be heard by an unbiased panel or person
- Check the standards of the hearing prior to its commencement – once underway, it may be too late or more difficult, to insist on your rights. Learn from the reported case of a coach who was banned from sport for life but was not told of the allegations (Healy, 2003)!
- If uncomfortable with, or uncertain about, any aspect of the proposed hearing, take appropriate action (e.g., discuss matters of fairness with those conducting the inquiry or get legal representation).

Fair Treatment of Players

The discussion to date has focused on how natural justice applies to a coach in the event of disciplinary proceedings. It is also relevant, and important, to discuss how natural justice can, and should, be applied by a coach in his/her treatment of players.

Coaches are continually making decisions that affect players (Martens, 2004). Let's consider a couple of decisions a coach may face relating to player selection and discipline. Should an injured player be eligible to compete in a team final or selected for an overseas touring team? Should a player be suspended for missing a training session?

Natural justice stipulates that coaches, in addressing such questions, must act without bias and give the players affected by the decision the opportunity to be heard. Can coaches vouch that all their decisions would pass this 'fairness test'? Food for thought here!

So, what can coaches do to treat players fairly at all times? Here are some suggestions with respect to issues of player selection and discipline.

TEAM SELECTION

- Develop a policy setting out selection criteria as objectively and clearly as possible. If subjective criteria are included, develop your own guidelines to evaluate players in relation to each of these. Consult with players and qualified others for input into the policy
- Publish and distribute policy and procedures including existence of a selection panel (where possible to consist of more than just the coach) and an appeals mechanism and process
- If required, get professional advice to ensure policies and procedures satisfy fair and equitable standards
- Ask the question, 'If I were a player affected by this selection policy and procedure, what would I think and feel?' – if the response is a positive one, proceed. If not, regroup and go back to the drawing board!
- Adopt an 'open door' approach to discuss any queries from players



Player Conduct: Disciplinary Action

- Develop a written (and readily available/distributed) policy/code of conduct in consultation with players and qualified others
- Consult with players as to the benefits of adherence and consequences if standards are not met
- Ensure other qualified person(s) conduct any inquiries/investigations of alleged breaches if you feel you cannot act impartially
- Allow players to present their case – presume innocence and try not to prejudge players before listening to the 'other side'
- Ensure any punishment 'fits the crime' – look at alternative disciplinary measures in the event of indiscretions such as: (a) getting the player to recommend a suitable penalty; and (b) introduce community tennis projects (e.g., player to conduct a tennis clinic for underprivileged children)
- Ask the question, 'If I were a player, would I consider the actions/decisions of my coach to be fair?' – as above, keep working on it until you get it right!
- Adopt an 'open door' approach to discuss any queries from players.

CONCLUSIONS

The term 'natural justice' is not commonly found in the tennis literature. But do not be fooled, natural justice goes to the very heart and spirit of the game – it denotes fair play at all times both on and off the court. In the context of coaching, natural justice applies both to the rights of coaches as well as their duty to act by the rules of fairness.

In conclusion, it may be useful and timely to recall the well-known saying, namely, 'Justice should be done and be seen to be done'. Coaches have the power and authority to ensure they receive, and give, fair treatment in all their coaching activities. Why not give it a fair go?

REFERENCES

- Australian Institute of Sport. (2009). Policy on the deregistration of NCAS coaches. Retrieved January 1, 2009, from <http://www.ausport.gov.au/supporting/coachofficial/Guidelines/policy>
- Healy, D. (2003). Sport and the law: A guide for people involved in sport. Sydney, Australia: University of New South Wales Press Ltd.
- International Tennis Federation Code of Ethics for Coaches (n.d.). Retrieved January 1, 2009, from <http://www.itftennis.com/coaching/practicalinfo/codeofethics.asp>
- Martens, R. (2004). Successful coaching (3rd ed.). Champaign, IL: Human Kinetics.
- Martin, E.A. (Ed.) (2003). Oxford dictionary of law. Oxford, UK: Oxford University Press.

Influence of fatigue on the muscular activity and performance of the upper limb

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ABSTRACT

The aim of this study was to examine the effect of fatigue on accuracy, ball speed and muscle activity in the serve and forehand. The fatigue protocol resulted in a decrease of ball speed in serves and of accuracy in forehands, associated with the decreased activation of certain muscles. The players experiencing fatigue seemed to use an adaptation strategy based on the type of stroke, without modifying their inter-muscular coordination. These results make us consider the possibility to work on resistance to fatigue for specific strokes and muscle groups.

Key words Fatigue, ball speed, accuracy, adaptation strategy

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INTRODUCTION

With the physical dimension of modern tennis, fatigue becomes an issue that is inextricably linked to the performance of competition. While there is a consensus on the importance of fatigue in tennis and its influence on the outcome of the game, it remains necessary to understand why it occurs in order to limit its effects. Several scientific studies have confirmed the observations of coaches on the degradation of strokes, movements and poor tactical choices occurring in situations of fatigue (Davey et al., 2002). A summary of the results published in this area was conducted by Hornery et al. (2007). It was shown that after a tennis session leading to exhaustion, fatigue led to a 69% decline in precision in groundstrokes and a 30% drop in ball speed in serves (Davey et al., 2002). Similarly, an intense workout of 2 hours resulted in a decrease in speed and precision in groundstrokes and second serves, as well as an increase in the error rate of the latter (Vergauwen et al., 1998). Finally, the electromyography activity (EMG) and the maximal isometric force of the quadriceps decreased significantly during simulated matches (Girard et al., 2006, 2008). According to Girard et al. (2008), the deterioration of the neuromuscular function during a prolonged tennis match could be explained by a failure at both central (motor command) and peripheral (excitation / contraction) levels.

However, in spite of significant fatigue being experienced, some players maintain speed and accuracy on their serve (Hornery et al., 2007). Thus, it seems that during serve, compensatory neuromuscular strategies may occur in situations of fatigue (Girard et al., 2009) to maintain the level of performance. It therefore seems interesting to study the muscular adaptations of the upper limb associated with fatigue in tennis.

METHOD

Following a standard 20 min warm-up, 8 adult tennis players (ranked 15 to 4/6) were submitted to a test measuring their stroke performance before and after an intermittent exercise leading to fatigue (Figure 1).

The performance test focused on the speed - measured by a radar - and accuracy of the serves and cross-court forehands. The subjects had to hit a powerful and accurate serve, seeking the ace on the "T". The forehands were fed using a ball machine (3 seconds per stroke). Shot accuracy was evaluated by means of targets, the smallest yielding the most points (Figure 2), a ball bouncing outside the target areas yielding no points. The error rate was calculated as the number of strokes in the target / the total number of strokes. The electrical activity of eight muscles of the dominant upper limb was recorded by the surface EMG during stroke production. The starts, ends, durations and levels of the activation of each muscle were calculated.

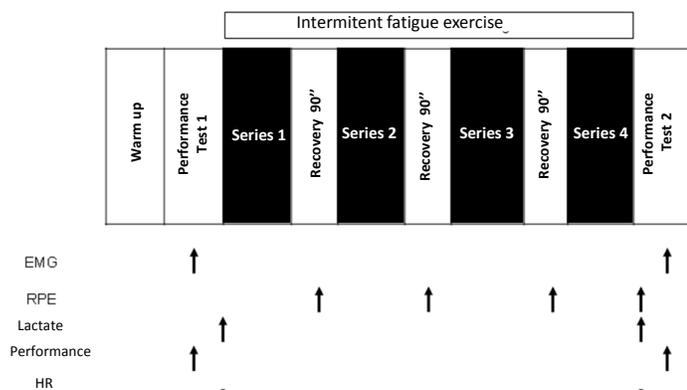


Figure 1: Structure of the experimental protocol and the various parameters measured. (EMG: surface electromyography; RPE: perceived exertion; Performance: measures of accuracy and ball speed; FC: heart rate)

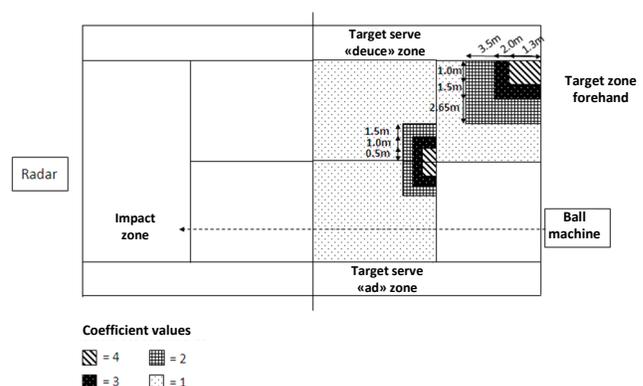


Figure 2: Diagram of the performance test and coefficient values associated with target areas (squares for serves)

The fatigue-inducing exercise consisted of four sequences of 12 repetitions of 1 serve + 8 cross-court forehands (2 seconds per stroke). Recovery periods of 20 seconds (semi-active) between repetitions and 90 seconds (seated) between sequences were allowed (Figure 1). The players had to hit at maximum intensity and reposition at centre court between each forehand. The heart rate (HR), blood lactate concentration ([La] s) and perceived exertion (RPE) were measured during testing.

Repeated ANOVA measures and a Student's t-test were used to assess the differences between the various indicators before and after fatigue.

RESULTS

The average heart rate remained constant between the sequences (174.7 ± 10.6 bpm) while the [La] s increased significantly from 2.8 mmol.l⁻¹ to 5.7 mmol.l⁻¹ (p = 0.04). RPE values increased between sequences (p < 0.02) except between sequences 3 and 4. The players saw their effort as "hard" (RPE = 14.5) during the first sequences, then "very hard" (RPE = 17.5) during the last sequence of the exercise.

	SPEED (M.S-1)		ACCURACY		CONSISTENCY (%)	
	Pre	Post	Pre	Post	Pre	Post
Serve	38.9 (10)	37.8 (10) *	1.3 (0.4)	1.1 (0.4)	43.4 (15.4)	48.6 (15.2)
Forehand	26.9 (10)	26.9 (10)	1.3 (0.3)	1.0 (0.2) *	41.7 (15.4)	49.9 (15.2)

Values: mean (standard deviation). * Significant difference between pre and post-test (p < 0.05)

Table 1. Performance criteria for serve and forehand in pre and post-fatigue states.

Significant decreases were observed in serve speed (3.2%) and forehand accuracy (21.1%) after the fatigue-inducing exercise (Table 1). The error rate also tended to increase, especially in the forehand (27.6%) (p = 0.056)

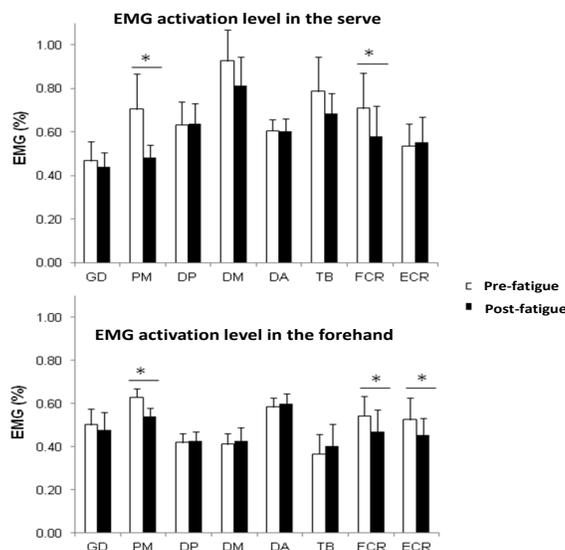


Figure 3. Standardized EMG activation level of upper limb muscles in the serve and forehand in pre and post-fatigue states. (LD: latissimus dorsi; PM: pectoralis major, PD: posterior deltoid; MD: middle deltoid; AD: anterior deltoid, T: triceps, FCR: flexor carpi radialis, ECR: extensor carpi radialis)

LEMG activation levels of the pectoralis major (PM) and flexor carpi radialis (FCR) decreased significantly during the serve and forehand, while they decreased for the extensor carpi radialis (ECR) during the forehand (p < 0.04). No difference was reported in the starts, ends and durations of muscle activity, irrespective of the muscle observed.

DISCUSSION

This study brought to light the negative effect of fatigue on serve speed and forehand accuracy, as well as a significant decrease in the amplitude of the PM, FCR and ECR EMG. However, the temporal pattern of the inter-muscular coordination did not seem to change. Given the average heart rate, blood lactate and evaluation of perceived exertion (RPE), the fatigue protocol imposed a workload greater than that of a match, approaching that of an intense rally (Kovacs 2006). The specific fatigue experienced by the player triggered different coping strategies depending on the stroke. Indeed, players decreased their serve speed, probably in order to maintain a high accuracy and a low error rate. However, in forehands, they preferred to preserve speed at the expense of precision and consistency. Despite differences in protocol across studies, our results confirm those of previous work (Hornery et al., 2007). This strategy, whether conscious or unconscious, refers to Fitts' speed-precision conflict, which might explain the inverse evolutions of ball speed and stroke accuracy.

Serve is considered one of the most important elements of the game of tennis (Elliott, 2001) and has a significant impact on the results of a modern tennis match (Gillet et al., 2009). Thus, in training as in competition, the accuracy and consistency of the serve are perceived by players as essential. Regarding the forehand, it has been described as a key stroke of modern tennis (Brabenec, 2000) and is often used as an offensive weapon in order to hit winners. Working on the forehand during training involves exercises with target areas much larger than those used for the serve and that are based more on power than on the search for accuracy. Therefore, these stroke-specific training requirements might influence the strategies adopted in relation to the speed-precision conflict during fatigue situations.

Fatigue could likely cause a remodeling of the inter-muscular coordination in order to maintain task performance. However, no change in the temporal pattern of activation was observed in our study. Still, the loss of speed in the serve could be partly explained by the decreased activity of two muscles involved in generating speed, the PM and FCR, which appear to be determining in the acceleration phase (Morris et al. 1989, Ryu et al., 1988). They are involved, respectively, in the rotation of the shoulder and flexing of the wrist, which contribute 40% and 30% to the total speed of the serve (Elliott, 2006). During a state of fatigue, players seem to decrease the activation of these muscles, causing a decrease in speed. The purpose of this adaptation may be to limit the risk of injury by reducing the amplitude and forces of the movement (Kovacs, 2006). The deterioration of forehand precision could be linked to the decrease of the FCR and ECR EMG activation levels since a decreased activity of these muscles can lead to poor racket control. This decline in muscular activity could cause an alteration of racket holding, wrist stabilization (Morris et al., 1989) as well as impact shock and vibration dampening (Chow et al., 2007). Changes in the EMG activity of the FCR and ECR muscles observed in the forehand, associated with the forearm pains experienced by some players confirm that the high gripping forces generated at impact during groundstrokes lead to significant constraints on the forearm of the player (Davey et al., 2002) and can generate highly localized fatigue.

CONCLUSION

This study highlights the utility of working on serve speed and forehand accuracy while in a state of fatigue. It also seems useful to develop the muscular endurance of the PM and the muscles of the forearm, which appear most susceptible to fatigue. Thus, based on these results, coaches and players will be able to develop a specific

training program designed to delay the onset of fatigue and develop effective strategies for maintaining performance, while reducing the risk of injury.

REFERENCES

- Brabenec, J. (2000) Why the forehand is a key stroke. *ITF Coaching and Sport Science Review* 21, 11-13.
- Chow, J.W., Knudson, D.V., Tillman, M.D. & Andrew, D.P. (2007) Pre- and post-impact muscle activation in the tennis volley: effects of ball speed, ball size and side of the body. *Br J Sports Med* 41(11), 754-9.
- Davey, P.R., Thorpe, R.D. & Williams, C. (2002) Fatigue decreases skilled tennis performance. *J Sports Sci* 20(4), 311-8.
- Elliott, B. (2006) Biomechanics and tennis. *Br J Sports Med* 40(5), 392-6.
- Elliott, B. (2001) The serve. *ITF Coaching and Sport Science Review*, 24, 3 - 4.
- Gillet, E., Leroy, D., Thouwarecq, R. & Stein, J.F. (2009) A notational analysis of elite tennis serve and serve-return strategies on slow surface. *J Strength Cond Res* 23(2), 532-9.
- Girard O., Guerin P., Teulier C., Millet G.P., Micallef J.P. (2009) Effets de la fatigue sur les coordinations segmentaires au service en tennis : étude préliminaire. pp. 353-360 in Cronier L., Bayle E. (eds.) *Le tennis dans la société de demain*. AFRAPS.
- Girard, O., Lattier, G., Maffioletti, N.A., Micallef, J.P. & Millet, G.P. (2008) Neuromuscular fatigue during a prolonged intermittent exercise: Application to tennis. *J Electromyogr Kinesiol* 18(6), 1038-46.
- Girard, O., Lattier, G., Micallef, J.P. & Millet, G.P. (2006) Changes in exercise characteristics, maximal voluntary contraction, and explosive strength during prolonged tennis playing. *Br J Sports Med* 40(6), 521-6.
- Hornery, D.J., Farrow, D., Mujika, I. & Young, W. (2007) Fatigue in tennis: mechanisms of fatigue and effect on performance. *Sports Med* 37(3), 199-212.
- Kovacs, M.S. (2006) Applied physiology of tennis performance. *Br J Sports Med* 40(5), 381-5; discussion 386.
- Morris, M., Jobe, F.W., Perry, J., Pink, M. & Healy, B.S. (1989) Electromyographic analysis of elbow function in tennis players. *Am J Sports Med* 17(2), 241-7.
- Ryu, R.K., McCormick, J., Jobe, F.W., Moynes, D.R. & Antonelli, D.J. (1988) An electromyographic analysis of shoulder function in tennis players. *Am J Sports Med* 16(5), 481-5.
- Vergauwen, L., Spaepen, A.J., Lefevre, J. & Hespel, P. (1998) Evaluation of stroke performance in tennis. *Med Sci Sports Exerc* 30(8), 1281-8.
- Wu, C.L., Shih, M.C., Yang, C.C., Huang, M.H. & Chang, C.K. (2010) Sodium bicarbonate supplementation prevents skilled tennis performance decline after a simulated match. *J Int Soc Sports Nutr* 7, 33.

Mental obstacles to tennis performance in stressful match situations

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ABSTRACT

Tennis performance is determined by potential minus interference. Negative mental paradigms are often the cause for such interference. They provoke psychological switches that determine momentum changes within a match. Subconscious paradigms are subjective and they are made up from the nervous system to avoid and overcome stressful situations. By cognitive training it is possible to work and resolve such interferences. Elite players have a competitive advantage as they cope with the above interferences in tight match situations with a positive and functional mind frame.

Key words: brain, subconscious paradigm, self-fulfilling prophecy, critical mind

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INTRODUCTION

A human being is said to have 60.000 thousand thoughts per day (Murray, 1999). Usually a tennis player is asked during a match to make between 800 and 1200 decisions (Weinberg, 2002). However most of the cognitive processes on a tennis court can damage tennis performance. Since tennis is ranked second for mental sports and includes several in-play situations that can turn out to be extremely stressful for the nervous system, we built up a diagram which relates to game situations, harmful cognitive subconscious paradigm, and positive counter-statements.



Table I includes examples of game situations where the player is already leading.

GAME SITUATION	SUBCONSCIOUS PARADIGM	POSITIVE COGNITIVE RESPONSE
15:40 on own serve	If I lose this point I lose my serve. FEAR OF LOSING	Play one point at a time. Do what you have to. One point of the game is not the whole match even if it is a break or set point. The final result is what matters.
2-5 on own serve	If I lose this game the first set is gone. FEAR OF COMPETITION	You are anyway in a good position. The mental factor is with you. Take advantage of it. There are two sets in a tennis match. Losing one does not mean losing the match.
5-2	Reverse angle. I must win this game to win the set.	Reverse angle. You are leading, so keep up with good work or imagine you are down 2-5.
OWN SECOND SERVE 30:40 ON 5-6	This is a weak shot of mine. If I serve poorly I Lose the set. FEAR OF MAKING MISTAKES	Use your energy to focus on the next point. Remember (from visual, auditory or kinaesthetic sources) a nice second serve you did and keep repeating within your mind where you want to place it. Follow your service routine
4-2 AHEAD	I am winning, now I can't afford to make any mistakes. WRONG FOCUS, FEAR OF WINNING, OR FEAR OF LOSING ADVANTAGE.	Keep your attention on the next point and focus on your game plan. If you are too rational, bring back your attention to present by visualising a specific piece of your game plan. Try to set yourself back on the automatized processes that brought you there. If you are ahead, there is no reason to worrying. It is not time to think negatively. Enjoy the process

Table 1. Examples of game situations in which the player is leading.

Table 2 includes examples of game situations in which the player is behind or has made a mistake.

GAME SITUATION	SUBCONSCIOUS PARADIGM	POSITIVE COGNITIVE RESPONSE
6-3 5-4 40:30 all for your opponent	Match point against. If you loose this point everything is over. IDENTIFYING SELF WORTH WITH TENNIS ABILITY.	The match is not over until it is over and the score is very tight. Keep your opponent on the court for longer both playing and slow down the tempo. Test him. Please Note that statistically pressure is bigger on the player who is almost to win. The more you stretch the time, the harder will be for your opponent to win the match. Remember that momentum and balance can switch very suddenly within a match. If you win the point, the momentum could swing in your favour. Even if you lost the point and the match that means that you just lost a tennis match. It does not mean that you are a loser and does not say anything about you as a person. You must accept the match outcome without making excuses. Tennis is your responsibility. Even top players lose matches but at the end of the season they end up at the top of the ranking and can win many tournaments. As a tennis player your objective should not always be to win but also to improve your game. Give the best within your ability and you should be satisfied.



4-3 up; 30:40 break point for you. You miss an easy volley.	What an error. You cannot handle the pressure moments. CRITICAL MIND	Remain calm. Focus your energies on the next point. Bring yourself to the present time. Stick to your routines. Remind yourself about your game plan. Each point is the first point; each game is the first game. Please Note. Maybe you lost the point because you were thinking thoughts like “go for this point” or “don’t miss the next one”. The above thoughts can provoke stress in the nervous system while damaging performance. Moaning and complaining after a lost point on a tennis court in most cases can produce poor performance: 1) Usually the player alternates between winning and losing strikes according to their emotional up and downs. 2) Can produce fear which creates doubt in capabilities and shot production. 3) It brings the player temporary out of emotional balance. 4) A further step to losing overall emotional balance. 5) It produces too much stress to play at personal best on important points. Truth is the last point is already gone and one must focus on the next point. Above all, you cannot change what happened already. As Nadal states, “This is tennis. You just make a nice winner after a long, intense rally, but for the final score, it is no more valuable than the unforced error you made. Here comes mental strength, the ability that distinguishes champions from nearby champions. You must throw your failure away, free your mind, avoid thinking it over” (Nadal, 2011).
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Miss an easy approach to net.	What are you coming to net for? You know that you are poor at volleying. PSYCHOLOGIC DEFENSE SYSTEM	If you had already planned tactics in your game plan, follow it. Do what you have to according to chances offered by the tactical situation and accept everything that comes out of it, whether good or bad. Please note. Very often what makes yourself at ease on a tennis court is not what allows you to win a match. Trust and self esteem are the abilities which allow a tennis player to explore the space which is out of his/her comfort zone (Fox, 2010). In a match you can control the process but you cannot control the outcome.
Miss an easy mid-court shot.	You always miss easy shots at important times. PUT DOWNS	Help yourself with mental abilities: get back to normal breathing patterns, relax your muscles, keep your focus on a neutral aspect, visualise the next rally's tactics, check your optimal arousal and stick to your routines. Manage your emotional balance whatever just happened. It is just a question of will.
You miss a smash in the net.	It's always like that. You never make that shot. LACK OF SELF ESTEEM. POOR PERCEPTION OF SELF. INFERIORITY COMPLEX.	Keep your eyes on the ball and focus on your target. Please note. You don't miss smashes while training. You are capable to manage similar situations on a tennis court but in match situations. Trust your skills.

You miss an easy winner, open-court.	Why are you playing tennis? You are a total failure. LACK OF MOTIVATION AND PERSPECTIVE	You like playing tennis so you should try to enjoy the sport more. Welcome the challenge of testing your own abilities. Try to assert your personality and win the match if possible. Whatever the outcome, you are capable to react positively and with the correct perspective. If you cannot handle losing perhaps you should dedicate yourself to some other activity. You will lose matches, everybody does (even Rafa Nadal). Tennis is a highly stressful game and understanding that fact will allow you to be more prepared for matches. Find practical solutions, believe in your ability, put in 100% effort, and accept whatever the outcome assuming complete responsibility. If you are a true competitor, setbacks during the process will further reinforce your determination to succeed. If you play tennis for fun and lack competitive abilities, work and train on reprogramming paradigms and defeating harmful psychological mechanisms. If you want to compete against your opponent, first you must win the battle with yourself. Competitors are nurtured, not born, and you can become one with the right attitude.
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Table 2. Examples of game situations in which the player is behind or has made a mistake.

CONCLUSION

The brain is extremely powerful and it works for or against tennis performance. Tennis player performance is often harmed by poor mental skills. A tennis player's mental strength can be enhanced by education (parents, school, social background etc.) and specific on-off court training, work and application (Di Carlo, 2012).

REFERENCES

- Di Carlo, F.(2012). Il cervello tennistico, & My Book.
- Fox, A., (2010). Winning the mental match, Morris Publishing, Kearney, NE, US.
- Murray, J. (1999). Mental tennis, Jossey bass.
- Nadal, R., & Carlin, J. (2011). Rafa, La mia storia, Sperling & Kupfer.
- Weinberg, R. (2002). Tennis, winning the mental game, Miami University, Oxford, Ohio.



Application of “TRX” and “RIP training” to the development of strength endurance in tennis

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ABSTRACT

Periodization in tennis in current training is characterized by a progressive decrease of the preparation periods and a gradual increase of the competition periods. Physical condition is no longer the only priority in the preparation period of a player, it is necessary to aim at a global preparation in order to reach top performance from the very first week of the competition stage. This is a great challenge for trainers and coaches alike, to get an appropriate physical preparation of players so that they can keep a sustained top performance and be free from injury at the same time. Among all the physical conditions necessary for top performance in tennis, strength endurance is one of the most relevant. This article discusses the use of “TRX” and “RIP training” in tennis as endurance development methods.

Key words: physical condition, training, strength, TRX, RIP training, resistance

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INTRODUCTION

Taking into account various ATP statistics (Maquirriáin, 2000), the most frequent sources of injury in tennis players are:

Muscle decompensation: It is produced by the repetition of identical movements in the same direction. This develops agonist muscles, as opposed to antagonist muscles, which produce injuries and decompensation in the long run.

Muscle weakness: It is the lack of specific strength for tennis due to the inappropriate use of strength or the lack of strength training during a long period.

Fatigue: It generally occurs at the beginning of the season, when adaptation to load is poor, or at the end of the season, as a result of accumulated effort.

Even though we have certain doubts concerning strength, both during preparation and maintenance of players, we believe that it is always better to give some advice and to do a good strength job than to consider it a risk. Thus, we state the following:

“A strength working programme, even in the case of pre-pubescents, can significantly increase the maximum and explosive strength capacity, as well as the resistance strength, as long as the stimulus is intense enough” (Thiebault & Sprumont, 2009).

Today, tennis demands a fast, dynamic and accurate player, powerful in his movements, both to accelerate and decelerate, and able to sustain effort in time (longer points, larger movement areas). Therefore, only a powerful tennis player can be fast, and in order to make him so, we must develop and maintain strength. (Ellenbecker et al., 2009).

This article presents a strength programme applied to tennis. The idea is to maintain the strength while on the tour. This has always been a concern for the trainer, since it is impossible to find appropriate places to work on strength in the different tournament venues (Baiget, 2011). Our programme is carried out by means of strength in suspension with TRX and RIP Training.

WHAT IS TRX?

TRX is a suspension training programme created by the Navy SEAL of the American Army. Because of their working conditions, they usually found it hard to find the traditional training equipment and the appropriate space for that.

This offers an advantage for the participants, when compared to the simple training protocol for conventional strength training; each suspension training exercise develops functional strength and improves flexibility, balance and stability of the core to meet the demands of tennis (Sanchis, 2002).

TRX can be easily installed anywhere and an unlimited number of training exercises can be done in suspension to achieve any physical or performance condition. It can be used wherever there is a weight resistant anchorage point above the head. The supports for sit-ups, the bars for the back and biceps, the branches of a tree, beams and posts are all ideal to anchor a TRX.

The system can adapt resistance any time regulating the position of the body, making suspension training safe and effective for tennis players, regardless of their physical condition levels. TRX is portable and affordable. It is more functional than many other expensive devices for physical exercise. Its compact design makes it possible

to use anywhere: at the sport facilities, at home, or even in a hotel room when on the tour (see Figure 1).

As regards RIP training, it is a special adaptation of TRX, most appropriate for tennis since the player uses a bar attached to an elastic band, to work on some tennis specific movements, fixing it to the net post or to the end of the court fence.

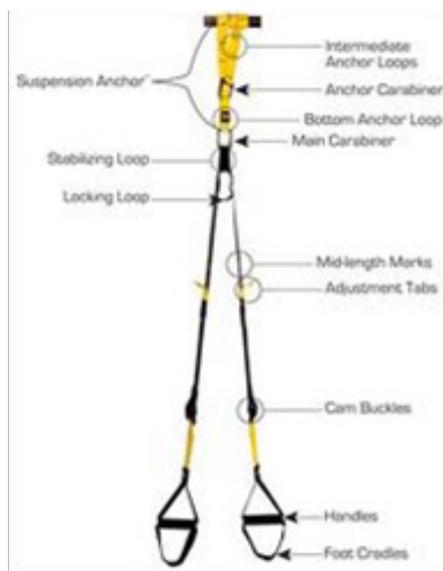


Figure 1. Parts of a TRX.



Figure 1b RIP Training.

BENEFITS OF TRX AND RIP TRAINING

TRX and RIP Training are some of the most efficient “core training” tools. This training helps to develop all the movements of tennis players in which explosive and endurance actions rotating the hip and the core are dominant. These are fundamental actions in all tennis strokes.

This system is used to work all muscular groups and several joints at the same time, in order to strengthen the body while simultaneously improving cardiovascular endurance and coordination, (intermuscular and intramuscular), strength, power, speed, flexibility and “core” stability in the three movement plans and anatomic axis (transversal, sagittal and frontal), so, it is a tridimensional training.

It is functional training since no part of the body is isolated; the body is an interconnected chain of muscles and each movement involves the whole body. With this kind of work, it is possible to develop great muscular masses, (pectoralis major, latissimus dorsi, quadriceps, hamstrings, etc.) fundamental for tennis (Carbonnier & Martinsson, 2012).

MODEL TRX AND RIP TRAINING: A PROPOSED APPLICATION TO TENNIS

TRX and RIP training can be used to train, either by means of repetitions and series or by time. The repetitions and series, as well as the intensity of the work and the training method, will depend on the objective. For this model session we will always work with 20 repetitions and two series of each exercise (González, 2012).

The structure of the training session shall be as follows: A 5 to 10 minute cardiovascular warm-up (on the treadmill, elliptical, rowing machine, rope jumping, etc.). Move all joints. The main part will follow the following structure:

EXERCISE	SERIES	REPETITIONS	REST
RIP Two handed rowing	2	20	30 seconds
TRX Squat with stretched arms	2	15 from each side	30 seconds
RIP Chest press with front lunge	2	15 from each side	no
RIP Chin rowing	2	15	30 seconds
TRX shoulders in Y	2	15	30 seconds
RIP Biceps Triceps (super series)	2	15	Time devoted to adapt TRX
TRX Power to one leg	2	15	no
RIP Two handed backhand	2	15	no

Tabla 1. Exercises

The exercises are shown in the next figures.



Figure 2a. Two handed rowing RIP.



Figure 2b. Two handed rowing RIP.



Figure 3. TRX Squat with stretched arms.



Figure 4a. RIP Chest press with front lunge.



Figure 5. RIP Chin rowing.



Figure 6. TRX shoulders in Y.

It will be followed by specific tennis training and the coach will decide on its duration. Recovery will take 5 minutes and will consist of cardiovascular work followed by active and passive stretching.

CONCLUSIONS

It is key to stress the importance of strength development in our tennis players, both to improve the game and to prevent injuries and decompensation. This system can be used on a tennis court and can be adapted to the level of each player exercising the muscles in all anatomic senses (transversal, sagittal and frontal).

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REFERENCES

- Baiget, E. (2011). Strength training for improving hitting speed in tennis. *Journal of Sport and Health Research*. 3(3):229-244.
- Carbonnier, A., & Martinsson, N. (2012). Examining muscle activation for Hang Clean and three different TRX Power Exercises: A validation study. Student Thesis. Halmstad University. <http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-17754>
- Ellenbecker, T.S.; Pluim, B.; Vivier, S.; & Sniteman, C. (2009). Lesiones Frecuentes en Jugadores de Tenis: Ejercicios para Hacer Frente a los Desequilibrios Musculares y Reducir los Riesgos Lesión. *G-SE Standard*. 01/10/2009. g-se.com/a/1094/
- González, R. (2012). TRX en tenis. www.topspinspainacademy.com
- Maquirriain, J. (2000). Lesiones en tenistas profesionales: informe del ATP Tour / Tennis injuries. *Rev. Asoc. Argent. Traumatol. Deporte*; 7(1):37-39.
- Sanchis, J. (2002). Efectos de la competición sobre la fuerza dinámica máxima en el jugador de tenis de élite: estudio de un caso. *Apuntes: Educación física y deportes*, N° 67, 2002 , págs. 28-44
- Thiebaud, C. y Sprumont, P. (2009). El niño y el deporte. *Tratado de Medicina del Deporte Infantil*. Ed. Inde Publ., Zaragoza.

Figure 7a. RIP biceps and triceps.



Figure 7b. RIP biceps and triceps.



Figure 8. TRX Power to one leg



Figure 9. Two handed backhand RIP



Tools to create an appropriate coaching cycle

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ABSTRACT

This article presents a number of tools the coach can use during the “evolution process” to keep himself and his students in a good mental, emotional and physical condition, in order to achieve a continuous development at the highest possible level. It stresses the level that is expected and the order of implementation of the concepts, since the methods are only one form of help. These methods should not condition the freedom of the coach, on the contrary, they should liberate his own potential. They are guidelines to manage the improvement process.

Key words: Methodology, training, systematic, cycles.

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INTRODUCTION: STAGES OF THE TRAINING CYCLE

The training cycle we propose is the following (Fernández, 2011):

- **Stage I: Analysis:** We try to analyse the problem to be solved. Values and beliefs are reviewed in order to define our targets as clearly as possible. We try to separate desire from real passion.
- **Stage II: Resources:** This stage shows our resources, our strengths and which must be activated and in what order, so as to reach the previously set target.
- **Stage III: Training:** This stage consists of automating behaviour patterns by means of training, so that they can be used quickly and efficiently even under pressure. This is the time to visualize and develop rituals that favour the appropriate behaviour.
- **Stage IV: Action:** During this stage, we test all coaching in a real situation, whether in a championship or another situation for which we have been training or preparing.
- **Stage V: Control:** This stage should not be forgotten, it consists of revising the process and drawing the teachings. It helps to test what worked well, what went wrong, and how to get better.

This is a never ending process as long as we want to improve, expressed in Figure 1.

ANALYSIS

During this stage, we can identify the following fundamental aspects:

- **Acknowledge values:** Your values are placed there, where you target your focus of attention. What you observe in the others, in your environment that is what is important for you.
- **Define your target:** It is very important to know exactly where you are heading, and why, in order to move in the right direction. It may take some time, but it is a good investment, it is better to spend some time planning than to wander aimlessly. Once your target is clear, write it down (Table 1).

PURPOSE
My target is:
When shall I reach my target?
What will be my intermediate steps?
How shall I know I have reached it?
Why do I want to reach this target?
Is this my realistic target?

Table 1. Setting targets.

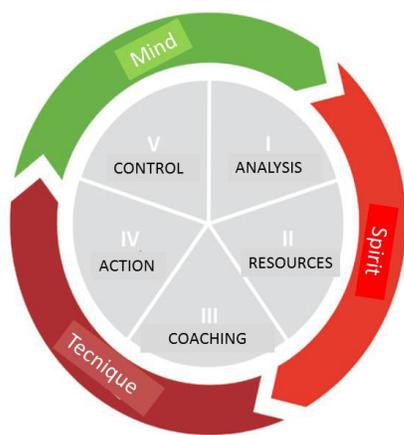


Figure 1. Coaching cycles (Fernández, 2008).

Percentage of targets met.

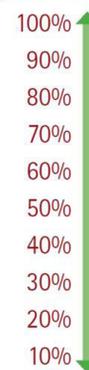


Figure 2. Percentage of targets met.

It is key to test the percentage of compliance with the objectives (GAP)

RESOURCES

During this resource stage, it is convenient to lay emphasis on the following:

- **Organize your priorities:** Once you know where you are heading, differentiate what is more important from what is not. The most important aspects are all that takes you to your target, the rest can be ignored.
- **Strengths and weaknesses:** It is important to know your own strengths and weaknesses. Analyse them as honestly as you can, reflect on them or look for help along the process.
- **Define your strategy:** Once you already know who you are and what your strongest points are, organize your steps towards the results you intend to achieve.
- **Practice patience and discipline:** Remember nothing is achieved overnight, although sometimes it may appear possible.
- **“Fight for every point”:** Perseverance in fight is one of the virtues of those who reach their targets. The toughest opponents are not always the most skilled, but they are the ones who do not give up and continue fighting.

TRAINING

During this stage, it is important to remember the following:

- **Visualize:** If you want your ideas or dreams to come true, first you must visualize them. Imagine what you want, as accurately as possible, look at your desire with the eyes of your mind, see your dream fulfilled as really as possible.
- **Rituals:** Create your own rituals to reach favourable physical, mental and emotional states. Remember that mind and body impact each other.
- **Train your body:** Your body is the shrine of your soul that leads you in life, so treat it with care and optimize your capabilities. You will see that after sweating, not only will your body be grateful, also your mind will. There are infinite ways of working your body, tennis is one of them.
- **Train your mind:** Just as you need training to improve your physical conditioning, it is necessary to train to improve your mental capabilities. Nurture your mind with knowledge, read good books, attend cultural events, learn new things.
- **Create your rest island:** It is vital to have a place where to recharge your energy to keep up a top level. Create this place at home, or in a place in nature, or just in your mind, create a place where you can be with yourself, and renew your energy.

ACTION

During action stage we consider the following aspects:

- **Decision making:** Be aware of your emotional state the minute you make your decisions, this will have a great impact on the quality of your decisions.
- **The quality of your experience:** Learn to enjoy your experiences focusing on here and now. If you really want to attain something satisfactory for you, this is the only way out.
- **Load and rest:** Learn to play the pauses properly. You cannot be in constant tension and perform for a long time. Human energy is finite; therefore, we must learn how to use it by means of the recovery stages.

CONTROL

This stage considers the following:

- **Learning from your errors:** This is much easier said than done. It is necessary to have a sound knowledge of oneself in order to correct past experiences and learn from them. It is also necessary to listen to the constructive criticism that significant others provide.
- **Celebrate your achievements:** Emotions reinforce learning, the greater the emotional element, the stronger the emotional capacity to keep in the memory. A little reward is emotionally encouraging, it will help us to look for and to store successful situations.



CONCLUSIONS

This article presents some tools to compare what is learnt and necessary on a tennis court, with the skills that are necessary in daily life. It is important to reflect on the positive teachings that can be drawn from a life on a tennis court, or learnt on court that can be applied to life. We do hope that the ideas presented here are useful for those coaches and players who are getting ready to learn and are ready to improve to get the best out of themselves.

REFERENCES

- Fernández, J.A. (2008). *Evolución en arcilla*. Santiago. Ed. Centro de Estudios del Deporte (CEDEP) Ltda.
- Fernández, J.A. (2011). *Descubre tus fortalezas*. Santiago. Ed. Centro de Estudios del Deporte (CEDEP) Ltda.

Variability during training sessions to develop coordination skills in the development of tennis players

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ABSTRACT

This article discusses a transversal methodology to develop the different coordination skills as applied to tennis. We consider this work to be relevant because of its cognitive implication for the performance of different coordination skills. The tennis player on-court, is constantly performing a series of technical activities that require different coordination skills, but he is also in a continuous process of decision making, which is constantly “contaminated” by uncertainty. It is an unquestionable reality that the specificity of the tasks involved in the training process is a key variable to its success. The specificity in the tasks is determined by the knowledge of the coach about fundamental learning and its timely sequence along the coaching process.

Key words: coordination skills, variability in training, coaching and methodology.

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INTRODUCTION

Tennis is an open skill sport: the skills are subject to the different stimuli of the environment. The learning process should be based on learning in an environment that provides all the possible stimuli to face the multiple game situations that tennis demands. The player must develop his capacity to adapt to the environment and to the stimuli that tennis training involves, and, to do so in a very short time. In this regard, coordination is an indispensable capacity to optimize a tennis player's performance (Born, 1999). Although it is true that tennis is a multiphase sport, (Koning et al, 2001), technique is considered the most important determining quality to reach top performance. This technical component, that has to do with correct execution from the mechanical point of view, needs adjustment of the different body segments in space and time, to be able to hit the ball. This way, for the correct technical execution of the movement, one of the basic biomechanical principles applied to tennis will be taken into account (Elliot, B., 2006): the principle of coordination of partial movement, that entails correct and timely participation of the body segments to perform a certain movement. This implies moving towards the ball, adjusting before hitting, hitting the ball and recovering after impact. Therefore, coordination will contribute to the necessary adjustments in the development of the other conditioning capabilities (strength, endurance, speed and flexibility) to be able to perform the technical movements as efficiently as possible, both from the mechanical and from the physiological point of view.

Variability in training and its application to tennis coaching

Variability is present in all biological systems, and was initially characterised as the changes that happen in motor performance during many repetitions of a task (Glass & Mackey, 1988). Variability is a differentiating characteristic of a person's behaviour. It must not be considered harmful for performance; it is now suggested that variability in motor execution may be beneficial for the organization and performance of the movement, and can even be a signal of endurance to the conditioning elements to that execution. From this point of view, variability can be a parameter to consider, in relation to the stability of the movement pattern. Great variability can suggest unstable movement patterns, but, if this variability is used in favour of the possibilities of action, it could result in a more efficient performance (Menayo et al., 2010). A great part of the research confirms the benefits of variability when training to increase sport

performance (Schöhlhorn et al., 2001; Rein & Simon, 2003; Jaitner & Pfeifer, 2003; Schönherr & Schöhlhorn, 2003; Beckman & Schöhlhorn, 2003; Wagner et al., 2003; Jaitner et al., 2003).

Consequently, the benefits of variability in training can be defined as the adaptation of the athlete to the variability of the intrinsic dynamics of the task by means of the application of variable loads controlled by the coach (Davids, Bennet & Newell 2006).



Foto 1. Stroke in an unstable condition.

Therefore, in tennis, coaching by variability, will provide the player an initial instability in his behaviour, but, gradually, and as long as we adapt the loads to the learning/coaching levels of the player, he will adapt and improve his response to unstable situations in such a way that the movements and actions trained will become more stable and permanent in time (Moreno et al., 2003; Davids et al., 2006).

However, as Davids et al. (2003), pointed out: to achieve stability in behaviour, variability in practice must be intermittent. This contextual interference in practice consists of exposing the tennis player to the practice of several types of strokes and/or movements, actions in different game situations in a random way. Thus, research states that this practice prepares the tennis player for his movements to be more resistant to instability since we are exposing him to continuous changes in his tasks.

Guidelines to design coordination exercises through variability during training

From the point of view of the dynamic systems, the tennis player is taken as a complex system with a capacity to adapt and is in continuous interaction with his environment (Kelso, 1995). In this context, any variation will create changes in the system and will make the tennis player adjust to the conditions of his environment. Consequently, the tennis player becomes an active information processor of the skills that must be learnt to respond to each situation.

It is then, a complex dynamic in which the tennis player is self-organized to progressively get the appropriate movement patterns to solve the motor problems he faces.

Contextual interference in training, i.e., exposing the tennis player to several types of strokes in different situations at random, prepares his movements to be more resistant to instability, by being exposed to continuous task changes that become more stable and permanent (Moreno et al., 2003). Strategies in analytical or global training (learning by parts according to Schmidt & Lee, 2005) must be applied as specific training loads depending on the errors detected in technical movements.

When designing variable training based exercises, we propose a number of guidelines for the development of coordination skills (Adapted from Moreno & Beneroso, 2005):

- To create exercises for the game conditions and coaching of the tennis player.
- To use elements that generate instability in the strokes and movements (elastic bands, bosu balance trainer,...) (Foto 1).
- To use elements that disturb the execution (balls of different weights and sizes, rackets with less strings,...) (Foto 2).
- After doing the exercises using these elements, they must be removed to evaluate their impact and they must be introduced to them again in case the movement of the tennis player returns to its previous status.
- To avoid coordination exercises that entail an important load for the player or when the player is subject to high loads of work (for ex. load or impact micro cycles).
- To consider the adapting skills of the tennis player to adjust training/ learning loads to his/her characteristics.
- The key is not to repeat the same solution over again but to develop the capacity in the players to find different appropriate solutions.

Working coordination with developing players

As Busch & Strauss (2005) pointed out, coordination is one of the most important elements to determine individual differences in sport achievement. Because of its characteristics, tennis is a complex sport from the motor point of view, since there are over 20 different strokes with different types of execution, intensity and tactical objectives and these strokes are coordinated with specific movements that have a great impact on execution. An appropriate development of coordination capabilities is key for optimal stroke performance and movement in tennis (Filipic, 2005).

In spite of the importance given to the different conditioning capabilities (endurance, strength, speed) that the tennis player has to train during this developing stage, we must also consider the

fundamental role of the development of coordination skills and work on them from the early stages, as they will be particularly important for the maturity of the nervous system.

We consider that both the coach and the trainer must stress coordination work in order to optimize the technical movement for the stroke and sprint (Forcades, 2006). We also recommend working all the coordination skills even though we may delve into the kinaesthetic and reaction capability differences which seem to be of utmost importance in tennis (see Table 1).



Foto 2. Coordination materials.

CONCLUSIONS

Finally, we suggest working variability in training from the dynamic system perspective, as a methodology for the development of coordination. It is reasonable to think that if we train different capabilities in a situation that is similar to the one the tennis player will face in front of an opponent on court, the possibility of transfer and versatility to solve problems will be much better (Fernández et al., 2012).

So, we consider that both, the coach and the trainer must lay emphasis on the coordination work in order to optimize the technical movement for the stroke and sprint (Forcades, 2006). We also recommend working all the coordination skills even though we may delve into the kinaesthetic and reaction capability differences, which seem to be the most important in our sport.

Lastly, we consider that the development of coordination is an essential element for young developing tennis players. Therefore, it should be included in the content of the programme from the first stages if we expect our players to play at a competitive level.

COORDINATION CAPABILITIES	EXERCISES	
	GENERAL	COURT
ORIENTATION	To control two lobs in the air without touching the ground.	The coach feeds balls of different colours and, the player has to send them to different areas of the court, depending on their colour.
DIFERENTIATION	To bounce a tennis ball with one hand and a basketball with the other one.	To rally with a regular ball and a mini tennis ball.
BALANCE	To kneel and stay on a Swiss ball.	To hit a forehand tied to an elastic rope at the waist (balance indicator).
RHYTHM	To jump the rope at a different rhythm.	To rally with two balls.
REACTION	To start from different positions paying attention (like in tennis) to visual, acoustic and kinaesthetic stimuli.	When the player hears "Go!" he opens his eyes and plays the ball the coach has fed.
COUPLING	To bounce two basketballs at the same time to a different pace.	To hit forehands with a weighted wrist on his free hand.
CHANGE	To gather Z balls fed by the coach to a corner.	To play on a clay court with holes, broken lines, etc.

Table 1. Suggested coordination work for developing players (Forcades, 2006).

REFERENCES

- Beckman, H. y Schöhlhorn, W. Differential learning in shot put. In W. Schöhlhorn, C.Bohn, J.M. Jäger, H. Schaper y M. Alichmann (eds.), European workshop on movement science Mechanics and Physiology, Münster (alemania), 2003. 22-24 de mayo (libro de actas).
- Born, H.P., La mejora de la forma física y de la coordinación en jóvenes tenistas. *ITF Coaches Review*, 1999(17).
- Davids, K., Bennett, S., Newell, K.M., Movement System Variability. Champaign. Illinois. Human Kinetics., 2006.
- Davids, K., Glazier, P., Araújo, D., Bartlett, R.M., Movement systems as dynamical systems: The role of functional variability and its implications for sports medicine. *Sports Medicine*, 2003. 33: p. 245 – 260.
- Elliott, B., Biomechanics and tennis. *British journal of sports medicine*, 2006. 40(5): p. 392.
- Fernández, J.; Méndez, A.; & Sanz, D. Fundamentos del entrenamiento de la condición física para jugadores de tenis en formación. Madrid. RFET. 2012.
- Filipic, A.F., T., The influence of tennis motor abilities and anthropometric measures on the competition successfulness of 11 and 12 year-old female tennis players. *Acta Universitatis Palackianae Olomucensis Gymnica*, 2005. 35(2): p. 34 – 35.
- Forcades, J., El entrenamiento integrado en el tenis. Planificación del Centre de Tecnificacio Esportiva de les Illes Balears. Conferencia en las Jornadas de Tenis de la Academia Sánchez-Casal., 2003.
- Glass, L. y Mackey, M.C. From clocks to chaos: The rhythms of life. Princeton, New York: Princeton University Press. 1998.
- Jaitner, T. y Pfeiffer, M. Developing jumping strength based on systems dynamics principles. In W. Schöhlhorn, C. Bohn, J.M. Jäger, H. Schaper, and M. Alichmann, (eds.), European workshop on movement science Mechanics and Physiology, Colonia, 2003. 31 mayo-2 junio (libro de actas).
- Jaitner, T., Kretzschmar, D. y Hellstern, W. Changes of movement patterns and hurdle performance following traditional and differential hurdle training. In E. Müller, H. Schwameder, G. Zallinger, and V. Fastenbauer, (eds.), 8th Annual Congress of ECSS, Salzburg, 2003. 9-12 julio (libro de actas).
- Kelso, J., Dynamic Patterns: The self Organanisation of brains and behavior. Cambridge, MA. MIT Press., 1995.
- König, D., et al., Cardiovascular, metabolic, and hormonal parameters in professional tennis players. *Medicine & Science in Sports & Exercise*, 2001. 33(4): p. 654
- Moreno, F., Ávila, F., Damas, JS., Garcia, JA., Luis, V., Reina, R., Ruíz, A., Contextual interference in learning precisión skills. *Perception and Motor Skills*, 2003. 97: p. 121 – 128.
- Moreno, F., Variabilidad, adaptación y aprendizaje de habilidades cerradas. I Congreso de la Sociedad Española de Control Motor. Melilla., 2006.
- Moreno, F.J y Beneroso, F. Criterios metodológicos en el trabajo de la técnica basados en el Síndrome General de Adaptación. *Revista electrónica RFET E-Coach*. 2009. 5, 1-14.
- Moreno, F. J.; Ordoño, E. M. Aprendizaje motor y síndrome general de adaptación. *Motricidad. European Journal of Human Movement*, 2009. 22, 1-21
- Rein, R. y Simon, C. Influence of technique variation training on technique variability in long distance running. In N. Balagué (ed.), Proceedings of the 1st Meeting of Complex Systems and Sports, Barcelona, 2003. 14-17 de mayo (libro de actas).
- Schmidt, R.A. & Lee, T. (2005). Motor Control and Learning. A behavioural emphasis. Illinois. Human Kinetics.
- Schöhlhorn, W., Röber, F., Jaitner, T., Hellstern, W. y Käubler, W. Discrete and continuous effects of traditional and differential sprint training. 6th Annual Congress of the European College of Sport Sciences Colonia, 2001. 24-28 de julio (libro de actas).
- Schönherr, T. y Schöhlhorn, W. Differential learning in basketball. In W. Schöhlhorn, C.Bohn, J.M. Jäger, H. Schaper, and M. Alichmann (eds.), European workshop on movement science, Mechanics, and Physiology, Münster (Alemania), 2003. 22-24 de mayo (libro de actas).
- Wagner, H., Müller, E., Kösters, A., Von Tscherner, V. y Brunner, F. Optimization of complex movement patterns (handball throw) motor development and the variation of kinematic and EMG parameters. In E. Müller, H. Schwameder, G. Zallinger, and V. Fastenbauer (eds.), 8th Annual Congress of the ECSS, Salzburg, 2003. 9-12 de Julio (libro de actas).

The psychology of teaching tennis to persons with an intellectual disability

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ABSTRACT

This paper reviews a tennis program for persons with an intellectual disability conducted at Victoria University in Australia. Key principles associated with successfully coaching this special population of athlete are highlighted reinforcing the notion that 'coaching is coaching' irrespective of the target group. Practical suggestions for coaches working with persons with an intellectual disability are offered.

Key words: coaching, intellectual disability, tennis

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INTRODUCTION

As part of its Adapted Physical Education program, Victoria University recently trialed the introduction of tennis to a group of persons with an intellectual disability. This paper reviews this initiative including details of the program, its findings and recommendations. In doing so it is hoped the guidelines developed from the experiences of the coaches in this program may be assistance to other coaches looking to widen their horizons and target the oft-neglected persons with an intellectual disability (CAC, 2005; Mcdowell et al., 1989).

THE PROGRAM

At the Footscray Park campus of Victoria University, a weekly multi-sport activity morning of 90 minutes was conducted for 18 (9 male and 9 female) persons with an intellectual disability (predominantly persons with Autism and Downs Syndrome). These persons ('clients') attended two local special schools and were aged between 12 and 18 years. The sessions were conducted in a large gymnasium on site at the university where clients were paired with a Third Year Victoria University student ('coach') who was enrolled in the Adapted Physical Education unit of study. Each coach was paired with one client to work together for the duration of the series of 10 sessions. Clients were attended by two carers from each school who 'doubled' as their bus drivers to and from the university.

The activities conducted during the series of sessions focused on the development of key fundamental motor skills and included such activities as shooting basketballs, playing t-ball and cricket, skipping, throwing bean bags into buckets, dance routines and rolling balls and hoops. In response to a number of requests from the clients, their carers and coaches, it was decided to introduce tennis as one of the activities and gauge its popularity and benefits. Access to modified tennis equipment was not a concern given the university had been fortunate to secure a large number of modified racquets, multi-coloured low compression balls and portable nets from TennisVic (governing body of tennis in Victoria) for another of its adapted program (tennis for deaf children) (Young, 2007).

In brief, the weekly schedule followed a similar format each week, namely:

- 10am. Greet client. Group warm-up activity (e.g., Follow the Leader, Captain's Treasure).
- 10.15am. One-on-one session coach and client.
- 10.50am. Morning tea break (taken together with coach and client).
- 11.05am. Resumption of one-on-one session coach and client.
- 11.20am. Group warm-down activity (e.g., throwing and catching plastic balls on a large multi-coloured Parachute).

- 11.30am. Farewell to clients. Coach debriefing session.
- 11.45am. Conclusion of morning session for coaches.

To assist coaches in conducting the sessions, a weekly series (12) of lectures on adapted coaching topics were given. These topics included barriers to participation for persons with a disability, legal and ethical considerations for inclusion and planning lessons for persons with a disability.

Pairings of a coach with a client were made at the beginning of the first session in consultation with the client's carer and took into account any special request e.g., male client worked best with male coach. These pairings then remained the same throughout the series of sessions (although sometimes changes were required if a client or coach was absent for some reason [eg., medical, family] from a particular session).



Prior to each session with the client, coaches were required to prepare a lesson plan under the guidance of a qualified tennis coach experienced in working with persons with a disability. This qualified coach supervised the sessions each week and was available to work with coaches to answer any questions prior to, during, and after the sessions. As noted above, at the conclusion of each session, all coaches attended a de-briefing session to share experiences and exchange ideas as to what worked, why it worked, what changes were required and discuss any other challenges faced in conducting the session. After each session, and at the conclusion of the series of sessions, coaches were asked to report on what they considered to be

important considerations in working with persons with an intellectual disability and what insights they as coaches had gained. A series of inductive content analyses was conducted to analyse coaches' responses.

Key Coaching Considerations

The analyses of data revealed a number of key themes were considered important in coaching persons with an intellectual disability. These themes and representative quotes are presented in Table 1.

KEY THEMES	REPRESENTATIVE QUOTES
Ensure a safe and inclusive environment	Sometimes in their excitement they would swing the racquet around not aware of the danger of hitting someone behind them.
Make it fun <ul style="list-style-type: none"> • Variety of activities • Use of colour (hoops, cones, balls, balloons etc) 	Participation is what's important so it must be fun. Using colourful equipment can help to get players motivated and involved.
Adopt a player-centred approach	The lesson needs to be designed around what the client can do rather than cannot do.
Think about Communication <ul style="list-style-type: none"> • Take time • Keep instruction/ demonstration simple • Repeat • Provide feedback 	Keep verbal instructing to a minimum using only short concise words. Lots of demonstrations of what you want your player to do. Small achievable and realistic steps are best.
Plan Lessons <ul style="list-style-type: none"> • Short activities • Breaks • Fundamental motor skills 	Plan for plenty of breaks during the lesson as players get tired, thirsty and may need to go to the bathroom. Attention spans are generally low so activities need to be short.
Be flexible and adapt	I need to have a lot of additional activities to suggest and need to adapt my approach when my player gets frustrated, fatigued or over excited.
Ensure challenges are appropriate	Players need a sense of achievement so they want to attend the program. To see them smile when they get to a goal or complete an activity correctly is so worthwhile,
Routines and structure are helpful	Following the same routines and format each time makes the client feel comfortable and at ease.
Ask when in doubt	If a client appears to be distressed carers should be asked about medication as they know his special needs.
Take a genuine and respectful interest	They need to feel they are participating just like everyone else and that their achievements are worthy of your praise not pity.

Key Coaching Themes and Representative Quotes. .

CONCLUSIONS

The program's findings support the notion that 'tennis is a sport for everyone'. There is no question that all who participated in the program, including clients, coaches and carers, found it to be a positive experience. But was it a different experience because the clients had an intellectual disability? In some ways it was, in other ways not. Coaches were challenged because it was a new target group for most and this specific target group required coaches to pay particular attention to their communication and planning skills to address the generally shorter concentration spans, poor memory recall and restricted abilities to easily process information of their clients. Notwithstanding this consideration, most challenges faced by this program's coaches were similar to those faced by any coach when taking on new clients. Abilities and interests of clients needed to be determined, a safe, fun and inclusive learning environment had to be provided, lessons needed to be planned and establishing trust and rapport between coach and client was critical. So based on our experience, what are some of the practical suggestions for coaches working with persons with an intellectual disability?

Suggestions for Coaches

1. Come to lessons with a smile, enthusiasm, open mind and keenness to learn as a coach – remember it is all about possibilities, abilities and potential rather than disabilities. Working with persons with an intellectual disability is a wonderful opportunity to improve your own coaching skills. The best teacher is 'experience' so pay attention to this opportunity to learn what needs to be done to fulfill your own coaching potential.
2. Focus on safety and fun - throw away the idea that it is all about skill development because, paradoxically, this will most likely to be achieved when clients are having fun and feeling safe and secure. This requires detailed planning by coaches of activities and the environment (i.e., court, playing areas and facilities) prior to conducting lessons.
3. Take an individual approach – just as all right handed tennis players do not play the same style of game, not all persons with an intellectual disability (or persons within a specific 'classification' such as Autistic) are the same. Treat the person as an individual and seek to understand them as a unique human being. For example, what do they know about tennis, have they played tennis before and what would they like to achieve from the lessons? The best person to answer these questions is the client him/herself but, if in doubt, you might ask the carer who generally accompanies the client.
4. Use a wall if available – hitting against a wall can be such good fun. Adopt a creative approach to not just hit directly to the wall but hit to the ground first before hitting the wall, hit to targets on the wall, hit and catch off the wall etc. There are endless fun activities that can be done around using surrounding props if court area or space is restricted!
5. Embrace colour in activities – hitting coloured balloons remains a favourite as it is engaging, fun and confidence boosting. Balloons are easier to hit than low compression tennis balls and require no net or marked playing areas. Hitting balloons, or coloured low compression tennis balls off coloured cones and through hoops also works well to motivate and encourage participation.
6. Monitor your client - change and adapt activities, game rules and equipment as required and do not be hesitant to take a break. This can be valuable time to build rapport with your client. It is not all about all about playing tennis according to the rule book but rather seeing what can be achieved both on- and off- the court. As such, achievements extend beyond fundamental motor skills and hitting tennis balls and embraces relationship and socialisation skills.
7. Take a genuine interest in your client – turn off the mobile phone and give your client your full attention! He/she is your sole focus for the lesson so look them in the eye when speaking, ask questions, check understanding and seek feedback.



In closing, it is hoped that in sharing our experience will re-enforce for coaches that adhering to good coaching principles is important across all target groups (Young, 2010). Tennis coaches do not require specialist training to work with persons with an intellectual disability. What is however important is that coaches embrace, and demonstrate, a genuine love of teaching tennis to all those interested in playing. Many times this will require coaches to move out of their comfort zone and look for groups of persons who appear to be less fortunate in life than others.

Coaching special groups of persons can be most rewarding for all as we discovered at Victoria University. Our program was a winner! And as they say, 'do not change a winning game', so we look forward to building on the insights we gained in conducting the initial program. In doing so we are reminded of advice offered some 25 years ago,

Persons with disabilities need what every individual needs – respect, encouragement, satisfying experiences, and the opportunity to develop his or her abilities (Young & Browne, 2009)).

REFERENCES

- Coaching Association of Canada (2005). Coaching athletes with a disability. National Coaching Certification Program, Canada: Investors Group
- McDowell, W.A., Bills, G.F., & Eaton, M.W. (1989). Extending psychotherapeutic strategies to people with disabilities. *Journal of Counseling and Development*, 68(2), 151-154.
- Young, J.A. (2007). Coaching players with a disability. *ITF Coaching and Sport Science Review*, 41, 14-15.
- Young, J.A. (2010). The state of play: Coaching Persons with Disabilities. *ITF Coaching and Sport Science Review*, 50(18), 9-10.
- Young, J.A. and Browne, A. (2009). Teaching tennis to deaf children: A review of an Australian-based program. *ITF Coaching and Sport Science Review*, 49, 5-7.

Women's tennis: training methodology and evolution so far

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ABSTRACT

This article discusses the methodological treatment of tennis as a sport, its different methodologies in history, and their pros and cons. It also includes some statistic data related to the methodology used in current tennis training, and analyses intensity and volume guidelines as well as recovery and other didactic related aspects.

Key words: Tennis, methodology, decision making, modelled training, practice.

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METHODOLOGY: HISTORICAL BACKGROUND

During the early 40's tennis teaching methodology was characterized by its global nature. The coach used to show and perform the stroke, while the student would only reproduce the movement, always followed by a verbal explanation. The student would then perform many repetitions to get an execution as close as possible to that of his/her coach. This methodology was closed in nature. Under no circumstances could the player participate, because everything had been pre established. Once the technique was incorporated, tactical learning would begin.

The second stage, which can be called analytical, lasted from the 50's to the 80's. It was at that time that the analytic method began to be used. It consisted of dividing the technical movements into several sequences. The coach would show each sequence of each technical movement and the students would copy them. Once they had a full command of all the parts of the technical movement, they were grouped until they had learned the global movement. In a nutshell, the problem of this method is that it has little relation with reality, there is little probability for the students to participate in the teaching-learning process. The fact that the individual aspects and characteristics of each player are not taken into account, since they are all treated and taught in the same way.

Current methods are based on observation of real match situations, and we realize that many players play very well during training, but are not able to do so during real match play. A possible cause for this phenomenon might be the lack of transference of the knowledge learned during training to real game situations. Current methods are fully developed in the next section of this article.

ACTIVE AND PARTICIPATIVE METHODOLOGIES IN TENNIS

Thorpe et al. (1983) consider it necessary and indispensable to have a good understanding of the game, to know its fundamentals and, in order to improve, it is important to put tactics before technique. They state that: "It is necessary to develop a tactical awareness and decision making process in the students, always anticipating the technical execution factors, that is to say, technique must be subject to tactics." If the coach can apply a methodology that is based on the real game, it will help the students to have an extra motivation that will facilitate the transfer to the real game.

Similarly, Crespo (1993) says that with traditional methodologies players get a command of technique in closed situations. The problem starts with an open sport, with a variable environment, in this case, decision making is key.

Bunker & Thorpe (1986), who centre sport teaching on understanding the nature of the game, and on the decision making process, consider that understanding and knowing the game, together with tactics, must precede technique. That is why it is important to create real game situations. This kind of work increases motivation. Cooke (1999, quoted by Crespo 2007), is in agreement with this mentality when he says: "you only understand something when you are able to put it in practice in different situations and in varied contexts".



Elderton (2008), suggests situation training with a playful perspective at all times. Learning technical movements is key to this methodology, but they must never be learnt in isolation as the learning of the technique alone will be too weak.

As to the open methodology, Dent (quoted by Crespo, 1999) states that open methodology entails more interest on the part of the player because it is centred on the global aspect of the game.

Stojan (1988), states that this training is nothing but the simulation of the atmosphere of a real match. On the other hand, Schonborn (1989) indicates that training must always be as similar to competition as possible.

Likewise, Budó (2009) highlights the importance of a totally globalized practice that takes the training situations as close as possible to the real situations of the game. The length and time of recovery from the exercises must be similar to that of real times of the game. Even Jofre

Porta, former coach of Carlos Moyà, called his academy Global Tennis just for the fact that he believes in the global work of all four tennis components.

Finally, Campos (2009) differentiates two teaching models in current tennis: on the one hand, the traditional model based on the characteristics of analytical methodology giving priority to the technique and on the other hand the active model or active pedagogy that gives priority to discovery based teaching and encourages players to make decisions.

RESEARCH: METHOD AND RESULTS

An interview of 28 top performance tennis coaches was prepared. Results were statistically analysed with the SPSS 15.0 programme.

The first methodology related question of our study was asked in order to distinguish if coaches of women players who participated in the investigation worked with the same intensity, volume, and recovery guidelines during training and in competition.

17,86% did not pay too much attention and, finally, 14,28% include the ones who did not pay attention and those who paid some attention depending on the time of the season.

Figure 3 summarizes the results of the question if coaching is an integral whole or each component is independent.

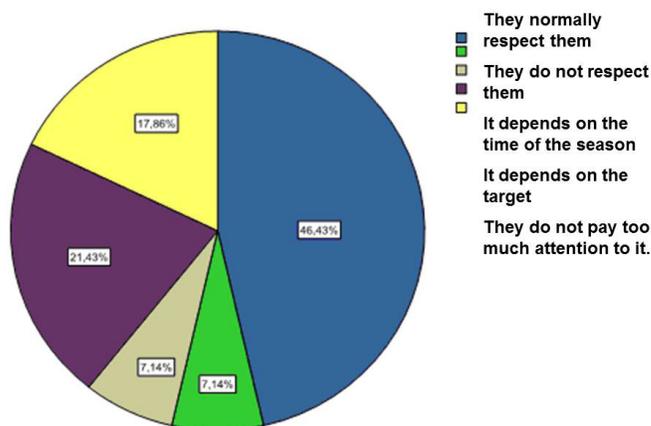


Figure 3. Is training integral or is it not?

39,29% of the coaches prefer integral coaching. 17.86% occasionally work integrally. There is a similar percentage of those who work technique and tactics together. Then, 14,29% work with each component separately.

Finally, there is a relationship between two variables: the type of coach and participation of the players in the coaching process.

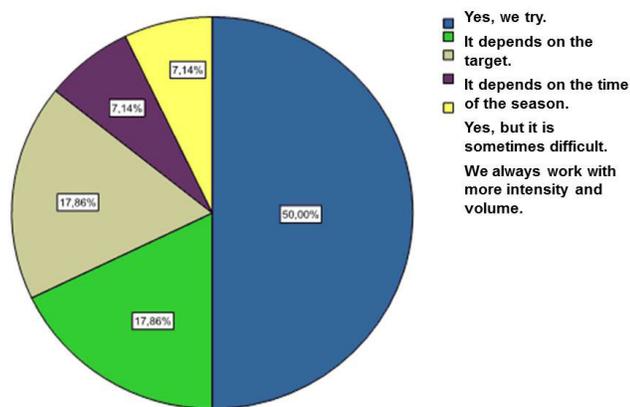


Figure 1. Do you train with the same intensity and volume as in competition?

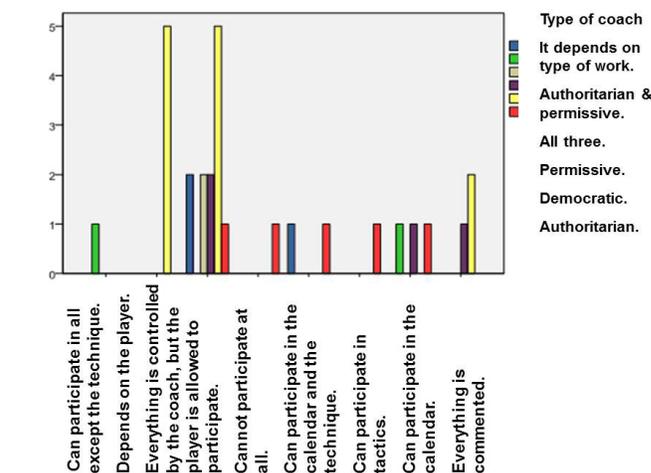


Figure 4. Correlation between the type of coach and the degree of active participation of the players.

We notice that the democratic coach normally keeps control over the process, always offering the players the possibility of active participation, depending on their degree of maturity.

CONCLUSIONS AND DISCUSSION

Half of the coaches involved in the study respect, during coaching, the parameters of intensity, volume and recovery that real competition demands. This conclusion is in line with the studies made by Ripoll (1989) and Fuentes et al., (2003).

A little more than one third of the coaches in our study work globally, that is to say, dealing with all four components as a whole. This conclusion is supported by Schonborn (1983), Stojan (1988) and Balaguer (1996).

Figure 2. Recovery guidelines

50% of the coaches try to respect intensity and volume parameters. 17,86% state that they bear them in mind depending on the target and on the time of the season. 7,14% always apply high intensity and volume. Finally, 7,14% try to do it but find it hard.

Figure 2 shows the results of the second question in the investigation, training women respecting recovery guidelines.

46,43% state that they intend to respect recovery guidelines as close to reality as possible, 21,43% respect them in relation to the target;

The democratic approach is the most common among the coaches in our study. Besides, there is a significant relationship between the coach and his greater desire to have his player participating in his/her own learning process. The ideal approach consists of sharing decision making between the player and the coach. This result is supported by Fuentes et al., (2003), Lorenzo (1997) and Garcia (1987).

We hope the results of this research contribute to a better knowledge of the characteristics and needs for coaching female tennis players.

REFERENCES

- Balaguer, I. (1996). "Entrenamiento psicológico en un grupo de competición femenino de tenis". Revista Apunts EF i Sport, nº 44-45, 143-153, Barcelona.
- Budó, X. (2009). Entrenamiento específico de tenistas. Simposium de tenis femenino. Oviedo (Asturias), RFET.
- Bunker, B., & Thorpe, R. (1986). The curriculum model. In R. Thorpe, Bunker, D., & Almond, L (Ed.), Rethinking games teaching (pp. 7-10). Loughborough: University of Technology, Loughborough.
- Campos, J. (2009). Metodología de la enseñanza a iniciantes. Clínica en las instalaciones del Club Tenis Barcelona. Torneo "Compte de Godó". Abril.
- Crespo, M. Andrade, J C & Arranz, J (1993a). La técnica del tenis". Tenis II. RFET – COE. Madrid, 1- 3.
- Crespo, M, Andrade, J C & Arranz, J (1993). "La táctica del tenis". Tenis II. RFET – COE. Madrid, 1- 3.
- Crespo, M (1996). "Nuevas estrategias en la enseñanza del tenis. El descubrimiento guiado y la resolución de problemas aplicados al tenis". Taller centroamericano de entrenadores. Guatemala. www.miguelcrespo.net
- Crespo, M. (1999). "Conceptos importantes para la enseñanza del tenis" III Simposium Internacional APE tenis. España. Club de tenis Valencia.
- Crespo (1999) Métodos de enseñanza modernos y clases programadas para jugadores intermedios según el enfoque basado en el juego. Revista Stadium p:56.
- Crespo, M. (2002). "Evolución de la metodología en la enseñanza del tenis". www.miguelcrespo.net
- Crespo, M. (2007). "Consideraciones sobre los padres – entrenadores". www.miguelcrespo.net
- Crespo, M. (2007). "Implicaciones psicológicas de las nuevas metodologías de la enseñanza del tenis". www.miguelcrespo.net
- Del Campo, V.L. (1996). Influencia del entrenamiento perceptivo basado en la anticipación, sobre el comportamiento visual y la respuesta de reacción aplicada al tenis. Tesis doctoral. Universidad de Salamanca.
- Del Villar, F. & Fuentes, J.P. (1999). "Las destrezas docentes en la enseñanza del tenis". Interamericana de España. www.efdeportes.com/efd145/la-evolucion-historica-del-tenis.htm.
- Elderton, W. (2008). Situation training: key to training in a game-based approach, ITF CSSR., 44, 24-25.
- Fuentes, J.P. (1999). Entrenamiento integral en el tenis de competición. En D. Sanz y P. del Río (coords.) *Actas del Congreso Nacional de Tenis: "Entrenamiento en alto rendimiento"*, Universidad de la Rioja, Área Docente de la Real Federación Española de Tenis (ENMT), pp. 23- 38.
- Fuentes, J.P., Sanz, D., Ramos, L.A., Julian, J.A., & Del Villar, F. (2003). "La relación de los entrenadores de tenis de alta competición con su contexto social profesional: influencia en el rendimiento deportivo del tenista" Revista digital www.rendimientodeportivo.com
- Lorenzo, M. (1988) "Operativización de objetivos", en W. AA., *Didáctica general*, Madrid, Anaya. (Textos Universitarios), pp. 85-107.
- Ripoll, R. (1998/99). "Tennis i dona". Centre d'estudis Olímpic. Universitat Autònoma de Barcelona. Treball dins de l'assignatura Campus: Esport, Olimpisme i Cultura Contemporània i tenis y su legado pedagógico.
- Schonborn, R. (1989). "Nuevos test y estudios sobre el entrenamiento en tenis: principios fisiológicos", en N Simposium Int. Prof. Enseñanza. Granada, 1989, Madrid, Real Federación Española de Tenis, Escuela Nacional de Maestría de Tenis, pp. 223-239.
- Stojan, S. (1988). "Ejercicios de entrenamiento modelado", en Simposium Europ. Tennis Assoc. (ETA). Madeira, 1988, Madrid, Real Federación Española de Tenis, Escuela Nacional de Maestría de Tenis, pp. 26-36.
- Thorpe, R., Bunker, D., & Almond, L. (Ed.). (1986). Rethinking games teaching. Loughborough: University of Technology, Loughborough.

Recommended books

ITF GUIDE TO RECOMMENDED HEALTH CARE STANDARDS FOR TENNIS TOURNAMENTS

Author: ITF. Language: English, French and Spanish. Type: 36 page booklet. Level: All levels. Year: 2012.

Tournament directors should be prepared for medical emergencies and evacuations in case of disasters. The ordinary standard of care does not require a tournament director to be trained in emergency medical care. However, common sense suggests that tournament directors should be prepared for medical emergencies and evacuations in case of disasters. This pamphlet outlines guidelines for emergency care practices that should be implemented by tournament directors, and provides recommendations for a minimum standard of medical care required at tournaments. If you would like to download the minimum health care guidelines for professional tournaments file, please go to: <http://beta.itftennis.com/scienceandmedicine/health/healthcare-guidelines.aspx>

Hard copies of these pamphlets can be obtained upon request by email to: scienceandmedicine@itftennis.com



Federico Di Carlo

IL CERVELLO TENNISTICO

Come la mente influisce sui tuoi risultati



IL CERVELLO TENNISTICO (THE TENNIS BRAIN)

Author: Federico di Carlo Language: Italian. Type: 334 page book. Level: Advanced and high performance. Year: 2011.

This book explains how the mind influences the results of the tennis player. It introduces the brain as the key aspect in the integration between body and mind. It emphasises the identification of the mental obstacles in tennis with an in depth analysis of the mental-emotional-behavioural loop. Aspects such as the education of the young tennis player through mental coaching and training as applied to the real match situation are extensively covered. It follows the tenets of the modern scientific theories that apply the neuro behaviour of the brain during performance tennis. By providing useful information, tips, exercises, and advice on how to train the brain to optimize performance on and off court, this resource can be excellent for players as well as coaches and parents.

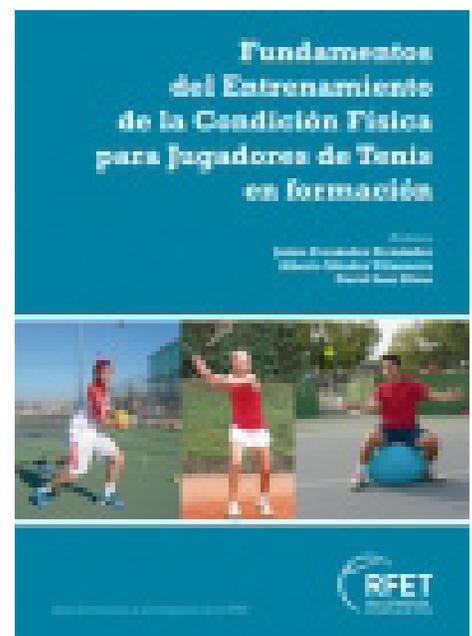
For more information contact: federicodicarlo@tennismentalacademy.com

FUNDAMENTALS OF THE PHYSICAL CONDITIONING TRAINING FOR DEVELOPING TENNIS PLAYERS

Authors: J. Fernández, A. Méndez, D. Sanz. Language: Spanish. Type: 205 page book. Level: Intermediate. Year: 2012

This book is a reference manual for all coaches and physical conditioning tennis specialists working with developing tennis players. The manual summarises the latest research and practical experiences available in the field of tennis specific physical conditioning training geared towards developing players. The book covers topics such as the demands of competitive tennis, the influence of training in the growth and development of the young tennis player, the aerobic performance, the anaerobic performance, power, speed and agility, the coordination qualities, the prevention of injuries in the developing player, flexibility, physical conditioning assessment and evaluation, as well as practical applications of all topics covered.

For more information, please contact: <http://docencia.rfet.es/>



ASPIRE TENNIS: CELEBRATING TENNIS AT THE OLYMPICS 2012

Author: ITF. Editor: Emily Forder-White. Language: English. Type: 140 page book. Level: All levels. Year: 2012

Thirty-six of the world's leading tennis players take part in the ITF project to help promote the 2012 London Olympic and Paralympic Tennis Events. The Olympic Book was launched at Wimbledon and an online version was posted on the website for the start of the Games.

This publication features a series of specially commissioned photographs of the game's top names posing with pictures of themselves as a child and talking about their sporting heroes. The book looks at which athletes inspired them when they were younger and even includes good luck messages from Olympic legends such as Usain Bolt, Sergey Bubka and Cathy Freeman. Among the stars represented in the book are Beijing bronze medallist Novak Djokovic, who nominated Italian skier Alberto Tomba as his hero; Britain's Andy Murray, who picked US track and field star Michael Johnson; Olympic champion Rafael Nadal, who talks about his memories of the Barcelona 1992 Olympics; Victoria Azarenka, who selected pole vaulter Bubka; and wheelchair tennis legend Esther Vergeer, who talks about Dutch swimmer Pieter van den Hoogenband. Several players have nominated other tennis stars as their heroes, including Olympic doubles winner Roger Federer, who chose the 1992 Barcelona champion Marc Rosset as his hero, while Federer himself was selected by Japan's Kei Nishikori; and Beijing bronze medallist Vera Zvonareva, who picked 2000 Sydney champion Yevgeny Kafelnikov. Newcomers to the Olympic Tennis Event such as Kim Clijsters, Juan Martin del Potro and Jo-Wilfried Tsonga also share their childhood memories, inspiration and ambitions for this summer's Games.

Aspire, Inspire follows in the footsteps of the highly successful ITF publication Journey to Beijing that was produced for the last Olympic Games in China



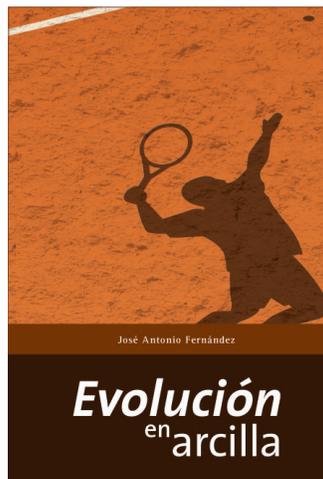
EVOLUTION ON CLAY AND DISCOVER YOUR STRENGTHS

Author: José Antonio Fernández. Language: Spanish. Type: 108 and 130 page books. Level: All levels. Year: 2009 and 2011/2

These two books are written by former ATP Chilean player J.A. Fernández. Both books are the result of his years as a professional tennis player and coach and as a mental coach. The ideas are packaged in a scheme to avoid the reader learning through the "trial & error" process by which the author went through. This method took the author considerable time and energy to develop since it emphasises the practical implications and applications of the professional experiences of the author. The main principle of the books lies in the idea that work in one's wellbeing will improve one's self-image and respect. This value is essential to make a positive contribution to the environment in which the person interacts.

Throughout both books it is possible to understand how much the game of tennis has in common with life itself and how the improvement and evolution of the person...and the player, is a journey, not an end in itself. By reading these books, it is easier to understand how success is a state of mind.

For more information on these books, e-mail to: cedep@cedep.cl



ITF BIOMECHANICS OF ADVANCED TENNIS (KINDLE EDITION)

Author: Miguel Crespo, Bruce Elliott, Machar Reid. Language: English. Type: E-Book. Level: Advanced. Year: 2003.

ITF biomechanics of advanced tennis provides a detailed analysis of stroke production and mechanical implications specific to the tennis player. Complete with theoretical information and practical examples from some of the tennis world's leading biomechanists, this ITF publication reflects the ITF's ongoing role in making available the most up-to-date tennis-specific information to players and coaches worldwide. As a tennis coach ITF Biomechanics of Advanced Tennis is essential reading and will help make tennis players' training programmes more specific, enjoyable and effective.

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COACHING

ITF Regional Coaches Conference by BNP Paribas

Conference Information Here

UPCOMING COACHING COURSE WORKSHOPS

7 - 10 November ITF Asian Regional Coaches Conference by BNP Paribas - Bangkok, Thailand

13 - 24 November ITF100 Advanced Coaches Course (Level 2)- Tel Aviv, Israel

Click here to view the full course and workshop calendar and to view further information

PLAY+STAY SERVE RALLY SCORE

ITF

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TENNIS IS EASY, FUN & HEALTHY

The Rules of Tennis have changed!

From 1st January 2012 the Rules of Tennis will change and it will be mandatory for competition for players aged 10-and-under to be played with slower Red, Orange and Green balls on the appropriate sized courts. The traditional Yellow ball will no longer be permitted for 10-and-under competition.

ITF tennis.com

DEVELOPMENT

ITF Development Links

Grand Slam Development Fund Olympic Solidarity

GRAND SLAM DEVELOPMENT FUND

The next GSDP Committee meeting will be held 07 August 2012. All applications must be submitted by 01 August 2012.

ITF Development Programme - Annual Report 2011 published online

(24 May 2012) The ITF Development Programme, a publication providing a funding breakdown of the various projects supported by the Development programme of the ITF and the Grand Slam Development Fund, is now available online...

Upcoming Development Events

5 July - 12 August: South American 14 & Under ITF/GSDP Team in Europe, France, Netherlands, Germany & Belgium

5 July - 12 August: Asian 14 & Under ITF/GSDP Team in Europe, France, Netherlands, Germany & Belgium

Click here to view the full events calendar and to view further information

tennis 10s PLAY+STAY

THE RULES OF TENNIS HAVE CHANGED - IN EFFECT FROM 1st JANUARY 2012 -

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CoachTrue - Elite

CoachTrue - Computer-based anti-doping learning tool

In order to cater to the various learning styles and demanding schedules of coaches, WADA has created CoachTrue.

STMS Congress Announcement 2013



13th STMS
World Congress of TENNIS MEDICINE
"Meet the Expert"

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21-23
FEBRUARY
2013

Buenos Aires - ARGENTINA

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Buenos Aires - ARGENTINA

13th STMS WORLD CONGRESS OF TENNIS MEDICINE

Welcome to Buenos Aires 2013!

The STMS Board has provided for the first time, the organization of the highest educational event to a Latin American country. ... [\[more\]](#)

Dr. Luis Múscolo appointed Honorary President of the Congress

The Organizing Committee appointed Dr Luis Múscolo as Honorary President... [\[more\]](#)

COSAT to endorse the 13^o STMS World Congress.

The South American Tennis Confederation (COSAT) granted the institutional endorsement to the 13^o STMS ... [\[more\]](#)



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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

ITF Coaching and Sport Science Review is published tri-annually in the months of April, August and December.

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

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