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Editorial

The ITF Coaching department is proud to welcome you to the historic 50th issue of which will find articles from authors who have had a close association with the journal for many years and have published before within their various chosen fields. The articles summarise advances made in the world of tennis since the first issue of ITF Coaching and Sport Science Review in April 1993.

In 1993 the journal was called ITF Coaches Review. Created as a direct result of the ITF Coaches Commission, its main goals were to publish tennis specific sport science and tennis coaching material that could assist coaches with the training of all levels of tennis players, to act as a forum for new research in tennis, to become a publication with the most up-to-date tennis research and to reach both the performance coaches and those working with other levels of players in the ITF member nations around the world.

Since its launch 17 years ago, the ITF have published over 500 articles from contributors of more than 35 different nationalities. Popular areas of research have included psychology, biomechanics, conditioning, physiology, coaches education, player development, and periodisation. The various topics are authored by experts in their fields, including Davis Cup and Fed Cup captains, professional players, sport scientists and doctors. The ITF Coaching Department would like to acknowledge the members of the editorial board and the Coaches Commission, past and present, who have made the journal such an outstanding periodical.

The ITF Coaches Review started off in 1993 with 2 biannual issues and printed as a magazine in only the English language. Today the review is available free of charge in all 3 of the official ITF languages (English, Spanish and French), with three issues a year being produced, one being a specific monographic issue. It is currently available worldwide on the ITF coaching weblet and searchable within many of the most renowned academic databases. The review is used within the ITF recommended coaching syllabus and provides some of the core reading at universities with sport and health related courses.

The ITF will continue to use the review to disseminate the most important tennis specific information and research and we hope that the next 50 issues will be as informative and as important as the past 50 issues in the development of our great sport of tennis and the improvement of coaching worldwide.

Coaches who are interested in the Regional biannual Coaches Conference should approach their National Associations who will shortly be receiving detailed information regarding the conferences. More information will be included in www.itftennis.com/coaching. The ITF Regional Coaches Conferences are conducted in partnership with Olympic Solidarity and the Regional Associations (ATF, COSAT, COTECC, and CAT) and the tentative dates for the Regional Coaches Conferences are as follows:

- Central American & Caribbean - Puerto Vallarta, Mexico, 20-24 September
- Asian - Subic Bay, Philippines, 1-7 November.
- African - Pretoria, South Africa, Tentative dates 18-21 September.
- South American - Mar del Plata, Argentina, 4-10 of October
- North African - Argelia, Algeria, 5-9 of October

We hope you enjoy edition 50 of the ITF Coaching and Sport Science Review, and welcome your comments on any of the information published in the Review either to the editors or to the specific article author whose email has been provided.



COACHES REVIEW

Spring 1993



Welcome to the first issue of ITF Coaches Review. This brand new ITF publication contains material that we believe can assist coaches with the training of elite young tennis players. This issue features articles from Australia, Canada, Germany, Sweden, Britain and the United States. Over the past decade, developed tennis nations such as these have conducted a great deal of research into specific tennis areas. As a result, the application of sports sciences (biomechanics, physiology, psychology etc.) has played an important role in the development of many top young players. We are pleased that the coaches and National Associations conducting this research have agreed to share their findings with their colleagues from around the world through the ITF Coaches Review.

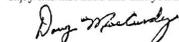
The ITF Coaches Review is a direct result of the formation of the ITF Coaches Commission. The Commission, comprising nine international experts, held its inaugural meeting last September during the US Open. The primary functions of this new Commission are to advise the ITF on matters related to coaching, recommend topics for future research and to review new research in tennis. The members of the Commission are: Charles Applewhite (UK), Tim Gullickson (USA), Carlos Kirmayr (Brazil), Pierre Lamarche (Canada), Alberto Riba (Spain), Lynne Rolley (USA), Richard Schonborn (Germany), Masaru Uchiyama (Japan) and Ron Woods (USA).

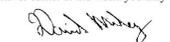
At its first meeting, it was recognised that it is difficult and often impossible for coaches from many nations to obtain tennis specific sports science material. Research in this area is usually printed in books and magazines in large nations such as the United States, Germany or Australia. For various logistical reasons, this information does not reach the coaches in many ITF member nations.

The Commission proposed that the ITF Coaches Review be created to act as a forum for new research in tennis. In the first issues we intend to publish research that is already in existence. However, in the long term, we hope that coaches from all over the world involved in research will submit articles regularly for publication. The members of the Commission will review the material submitted and decide if it warrants inclusion in the Coaches Review. In time, we believe that the ITF Coaches Review will become the publication with the most up to date tennis research, and will be distributed by the ITF to performance coaches around the world.

In this issue you will also see details of the 8th ITF Worldwide Coaches Workshop which will be hosted by the USTA in Key Biscayne, Florida in November. This unique event will once more see a gathering of the coaching fraternity from around the world to exchange ideas and learn of new developments in coaching tennis. Each nation is limited to four participants who must be endorsed by their National Association. We hope to see you there.

Finally, we would like to thank all of the coaches that have allowed us to reproduce their work in ITF Coaches Review. We are especially grateful to the Coaching Department of the British LTA, particularly Charles Applewhite and Paul Dent, who have assisted us with the preparation of this first issue and allowed us to reprint their "Coaching Excellence" publication which appears in pages 3-10. We would also like to thank the USTA who have, through Ron Woods and Paul Roeter, given us permission to publish articles from their "Sports Science for Tennis" booklet. We hope that you enjoy this first issue and that you find it useful in your work on court, in whichever corner of the world you may be.


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Maximise You – 10 Tips for Coach Well Being

Ann Quinn (Quinnessential Edge, London, UK)

ITF Coaching and Sport Science Review 2010; 50 (18): 3 - 4

ABSTRACT

This article summarises some tips to help you maximise the most important person of all – you, so that you can enjoy the journey to your success both on and off the court.

Key words: Coach well being, health, self improvement.

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INTRODUCTION

Research into coaching has increased considerably over the last two decades but an area that is still in its infancy has been that of the well being of professional coaches. Much is expected of you as a coach. On any given day, you may play the role of a coach, educator, physiologist, business executive, psychologist, administrator, and so the list goes on. You are always busy planning and giving lessons, organising teams and competitions, running the pro shop, or watching matches, and that is just at work. On top of that is often family, community and a host of other commitments and often the last on the list is You! Does that sound familiar? Well you are not alone.

1. EVALUATE YOU!

We evaluate our players, their strengths and weaknesses and prepare regular report updates but what are you doing for you? Do you really know how healthy you are? How long is it since you have had a blood test, checked your cholesterol and blood pressure, or had a full medical check up? Have you been to the dentist or had your eyes checked recently? Just because you are fit and active and on the court, does not mean you are invincible and nothing will happen to you. Tennis coaches on average suffer from levels of burnout similar to those of other helping professionals. (Eklund, Kelly & Ritter-Taylor, 1999). The pressure and stress levels juggling your own business and other obligations can be enormous. You are no help to anyone if you are sick, stressed and exhausted. The most valuable asset you have is your health.



2. CREATE AN EXCITING VISION – FOR YOU AND YOUR BUSINESS

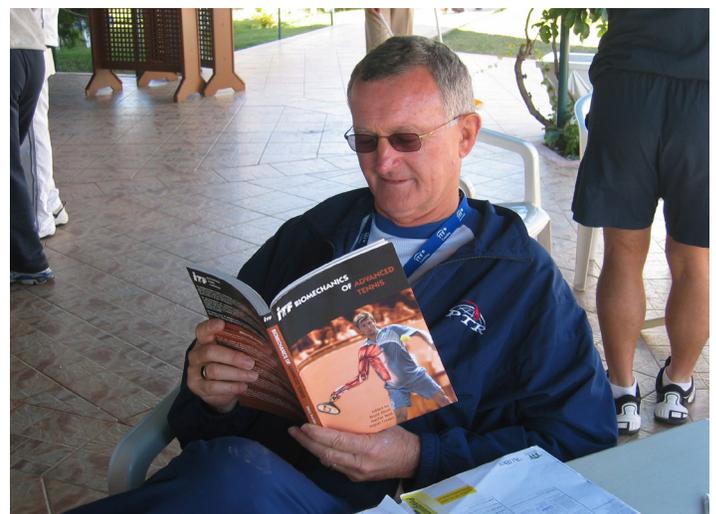
Create the vision of exactly where you want to go so you can get excited to move towards that direction. Make those goals inspiring and compelling. See it day in and day out. What you would like to achieve for your players, for your business? Set your goals and create that vision plan for that exciting future because that is where you are going to spend the rest of your life. Working towards such important life goals is associated with increased well being. (Klinger, 1977; Sheldon, Kasser, Smith & Share, 2002) Make it happen!

3. PREPARE TO COACH

We all tell our players to warm up and prepare for their matches and training but do you prepare to coach or do you just walk on the court and start coaching? The time taken to warm up is much better than spent off the court injured. Likewise, do you put on sunscreen and a hat if you working in a hot climate? Not too many coaches could say they do this properly. Sunscreen should be reapplied every two hours, or more often if it is wiped, washed or sweated off. Skin cancer is the most easily preventable form of cancer and yet in Australia, more people die from skin cancer each year than are killed in road accidents. Remember, prevention is better than cure. Prepare to win for you.

4. BE INNOVATIVE

We all want to be the best we can be? What can you do to be innovative? With the plethora of information available through the Internet and the capacity for coaches (and athletes and parents of players) to get any information they need anywhere, anytime, how can you be innovative? Be creative. Think outside the box. Olusoga et al (2009) highlighted the importance of psychological skills training for coaches to help them cope with the diverse demands of world class coaching. Also look to what other sports are doing. Create an effective learning environment for you and your players, read, talk to other coaches, find a different way. Get excited. Engage with your players and inspire them to be all they can. It is the little differences that make the big difference.



5. CONTINUE TO LEARN

A commitment to continuous improvement and accelerated learning is essential for coaches at all levels. There are so many ways to do this, from attending conferences, reading, watching videos, on the internet, talking to other coaches, and letting your life experiences become your own coaching lab. Stimulate you. The best way to learn is by doing. Be one step ahead all the time. Have fun and get creative. Sometimes it is our mistakes that teaches us the greatest learning.

Don't focus on win-loss records. Coaches have been found to be more likely to burnout if they focus on wins and losses. Focus on your own coaching performance such as teaching more effectively, strategizing, optimizing training, developing mental toughness and emotional control, and creating a motivational environment for players Duda et al (1999). Look at things differently. Find a mentor to support you..

6. ENERGISE YOU

Do you practise what you preach? Coaches are always telling their players to drink up and eat to win. Do you lead by example? Do you have energy snacks and a drink close by all the time? The same principles apply to you, as to your players. Be a role model for your students. Inadequate fluid intake and/or excessive sweat losses mean that you work harder, your intensity is lower, you fatigue faster and you react slower. You cannot win. Energise you!



7. RECHARGE AND RECOVER

A sign that you are overworking is irritability, hypertension, impatience and a loss of your drive and determination. Working too hard is not good for your health or your lessons. Be sure you plan to recover too. Learning how to shut down, turn off and re-energise is as important to success and well being as firing up, and ready to win a big match. It is as much a physical as it is emotional rejuvenation. Getting a great night's sleep goes a long way to help you recuperate and recharge. Some passive recovery activities include massage, hot baths, ice baths, meditation, naps, deep breathing, reading, watching television, or some quiet down time. Active recovery activities involves movement of the body, such as walking or jogging, yoga, stretching, pilates and recreational sports. Taking regular breaks between your lessons also helps to sustain full engagement as does a short break away. Now there are no excuses!

8. LIVE WITH GRATITUDE

A great way to achieve well being is simply just taking time to be grateful. How lucky are we that you get to play tennis for a job, travel the world, and can have life long impacts on so many around players. Notice, appreciate, feel, experience and anticipate all the good that currently exists in your life. Go and write them down now. Embrace the massive blessings around you every day. Live with an attitude of gratitude.

9. CREATE A WINNING ENVIRONMENT

Contrast the difference between practicing on the Centre Court at a Grand Slam versus a court with pot holes, broken fence lines and dull lighting. Your environment really does make a difference to your well being and to all those around you. What could you do to improve your environment? This might include not only where you teach, but also your office, your home, your car, your clothes, and everything all

around you. In well designed environments, you are more creative and productive (Leonard, 2000). You have more energy, and can accomplish things so much easier. Having the right equipment puts you in a position to do your best and makes you feel great too. Create an atmosphere where your players' talents can flourish.

10. MAKE TIME FOR FUN

It is especially important to plan time out to have fun. When you are consumed by your work, you suddenly lose contact with everything else that is meaningful in your life. Block out time for fun. Rekindle your intrinsic fire. Make your rejuvenation just as important as work. Your health depends on it. Some ideas include making time for dinner, getting together with friends, or getting a massage. Keep your blackberry or your iphone turned off! Get present to the experience in the moment. Fun should be a central theme for your players and for you! Life is a journey, not a destination.

As lucky as we all are to be involved in such a great sport day in and day out, remember it is only one part of your life and one facet of who you are as a person. Establish your priorities, set your goals and never stop learning. Constantly energise and recharge you to keep the balance. Live with an attitude of gratitude and enjoy the journey winning the game of your life.

References

- Duda, J.L., Balaguer, I., Moreno, Y., & Crespo, M. (2001). The relationship of the motivational climate and goal orientations to burnout among junior elite tennis players. Paper presented to AAASP Orlando.
- Eklund, R. C., Kelley, B.C., Ritter-Taylor, M. (1999). Stress and burnout among collegiate tennis coaches. *Journal of Sport and Exercise Psychology*, 21(2).
- Green, L.S., Oades, L.G., & Grant, A.M. (2006). Cognitive-behavioral, solution-focused life coaching: Enhancing goal striving, well-being, and hope. *The Journal of Positive Psychology*, 1(3): 142-149.
- Kallas, K.L. & Kellmann, M. (2000) Burnout in Athletes and Coaches. In: Hanin, Y.L. (2000) *Emotions in Sport*. Champaign, IL: Human Kinetics.
- Kelley, B. (1994). A model of stress and burnout in collegiate coaches: Effects of gender and time of season. *Research Quarterly for Exercise and Sport*, 65, 48-58.
- Kelley, B., Eklund, B., & Ritter-Taylor, M. (1999). Stress and burnout among collegiate tennis coaches. *Journal of Sport and Exercise Psychology*, 21(2), 113-130.
- Klinger, E. (1977). *Meaning and void: Inner experience and the incentives in lives*. Minneapolis, MN: University of Minnesota Press.
- Leohr, J. & Schwartz, T. (2003) *The Power of Full Engagement*. NSW, Australia. Allen & Unwin.
- Leonard, T.J. (2000). *The Portable Coach*, New York: Scribner
- Olusoga, P., Butt, J., Hays, K., & Maynard, i.(2009). Stress in Elite Sports Coaching: Identifying Stressors. *Journal of Applied Sports Psychology*, 21, (4), 442-459.
- Quinn, A.M. (2010) *Become the CEO of your Life*. Melbourne Australia, Quinnessential Coaching.
- Sheldon, K. M., Kasser, T., Smith, K., & Share, T. (2002). Personal goals and psychological growth: Testing an intervention to enhance goal attainment and personality integration. *Journal of Personality*, 70, 5-31.
- Weinberg, R.S., & Gould, D. (1999). *Foundations of Sport and Exercise Psychology*. Champaign, IL: Human Kinetics.

Biomechanical Analysis of Stroke Production

Bruce Elliott (Winthrop Professor of Biomechanics, The University of Western Australia)

ITF Coaching and Sport Science Review 2010; 50 (18): 5 - 6

ABSTRACT

Before discussing how biomechanics and technical analysis are integrally linked, it is important to understand the term biomechanics as it relates to stroke evaluation. Biomechanics provides an appreciation of stroke production and court movement from mechanical and anatomical perspectives. For the coach, with special reference to stroke production, this involves the following.

Key words: Tennis, biomechanical, analysis, serve.

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INTRODUCTION

• How do I modify stroke production to improve performance? That is how does the player:

- Hit the ball more powerfully with control;
- Manoeuvre the ball to different parts of the court in order to create a better tactical game situation.

• How do I reduce the potential for injury in the following situations?

- During player development as the body matures;
- For the tournament player, who is required to repeatedly perform – how do I reduce the incidence and severity of overuse injuries?

To achieve these results requires an effective analysis structure. A systematic approach to analysis generally requires 5-stages (Fig 1) to permit the coach to 'see and then evaluate' what is happening during stroke production. Such an approach enables the coach to confidently analyse movements at all levels of development.

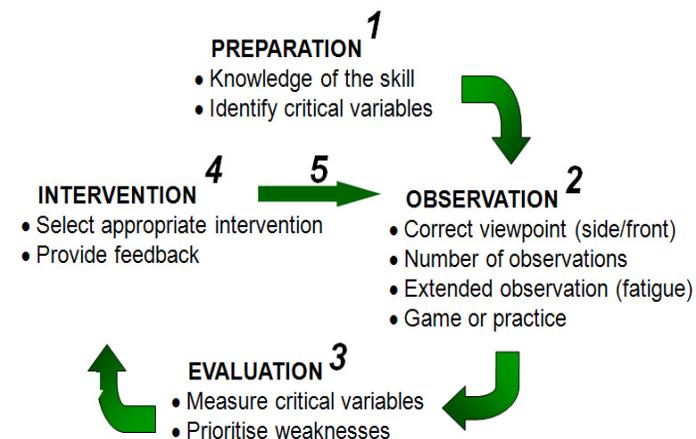


Figure 1: 5-stage analysis process – a key to effective analysis (Modified from Knudson and Morrison, 2002)

The Preparation Phase of the analysis process involves identifying the critical mechanical variables that underpin stroke development. Armed with the knowledge of these critical variables or key ingredients prepares you to observe and evaluate the performance of any stroke. Some of these critical variables include:

- Level of rotation of the hip and shoulder alignments in ground strokes (separation angles)
- Racket trajectory pre- and post-impact in creating 'heaviness' in stroke production
- Level of knee flexion prior to the drive phase of the serve
- Positioning of the 'line of drive' from the feet through the lower limbs to the trunk in the serve
- The alignment of the racket and hand in a volley

All of these must be formatted in your mind prior to commencing the actual analysis and will likely change with player age (or even gender).

Remember:

• These critical features of stroke production will vary depending on the stage of player development. For example, in the serve, rhythm may be the most important aspect of early learning, whereas internal rotation at the shoulder may be an area needing development as players mature (i.e. for a 16-year old).

• The need for variability in stroke production will dictate that selected mechanical factors be emphasised at various stages of development (Elliott, Reid & Crespo, 2009). For example in 'building' a forehand, it is important that this be achieved by hitting balls of various heights, spin types and court locations.

In the world of biomechanics a coach may approach the analysis of stroke production in a number of ways:

• Qualitative analysis – use of the eyes attached to a thinking mind (here, video may be used in the observation phase to provide more detailed and repeated viewings of performance). This is the type of analysis used by coaches on an everyday basis.

• 2D quantitative analysis – use of a video linked with appropriate software (e.g. Dartfish or Siliconcoach) to measure features of performance that are clearly 2D – that is, the movement is in one plane or by definition is planar. Obviously the software packages mentioned above may also be used to assist in qualitative analysis. For example you may draw a line on a sequence of frames (the head in a forehand drive) to qualitatively appraise some aspect of balance. Make sure that you place your camera perpendicular to the line of motion if you intend to measure any 2D angles or distances from the video.

• 3D quantitative analysis – this level of analysis would only be used with national level programs, where a player has problems with injury or power generation. Coaches can use data from 3D analyses of players to improve their ability to qualitatively analyse performance.

How then can a coach use biomechanics and the methods of analysis most readily available to them (Qualitative and 2D Quantitative) to shape their approach to technique development? Let me use a series of images from Andy Roddick's serve to explain. As a coach you may do some or all of the following. The points listed are examples of what may be performed and a comprehensive list can be found in Elliott, Reid and Crespo (2003, 2009).

With a sound understanding of the biomechanics of stroke production (preparation), the coach can analyse movement effectively (observe and evaluate) and then start the very difficult task of modifying motion (intervention) - by far the hardest part of the analysis structure. Remember, the learning pathway requires you to look for different mechanical aspects of stroke production at the various stages of development.

References

- Elliott, B., Reid, B. & Crespo, M. (Eds)(2003). Biomechanics of Advanced Tennis. Valencia, Spain: ITF Publications.
- Elliott, B., Reid, B. & Crespo, M. (2009). Technique Development in Tennis Stroke Production. Valencia, Spain: ITF Publications.
- Knudson, D. & Morrison, C. (2002). Qualitative Analysis of Human Movement (2nd Ed.) Champaign, IL: Human Kinetics

RODDICK SEQUENCE MECHANICAL FEATURE OF INTEREST	QUALITATIVE ANALYSIS	2D QUANTITATIVE ANALYSIS
	<ul style="list-style-type: none"> • Balance • Position of the racket and ball to body • Position of the feet relative to each other • Position of the hips and shoulders • Alignment of the trunk 	<ul style="list-style-type: none"> • The distance between the feet • Alignment of the trunk (hips and shoulders)
	<ul style="list-style-type: none"> • Angle of the front arm (a characteristic of the Roddick serve, where he positions the ball closer to the body – permits good back hip drive) • Knee flexion and position of both knees (drive-line to the ball) • Hip and shoulder alignment rotations (both horizontal and vertical) • Position of the back to the front foot 	<ul style="list-style-type: none"> • The inclination angles of the shoulder and hip alignments • Rotation of hip and shoulder alignments • The height of the ball toss compared with player standing height • The level of knee flexion
	<ul style="list-style-type: none"> • Position of the racket relative to back (away from the back and with respect to the hips) • Level of external rotation at the shoulder • Leg and particularly back-hip drive • Position of the head and front arm 	<ul style="list-style-type: none"> • The position of the racket to the back • The velocity of the back-hip during the upward drive • Alignment of the forearm to the court (indicator of maximal external rotation at the shoulder)
	<ul style="list-style-type: none"> • Position of the head • The rotation of the trunk from A to D (check movement of the trunk about the 3 axes of rotation, particularly shoulder-over-shoulder) • Presence of internal rotation 	<ul style="list-style-type: none"> • Flexion angle of the trunk • Hip alignment • Position of the back compared with front hip joint
	<ul style="list-style-type: none"> • Body positions at impact (vertical, forward-back and laterally with respect to body) • Alignment of racket and forearm • Shoulder abduction angle • Trunk flexion • Position of head and non-racket arm 	<ul style="list-style-type: none"> • Impact position (vertical, forward-back and laterally with respect to body) • Alignment of the racket and the forearm • Shoulder abduction angle
	<ul style="list-style-type: none"> • Follow through of racket (include forearm pronation and shoulder internal rotation) • Landing position and preparedness for next stroke • Arabesque of back leg (following landing – not in image F) • Balance 	<ul style="list-style-type: none"> • Landing position in the court – both forward and lateral • Flexion angle of the trunk

Player Development – 1993-2010 and Beyond

Doug MacCurdy (International Tennis Federation)

ITF Coaching and Sport Science Review 2010; 50 (18): 7 - 8

ABSTRACT

In this article, we will look at some of the player development strategies that have evolved over the last 17 years. More importantly, we will gaze into the crystal ball to see what will be necessary to succeed in the next 17 years.

Key words: Player development, pathway, history.

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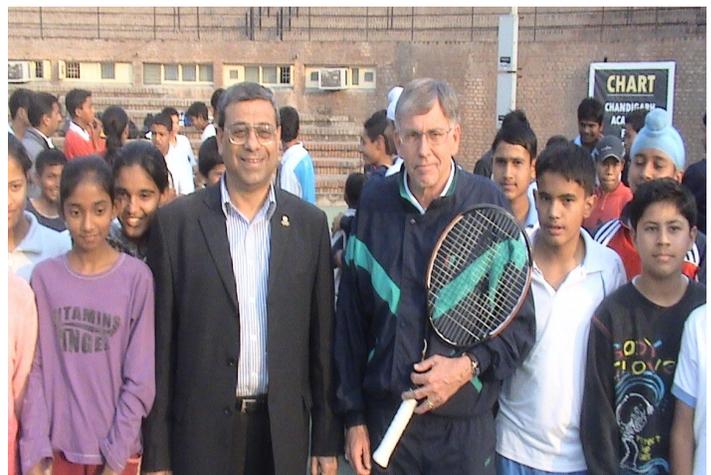
INTRODUCTION

It gives me great pleasure to contribute to this 50th edition of "ITF Coaching and Sport Science Review." The publication has grown and developed over the past 17 years. Obviously, the Internet has led to wide availability of coaching and sports science information. However, "ITF Coaching and Sports Science Review" was and remains a truly unique tennis publication. This is due to the excellent contributions from top experts in numerous fields from all over the world. Specific topics are presented in great detail for the coach that is a true student of the game. Congratulations to Miguel Crespo for his work in organizing and developing this fine educational tool since 1993. His own contributions, in terms of content, have also been outstanding. I look forward to the next 50 editions.

Successful player development is more of an art than an exact science, although sports science principles certainly apply to player development. There is no singular formula that guarantees success. Some programs seem to produce a long line of top players for a period of time, and then the production line can slow down or come to a complete stop.

Player development programs exist in many different formats that often overlap. A national association may have a reasonably well-funded and serious program for developing players. Players often move to private tennis academies once they have attained a certain level of proficiency. However, do not underestimate the role of clubs and individual coaches in getting players started and doing most of the formative work that ensures that they do not have weaknesses that will breakdown under the pressure of higher level competition later on.

Apart from the dominance of European players, we have also seen two additional trends. On the men's side, many South American players such as Brazilian Gustavo Kuerten, Argentines David Nalbandian, Guillermo Coria, Gaston Gaudio, and Juan Martin del Potro, and Chileans Marcelo Rios, Fernando Gonzales and Nicolas Massu, have made a significant impact on the men's game in terms of both excellence and depth. In the women's game, we are seeing more and more good players emerging from Asian countries, indicating a bit of a change in the world tennis order.



A few players have risen above the rest in terms of Grand Slam superiority since 1993. In men's tennis Andre Agassi, Pete Sampras, Roger Federer and Rafael Nadal have won multiple Grand Slam titles. Among the women, the most prolific Grand Slam champions have been Steffi Graf, Martina Hingis, Venus Williams, Serena Williams and Justine Henin. I do not think that any particular conclusions related to player development can be drawn from looking at the careers of these spectacular players. The things that they seem to have in common are remarkable talent and the fact that all of them enjoyed success at the professional level at young ages. The player development pathways followed by these great players were quite varied. In the case of the Williams sisters, their pathway was very unique, and never duplicated. They simply did not play in any significant junior competition and went directly from the training court to the pro tour.

ESSENTIAL INGREDIENTS FOR SUCCESSFUL PLAYER DEVELOPMENT

Having established that there is not one foolproof formula for developing elite players, and taking into consideration the vastly different environments from which outstanding players emerge, I will outline what I think will be the key elements for successful player development going forward.

1. You must have excellent athletic talent.

During the 2010 Australian Open, Roger Federer mentioned that the biggest change that he has seen in the men's game during the past

INTERNATIONAL RESULTS AND INDIVIDUAL GREATNESS

The approach to player development in different countries around Europe is quite diverse. In spite of these various pathways, about 80% of the top 100 men and women have come from Europe over that last 17 years. European countries have won 13 of the last 17 Davis Cups and 14 of the last 17 Fed Cups.



five years has been the overall quality of the athletes. He said that when he first began to reach his peak performance levels, most of the players had various weaknesses that he could exploit. He feels that the emerging players now have very few weaknesses and the only way to beat them is to get better yourself. Being a good tennis player without truly outstanding general athletic ability will not be good enough.



2. Planning will be essential.

Given the hundreds, if not thousands of young players that are now participating in good development programs, it will become more and more difficult to succeed if significant aspects of a player's development are missing or done poorly. Principles of physical and psychological development need to be respected. The right work must be done at the right time.

3. The financial aspects of becoming an elite player will be a major challenge.

In many countries, the player's family covers nearly all of the expenses for advanced training and competition. This is beyond the means of all except wealthy families. Wealthy families are often understandably very reluctant to gamble their child's future on a career in tennis.

On the contrary, families from some countries and/or from less privileged backgrounds are willing to chase the dream of stardom without giving too much thought to the consequences if the tennis career does not work out.

Eventually, I feel that support from national associations, sponsors, private investors and/or management companies will be essential to fund serious tennis careers in all but a few exceptional cases.

4. Talent identification more widely practiced and more sophisticated.

Due to the costs involved in top player development, national associations or private investors will want to have as many assurances as possible that a player has genuine talent before beginning the process of spending on high-level coaching and international travel.

5. Physical fitness will become a given.

This means that virtually all players will be in superior physical condition as a prerequisite for success. We see top players such as Federer, Nadal, Murray, or Roddick competing in tough, long matches day after day. Their fitness levels are superb. Any player hoping to make a career in tennis will have to achieve the levels of fitness like players mentioned above.

6. Good coaching will be necessary at all levels.

This begins with coaches' education. In order for players to receive good early training there is need for good coaches beginning at the starter level. There is crucial technical work to be completed by the age of 12. Coaches should be equipped to give large numbers of players a fine physical, technical and tactical foundation by the time the players reach their early teens. At that point, many players may need to move on to programs where there are better opportunities in terms of receiving daily high-level practice and ready access to good competition. An example of this already exists. Many Russian juniors receive a high quality introduction to the game in their home clubs, but many move to Spain where there is good daily training, including practice match play, as well as numerous competitions.

7. Belief and confidence are critical to the process of becoming a top player.

There are quite a few examples of countries that are continuously producing large numbers of good players. Current examples would be Russia in women's tennis, and Spain and Argentina on the men's side. Players from these hotbeds of talent seem to have a collective belief in their abilities, similar to Brazilian football players. They see so many of their peers succeeding that they adopt the philosophy that "if he/she can do it, so can I."

In this regard, one of the most interesting statements that I have heard came from Sweden. In their golden period in the 1980's, Sweden once had over half of the top 20 men in the world. One former player that had become a coach said that just about anybody could make the top 50, but reaching the top 20 is pretty good. Now, that's belief and confidence!

Player development success should not be judged entirely by top international results. A country's players may not feature on the world stage but may be recording outstanding success on regional basis, or simply performing much better than they had in the past. For example, in the 1990's, a substantial number of players from Cote d'Ivoire were able to attain ATP rankings and win African championships. This success occurred in a country that had no history of tennis excellence. It happened because some talented athletes were given some good coaching and a bit better competitive opportunities.

The State of Play: Coaching Persons with Disabilities

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Abstract

In its broadest sense, the term 'special population' refers to any group that is considered 'different' or 'non-traditional' because of circumstances (e.g., the homeless, substance abusers, persons within the juvenile justice system) or disability (i.e., reduction of functional ability resulting from physical and/or intellectual impairment) [Coaching Association of Canada, 2005; United States Tennis Federation, 2006]. For the purpose of this article, the scope of this review will be limited to coaching persons with a disability and, specifically, to key themes that are currently considered relevant and appropriate for coaches to embrace in order to provide an inclusive environment for persons with a disability to play and enjoy the game. These key themes will now be briefly examined with respect to coaching persons with a disability (physical and/or intellectual).

Key words: Special Populations, disability, coaching, tennis.

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INTRODUCTION

'We've come a long way' is a slogan that might well apply to the awareness of the importance of, and availability of published material about, coaching special populations. While much still needs to be done, a review of the literature suggests an increasing range of material about coaching special populations is now available for coaches to access (e.g., Bullock, 2007; Young, 2007; Young & Browne, 2009).

INCLUSIVE COACHING SO EVERYONE CAN PARTICIPATE EQUITABLY

A. Focus on a Player's Ability

A recognised starting point is for a coach to identify a person's abilities and what he/she can (versus cannot) do. Here it is important to focus on possibilities and avoid looking for limitations! To this end, asking the person to tell you about his/her capabilities, skills, interests and goals may be all that is required for a coach to gain enough information to plan challenging and engaging sessions that are individualised, where possible, to the person's needs.



B. Adapt when Appropriate

A coach should be prepared and able to adapt activities, skill practice and/or games to ensure all players can participate. Possible adaptations include changes to one's teaching style, rules, equipment or environment. For example,

Teaching style:

- Use more demonstrations and less verbal instruction

Rules:

- Allow players to hit the ball after 2 or 3 bounces; score first to 10 points and/or play to a time limit

Equipment:

- Use shorter racquets and lighter/softer balls (e.g., foam balls or balloons), lower or remove the net

Environment:

- Change the size of the court playing area; move to an area with less noise and distractions

C. Engage in Effective Communication

Coaches need to be mindful that we all learn and respond in different ways, and accordingly, coaches require skills to show, listen, explain and demonstrate in a variety of ways to and with a variety of people. Notwithstanding cultural differences, smiling is a recognised universal way for coaches to warmly welcome and give positive feedback and encouragement.

D. Ensure Fun and Safe Environment

The challenge here is for coaches to plan and deliver engaging sessions that are fun and safe. This is an on-going and demanding task if a coach is to fulfill his/her duty of care to his/her players. To this end, detailed attention to risk management strategies are imperative and should never be compromised. As is appropriate for all players, coaches should enquire about any relevant safety or medical condition before a player starts taking lessons.



E. Be Prepared to Have a Go

It is natural for coaches to feel nervous or apprehensive about working with persons with a disability and, as such, the first step may be the most

difficult. In many instances a pro-active approach may be required to target persons with a disability and introduce one's coaching services. Thereafter, the best advice is to 'have a go' and not worry about making the occasional mistake given persons with a disability often just want to know they are respected and valued.

F. Integrate into Existing Programs or Create New Program

The decision to integrate persons with a disability into an existing tennis program/session, or to start a new program/session, depends on a number of factors (e.g., are players of a comparable standard; does the coach have the time and resources to start a new program?). Given persons with a disability generally appreciate the choice to participate in a program or activity that suits them best, a good starting point is to ask persons with a disability what might attract them to the game and work for them.

Conclusions

The themes noted above are currently considered pertinent for inclusive coaching and are consistent with recognised general coaching principles (e.g., Martens, 2004) and coaching athletes with a disability principles (Coaching Association of Canada, 2005). As such, this review re-enforces the notion that 'coaching is coaching' irrespective of the targeted group.

No longer is there a complete void of material about coaching persons with a disability. Since its inception in 1993, the ITF Coaching and Sport Science Review has actively sought articles that address coaching 'non-traditional' groups. Notwithstanding, the opportunity exists for further research and the sharing of information from those coaches who have had inspirational and insightful experiences in coaching persons with a disability. In the past, certain groups have been oft-overlooked, or even avoided, but if we are to truly grow the game and embrace the notion of equity and 'fair play', then coaches have a responsibility to reach out to all including those persons with a disability.

References

- Bullock, M. (2007). Tennis for the blind and partially sighted. *ITF Coaching and Sport Science Review*, 43, 15.
- Coaching Association of Canada (2005). Coaching athletes with a disability. National Coaching Certification Program, Canada: Investors Group
- Martens, R. (2004). *Successful coaching* (3rd ed.). Champaign, IL: Human Kinetics.
- USTA (2006). *Manual for teaching adaptive tennis*. NY: United States Tennis Association.
- Young, J.A. (2007). Coaching players with a disability. *ITF Coaching and Sport Science Review*, 41, 14-15.
- 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.

Being a team captain

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ABSTRACT

Davis cup and Fed cup are no doubt the most renowned team competitions in tennis and go back a long way in tennis history. Other team events at international level include Junior Davis and Fed cup, national club matches. This article is a personal account of what was required as a team captain within the ITF team competition setting. I summaries key roles and how the role has changed throughout the years

Key Words: Tennis team captain, roles, coaching.

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Historically the teams consisted of players and often only an official delegate. One of the players took the role as "playing captain".

With the introduction of coaches in tennis the "non playing captain" was added.

In my beginning years as captain of the Belgian Fed cup team I remember it was just me and the official delegate to guide the team. Gradually the teams around the world saw other people added. In the first place this was an assistant coach (tactical advice, training sessions...) and a physiotherapist (rehab, interventions on court...). Some teams even got a physical coach (warm ups, maintenance training within the long season...).

By the time I was Davis captain in the 2000's a lot of the teams also used a doctor and/or exercise physiologist. Recovery (especially in long 5 set matches) became a key element in the difference between winning and losing. Many teams brought their own stringer (the men are a lot more fuzzy about the right string-tension... the week leading in to the tie is often a continuum of slightly adapting tensions towards the surface, the balls...)

I also had the experience to work with a sports psychologist (who observes team interactions, body language of "the bench" and the captain during the matches...)

Modern technology also allowed for match analysis being done (either during the tie or afterwards). I recall Carl Maes as Fed cup captain analysing Clijsters - Dementieva till late at night in order to prepare for Henin to play Dementieva the day after...with success!



The number of players also changed throughout the years. Often juniors were brought into the team as sparring partner, but also to get them acquainted with the typical atmosphere around this type of competition (which is rare in our individual sports).

Often Davis captains these days make the choice to align a specialist doubles team. Patrick McEnroe had major success with the US team selecting the Bryan brothers. The risk of a

potential injury of one of the singles players is outweighed by the virtual guarantee to win the so important doubles match in the tie.

Given all the changes above over the last 20 years, it is clear that the skill set needed to be an effective captain has changed.

The coaching on court does still rely on the same principles. It is still about the right type of communication with the player during the match (what to say, when to say it, how to say it, how much information is effective for which type of player, body language throughout etc)

However, how to use all the extra staff members both in the preparation and during the matches, has given the job of the captain another dimension.

Leadership skills are nowadays essential to make sure that everybody in the team knows his/her task to maximise the performance of the players (internal communications, delegation of responsibilities, working principles...)

In the case one has real top players in the team, another aspect surfaces. The psychology of dealing with top players is often very different as they are used to attract a lot of attention. Very often the work ahead of the tie is in this case much more time consuming (scheduling – discussion with managers – potential help in the negotiations on commercial aspects...). In this case security people are during the tie often present to avoid unwanted situations...another person around the team...

Media demands have changed over the last 2 decades too. Matches are televised or streamed via the internet, journalists need to provide more up to date information (newspapers and online articles...). The way the captain is communicating with the press plays an important role in the image of the team. In the mean time captains are conscious that what they say is also a form of indirect messaging towards their players. A press officer often assists the captain and the players in this particular role.

Personally I have always found the preparation of tennis players for a weekend tie very different to what one does in normal individual competitions. Living towards a tie in the weekend ahead automatically builds up expectations within the team. One has a lot more chances for practice and specific preparation. There is time to maximise readiness, to make choices for the week (selection, match ups...). On top of the responsibility to play for your team/nation, this all adds to the pressure for the players. Hence the many upsets in Davis cup or Fed cup.

Of course there is lot more team coaching to do than just Davis cup or Fed cup. There are some key differences between the role of an educational captain (juniors) versus a result oriented captain (DC, Fed cup).

While the result is always important, captains of junior teams can use team competitions as an optimal vehicle to assist in player development. Coaching on court allows you more than in any other circumstance to shape decision making and game styles together with the player in a real match situation.

As said, this multidisciplinary approach to a national team as described above has changed the role of the captain in the last 2 decades. Some of the very top players have adopted this approach and we now often see them surrounded by a larger team of specialists as well...



I have always viewed being a team captain as an honour as well as an exciting chance for a coach to bring an extra dimension to the job. The different ways of interaction allow you to make more of a difference with the players. It increases the exposure for coaches and what they can bring to the game. From a coaches perspective it is a pity that many of the coaching aspects that one can bring to a team, are only partially possible on the individual tour.

Strength & Conditioning for Tennis - A 25 Year Journey

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ABSTRACT

This article will highlight the major areas of physical training and how each area has changed since the first issue of the ITF Coaching and Sport Science Review. The focus gives an insight into strength, power, speed, endurance, flexibility and recovery.

Key words: Strength, conditioning, physical training.

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INTRODUCTION

In any industry, time results in change. Certain time periods in history are acknowledged as defining periods – the industrial revolution, the roman empire, the internet age. In tennis, it could be said that we are in the physical age of tennis. The game has changed dramatically in the past 30 years: the requirements of the sport, distances covered, forces produced, stroke changes due to racket and string technology all have resulted in an extremely physically demanding sport. As a result the players/coaches have adapted their training to be successful in this new era of tennis.

STRENGTH TRAINING

Strength training is a confusing term for many coaches. Many times this term is used to define any exercise involving loading - via body weight or added weight - (barbell, dumbbell, medicine ball, kettlebell, cable pulley etc) irrespective of the purpose of the exercise. Unfortunately, this has resulted in some confusion about exercises and how best to use them in designing programs. For the sake of simplicity strength training will be defined as movements requiring loading that results in appropriate overload based on age and stage of development and has three overarching purposes: 1) Absolute Strength, 2) Hypertrophy 3) Muscular Endurance.

All three components of strength training are important for the tennis player. The focus of each of these needs to be altered throughout a training and competition cycle; this will change substantially as athletes' develop. Over the last few decades the focus of strength training programs has changed. In the early 1980's, strength training became popular and most techniques involved isolated muscle movements predominantly on machines, to more multi-joint "functional" movements that load the movements seen in tennis more than just developing strength in the individual muscles.



POWER TRAINING

Power training should be thought of as a separate training component than strength training. Power is the major training variable that directly relates to improve on-court tennis performance. All other components

(strength, flexibility etc) directly and indirectly relate to improved power output, but power training needs to be a major focus of a training program. Power training has changed tremendously over the decades. The use of implements such as medicine balls, cable pulley machines, hydraulic machines and other tools that allow for unimpeded movements at high rates of velocity aid in the development of power. Also, technology has improved whereas power (as measured in Watts) can now be measured using different devices and machines. The goal of power training is to recruit as many fast twitch muscle fibers as possible, so that these fibers can be recruited more often during play to hit the ball harder and move more powerfully. It must be mentioned that improved power is a combination of strength and speed, so developing power also means a need for improvement in both speed and power. This area of training will continue to be a major focus in the coming years and more tennis-specific power movements will be integrated into players' training programs.



SPEED TRAINING

Tennis speed training has developed from general speed training (i.e. track or soccer sprint training) to more tennis-specific individualized to the individual athlete, playing style and goals. Historically a lot of speed training was done on a track running 20, 40 or 100 meter sprints to develop speed. It is clear that this type of one-directional movements can be beneficial, but is not the most efficient way to train for tennis. Linear speed is one component of tennis movement, but we know that this is less than 20% of all movement on a tennis court (M. S. Kovacs, 2009; Weber, Pieper, & Exler, 2007). The majority of tennis movement is multi-directional (specifically lateral), and this needs to be the major focus of movement training for tennis. Developing speed and quickness over short distances (<10 meters) will continue to be the focus of speed training programs over the coming years.

TENNIS-ENDURANCE

Debating the best way to train for tennis endurance is and will continue to be a discussion point between coaches, trainers and sport scientists. The majority view has changed over the last few decades as more

research has highlighted the demands of tennis. It is recommended to train for tennis endurance by simulating work and rest ratios, intensities and durations similar to matchplay. Long slow distance running (i.e. 5-8km) is an example of an endurance workout that does not simulate tennis requirements or muscle recruitment patterns, but can improve aerobic capacity. From a physiological standpoint, it is not the best method to train for tennis endurance, yet many coaches and players feel this type of training is beneficial. This perception is more likely a psychological benefit, as this type of training is not the most physiologically efficient method to improve tennis-specific endurance. Short repeated, multi-directional sprints, using a work:rest ratio similar to tennis for an extended period of time (>30-45 minutes) will develop tennis movements, utilizing explosive movements, yet still improve aerobic capacity.

FLEXIBILITY

Flexibility training has changed substantially over the past three decades. Static stretching was considered the safest and best method to improve an athlete's flexibility. Static stretching is still a good safe method to improve range of motion for athletes, but it is in a static environment and the direct transfer to dynamic situations (ie. tennis play) is still not well understood. Also, the timing of static stretching is important. Research studies on strength and power performances following static stretching have shown decreases in immediate performance by as much as 2%-30% (Avela, Kyröläinen, & Komi, 1999; Fletcher & Jones, 2004; Fowles, Sale, & MacDougall, 2000; Kokkonen, Nelson, & Cornwell, 1998; M. Kovacs, 2010; Nelson, Guillory, Cornwell, & Kokkonen, 2001).

Over the years many different stretching techniques have gone in and out of favor with coaches. Currently, dynamic stretching routines have been shown to improve dynamic range of motion and improve strength, speed and power activities if used during the warm-up period (Bergh & Ekblom, 1979; Blomstrand, Bergh, Essen-Gustavsson, & Ekblom, 1984; M. Kovacs, 2010; M. Kovacs, Chandler, & Chandler, 2007; M. S. Kovacs, 2006a, 2006b; Shellock & Prentice, 1985). It is recommended to limit static stretching to post-match and evening stretching and utilize dynamic movements before and during tennis or fitness training or competition.



RECOVERY

Training has changed substantially over the past few decades and in the next decade recovery will be the next major area that will substantially result in improved on-court performance and a reduction in injuries in tennis. At present, our understanding of recovery is less advanced than our understanding of training, but much work is currently being done looking at how to improve recovery for tennis. Nutrition, flexibility, injury prevention, sleep, massage, contrast therapy, psychological and medical are just some areas that directly aid in the improvement of recovery. Please see the following resource for an in-depth review of tennis recovery (M. S. Kovacs, Ellenbecker, & Kibler, 2009).

References

- Avela, J., Kyröläinen, H., & Komi, P. V. (1999). Altered reflex sensitivity after repeated and prolonged passive muscle stretching. *J. Appl. Physiol.*, 86(4), 1283-1291.
- Bergh, U., & Ekblom, B. (1979). Physical performance and peak aerobic power at different body temperatures. *Journal of Applied Physiology*, 46, 885-889.
- Blomstrand, E. V., Bergh, B., Essen-Gustavsson, B., & Ekblom, B. (1984). The influence of muscle temperature on muscle metabolism and during intense dynamic exercise. *Acta Physiologica Scandinavica*, 120, 229-236.
- Fletcher, I. M., & Jones, B. (2004). The effect of different warm-up stretch protocols on 20-m sprint performance in trained rugby union players. *Journal of Strength and Conditioning Research*, 18(4), 885-888.
- Fowles, J. R., Sale, D. G., & MacDougall, J. D. (2000). Reduced strength after passive stretch of the human plantar flexors. *J. Appl. Physiol.*, 89(3), 1179-1188.
- Kokkonen, J., Nelson, A. G., & Cornwell, A. (1998). Acute muscle stretching inhibits maximal strength performance. *Research Quarterly for Exercise and Sport*, 69, 411-415.
- Kovacs, M. (2010). *Dynamic Stretching: The revolutionary new warm-up method to improve power, performance and range of motion*. Berkeley, CA: Ulysses Press.
- Kovacs, M., Chandler, W. B., & Chandler, T. J. (2007). *Tennis Training: Enhancing On-Court Performance*. Vista, CA: Racquet Tech Publishing.
- Kovacs, M. S. (2006a). The argument against static stretching before sport and physical activity. *Athletic Therapy Today*, 11(3), 24-25.
- Kovacs, M. S. (2006b). Is static stretching for tennis beneficial? A brief review. *Medicine and Science in Tennis*, 11(2), 14-16.
- Kovacs, M. S. (2009). Movement for tennis: The importance of lateral training. *Strength & Conditioning Journal*, 31(4), 77-85.
- Kovacs, M. S., Ellenbecker, T. S., & Kibler, W. B. (Eds.). (2009). *Tennis recovery: A comprehensive review of the research*. Boca Raton, Florida: USTA.
- Nelson, A. G., Guillory, I. K., Cornwell, A., & Kokkonen, J. (2001). Inhibition of maximal voluntary isokinetic torque production following stretching is velocity specific. *Journal of Strength and Conditioning Research*, 15(2), 241-246.
- Shellock, F. G., & Prentice, W. E. (1985). Warming up and stretching for improved physical performance and prevention of sports related injuries. *Sports Medicine*, 2, 267-268.
- Weber, K., Pieper, S., & Exler, T. (2007). Characteristics and significance of running speed at the Australian Open 2006 for training and injury prevention. *Medicine and Science in Tennis*, 12(1), 14-17.

Analysis of Strategy and Tactics in Tennis

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ABSTRACT

This article is a review of previous studies related to tactics and strategy in tennis and an insight into current trends and observations within the modern professional game. The purpose of performance analysis of interest to the current paper is tactical analysis. In this paper, we will firstly discuss the nature of tactics and strategy in sport before covering how tactical aspects of tennis can be analysed.

Key words: Tactics, analysis, strategy.

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INTRODUCTION

Performance analysis of sport is an observational analysis of actual sports performance that typically involves audio-visual and computer equipment. Performance analysis can be done using any methods that allow data from actual sports performance to be recorded and analysed; such methods include notational analysis, biomechanical analysis of technique, qualitative observation and the use of physiological measures taken during actual sports performance (O'Donoghue, 2010, p.2). The purposes of notational analysis identified by Hughes (1998) have been adopted as the purposes of the wider performance discipline. These purposes are technical evaluation, tactical analysis, analysis of movement, coach and player education as well as developing sports performance databases for modelling purposes.

Tactics and strategy

Strategy and tactics are related concepts in sports performance. A strategy is planned prior to competition (O'Donoghue, 2010, p.6-7) that will make best use of the player's strengths while limiting the effects of any weaknesses. At the same time, the strategy should seek to exploit any known weaknesses of the opponent while avoiding situations where the opponent can make use of their strengths. Tactics are moment to moment decisions made during the competition by players based on the options available to them and the perceived risks and opportunities associated with these options (Fuller and Aldersson, 1990). Talented players make good use of situational probability during rapid decision making in sport (Singer and Janelle, 1999).

A strategy planned before the match and tactical decisions made during the match are mental concepts that are not directly observable during competition. However, the different skills performed by players, the locations where they are performed on the playing surface as well as the timing of these actions can give an indication of the strategy and tactics being applied. For example, if a tennis player approached the net then he or she can be assumed to have adopted a net strategy. If, on the other hand, the player did not approach the net, then the player can be assumed to have adopted a baseline strategy. The analysis of player decisions requires an understanding of the different options available, their relative chance of success and any risks involved. The time pressure that a player is under when making a decision should also be considered.

Performance Indicators in Tactical Analysis of Tennis

There are many different types of tactics in tennis including service tactics (Unierzyski and Wieczorek, 2004) and shot placement (Hughes and Clarke, 1995). Performance indicators are used to represent important and valid aspects of sports performance including tactical aspects (Hughes and Bartlett, 2002). "Performance indicator" is not a fancy new term for variable and there are specific qualities that sports performance variables need in order to qualify as performance indicators. Performance indicators should be measures of valid and important aspects of performance, have an objective measurement procedure and a valid means of interpretation (O'Donoghue, 2010, p.21). We will look at some performance indicators of tactics in tennis. The

distribution of service directions can be represented by the percentage of services played to the left and right thirds of the target service court (Unierzyski and Wieczorek, 2004; O'Donoghue, 2009a). This can be done for first and second serve to the deuce and advantage courts separately. Figure 1 shows that male players in Grand Slam tournaments adopt a different service strategy when facing left and right handed opponents (O'Donoghue, 2009a). There are other aspects of service strategy that can be observed including speed of serve and the use of slice, kick and flat serve types (Bollettieri, 2001, p.137). Knowledge of the service strategy of opponents can help players prepare to receive service against these opponents (Roetert and Groppe, 2007).

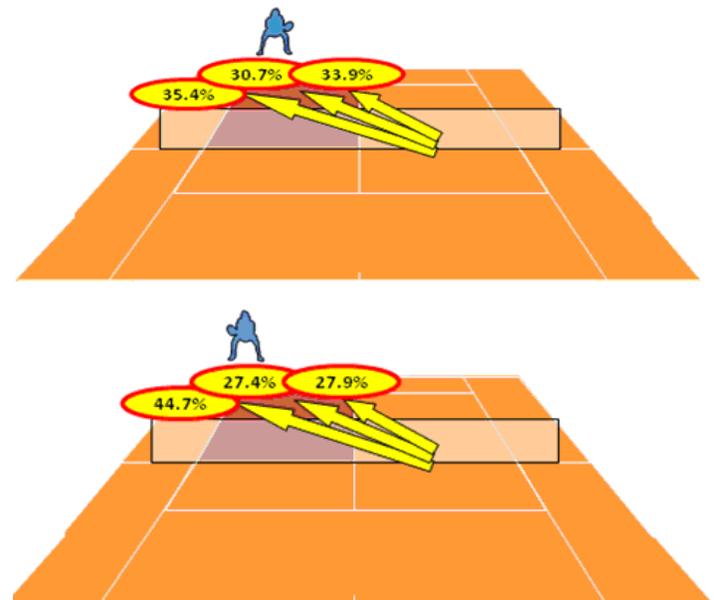


Figure 1. Distribution of serve direction of right handed players playing (a) right handed and (b) left handed opponents in men's singles at the French Open (O'Donoghue, 2009a).

Another indicator of strategy is the percentage of non-service points where players go to the net (O'Donoghue and Ingram, 2001). Service points include aces, double faults, serve winners and serve return winners. If there is a high or low percentage of service points in a match, it can distort the value calculated for the percentage of points where a player goes to the net. Therefore, these points should be excluded from the analysis of net strategy so as only those points of 3 or more shots where players had an opportunity to go to the net should be included. Like service strategy, net strategy can also be influenced by the opponent with different players reacting differently to the same opposition effects (O'Donoghue, 2009b). There are some players who will go to the net less against opponents who frequently go to the net, there are some players who will go to the net more against opponents who prefer to go to the net in order to prevent the opponent going to the net and there are some other players whose own net strategy is unaffected by how often the opponent goes to the net (O'Donoghue, 2009b).

Strategy in tennis is not only influenced by the opponent, but also by court surface (O'Donoghue and Ingram, 2001; Collinson and Hughes, 2003). Since the introduction of surface grading and the use Type I and Type III balls, it is no longer correct to talk about a surface effect as surface is not the only thing that differs between tournaments. Therefore, the differences which still persist between Grand Slam tournaments (Brown and O'Donoghue, 2008) are tournament effects rather than surface effects. There are also gender effects on tennis tactics with male players tending to go to the net more often resulting in shorter rally durations (Brown and O'Donoghue, 2008). Knowledge of the different tactics used in men's and women's singles tennis is important to aspiring players and their coaches. Scoreline within matches has also been found to influence the tactics of players with male players tending to go to the net more when facing break points on serve than during non-game points (O'Donoghue, 2007). A further scoreline effect on strategy is that women tend to go to the net less during tiebreakers than normal games while the percentage of net points played by men is similar between tiebreakers and normal games (O'Donoghue, 2006).

Player Profiles addressing opposition effects

The fact that the opponent has an influence on service strategy (O'Donoghue, 2009a) and net strategy (O'Donoghue, 2009b) presents a challenge for player profiling in tennis. Player profiles show the typical values for performance indicators as well as an indication of variability in these values between performances (James et al., 2005). O'Donoghue (2005) mapped performance indicator values onto percentile norms to help interpret the typical value for a player as well as the spread of performances about the typical performance. It is necessary to understand how a player plays against different types of opponents. We could define baseline players as those who go to the net on 10% or less of non-service points and net players as those who go to the net on 10% or more of non-service points. Table 1 is an example of a profile for a player that separates performances against different types of opponents. The main tactical indicators in the profile are the percentage of net points played as well as the percentage of points where the player plays a winner or unforced error. This is an indicator of strategy because some players are more aggressive than others and try to finish the point earlier, and thus, they play their last shot of the point sooner than other players, whether that last shot is a winner or an error. A profile such as the one shown in Table 1 could also include separate performance indicator values for matches where the opponent is right or left handed. Furthermore, the profile could distinguish performances at different tournaments providing important information about the player's strategy when different surfaces and ball types are used.

Table 1. Performance profile for Maria Sharapova playing against baseline players and net players.

OPPONENT	Baseline opponent (n=9)	Net opponent (n=6)
%First serves in	61.4	61.0
%Points won on first serve	74.7	77.5
%Points won on 2nd serve	51.5	59.3
%Aces	9.6	5.6
%Double faults	6.4	6.1
%Points won when receiving	54.6	55.0
Mean 1st serve speed	160.7	157.0
Mean 2nd serve speed	134.6	133.3
%Net points played	15.9	16.2

%Net points won	78.2	78.3
%Points where winners are played	24.7	25.4
%Points where unforced errors are played	21.6	16.5

CONCLUSIONS

Understanding the tactics of a player allows decisions to be made about how to prepare for a match against that player. There are tactics for different aspects of tennis performance and these can be represented by relevant performance indicators. Performance analysis has a role in analysing the tactics of players. Players never play against an "average" opponent on an "average" court surface with "average" balls. It is, therefore, important that player profiles represent the tactics of players in different types of competitive situation.

References

- Brown, E. and O'Donoghue, P.G. (2008b) 'Gender and Surface effect on elite tennis strategy', *Coaching and Sports Science Review*, 46: 9-11. Online. Available HTTP: <http://www.itftennis.com/shared/medialibrary/pdf/original/IO_38643_original.PDF> (accessed 25 June 2009).
- Collinson L, Hughes M. Surface effect of elite female tennis players. *Journal of Sports Sciences* 2003; 21: 266-267.
- Fuller, N. and Alderson, G.J.K. (1990) The development of match analysis in game sports. In *Match Analysis in Sport: A State of the Art Review*, Leeds: National Coaching Foundation.
- Hughes, M. and Bartlett, R. (2002) 'The use of performance indicators in performance analysis', *Journal of Sports Sciences*, 20: 739-754.
- Hughes, M. (1998) The application of notational analysis to racket sports. In A. Lees, I. Maynard, M. Hughes and T. Reilly (eds), *Science and Racket Sports 2* (pp. 211-220), London: E and FN Spon, London.
- James, N., Mellalieu, S.D. and Jones, N.M.P. (2005) 'The development of position-specific performance indicators in professional rugby union', *Journal of Sports Sciences*, 23: 63-72.
- O'Donoghue, P.G. (2005a) 'Normative profiles of sports performance', *International Journal of Performance Analysis of Sport*, 5(1): 104-119.
- O'Donoghue, P.G. (2006) Elite tennis strategy during tie-breaks. In H. Dancs, M. Hughes and P.G. O'Donoghue (eds), *Performance Analysis of Sport 7* (pp. 654-660). Cardiff: CPA Press, UWIC.
- O'Donoghue, P.G. (2007), Data mining and knowledge discovery in performance analysis: an example of elite tennis strategy, paper presented at the 6th International Symposium of Computer Science in Sport, Calgary, June 2007.
- O'Donoghue, P.G. (2009a), Opposition effects in men's singles tennis at the French Open, paper presented at the 3rd International Workshop of the International Society of Performance Analysis of Sport, Lincoln, April 2009.
- O'Donoghue, P.G. (2009b) Interacting Performances Theory, *International Journal of Performance Analysis of Sport*, 9: 26-46.
- O'Donoghue, P.G. (2010), *Research methods for sports performance analysis*, London: Routledge.
- O'Donoghue, P. and Ingram, B. (2001), A notational analysis of elite tennis strategy. *Journal of Sports Sciences*, 19, 107-115.
- Singer, R.N. & Janelle, C.M. (1999). Determining Sport Expertise: From genes to supremes. *Int. J. Sport Psychol.*, 30, 117-150.
- Unierzyski, P. and Wiczorek, A. (2004) Comparison of tactical solutions and game patterns in the finals of two Grand Slam tournaments in tennis. In A. Lees, J. Kahn and I. Maynard (eds), *Science and Racket Sports 3* (pp. 169-174). London: Routledge.

Injury Prevention

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ITF Coaching and Sport Science Review 2010; 50 (18): 17 - 18

ABSTRACT

This article explores injury prevention, how injuries occur, what preventative actions can be taken, and what coaches should promote with each tennis player's career. At the top level the season is demanding and virtually non-stop, thereby requiring a combination of thoughtful periodization and recovery. Being injury free means that a player is more likely to achieve his or her true potential—on and off the court.

Key Words: Injury prevention, tennis, periodization, recovery.

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INTRODUCTION

Playing competitive tennis means that the “mind-body,” which is the physical, emotional, mental and spiritual self, must be progressively developed in order to compete to the best of one's ability. The tennis player never achieves a final level of development. Each time you learn a new stroke, a new technique, or a new lesson of what it means to win or lose, you can become ready to use this new foundation as a springboard to develop even further. However, injuries impede this process, and for too many players, failure to address injuries leads to a plateau or even a decline in the developmental process. Injuries are not simply physical sprains and strains, but occur across the spectrum of the mind-body.

To improve in competitive tennis means that you must train properly to improve. Training does not simply mean hitting more balls or spending more time on a court. Indeed, too much court time can lead to overuse injuries and burnout. Overuse injuries are physical injuries that result from an improper balance of what is demanded from the body versus what the body is able to withstand. Burnout is the psychological, emotional and spiritual equivalent of an overuse injury, and is accompanied by physical lethargy and withdrawal. The first principle of injury prevention is to understand that you must have a proper balance, which means you must have a schedule that serves your needs.

PERIODIZATION

Periodization is an organized approach to training that involves progressive cycles of on-court training, off-court training and recovery during a specified time period. Periodization is the underpinning of injury prevention, and should be the driving force of your short-term and long-term training and competitive goals. Without periodization, players simply train and compete without proper awareness of the needs of the mind-body.

A good periodization schedule maps out your needs and goals on a daily, weekly, monthly, and seasonal basis. The schedule may need to be adapted based on how you are feeling or performing. The schedule is essential, but should not drive your training and recovery in a rigid manner; rather, the schedule should be set with an agreement between you and your coach, with the understanding that it may need to be adapted from time to time. In any periodization schedule, there are short-term and long-term goals. One of the best examples of a long-term goal is a Little League pitcher in baseball, whose throw is similar biomechanically to the tennis serve. Young pitchers are not allowed to throw over a specified number of times in a game, in a week, and in a season. In essence, the essential question is: “Do you want to be the best 12 year-old pitcher or the best 18 year-old pitcher?” Tennis players need similar short-term and long-term schedules and limits to answer a similar question.

OFF-COURT TRAINING

Off-court training is essential to injury prevention. Plyometric training is designed to produce fast, powerful movements that improve the

function of the entire mind-body. To perform plyometric exercises properly, you must learn to focus on your ability to move in an explosive, powerful manner, which is the essence of tennis play. To support plyometric type exercises, off-court exercises must also focus on strength, agility, balance and flexibility. Explosive tennis power is generated from the legs, and moves in a kinetic-chain manner through the trunk to the upper body, shoulders, and finally the arms and wrists. A breakdown in any part of the kinetic chain leads to an overcompensation elsewhere, which leads to overuse injuries.

It is important to understand the kinetic chain principle in tennis. For example, a shoulder injury may actually result from improper leg movement secondary to poor leg strength and balance. Without the push-off from the legs, it is not possible to generate full shoulder movement and strength. Young tennis players very often have poor strength and agility in the ankles, the knees, the core abdominal and back muscles, and the scapular stabilizing muscles of the shoulder. Such diminished strength and agility impedes proper stroke execution and makes you more vulnerable to injury. However, to train properly on these important aspects of strength and agility requires patience, will power, focus, and the desire to improve slowly and progressively over time. It is often much easier to hit 1000 cross-court forehands than to spend one hour on carefully applied plyometric exercises with appropriate strength, agility and flexibility training. Proper off-court training requires a long-term sense of purpose in your life.



ON-COURT TRAINING

The most essential element of on-court training is mindfulness. Each time you step onto a court, know why you are there and what you want to achieve. You should be able to check in with yourself and know that you want to train on the court with a specific purpose in mind. Simply hitting and playing sets without a purpose impedes proper development of the mind-body, and leads to overuse injuries. Be certain that the on-court training is part of your short-term and long-term periodization schedule.

RECOVERY

Recovery is as important as on-court and off-court training. Failure to address recovery is a leading cause of underperformance and overuse injuries. Recovery must be multi-dimensional, addressing the entire mind-body. As with on-court and off-court training, recovery should address short-term and long-term goals. Short-term recovery is critical in addressing your daily needs. Indeed, the first 45 minutes following on-court or off-court training (or competitive play) determine the efficiency of how the body will regain essential glycogen and protein stores—which are critical to refueling and rebuilding the muscle—plus regaining proper hydration balance, which enables proper physiological balance. Players should replace lost fluid with about 20 ounces of a sport drink for every pound lost during the training/competition session. Immediate nutrition should include at least 30-60 grams carbohydrate and at least 10 grams protein within 45 minutes of completion of a training/competition session.

Following each training/competition session, the body needs to warm down with a slow walking or cycling session, followed by proper stretching. During this time, you should check in with your goals and assess how you performed during training/competition. Come to terms with your anger, fear or elation. Understand your tactical errors or lack of mindfulness. Place your training or competition in a bigger context in terms of your purpose in playing tennis. Failure to address your mind-body in recovery means that you become under-fueled physically, emotionally, mentally or spiritually, and this leads to underperformance, overuse injury and burnout.

Recovery is not simply daily or weekly, but should also include time off from the sport. Most sport scientists recommend 3 months of time away from your sport each year. The 3 months do not need to be consecutive, and can be taken in intervals such as 3 intervals of 1 month away from tennis. It is noteworthy that the WTA Tour has recently applied this recovery model into their yearly schedule.

LISTENING TO YOUR MIND-BODY

It is critical to develop a daily habit of checking in with your mind-body. At a physical level, never ignore pain, as this may be the first sign of an overuse injury. Be certain that a physician or certified athletic trainer evaluates new pain and addresses the issue comprehensively. If new pain is the result of an overuse injury, then something is out of balance and must be addressed. It is not enough to simply rest until the pain abates. Just as importantly, check in with your emotional, mental and spiritual self. Learn to journal, which is a great way to come to terms with where you are in your path of becoming a tennis champion.



CONCLUSION

Injury prevention is best accomplished by addressing the short-term and long-term needs of your mind-body in a periodization schedule that meaningfully addresses on-court training, off-court training and proper recovery.

Developments in coaches education

Frank van Fraayenhoven (KNLTB)

ITF Coaching and Sport Science Review 2010; 50 (18): 19-20

ABSTRACT

Changes have occurred within Coaches Education due to a strong focus on sport science and the drive by many associations to fund and develop the area as a true profession. Certification and education of coaches has become necessary compared to a bonus in the past. The introduction of a competency based approach and the dissemination of quality information through the internet and other sources, have allowed international coaches education to be more relevant and available to coaches worldwide.

Key Words: Coaches Education, competencies, media.

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INTRODUCTION

In the last 30 years I have seen a lot of changes in coaches education. The two words covering most of the developments are: competencies and media.

COMPETENCIES

Federations used to apply a more or less limited margin in the description of how to actually play (ideal grips and strokes) and coach (coaching style). Players like Borg, Berasategui and Courier (to name just a few) showed that playing at top-level could be done in different ways that the textbook descriptions 'forced' us to do. By looking at the qualities of those players, coaches started (implicitly) to understand the importance of the competency instead of just the 'technical looks' of a player.

In coaches education most curricula were based on a - sometimes eclectic - gathering of books and specialists that would automatically lead to a necessary number of hours to get through that information. Knowledge seemed to be enough to become a good coach.

A few years ago competency based learning was introduced to coaches education and became the new standard within the European Union (also in Australia). A competency can be defined as a combination of knowledge, skills and attitude.

First describing the occupation of a tennis-coach, we were challenged to then think about the necessary competencies to be able to be successful in that job. Among the last steps in the thinking process appeared the curriculum and the textbooks. Indeed, the steps we used to start with!

'On-the-job learning', being reflective, using 360° feedback and assessment with concrete criteria (observable behaviour) became standards in the field of coaches education. Together with some of the most developed (coaches education) countries, the ITF has now available lists with competencies and 'learning outcomes' on different levels. Through this material all countries willing to start or review a national tennis coaches education programme can use this information and through that catch up with other countries.

MEDIA

When I started coaching I was depending mostly on books from Germany and the United States. It wasn't easy to get specific information on tennis. Later on, video-tapes appeared and introduced a different means of practical information. Through my position in the Dutch federation, the KNLTB, I have been fortunate to be able to go to the most important international coaches workshops and conferences. Through those conferences I was able to inform coaches in The Netherlands about the latest trends in coaching and other developments.

In the last decade things have improved at an incredible speed. Through the internet people can have access to tons of information on all possible topics. Through Google one can find information about everything on tennis, unfortunately without a guaranty on the quality.

Tennis-specific websites with memberships and annual fees mostly have a more professional approach and try to inform you with higher quality. ITF's iCoach is a good example of lots of high quality information on all topics and for all levels.

Through internet, coaches worldwide can have access to up-to-date information from specialists from every continent.

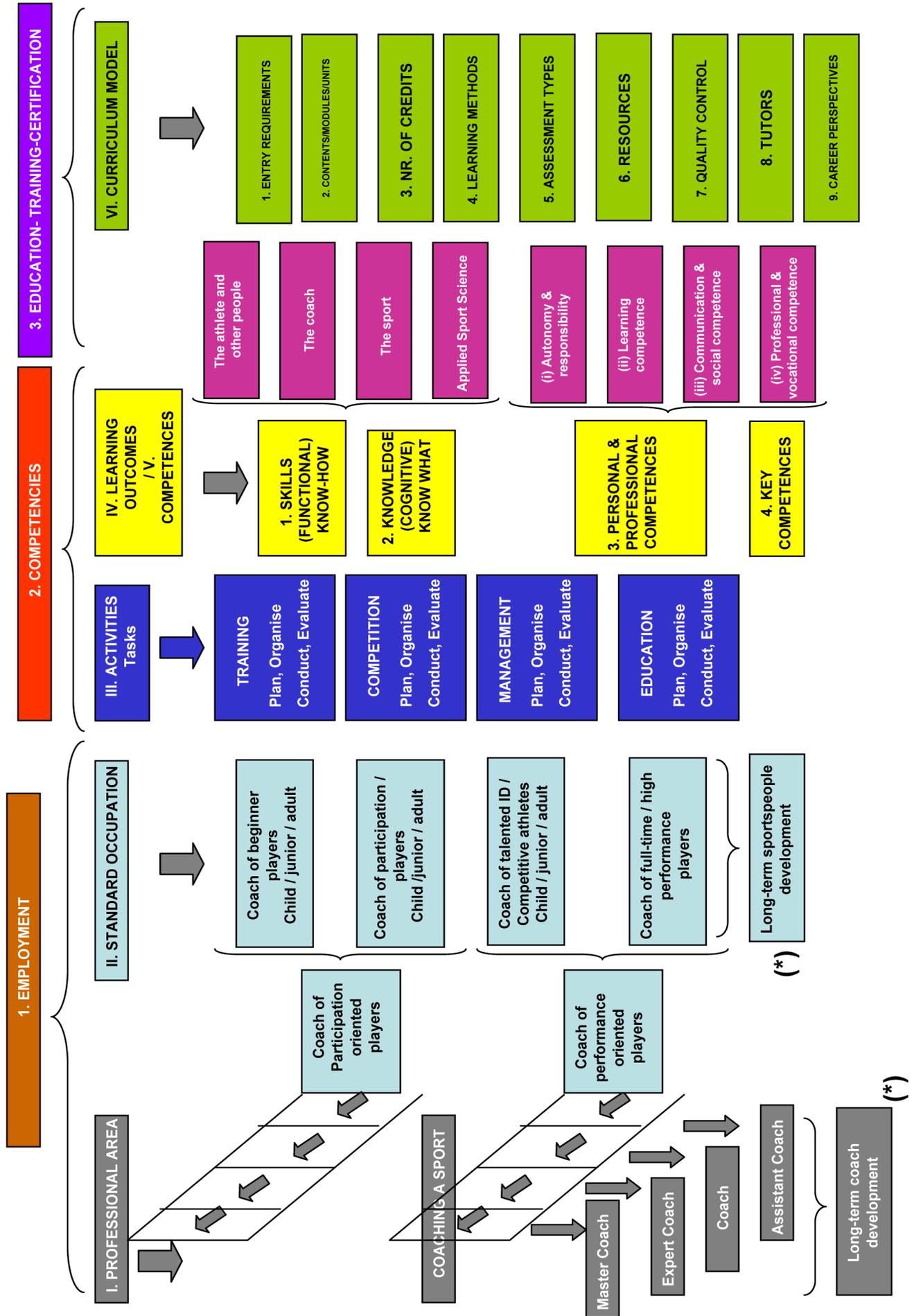
Apart from all this information, the web is also used for different ways of learning. Interactive modules, online assessment, learning facilitators on distance, uploading video-clips with analysis in words or drawing, make learning and teaching much more flexible. Especially in large countries this is a crucial development in coaches education.

PROGRESSION

It is my feeling the development in coaches education has jumped forward in the last decade. Only a few countries can afford a well organised coaches education system, but even smaller and/or poor countries at least have access to all information needed. Countries lacking the structure for a decent tennis coaches educational system, will still have individual coaches browsing the internet and finding information to improve the quality of their work. We can expect more good players from countries formerly not being able to produce players, just because of the availability of all information that is shared by Federations, scientists, top-coaches and other talented coaches with good ideas and experiences.



OUTLINE FRAMEWORK OF COACHING QUALIFICATIONS / CURRICULUM BUILDING



New trends on tennis psychology and psychological training

Antoni Girod

ITF Coaching and Sport Science Review 2010; 50 (18): 21 - 23

ABSTRACT

This article reviews the main developments of sports psychology in general and tennis psychology in particular during the last 20 years. It focuses on four main areas: specific psychological analysis and testing, on-court mental training, psychological training aids, and technological equipment that can be used for mental training in tennis. It provides practical examples and tools for a true tennis-specific mental training that will benefit players at all levels of the game.

Key Words: psychology, training, tennis.

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INTRODUCTION

During the last 20 years, sport psychology in general, and tennis psychology in particular have developed around four main areas:

1/ Those general psychological questionnaires, that were so difficult to fill in, have been replaced by more specific and concrete tests, that are directly related to sport practice.

2/ Mental training, which used to be far from technical and tactical training, is increasingly becoming part of performance parameters. That is to say, on-court psychology is integrated to classical training drills. Mental preparation is planned for the court, and always holding a racquet.

3/ There exist now new pedagogical tools which facilitate on-court practice, and help coaches to provide players with something more concrete instead of something that had always been perceived as abstract.

4/ The exponential development of new technologies has taken psychological training from the Stone Age to Star Wars, due to software based video analysis tools and bio-feedback.

This article illustrates this development with some examples.

SPECIFIC PSYCHOLOGICAL ANALYSIS AND TESTING

Here is an extract of a self-evaluation test for emotional control :

1/ BEFORE AN IMPORTANT MATCH		
On the night before the match you're so nervous that you can't get to sleep. The closer the match is getting, the more nervous and tense you feel.	A	
You can't wait to play your first match. You warm up with enthusiasm. You can feel power gradually rising up within yourself. You are like a boxer about to enter the ring.	B	
For you it is a match like all others. You don't even think about it. You go calmly through your pre-match ritual. You feel calm and relaxed.	C	
You feel weak and have no energy. You're counting on the first set to wake you up and get re-energized.	D	

2/ AFTER A FAULT ON AN EASY BALL		
You scream names to yourself. You make angry gestures. And you cannot keep your mind off that fault until the next point.	A	
You make the same movement again correcting it dynamically. Then you encourage yourself and jump about a little to get ready for the next point.	B	
Faults just go by and never affect you. You mentally erase your mistakes and you move on to the next point feeling calm and unconcerned.	C	
Your body language is poor. You look fed up. You breathe out in a disillusioned way.	D	

There are similar tests for other mental skills such motivation, concentration, self-confidence, etc.

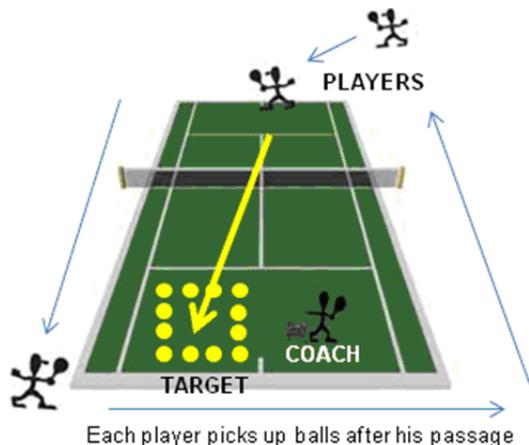
Here is an example of a match observation sheet centered on the attitude of the player :

MATCH EVALUATION	POOR	AVERAGE	GOOD
PLAYER : OPPONENT :			
DATE : SCORE :			
1/ General motivation (energy, enthusiasm, pumping after winners)			
2/ Focused at the very beginning of the match			
3/ Body language before serving (eye of tiger, head up, shoulders back)			
4/ Activating before receiving (bouncing toes)			
5/ Reaction after unforced errors			
6/ Body language when down in the score			
7/ Take time between points (breathing, strings, towel, etc,)			
8/ Use change overs to recover and prepare next two games			
9/ Proactive in rallies (play with confidence and audacity, seize opportunities)			
10/ Constant in the pre point routine before big points (no rush, no stress)			

This match observation sheet, to be used by the coach, can easily be used by the player as a match self analysis tool, which can be easily filled in to help the player to become aware of his/her strengths and progress in the mental aspect during a match.

ON COURT TRAINING

Among all the range of on-court exercises, this one has the advantage of helping with all four: technical, tactical, physical and mental aspects



This drill is for three or four players. The coach feeds the balls from the basket. One player is on the base line, inside the court. He receives balls that are short and to the center, which he hits back with offensive forehands aiming at the area limited by the 12 targets (see diagram). If the ball is inside the area, the player wins one point (+1). If the ball is outside the area, the player loses one point (-1). The aim is to reach « +5 ». The series stops when the player reaches « +5 » or « -5 ». He picks up his balls while another player takes over and so on...The exercise may also be done with backhands or any other shot in a chosen area. The size of the area is of course determined according the level. To emphasize success and reduce the feeling of failure, one may give two points when the area is reached, and take away only one when the ball is out. In this exercise, the target is an area situated 1 meter away from the lines. The player thus integrates the notion of security margin to his offensive shots. To use scoring allows the player to measure his level of accuracy and efficiency under the pressure of the score.

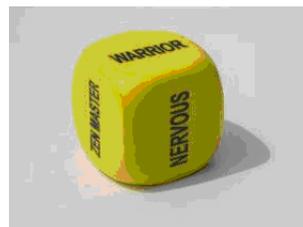
As to the technical aspect, this exercise strengthens the stroke by means of repetition. The target zone provides a tactical dimension. The number of repetitions, the physical demands of each stroke and the speed to recover the hitting position add a physical dimension to the exercise. The scoring system helps to develop mental skills like concentration, tolerance to failure and self confidence. This is a very complete exercise which very well illustrates the concept of integral training.

TEACHING EQUIPMENT

The following are simple examples of teaching equipment used to facilitate the implementation of concrete on court mental training exercises.

Visual concentration : use smaller micro balls) or bigger (foam balls) training balls or even odd bouncing Z-shaped balls to foster visual concentration

Body language : ask players to play points after throwing the dice so as to determine the specific rol to be played and to be used in order to become aware of the impact of the body language on the game. (The 6 sides of the dice are: Warrior, Zen Master, Eye of the Tiger, Loser, Nervous, Complainer).



Routine of concentration : required teaching tools : 4 steps routine markers. Just after the last strike of a point, ask the player to start this four step after-point routine, in the following order :

Step 1 : Turn your back

Step 2 : Cut the contact between hand and grip

Step 3 : Breathe out

Step 4 : Fix your strings

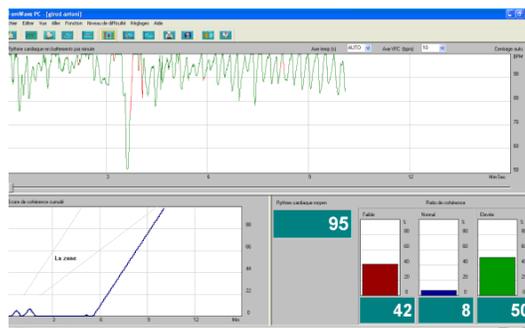


The coach has three or four players facing him. He feeds two balls : the first one is short and to the center (1), the player should hit an offensive shot, and the second is high and to the forehand side (2), the player should hit a high winning volley. After the last shot, all the player has to do, is to go through the four steps that are marked on the ground. This visual reminder furthers learning and helps the routine become automatic.

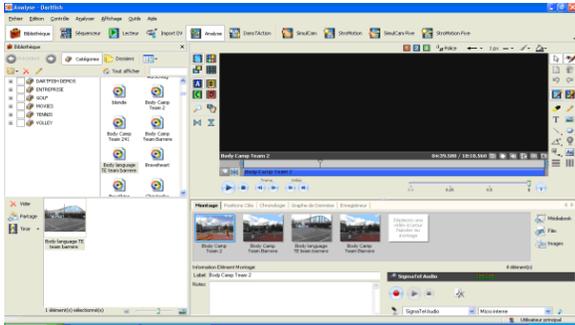


USE OF TECHNOLOGY

These are some of the software tools available to support the psychological aspect of training:

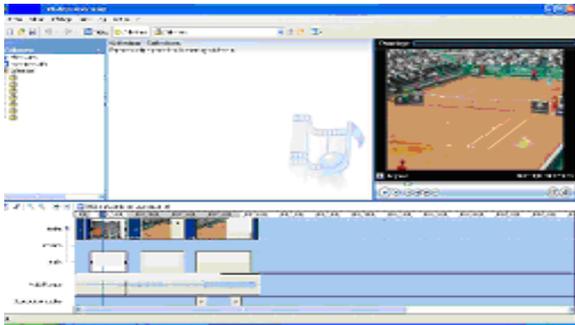


This excellent bio-feedback software called emWave helps players to appreciate the impact of breathing, internal dialogue and mental images to control emotions.



To support technical or tactical visualization exercises, to increase awareness of body language, there is a very well developed video analysis software tool called Dartfish. There is also another tool developed by Dartfish, a platform called Dartfish TV, for distant use.

Windows movie maker is a video assembled software to be used for motivation clips and to be watched before the match.



Although new technological and pedagogical tools that can be used for mental training appear on a daily basis, it is the role of the coach that is always key for the player's sport education. In fact, apart from the mental preparation techniques and mental training exercises, the spirit of fair play and sport values must be emphasized from an early stage in order to provide solid foundations to the younger players.

References

- Cooke, K. & Crespo, M. (2000). What tennis research tells us about visualisation and imagery, *ITF CSSR*, 21, 13-14.
- Crespo, M. (1998). Mental training applied to tennis, *ITF CSSR* 14, 9-10.
- Crespo, M., Quinn, A & Reid, M. (2003). Drilling psychology on court! *ITF CSSR*, 30, 11.
- Girod, A. (1999). Concentration and tennis: mechanisms and exercises, *ITF CSSR*, 17, 4-5.
- Girod, A. (2001). Self-confidence, *ITF CSSR*, 25, 9-10.
- Girod, A. (2003). Visualization in tennis, *ITF CSSR*, 30, 7-8.
- Girod, A. (2005). How to manage stress before and during matches, *ITF CSSR*, 35, 13-14.
- Hughet, S. (2008). The psychodynamic approach, *ITF CSSR*, 46, 18-20
- Lubbers, P. (2006). Psychological profiles of champions, *ITF CSSR*, 39, 7-8
- Peden, A. (2009). Breathing to manage anxiety in tennis, *ITF CSSR*, 49, 17- 18.
- Samulski, D. (2006). Tennis is a mental game – Part one, *ITF CSSR*, 40, 14- 15.
- Simon, V. (2007). Mental rehearsal and learning in tennis, *ITF CSSR*, 41, 2- 3.
- Samulski, D. (2007). Tennis is a mental game – Part two, *ITF CSSR*, 41, 4.
- Young, J. (2008). Coach, can you help me to be mentally tough? *ITF CSSR*, 44, 2-3.

Junior Development – Current Status and Future.... Do We Need New Programmes?

Piotr Unierzyski

ITF Coaching and Sport Science Review 2010; 50 (18): 24 - 25

ABSTRACT

This article looks at the development over the past years of junior tennis programmes. How the programmes have evolved and what should be present within a modernised player development training methodology.

Key Words: Player development, programmes, periodisation.

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INTRODUCTION

Tennis has been changing a lot during the last 20 years, and, I believe, these changes accelerated in last decade. It is not only the game we watch during Grand Slams, but also junior development and training methodology have improved so much. Upcoming juniors are generally more creative than before, they are also fitter and better mentally prepared, as the result they play aggressive all round game from the beginning. My opinion is that it is mostly because many coaches (among others due to hard work of the ITF Development Department) understand better tennis specific periodisation and that the development of junior players to successful performer is a multiyear, step by step process. Progressive mini tennis system (red - orange - green) is widely accepted, even by parents and the game based/tactical approach is more and more in use.

So because modern coaching is more and more sport science, game based, player centred and individualised coaching (Crespo 2005, Unierzyski, Crespo 2007), nowadays young players learn earlier more competences.

Almost all tennis nations possess junior/players development programs and they often go together with talent identification systems. Unfortunately, there is still lack of globally accepted models (Reilly et.al 2000) and because of this selection in majority of countries is still based on tournament results achieved at a young age. Because of this many junior players, who do not achieve good results early on are lost from the sport of tennis.

So, in my opinion there is still a space for improvement in few areas:

JUNIOR DEVELOPMENT SYSTEM.

Despite achievements of sport science natural model of players' is often still in place. It favors early maturing children, often born in first months of respective year (Malina 2003) and therefore because many players, who are not successful at the young age, drop out.

STRUCTURE AND ORGANISATION OF TOURNAMENTS.

Knock out system still dominates, even under 10-12. Research on relative age effect (e.g. Edgar, O'Donoghue, 2005, Unierzyski 2010). conclude that we are losing many players who were born later in the calendar year. Therefore, I have no doubt, that the cut off date for age groups should be flexible and based on calendar/chronological age of individual, not on fixed date (1st January). I also believe that there should be more events for 11 & 13's. Many research show stimulating role of tournaments for junior development (Brabenec 1999). Therefore ALL junior players of similar biological development should play similar number of matches regardless of current ranking/sport level

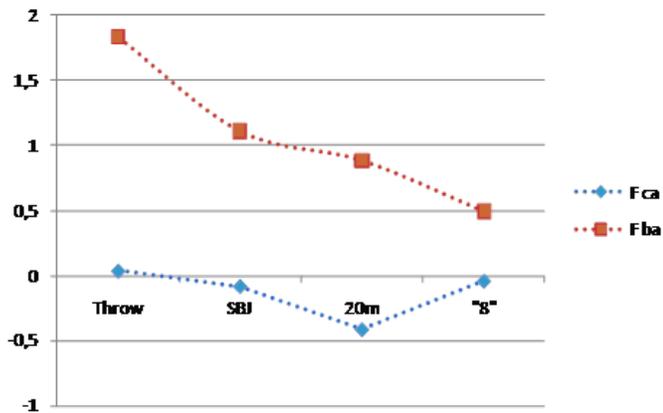


TRAINING LOADS.

Still many players work too much and biological and emotional development is not considered/ respected enough. Retrospective research showed, that the most successful men's players were following training regime adjusted individually to biological age and those, who were overloaded in vast majority were very good only as juniors (Unierzyski 2010)

TALENT IDENTIFICATION AND TESTING PROCEDURES.

Many nations implemented testing procedures in order to measure players' potential and effectiveness of training. In these models, instead of subjective judgment, knowledgeable experts measurable most desired characteristics of young athletes (like motor abilities, technique, tactics, mental features). But one of very common problems is how to interpret results of tests. Possessing numbers (cm, seconds etc.) is not enough. The influence of biological development on test's results is often not considered and many talented players are not spotted because they are late maturers. Graph 1 presents one of arguments why this issue is so important.



Graph 1. Fitness profile of 13 years old junior – future/currently the best tennis player in the world

Fca – profile standardised according to calendar age, Fba – profile standardised according to biological age.

A player who's profile is shown on graph, as a 13-years old was just one of many young competitors participating in European junior tournaments. He was not very successful, probably because he was biologically more than one year younger than his calendar age. He was also practising much less than his mates. Some years later he became probably the best tennis player in the history of the game. If his physical preparation is analysed traditional way i.e. according to his calendar age, he would be "average" and probably not selected to national team in many countries. (TiD theory says that talented player must possess fitness level above the average for his age). But if his real (i.e. biological) age is considered, it can be seen that his profile is much above the average so he meets criteria of "talent".

Presented case study of is, in my opinion a strong argument, that there is a need to improve programs and methods - we need to create more effective and high quality systems of junior development and talent identification.

As a life-time and mass sport, tennis needs different approach and solutions than classical "Olympic" disciplines, e.g. rowing, wrestling, canoeing, weight lifting, judo, in which selecting the most gifted early might be more important than creating a large participation base. I believe that using achievements of sport science and experience of sport practitioners in a one common system will help to form models suitable to many nations. In such program junior development programs, competitions and talent identification should work together as a one, integrated system. The system which Tennis Canada develops is good example.

Basic principles of a junior development program could be:

1) Everybody has a chance to practice at appropriate level ("Play-and Stay"). Most gifted players are scouted and invited to special programmes but everybody should have a chance to participate. To start with a relatively large number of potential champions is more proper than selecting only a small number at the young age.

2) Initially identification criteria are „wide“ (range of acceptability). They become narrower with the age and stages of career. This approach reduces the possibility of making mistakes when assessing potential of young players.

3) Depending of age and potential, players are invited to be part of: e.g. club (C), regional -B), or national (A) system. Individualised (or at least semi- individualised) programmes are offered to more talented children. Even theoretically less gifted kids should get treatment according to their needs (quality!). If they progress they will be able to join the elite group. It will keep them in a game and give a chance of further development (no one knows if they won't develop and reach „A“ Level later).

4) Everyone from e.g. „B“ group, may join „A“ group when he/she fulfils certain criteria/conditions (fitness level, results etc.).

References

- Brabenec J. (1999). Competition: The most desirable form of training. ITF Coaches Review, 17, 3.
- Crespo M. (2005). Quality Tennis Coaching for the Future...Now! 14th ITF Worldwide Coaches Workshop, Turkey 2005 - "Quality Coaching for the Future". The International Tennis Federation.
- Edgar, S., O'Donoghue, P. (2005). Season of birth distribution of elite tennis players. Journal of Sports Sciences, 23, 10, 1013-1020.
- Malina, R.M. (2003). Selection and development of talented young athletes: status, progress, and issues. Presentation at 8th International Scientific Conference "Sport Kinetics" Rydzyna.
- Reilly, T., Williams, A.M., Nevill, A., and Franks, A. (2000). A multidisciplinary approach to talent identification in soccer. Journal of Sports Sciences, 18, 695-702.
- Unierzyski P., Crespo M. (2007). Review of modern teaching methods for tennis. Revista Internacional de Ciencias del Deporte International Journal of Sport Science, 1-10.
- Unierzyski P. (2010). Talent identification in tennis – retrospective analysis of professional players (in Polish). AWF Poznań (in print)

Periodisation in tennis

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ABSTRACT

This article focuses on effective planning and periodisation within player development. It explores scheduling trends in the modern game and how that scheduling varies with specific reference to a player's late junior or early professional career.

Key Words: Player development, programmes, periodisation.

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INTRODUCTION

The planning of tennis player development is generally guided by the experiences of the coach or the schedules of the sport's contemporaries (Reid et al., 2009). The merits of different developmental pathways have been illustrated previously (Reid et al., 2007), yet little research has investigated the more intricate roles of planning and periodisation in player development. Indeed, the combination of emulative approaches to scheduling and uncertain micro backdrops (unpredictable playing times and numbers of matches) in tennis heighten the challenge for professionals working to maximise the performance, health, and well-being of the game's players.

Coaches generally want their players to compete. It's no surprise that those same players want to compete! This shared sentiment is often most pronounced between the ages of 16-21. This period encapsulates a player's transition to the professional game; a time where they're eager to compete to earn ranking points, or for that matter, a living. Consequently, it becomes an exercise in not only managing expectations but also determining what's needed to maximise the players' chances of breaking-through. For aspiring professional players, competition is very important but nor is every player a Nikolay Davydenko clone (he played close to 40 events in the first 11 months in the year that he turned 19). Priorities can also lie elsewhere, for example, in continuing to improve technique or in developing the requisite physical skills – and for that, you need time to train.

PLANNING AND PERIODISATION CONSIDERATIONS

The international junior and professional tours are well established and so observation of the different playing histories of current professionals can be instructive (Table 1, Reid et al., 2009). Using the men's game as a case in point, a close look at the schedules of some of game's best players during their transition to professional tennis reveals (on balance) more similarities than it does differences.



For example, while the competitive foci of Nadal and Federer in their 17th years are very different, their commitment to tournament play (number of events played) is similar. The parallels are even greater in their 18th years; while the schedules of Roddick, Murray and Djokovic also share a significant bias toward participation in professional events during their final year of juniors.

As evidenced here and in general (age eligibility rules permitting), most competitive players will play in 18-30 international tournaments per year in their late junior or early professional career. When combined with the nuances of the sport (i.e. the abovementioned irregular playing times, uncertain tournament cut-offs and an indeterminate number of matches per tournament), it's clear that this intensive scheduling does not lend itself to the textbook use of periodisation (Reid and Schneiker, 2008).

Table 1. Calendar of events played by the top ATP players in their 17th and 18th years.

Player	Year	Professional events			Junior events	Total
		ATP Circuit	Challenger	ITF Futures	ITF	
Nadal	17 th	11	9	0	0	20
	18 th	18	0	0	0	18
Federer	17 th	3	1	0	14	18
	18 th	14	7	0	0	21
Djokovic	17 th	3	7	6	3	19
	18 th	9	4	0	0	13
Murray	17 th	0	4	7	3	14
	18 th	9	7	3	1	20
Roddick	17 th	0	0	0	17	17
	18 th	5	5	0	12	22

As a result, the following points are made to highlight how the tenets of periodisation can be applied in a modern tennis context:

- Training blocks need to feature between clusters of tournaments. When astutely planned, this still provides coaches and support staff in the region of 20 weeks or almost 40% of total tennis time to focus on specific (technical, tactical, physical or mental) goals. From a strength and conditioning point of view, it's desirable (particularly with transitioning players) to have at least one block of 6 consecutive weeks for some more intensive exercise prescription. These blocks also provide athletes and coaches the opportunity to rejuvenate by training at home, without the associated pressures of competition.
- The WTA is known to recommend that players minimise the number of times that they compete in more than 3 consecutive weeks with a view to maintaining good health and high levels of performance. Scheduling in this way would also help to attenuate the effects of detraining that have been observed in other tennis populations (Kovacs et al., 2007). The extra cost associated with this approach may make it less viable for some, yet it reflects an important attempt to apply the notion of periodisation to tennis.
- Training does not need to stop during (all) competition. Strength and conditioning programs should look to incorporate undulations in load and stimulus to help elicit adaptations or to maintain performance, even during competition weeks. Kraemer and colleagues (2000, 2003) have variously illustrated the potential value of this approach to exercise prescription in tennis.

• Workload monitoring (in its various discrete forms) has now risen to prominence in most sports. Some would say to the detriment of coach intuition, or even, athlete work ethic; but most others would concede that it's another step toward making every second of each training session or match count. In tennis, our understanding of its potential contribution to player performance and injury is in its infancy. Nonetheless, at the level of the individual, it has started to play an important role in linking the psychological-physical domains and, more globally, in the modification of training programs.

• Given that players are required to back up 'day in, day out, 'week in, week out', the need to introduce some level of system in to the way in which they recover is key. Granted, the location, the facilities, the hotel, and the match's start and finish time can all shape the options available to a player but there are certain recovery 'one percenters' that can be undertaken as a matter of routine.

CONCLUSION

Planning and periodising the training programs and playing schedules of tennis players represents a significant challenge. For most players, and particularly those transitioning to the professional game, there exists the need to train and to compete ... and, the lines defining where one (training) starts and the other (competing) stops are sometimes blurred. And it is here where the tenets of periodisation can be applied to assist players and coaches meet both their training and playing priorities.

References

- Kovacs, M, Pritchett, R, Wickwire, J, Green, M & Bishop, P. (2007). Physical performance changes after unsupervised training during autumn/spring semester break in competitive tennis players. *Br J Sports Med*, 41, 705-710.
- Kraemer, W.J., Ratamess, N., Fry, A.C., Triplett-McBride, T, Perry Koziris, L., Bauer, J. A., Lynch, J. M., & Fleck, S. J. (2000). Influence of Resistance Training Volume and Periodization on Physiological and Performance Adaptations in Collegiate Women Tennis Players. *Am J Sports Med.*, 28, 5, 626-633.
- Kraemer, W.J., Hakkinen, K., Triplett-McBride, N.T., Fry, A.C., Koziris, L.P., Ratamess, N.A., Bauer, J.E., Volek, J.S., Mcconnell, T., Newton, R.U., Gordon, S.E., Cummings, D., Hauth, J., Pullo, F., Lynch, J.M., Mazzetti, S. A., & Knuttgen, H.G. (2003). Physiological Changes with Periodized Resistance Training in Women Tennis Players. *Med. Sci Sports Exerc.*, 35, 1, 157-168.
- Reid, M., Crespo, M., Santilli, L., Miley, D., & Dimmock, J. (2007). The importance of the International Tennis Federation's junior boys' circuit in the development of professional tennis players. *J Sports Sci*, 25, 6, 667-72.
- Reid M, Schneiker K. (2008). Strength and conditioning in tennis: current research and practice. *J Sci Med Sport*. 11, 3, 248-56.
- Reid, M., Quinlan, G., Kearney, S., & Jones, D. (2009). Planning and Periodization for the Elite Junior Tennis Player. *Strength Cond J*, 31, 4, 69-76.

Player Welfare- ITF Initiatives to Enhance Safety and Welfare

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ABSTRACT

The ITF, in partnership with National and Regional Associations, strives to provide players with a safe competitive environment, free of discrimination, in which all participants are treated with dignity and respect. We believe this to be vital for a player's continued success, enjoyment and the development of the game. The Player Welfare programme was instigated by the ITF in 2007 as part of its commitment to player safety and welfare. The Player Welfare Policy was adopted in 2007 and the ITF appointed a Player Welfare Officer (the author, Kathy Martin) in 2009 as part of this programme.

Key Words: Welfare, abuse, education.

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ITF INITIATIVES

These initiatives were implemented in response to recommendations from the 2006 Working Group on Player Safety, which was comprised of representatives from the ITF, the WTA Tour, professional tournaments and experts in sports psychology and elite sports and in response to the directive from the International Olympic Committee (IOC), issued in February 2007 to all International Sporting Authorities to review measures in place to prevent Sexual Harassment and Abuse within their respective sports.

The charter of the Working Group was twofold:

1. To examine athlete security in order to better understand existing and potential threats to athletes' safety and wellbeing; and
2. To review current rules, athlete programmes and services and provide recommendations to aid in safeguarding and protecting players' wellbeing where indicated.

THE WORKING GROUP FINDINGS

The Working Group reviewed the policies and practices of a number of international elite sporting organizations and the available peer-reviewed research relating to abuse prevention in sport. The research indicated that abuse does occur in sports, at all levels and that the prevalence is higher in elite sport. This abuse seriously damages an athlete's physical and psychological health and can cause reduced performance and premature drop-out from sport (Brackenridge, 2001; Fasting, Brackenridge and Sundon Borgen, 2003; Leahy, 2001).

Abuse frequently occurs when there is a power relationship and/or where the abuser holds a position of trust, such as exists between a coach and an athlete, parent and athlete or adult and child. Abusers and their victims come from all cultures, classes, ethnic groups, religions, and levels of education. Abuse is usually secret and hidden and in the vast majority of cases, the abuser is within the athlete's inner circle. The various types of abuse include:

Sexual: Any unwanted sexual activity, including sexual comments, touching or indecent exposure and forced or coerced sexual activity.

Verbal: Derogatory & humiliating names, yelling, offensive language

Economic: Unapproved control over the person's finances or income

Emotional: Intimidation, repeated humiliation or criticism

Physical: Aggressive acts such as hitting or kicking; forced or excessive training, restricting an athlete's access or consumption of food and drink

Social: Isolation of the person from family and friends; monitoring or restricting their activities; and/or restricting their access to help or information.

Bullying: Bullying and intimidating behaviour can occur in person, or via e-mail, chat rooms, social network sites and text messaging.

All are unacceptable and all cause damage to an athlete's career and life.

The Working Group found that elite sports organizations internationally are responding to this situation by adopting clear guidelines about standards of behaviour, education of key stakeholders in the sport and specific procedures for prevention, support and complaint systems (Brackenridge, 2001; Australian Sports Commission, 2009; Sport England, 2003). In 2007, the IOC recognised the need for such programmes. It recommended that sports adopt abuse prevention strategies including codes of conduct, education, training, complaint and support systems and monitoring systems (International Olympic Committee, 2007).

The recommendations of the Working Group, together with a number of others following the ITF's own review, were subsequently adopted. They include:

1. PLAYER WELFARE POLICY

The Player Welfare Policy was implemented in 2007 and is located on the ITF websites: <http://www.itftennis.com/womens/playerwelfare/playerwelfare.asp> It applies to all player support team members, such as any coach, manager, agent, fitness trainer, medical practitioner, family member, player guest or other similar associate of any player. It is a code of conduct, which describes clear standards of behaviour for coaches and others to promote a fair, respectful and lawful environment.

The Policy includes the following areas:

- Unfair/discriminatory conduct
- Abuse of authority/abusive conduct
- Sexual conduct, including harassment and abuse and a Hotel Room policy. The latter stipulates clear standards regarding sharing hotel rooms with minors, which is disallowed unless the adult is a relative of the child.
- Criminal conduct
- Anti-Doping
- General conduct & requirements

Anyone who is found to be in breach of the ITF Welfare Policy can be penalized. This can include denial of privileges or exclusion of the person in question from any or all ITF Tournaments, and other sanctions including monetary sanctions. Complete procedures for violations and appeals and management of complaints are described in the Policy.

- ALL coaches should be familiar with and behave according to the Player Welfare Policy.

2. PLAYER WELFARE OFFICER

The role of the Player Welfare Officer is to:

- Disseminate information and education programmes about abuse prevention to the ITF tennis community
- Communicate the need for programmes at national as well as international level
- Provide consistent guidance to the ITF on dealing with individual cases of harassment or abuse that complies with international best practices in athlete welfare
- Establish and monitor support services for players
- Monitor the implementation of the Welfare Policy and procedures and evaluate the impact of the same

3. PLAYER SUPPORT SERVICES

The ITF has launched a 24-hour counselling telephone helpline service, available in many languages, for the benefit of players at ITF events. While it is still hoped that a player will be able to turn in the first instance to a familiar and trusted source for advice and guidance, the ITF recognises that this is not always possible and provides this vital emergency service for those in need. Supportive tips and articles are also available at Achieve Solutions, the health promotion website. This is a great resource for ITF players to learn more about how to manage commonly encountered stressors, which will ultimately assist them to achieve peak performance.



4. EDUCATION

Education of all key tennis constituents, such as coaches, is crucial to prevent abuse and to facilitate a safe and respectful tennis environment. The ITF is taking a pro-active approach in the education area. To date, Player Welfare education includes:

- In-services for the ITF staff and all the Development Officers on player welfare matters and to introduce the Achieve Solutions website and telephone counselling services
- Update of the ITF Junior School module on Player Protection
- Presentation at the ITF Junior School, Wimbledon Championships, 2009
- Inclusion of Player Welfare information on the women's and men's circuits, wheelchair and juniors websites
- Presentation to the Worldwide Coaches' Workshop in Valencia, Spain, 2009

Future education initiatives include providing a Player Welfare e-learning module on i-coach and providing Player Welfare information via the ITF Coaching and Development websites.

5. THE COACH'S ROLE AND WELFARE

If you witness or suspect that someone is being abused or a person is behaving against the Player Welfare Policy, it is your responsibility to share your concerns immediately to the ITF Coaching and Development Department, National Association or tournament personnel as applicable. In cases where a child's welfare is involved, many adults are legally required to report to the relevant local authorities. Ultimately, everyone who coaches, plays or is involved in tennis in some way is responsible for the welfare of each other and for making the ITF tennis environment safer.

Coaches play a vital role in fostering a player's on-court success. That success includes enhancing a player's welfare and safety, which coaches can do with ethical and supportive behaviour that aims to nurture a player's physical, mental and emotional growth.

As a coach, it is in your best interest to make smart, professional decisions to protect yourself and the players in your care. These include:

- Avoid Dual Relationships (where a personal and professional relationship co-exist, such as when the coach is also the boyfriend or girlfriend of a player, or the player's parent). These relationships are complicated and can have many negative consequences. They are best avoided. Additionally, sexual relationships between coaches who are in a position of trust and their players, including with adult players above the age of majority, are against the ITF Code of Ethics for Coaches. The Coaches Code of Ethics can be downloaded from the ITF website at www.itftennis.com/coaching/practicalinfo/codeofethics.asp
- Respect the boundaries of your qualifications and experience. Refer to health practitioners for health advice; psychologists for mental skills; other coaches or fitness personnel for special areas of expertise.
- Avoid questionable practices & activities. For example, avoid giving massages to your players. This is known to be a high-risk situation where sexual abuse and harassment frequently occur. Avoid meeting players alone in hotel rooms- conduct your meetings, training sessions and other activities in view of others. Before using ANY physical contact in your coaching, always first ask permission, and do explain where you will touch the player and why.
- Be open to evaluation. Provide your training certificates, references and agree to be criminal record checked if asked. Reputable coaches are proud of their qualifications and welcome the opportunity to provide evidence of their skills.
- Abide by the Player Welfare Policy and the Coaches' Code of Ethics. They are in place to set appropriate standards for all and to protect you.

References

- Australian Sports Commission (2009) Member Protection Policy framework template. Available at http://www.ausport.gov.au/supporting/ethics/resources/member_protection
- Brackenridge, C.H. (2001) Spoilsports: Understanding and Preventing Sexual Exploitation in Sport. London. Routledge.
- Fasting, K., Brackenridge, C. and Sundon-Borgen, J. (2003) "Experiences of sexual harassment and abuse among Norwegian elite female athletes and non-athletes", *Research Quarterly for Exercise and Sport* 74(1): 84-97
- International Olympic Committee (2007) Consensus Statement on Sexual Harassment and Abuse in Sport. Available at http://www.olympic.org/Assets/ImportedNews/Documents/en_report_1125.pdf
- Leahy, T (2001) Preventing the Sexual Abuse of Young People in Australian Sport. Available at <http://fulltext.ausport.gov.au/fulltext/2001/ascpub/sexualabuse.asp>
- Sport England/NSPCC Child Protection in Sport Unit (2003) National Standards for Safeguarding Children in Sport. Available at www.thecpsu.org.uk

Wheelchair Tennis in 2010

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ABSTRACT

The ITF was the first international federation to include the disability element of the sport and this has allowed it to go from strength to strength. The growth and evolution of wheelchair tennis has been remarkable. For a wheelchair sport that is just coming up to its 35th birthday the developments have been significant. The most important factor was the early recognition by the International Tennis Federation that wheelchair tennis should be part of the tennis family.

Key words: Wheelchair, disability, NEC tour.

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Wheelchair tennis is well established in the Paralympic Games since the first medal event in Barcelona, Spain in 1992. In 2010 there will be 157 tournaments in 41 countries on the NEC Wheelchair Tennis Tour. There are sanctioned events in all four Grand Slams and the year end number one woman and man are honoured as ITF Wheelchair Tennis World Champions.

To play wheelchair tennis players must have a mobility related physical disability. Players have a wide range of disabilities; spinal cord injury, single amputees, double amputees, spina bifida and so on. There are three divisions in wheelchair tennis; men, women and quads (players who have a disability in their upper limbs as well).



The NEC Wheelchair Tennis Tour ranking system is based on the principles used in able bodied professional tennis. The ranking is based on the top 9 results for the men, top 7 results for the women and top 6 results for the quads. The highest ranked players at the end of the year compete for the prestigious NEC Singles Masters and the Camozzi Doubles Masters titles.

The Invacare World Team Cup is the flagship international team competition, the equivalent of the Davis and Fed Cups by BNP Paribas. In 2009 the event celebrated its 25th anniversary. The event has been hosted by fourteen different nations. The 2010 event will be held in Turkey and in 2011 Africa will play host for the first time with South Africa organising the tournament.

Wheelchair tennis has been successful commercially. Currently the ITF wheelchair tennis sponsors are NEC, BNP Paribas Invacare and Camozzi. The ITF wheelchair tennis department also receives significant support from the Cruyff Foundation for its junior and development programmes. The Silver Fund is a development programme introduced in 2001 to celebrate the 25th Anniversary of wheelchair tennis. It has now supported programmes in close to thirty countries. Recently the ITF has worked with the International Paralympic Committee (IPC) and the International Wheelchair Basketball Federation (IWBF) to develop a low cost sports wheelchair for low income countries. In 2009 almost 200 low cost tennis wheelchairs were delivered to developing countries.

In tandem with these developments the playing standards and professionalism of the players as developed. The design of the tennis

wheelchair has evolved and improved and coaches and players have developed techniques, tactics, movement patterns and training methods over time.

In that sense, the research about wheelchair tennis is growing up given us more information about how we can improve our job as coaches. We have not so much scientific information about our sport and we have to establish a comparison with able-bodied tennis in order to have some references to focus after in wheelchair tennis particularities. Concerning this matter we have some researches about what happens in a real tennis match about pattern activity (O'Donoghue & Ingram, 2001; Mendez-Villanueva et al., 2007; Fernandez-Fernandez et al., 2007), and some researches from this point of view of wheelchair tennis (Bullock & Pluim, 2003; Sanz, 2005; Sanz et al. 2005; Sanz 2006; Sanz, 2007; Roy et al, 2006; Filipčič, T. & Filipčič A. 2006; Filipčič, T. et al 2007), show us that the rally time is around 4-10 seconds, with ratios work/rest from 1:1 till 1:4, and with the number of strokes per rally about 4-6, with a length rally of 5 seconds per point (about 70%) as mean, and with a lower intensity of able competitive tennis. On the other hand, we have to take into account the second bounce, because sometimes we have the same number of strokes per rally, related able-bodied tennis, but the length of the point could be slightly different.

These studies could give us some useful information in order to be more accurate designing training systems according the demands of competitive wheelchair tennis.



We are studying at the moment the evolution of the pattern game in wheelchair tennis, and we have detected an increasing intensity of the game, from Paralympics in 2004 to Paralympics in 2008 (Sanz et al, 2009). We have analyzed the semifinal and final in both events, with a total of 150 rallies and 336 points. The results show us that the number of strokes per rally, the number of strokes with the second bounce and the play time are lower at the moment from the 2004, so its seems reasonable to think that the wheelchair tennis game is becoming faster and more intense, like able-bodied tennis, but we need much more research to dig deeper in this matter.



Other topics of research are concerning the changes in the stroke production from a biomechanical point of view, and also the injury prevention in wheelchair tennis (Reid et al. 2007). In that sense, we are studying the generation of new strokes, build from the own practical game situation to solve the problems that some kind of situations can provide to the players. For instance, the pronated backhand appeared from the quad wheelchair tennis as a way to be able to have an impact point higher and closer to the body, but nowadays is a classic stroke in wheelchair tennis for all kind of players and allow to the players to be more offensive in some situations that previously, with the classic backhand and on the chair, was impossible to be.



Another topic of research is concerning the external and internal load of playing wheelchair tennis (physiological responses and speed, pattern wheelchair mobility, distances recovered in a match,...) that will increase the knowledge about our sport in order to design specific training systems for the players.

References

- Bullock, M. & Pluim, B.(2003). Issues in physical training of wheelchair tennis players. En Miley, D; Crespo, M. y Reid, M. ITF physical training for tennis players. London: ITF.
- Elliott, B., B. Dawson, & F. Pyke.(1985). The energetics of single tennis. J. Hum. Mov. Stud. 11:11–20.
- Fernandez-Fernandez, J., A. Mendez-Villanueva, B. Fernandez-Garcia, & N. Terrados. (2007) Match Activity and Physiological Responses during a Junior Female Singles Tennis Tournament. Br. J. Sports Med. 41:711–716.
- Fernández, J.; Sanz, D.; Méndez-Villanueva, A. (2009). A Review of the Activity Profile and Physiological Demands of Tennis Match Play. J. Strength Cond. Res. 31(4):15-26.
- Filipčič, T. & Filipčič A. (2006). Analysis of tennis strokes in wheelchair tennis. Wheelchair tennis coaches review 14. 17-21
- Méndez, A., Fernández, J., Bishop, D., Fernández, B., Terrados, N.(2007) Activity patterns, blood lactate concentrations and ratings of perceived exertion during a professional singles tennis tournament. British Journal of Sports Medicine. London: 41, 296-300.
- O'Donoghue, P. and Ingram, B. (2001), A notational analysis of elite tennis strategy. Journal of Sports Sciences, 19, 107-115.
- Sanz, D.(2005). Physical conditioning issues with wheelchair tennis players. Actas del ITF Worldwide Coaches Workshop. Octubre, Turquía
- Sanz, D. (2006). Practical proposal to develop the specific physical conditioning of wheelchair tennis players. Actas del ITF Worldwide Wheelchair Tennis Coaches Workshop, Brasilia.
- Sanz, D, Ávila, F. (2003) La preparación física en el tenis en silla de ruedas. En Sanz, D. El tenis en silla de ruedas, de la iniciación a la competición. Barcelona: Paidotribo, p. 177-220.
- Sanz, D., Reina, R., Ávila, F., y Alvero, R. (2005). Valoración de la condición física del tenis en silla de ruedas. Actas del I Congreso Internacional de Deporte Adaptado. Octubre. Toledo
- Sanz, D. (2007). Investigación en el tenis en silla de ruedas de competición. En Actas Congreso Internacional de Deporte Adaptado. Fundación Andalucía Olímpica: Málaga.
- Sanz, D.(2007).Wheelchair Tennis Training Systems. Actas del ITF Worldwide Coaches Workshop. Octubre, Paraguay
- Sanz, D., Cid J, Fernández, J., Reina, R.(2009). Patrón de actividad en el tenis en silla de ruedas de alta competición. En STMS World Congress, Octubre, Valencia.
- Tjaša Filipčič, Aleš Filipčič & Janez Perš (2007)Comparative analysis of time and playing characteristics between two different quality groups of wheelchair tennis players.. Actas del ITF Worldwide Coaches Workshop. Octubre 2007, Paraguay.
- Reid, M., Elliot, B., Alderson, J. (2007) Shoulder joint kinetics of the elite wheelchair tennis serve. Br J Sports Med 2007;41:739-744
- Roy, J., Menear, K., Schimid, M., Hunter, G., Malone, L.(2006). Physiological responses of skilled players during a competitive wheelchair tennis match. Journal of strength and Conditioning Research, 20 (3), 665-671

ITF Coaching and Sport Science Review: An Analysis of 17 Years – 50 Issues

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ITF Coaching and Sport Science Review 2010; 50 (18): 32 - 33

ABSTRACT

The purpose of this article is to analyse the contents and authors that have contributed with articles to the 50 issues of the ITF Coaching and Sport Science Review, the ITF Official Coaching and Sport Science Publication. Data is provided on total number of articles, authors, content structure and author origins as well as details on most prolific authors, contributor groups, etc.

Key words: CSSR, content, articles.

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INTRODUCTION

The first issue of ITF Coaching and Sport Science Review was published in April 1993. At that time the journal was called ITF Coaches Review. Created as a direct result of the ITF Coaches Commission, its main goals were to publish sport science tennis specific material that could assist coaches with the training of elite young level players, to act as a forum for new research in tennis, and to become the publication with the most up to date tennis research in order for this information to reach the performance coaches in the ITF member nations around the world.

In 2001, when ITF CSSR reached its 25th issue, an article was included in which all the topics covered in the Review were summarised. In this 50th issue, we will review and analyse the contents and authors that have contributed with articles throughout the 17 years of publication.

METHODOLOGY OF ANALYSIS

The complete list of issues, articles and contributor authors was downloaded from the official ITF coaching web www.itftennis.com/coaching and four tennis coaches' education experts, which acted as content referees, were consulted to oversee the content classification elaborated.

For analysis purposes, it was agreed that those articles including information which was not considered as containing a sport-science or coaching information content (i.e. editorial, letters to the editors, recommended books and videos, new books or DVDs published, or information and advertisements on the Worldwide Coaches Workshop or on the Regional Conferences) was not included.

The results of this analysis are presented below.

ARTICLES

In the 50 issues of ITF CSSR that have appeared throughout 17 years, a total of 506 articles have been published. The mean articles published by issue is 10.12.

The contents of the articles were classified according to the professional criteria of the experts mentioned above. The contents were classified in the following groups: 1. Medicine and nutrition, 2. Physical conditioning, 3. Mini-tennis, play & stay, ITN, 4. Psychology, 5. Tactics, 6. Technique and biomechanics, 7. Planning, periodisation and talent id., 8. Coaching, training & teaching, 9. Coach development, and 10. Miscellaneous.



Figure 1. Depicts the breakdown and comparison of contents of the articles analysed.

Table 1. Compares and ranks the content group, number of articles published and percentage towards the total.

Rank order	Content group	Nr of articles published	% over the total
1	Psychology	75	16,1
2	Coaching, training & teaching	60	12,9
3	Physical conditioning	59	12,7
4	Mini-tennis, play & stay, ITN	51	10,9
5	Planning, periodisation and talent id	46	9,9
6	Technique and biomechanics	46	9,9
7	Coach development	40	8,6
8	Tactics	36	7,7
9	Medicine and nutrition	34	7,3
10	Miscellaneous	19	4,1

Inter - group content analysis

An in-depth analysis of the specific contents in each of the groups that accounted for 10% or more over of the total was further analysed to obtain data regarding the subcontents.

Table 2. The sub-contents of the psychology content.

Rank order	Content group	Nr of articles published	% over the total
1	Methodology and training systems	33	45
2	Training drills and tests	18	24
3	Special populations (juniors, women, adults, wheelchair, beach, with disabilities)	17	22
4	Tournament and competition, match statistics	6	8

Table 3. The sub-contents of the Coaching, training and teaching content groups.

Rank order	Content group	Nr of articles published	% over the total
1	Drills and training	28	47
2	General	21	36
3	Anticipation and perception	5	8
4	Communication, parents, groups	5	8

Table 4. The sub-contents of the physical conditioning.

Rank order	Content group	Nr of articles published	% over the total
1	Periodisation, training theory and methods	29	48
2	Physical conditioning training drills	24	41
3	Physical conditioning tests	5	9

Table 5. The sub-contents of the mini-tennis, play & stay, ITN content group.

Rank order	Content group	Nr of articles published	% over the total
1	Lesson Plans	28	55
2	Play and Stay Case Studies	11	22
3	Mini Tennis	8	16
4	Game Based Approach and ITN	4	8

Table 6. The sub-contents of the planning, periodisation and talent id.

Rank order	Content group	Nr of articles published	% over the total
1	Player Profiling	12	26
2	Planning	12	26
3	Periodisation	11	24
4	Talent ID	11	24

Table 7. The sub-contents of the technique and biomechanics.

Rank order	Content group	Nr of articles published	% over the total
1	BIOMECH and Technology	16	36
2	Stroke Production	14	31
3	Serve	11	24
4	Movement	4	9

AUTHORS

Origin

The first authors were analysed to find where the authors were situated worldwide. From the sample of 506 articles over the past 17 years, 35 countries were represented by a first author. Of these 35 countries the following were the top most frequently published as summarised in table 8.

Table 8. Articles by nationality of first author.

COUNTRY	FREQUENCY
USA	80
UK	56
Australia	45
Spain	39
France	30
Canada	27
Holland	21
Germany	17
Ireland	13
Chile	12

Number of author collaborations

The number of solo articles and group collaboration articles were also analysed and the results show that 315 articles (64%) were authored by one individual, 101 were authored by two or more contributors (20%), and the remaining 75 were submitted by federations or national associations and not individuals (16%).

Recourant authors

The ITF coaching department has been lucky to have an outstanding quality of authors and many have published more than one article. The following table 9 is a list of the most published authors throughout the history of the CSSR.

Table 9. Author appearance frequency.

AUTHOR	FREQUENCY
Miguel Crespo PhD.	27
Paul Roetert PhD.	16
Dr. Babette Pluim PhD.	15
Joseph Brabenec	13
Janet Young PhD.	11
Miguel Miranda	8
Machar Reid PhD.	8
Piotr Unierzyski PhD.	8
Howard Brody PhD.	7
Paul Dent	7

CONCLUSIONS

The purpose of this article has been to analyse the contents and authors that have contributed with articles to the 50 issues of the ITF Coaching and Sport Science Review, the ITF Official Coaching and Sport Science Publication. From the data that have been provided a wide variety of contents and sub-contents in published articles has been shown. An adequate combination of sport science and practical on-court applied articles have been included throughout these 17 years. A wider worldwide participation, which would include authors from more than 35 countries, is sought.

General Guidelines for Submitting Articles to ITF Coaching & Sport Science Review

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TOPICS

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FORMAT

Articles should be word-processed preferably using Microsoft Word, but other Microsoft compatible formats are accepted. The length of the article should be no more than 1,500 words, with a maximum of

4 photographs to be attached. Manuscripts should be typed, double spaced with wide margins for A4-size paper. All pages should be numbered.

Papers should usually follow the conventional form: abstract, introduction, main part (methods and procedures, results, discussion / review of the literature, proposals-drills-exercises), conclusions and references. Diagrams should be done using Microsoft Power Point or any other Microsoft compatible software. Tables, figures and photos should be relevant to the paper and should have self explanatory captions. They should be inserted in the text. Papers should include between 5 and 15 references that should be included (author/s, year) where they occur in the text. At the end of the paper the whole reference should be listed alphabetically under the heading 'References' using the APA citation norms. 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.

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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.

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