International Tennis Federation

COACHING & SPORT SCIENCE REVIEW

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Editorial

Welcome to issue 41 of the ITF Coaching and Sport Science Review, which is the first edition for 2007. This issue includes articles on a range of topics including psychological skills required for tennis play, a method for evaluating dominance during a tennis match, physical testing and training, and an article which discusses the various advantages and disadvantages of hiring a foreign coach.

The ITF is pleased to announce that the 15th ITF Worldwide Coaches Conference 2007 will take place at the Hotel Resort Casino Yacht & Golf Club in Asunción, Paraguay from 22 - 28 October 2007. The event will be organised by the ITF in conjunction with the Asociación Paraguaya de Tenis and COSAT.

It is the first time the event has been held in South America and the theme of the Conference is 'An integrated approach to coaching advanced players'. Confirmed speakers for the Conference include:

- Bruce Elliott, Professor of Biomechanics, UWA, Australia
- Paul Roetert Ph.D, Director of Player Development, USTA
- Gustavo Luza, Technical Director, AAT, Argentina
- Antoni Girod, Tennis Psychologist, France
- Victor Pecci, French Open finalist, Paraguay
- Machar Reid Ph.D, Sport Science Advisor, Tennis Australia
- Steven Martens, Head of Technical Support, LTA

More details about Conference can be found on the ITF Coaching website (http://www.itftennis.com/coaching/wcc07/eng/). Furthermore, the ITF is calling for the submission of abstracts to be presented as part of the Free Communication Applied/Scientific sessions. They will be in the lecture room and the duration of each presentation will be 15 minutes maximum including time for questions. For more information on the Free Communications please visit: http://www.itftennis.com/coaching/wcc07/eng/freecomm/index.asp.

On 26-27 February the ITF Tennis...Play and Stay Seminar took place at The Queens Club in London with over 80 attendees from over 28 nations. Among those in attendance were manufacturers, representatives of coaching bodies, the Tennis Industry Association, the ATP and the WTA. All four Grand Slam nations were represented by delegates from their national associations and four regional associations were also represented. The seminar also saw the launch of the ITF Play and Stay website which contains many resources related to the programme (http://www.tennisplayandstay.com).

Participants of the recent ITF Tennis...Play and Stay Seminar

Finally, we hope you enjoy edition 41 of the Coaching and Sport Science Review.

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Contents

Mental Rehearsal and Learning in Tennis

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THEORETICAL BACKGROUND

At present, mental preparation for tennis play is reserved for elite adult players and is practically non-existent for young hopefuls. Furthermore, in training, motor repetition is generally the only method used by coaches to reinforce learning. However, the majority of research in this area shows that gestural representation is a decisive tool in the learning process (Bertsch and Le Scanff, 1995). The serve is the most closed tennis stroke and a key motor skill in winning matches. It may therefore be assumed that visualisation work for the serve may be undertaken to facilitate learning and enhance performance.

What is imagery?

Chevalier (1990) demonstrated the importance of distinguishing between the concepts of representation, imagery and mental rehearsal within the context of cognitive representation studies.

Representation refers to a form of psychological exercise about current events or situations, or through the recalling of information coded in the long-term memory. The concept of cognitive representation refers either to a process or the product of a process (Denis, 1989). If it is a process, we shall look at the nature of the representation of the movement, for example the structural properties of the motor action. If it is the product of a process, we shall be looking at the functions of the representation, the effects of using the process on acquisition and motor performance (Chevalier, Hall and Nadeau, 1990).

Three sensory exteroceptive systems are connected with the representation: kinaesthetic, auditory and visual; we can also add the proprioceptive which includes kinaesthetic and vestibular. Representations arise from each of these systems. Kinaesthetic representations are utilised during the memorisation of movements (Chevalier-Girard and Wilberg, 1980; Chevalier, Denis and Boucher, 1987). Imaging refers specifically to the process of achieving the representation of situations, objects and movements, processes likely to play a role in mental activities such as solving motor problems, memorising movements, etc.

Players are known to use the time during change-over to visualise what they want to achieve in the next couple of games

Mental rehearsal involves the mental recall of a movement or motor pattern without its muscular production (Denis, 1989; Denis, Chevalier and Eloi, 1989). In athletic circles mental rehearsal has been utilised and it has been demonstrated that it contributes to developing an athlete's mental image (Chevalier and Renaud, 1990, 1991), and to enhancing sports performance (Chevalier 1989; Hall and Erffomayer, 1983; Mumford and Hall, 1985; Suinn, 1983).

Contribution of imagery to mental rehearsal

Chevalier (1990) demonstrated that imagery makes a significant contribution to acquiring motor skills by using mental rehearsal procedures (Denis, Chevalier and Eloi, 1989). Three main schools of thought seek to account for this phenomenon.

The neuromuscular theories postulate that the electromyographic activity detected in the muscle groups normally involved in performing a movement, when mentally recalling that movement, are conserved and subsequently re-used in the context of actually performing the movement (Denis, Chevalier and Eloi, 1989).

Symbolic theories highlight the cognitive component of mental rehearsal. They attribute its effectiveness to the cognitive processing that accompanies this activity. Accordingly, mental rehearsal is felt to gain its effectiveness from the possibility it provides for the performer to better organise the representation of the situation, of the movement to be performed, and in particular the perceptual cues essential to performing the task (Denis, Chevalier, Eloi, 1989). In short, symbolic theories place a greater emphasis on the cognitive relationship between imagery and mental rehearsal in learning motor skills.

The third school of thought focuses largely on concentration and mental preparation factors (Feltz, Landers, 1983; Weinberg, 1982). Mental rehearsal is thought to promote concentration on the motor task and reduce the risk of the performer's attention being diverted by exogenous or endogenous stimuli. These concentration factors can then be transferred to actual performance. The work has focused mainly on mental rehearsal of instructions, relying heavily on imagery.

Effect of mental rehearsal in the operational context

Field research has measured the effectiveness of mental practice. The more interesting studies are on athletes who compete regularly, with most of them associating a technique of relaxation with mental imagery, similar to the model of "visuomotor behaviour rehearsal" (VMBR) by Suinn (1983). The general results of these studies clearly demonstrate the relationship between these techniques and the enhancement of sports performance. In general, activities such as relaxation and cognitive restructuring are effective for individual sports. Furthermore, in the studies on athletes performing under pressure (in direct competition with others), cognitive-behavioural training techniques enhanced performance significantly. With regard to the types of performance measurement, results are more significant for measurable performance levels than for performances based on marks by judges. With regard to the types of skills, marked by Whealan et al. (1989), results are more significant for precision, strength and endurance tasks than for speed and balance tasks. These effects are typical for beginners but greater for experts.

When the use of imagery and learning strategies is effective

Chevalier (1990) defines the circumstances when effectiveness can be achieved in the use of imagery. Referring to several studies carried out in this area, she suggests seven conditions should be met to achieve the effective use of imagery and mental rehearsal.

Levels of familiarisation: it seems that the level of practical experience is a dependent variable in the ability to make use of imagery. Therefore, if mental rehearsal is used when the subject has not acquired sufficient experience of the task, negative effects may appear, particularly if the subject has constructed an incorrect representation of the skill to be acquired (Johnson, 1982). In other words, mental rehearsal depends on a minimum level of familiarisation with the task to be acquired and, in the cognitive phase of learning, enables a representation of it to be consolidated.

Nature of the task: the most noteworthy effects of the use of mental rehearsal are achieved in tasks where the cognitive component is substantial (task involving a high level of visual activity and requiring fine visuomotor adjustments).

Similarities between practice and image representation: the adequacy and similarity of the mental image called up during mental rehearsal with respect to the skill to be acquired are important conditions to be observed in the practice and learning of motor tasks.

Motivation: imagery is found to provide a motivational function in acquiring motor skills (Paivio, 1985; Hall, Toewes, Rodgers, 1990).

Cognitive style: imagery training has reduced the visual imagery skill level of verbally predominant subjects, suggesting that for subjects who refer spontaneously to verbal information coding, any orientation towards the visual components of the image would be of little use in their learning process.

Vividness of image: it seems that the degree of activation of the image estimated from its vividness as declared by the subject is an important factor in the functional effectiveness of the image in a mental rehearsal procedure (Denis, 1987). Subjects classified as highly imaginative on the basis of VVIQ results (Marks, 1973) demonstrated greater accuracy in location tasks than subjects with a low level of imagination (Hall and Goss, 1985).

Degree of maturity, children's mental image: it appears that a child over ten years of age can benefit from the mental image in a mental rehearsal activity, but is unable to develop an effective functional representation of a motor task.

Combining mental practice with physical on-court practice?

The following assumption was formulated: if combined training contained a greater share of physical practice, 70% comparted to 30% of mental rehearsal, the results would be better than with physical practice alone. Hird and his colleagues (1982) attempted to answer this question. The results showed that all the processing conditions increased the performance of the pre or post test, except for the cognitive task control group. The conclusion of this study was: if enhancing performance is the only variable to take into account, replacing physical practice by mental practice would not be effective.

However, in conditions where physical practice might be costly and take time in the event of fatigue or injury, mental rehearsal combined with physical practice or mental rehearsal alone was more effective.

OBJECTIVES OF THE STUDY

The objective of the study was to describe how young tennis players can effectively adjust the representation of the serve (acquired by visualisation training) according to the game context during the match.

In order to achieve our research objective, we experimented with an original performance preparation methodology as part of establishing a year-long training programme for young regional hopefuls. Two questions guided our research. The first focused on the methodology of mental rehearsal and was expressed in the following manner: how could one encourage the creation of mental images of the service motion that were easily adaptable in action for very young players? The second question focused on the use of such images during tennis play and was expressed: how and when does a young tennis player use the representation of the service motion created by imagery during match play?

METHODOLOGY

The participants in the study were three young tennis hopefuls in Brittany (2 boys and a girl) born in 1995. They were being coached in a training centre (specialised in producing high level tennis players) and had four training sessions per week (2 in the club and 2 at the centre).

Training at the centre included 30% mental preparation and 70% physical practice. A programme of mental preparation was implemented which involved the Jacobson relaxation method in an isolated environment in the dark, and then visualisation of the service motion followed by use of the training video.

Training sessions were filmed, as well as certain matches, and specific technical work was proposed to players. It was based on the use of self-analysis sessions (player talking through videos of their action during training and in matches) as a tool for verbalising and mobilising representations during tennis play and for improving performance.

RESULTS

The effectiveness of mental rehearsal was highlighted during self-analysis sessions with players making use of videos filmed during training and in matches. The coach also observed an effect of such training in the form of swifter tactical and technical learning compared to players in the group not taking part in the mental rehearsal programme.

Results showed that the methodology proposed gradually favours the understanding of the tactical aspects of the game. Indeed, for our young players and in the context of training serve technique, mental rehearsal creates greater awareness of one's body which allows them to more easily pinpoint what they must focus on from a sensorial and proprioceptive viewpoint. As far as tactical training for matches is concerned, imagery makes it possible to create more specific and longer tactical plans in terms of the number of strokes.

In a match situation, the use of visualisation during the season became a way in which to concentrate when serving. Indeed, during the last matches of the season, these young players systematically made use of visualisation techniques so as to better concentrate and make tactical choices before serving. During difficult moments (when they were behind), they said that they also relied on visualisation so as to better manage difficult situations.

Finally, the work of representing one's serve is conducive to preparing point construction in a more specific manner. Such point construction hinges on better anticipation of the return of serve and thus enables the player to envisage various options for his second shot. It has been observed that representation at the beginning of the season only covers the service but gradually "opens up" to include the various possible returns of serve at the end of the season.

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Tennis is a Mental Game - Part Two

By Dietmar Samulski
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This is a continuation of the article published in the last edition of the ITF Coaching and Sport Science Review (December, 2006, Nº40, pgs. 14-15)

PSYCHOLOGICAL PROFILE OF A TENNIS PLAYER: BASIC PSYCHOLOGICAL ABILITIES AND SKILLS (CONTINUED):

Establishing objectives: is a player's ability to plan and direct their career by means of short, medium and long term goals. These can be divided into result, performance and process objectives. Players should learn to focus more on performance and process objectives as these can be controlled by the player.

General feedback: consists of information regarding the correct or incorrect execution of a technique or tactic performed by the player. When a coach corrects a player they should consider two fundamental principles: minimise the use of negative criticism and remain calm.

Positive feedback: is the instrument used to praise players that have performed well or that behave in a positive and efficient way both in training and in match play, on and off the court. Thus, this kind of behaviour is promoted in the future along with all the benefits it entails. Receiving positive reinforcement from coaches or from other significant figures (parents, friends, opponents) when the effort and performance are suitable, is an extremely useful tool for motivating tennis players, especially for children and younger players who are still learning and perfecting their game. Positive reinforcement can be shown in two different ways: verbal and non-verbal (by means of gestures).

Flow: also known as the 'zone' is the feeling of effortless successful performance that arises during a match. It encompasses total identification and concentration on the activity (the strokes, the rallies) that is being carried out to such an extreme that the player completely forgets about himself. Playing in a state of "flow" means playing happily and fluently whilst being completely focused on the right moment and place.

Visualisation and mental training: a very common strategy used in mental training programmes is the organised, repeated and conscious visualisation of the motor skills (strokes, movements, etc) and the tactics that the player carries out. Visualisation can be done using two different perspectives: the internal and the external. In the *internal perspective* (also called ideomotor training) the tennis player tries to imagine themselves performing the actual movement thus feeling and experiencing it (kinesthetic flow sensation) from within. In the *external perspective* the tennis player becomes their own spectator analysing himself execute the movement (training through observation).

Visualisation can be carried out in different phases of the competition. Before the match, in order to anticipate a game strategy; during the match in order to mentally prepare for the serve; or after the match in order to analyse the match and study the player's strong and weak points so that the strategy may be redefined for the following match. Applying this imaginative capacity to movements requires complete control of the visual component (visual imagination). The tennis player imagines the movement as if in a movie and decides how they want to see that dynamic sequence of visual images. During visualisation, the tennis player can also generate kinesthetic feelings to increase the sensation of the movement's dynamics and harmony (flowing sensation). The player can visualise basic movements, specific shots, game patterns, situations in which they are successful, etc.

Intelligent thinking during match play: a player that is capable of perceiving, analysing and solving the situations they are confronted with during match play in a clever and efficient way is thought to be intelligent. Tennis specific intelligence is demonstrated when the player makes an effort in discovering, using and applying the right solution to every situation successfully, especially in situations where decisions have to be taken under space and time pressure. The crucial foundations of intelligent thinking during match play are varied: the right perception of the situation, a correct interpretation of the game (paying special attention to the relevant stimuli that affect the game), an appropriate ability to anticipate the intentions of the opponent, a selective attention depending on the stage of the match and a good match strategy which allows players to take advantage of their strengths.

Strategic thinking: is the ability to develop plans and match strategies according to one's own style and that of the opponent's. A strategic plan includes the tactical, technical, physical and psychological analysis of strengths and weaknesses of both the player and the opponent. The main objective in strategic thinking is to establish a key tactical plan and possibly one or more alternative plans which may help the player to win the match.

Perception: is a process by which we receive, select and process information via our senses (sight, hearing, touch, vestibular, kinesthetic). The visual perception (visual control of the ball) and the kinesthetic sensation (movement and flow sensations) are especially important to help attain an appropriate performance in tennis.

Persistence: is the ability to keep up the motivation, the willingness and the maximum effort until you reach the final aim: "never give up".

Relaxation and mental recovery: these are fundamental abilities in order to relax your mind during rallies and between games. Furthermore, it also helps the recovery of energy during the intervals and after matches. One of the most efficient relaxation techniques is Lindemann's deep breathing technique (1994), which can be applied before, during and after a match to help regulate the level of activation.

Getting over situations: a player betters themselves when they are capable of confronting difficult situations like a series of defeats, suffering illnesses, injuries or family problems; and is capable of overcoming all these obstacles increasing their own performance objectives.

Decision making: this is the mental ability to turn the intentions and strategies of the game into real technical-tactical actions. As tennis is a high speed game, the player must learn to analyse, anticipate and decide quickly, within seconds, and normally under pressure.

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Employing Foreign Coaches: The Pros and The Cons

By Doug MacCurdy
(ITF Development Officer for the Chinese Tennis Association)

In my travels, I have had the opportunity to meet hundreds of coaches living and working outside of their own countries. In addition, I have spent countless hours discussing the matter of foreign coaches, both in general and quite specifically, with numerous federations and clubs. The purpose of this article is to identify some of the components that make these relationships successful or unsuccessful, from the perspective of both the employer and the coach.

Organisations that often consider employing foreign coaches include national associations, regional associations within a country, tennis clubs and tennis academies. Sometimes an individual, parent or manager, will look for a coach to work with one or more players on a private basis, however this situation will not be covered in the article as each situation is vastly different.

CASE 1 - NATIONAL OR REGIONAL TENNIS ASSOCIATIONS

The first step for the association is to have very clear and realistic objectives of what they hope to accomplish by employing a foreign coach. These objectives might include:

- Improving the results of the existing top players
- Preparing the next generation of upcoming players
- Developing a system that includes components such as coaches' education, talent identification, nurturing the talent correctly and ensuring adequate and challenging competitive opportunities
- Growing the game at grass roots level

Few coaches possess all of the skills, experience, or time, to be truly effective in all of these areas so objectives should be prioritised.

It is essential that the programme for which an association employs a coach is adequately funded. For example, the coach may be very good, but if the players are not given an adequate amount of competitive opportunities at home and/or abroad, they will not make optimum progress.

Prior to seeking a foreign coach, the association should answer these questions:

1. Is there a national of the country that can fill the role?
2. If not, why not?
3. How can we prepare local coaches to perform these tasks successfully in the future?
4. Assuming that the foreign coach will eventually leave the country, what programmes/structures do we hope they will have left in place?

Once it has been decided to employ a foreign coach, it is important that the association finds out as much as possible about the candidates. The most important qualities to look for include:

- good character
- professional experience
- work ethic
- education
- employment history, track record

The new employee's credibility with the players, coaches and officials is also critical and must be earned. The employer should speak to numerous people that have dealt with the candidate both professionally and personally, while information given in resumes should be questioned, clarified and verified.

If possible, a trial period of one month or slightly longer prior to signing a final contract is recommended as it can be extremely advantageous to both parties. There is never a guarantee that the relationship will work although a trial period will increase the odds appreciatively. Obviously, if the coach is considering leaving their current job, which is possibly a very good one, for a new challenge the trial period may not be possible. In this case, the more experience the coach has had in the country concerned the better. Some transitions can be relatively simple, such as a coach moving from some Spanish-speaking nations to another. While more complicated moves involving major cultural differences and language barriers can prove to be much more complicated.

Doug MacCurdy (second from the left) is currently coaching players and educating coaches as an ITF Development Officer for the Chinese Tennis Association. He has actually taught tennis in 170 countries at last count.

CASE 2 - MAJOR TENNIS CLUBS

Certain tennis clubs have a tradition of high quality tennis and pride themselves on producing winning teams. Oftentimes they also have high performance programmes for juniors. It is for these reasons that major clubs will consider hiring a foreign coach.

When a major club is considering employing a foreign coach they should consider the same factors as a national or regional association.

CASE 3 - TENNIS ACADEMIES

Working for a tennis academy as a foreign coach is fundamentally different than working for an association or club. The owner or director of the tennis academy will have developed both a philosophy and a system of coaching that coaches are expected to follow. Working in a tennis academy can be a very good way for a younger coach to gain experience working with different coaches and types of players.

ADVANTAGES OF EMPLOYING FOREIGN COACHES

Generally speaking, foreign coaches tend to

be highly motivated and because it is a new job and experience, they often begin with a great deal of enthusiasm. They will also have some established credentials that make them attractive to an association or club. They will always want to do a good job and often view a position as a possible stepping-stone to an even better opportunity in the future.

Foreign coaches often do not bring pre-conceived ideas about the tennis situation in the country or the players, so everyone can enjoy a fresh start.

The coach should bring new ideas and expertise that can really help the players to improve. A profound understanding of international tennis at all levels can be a genuine asset.

DISADVANTAGES OF FOREIGN COACHES

The most common problems associated with employing a foreign coach include:

- Highly qualified foreign coaches may be expensive to employ, leaving insufficient funds for other player development initiatives.
- There may be language barriers. This problem is highlighted when the coach needs to communicate directly with the players, particularly when working on psychological or tactical topics.
- The coach may have difficulty adjusting to cultural differences or become homesick, which would negatively effect motivation and performance.

RECOMMENDATIONS

Ensure that all financial details are clearly stated in the contract. Obvious items such as the currency of the contract and any taxes that may be deducted must be stated clearly. Benefits, such as medical insurance, housing allowances and pension schemes should also be included in the contract. If all of these details are not clearly defined and one of the parties is surprised with any of the financial details in the first few months, it would be a bad start to the relationship, so ensure everything is clarified before the contact is signed.

Employer

The employer should make every effort to ensure that the coach feels welcome and comfortable in the country. Boredom and a feeling of isolation can be difficult for many people to deal with so try to include the coach in social occasions whenever possible. Part of this responsibility rests with the coach as well and they should remember that 'You can make what you want of almost any situation'.

Employee/Coach

Coaches should refrain from making frequent comparisons with their home country, especially if it is in a negative way. Coaches should also remember that making the most of the resources at hand are part of the challenge and satisfaction of working abroad.

FINAL THOUGHTS

Coaching abroad can be enlightening and will almost certainly make you a better coach and person.

Foreign coaches can be extremely helpful in the developmental process of all countries. However, developing your own experts will have a longer lasting impact in the long run.

A Method for Evaluating Dominance of a Tennis Match at an Elite Level

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INTRODUCTION

Statistical match reviews are a valuable tool to evaluate performance and can be complementary to discussions between the coach and the player. They play an important role as standardised quantitative data can be used to track a player's performance and progress, match by match, and identify the work that remains to be done. Furthermore, the availability of other players' statistics is a useful means to prepare for future matches.

In past issues of this publication, several authors from different countries have commented on certain aspects of official statistical data. Brody (2004) offers a critical analysis of some indicators and proposes a new statistical category, that of "forcing errors". He also recommends that all numbers be expressed as percentages. We subscribe to this percentage proposal since it is impossible to compare two matches with different numbers of points played. As for Brabenec (2005), he advocates the idea that the ratio of errors committed to each winning shot can be a useful indicator of the quality of a tennis match. What is causing a problem for tennis coaches, as suggested by these authors, is the relevance of statistics viewed in isolation. The winner of a tennis match does not inevitably dominate his opponent in every statistical category. This is why coaches have tried to define different statistical groupings aimed at facilitating analyses.

The approach we have taken is different. We present a method for using existing official statistics by comparing the statistics of two players who played each other. The ascendancy of one player over the other translates into a dominance in every statistical category. After the match, statistical data can be reviewed, category by category, and specific dominances can then be identified.

METHODOLOGY

To present and illustrate our method, we have chosen to focus on Federer's and Nadal's **wins** in three of the Grand Slam tournaments, namely the French Open (2005 and 2006), Wimbledon (2006) and the US Open (2006). The total number of wins is 25 for Federer and 24 for Nadal. Their head-to-head encounters at these tournaments are also studied. These particular matches are the 2006 French Open and Wimbledon finals and their 2005 French Open semi-final. The proposed method consists of a line-by-line comparison of both players' statistics in order to determine which player has the dominance (D) for each category. Depending on the statistical category, dominance goes to the player who has the highest number (e.g. first serve percentage) or to the player who has the lowest number (e.g. double faults). By adding the number of dominances, you get an idea of who holds the balance of power on a given surface. You can then rank the various indicators by compiling the statistics from all matches.

RESULTS

Table (1) examines the 3 Grand Slam matches between Federer and Nadal. It gives a clear picture of the method used to evaluate dominance. Tables (2) and (3) show the results of Federer's and Nadal's dominance over their opponents in matches **won** only.

The 49 best-of-five-set matches won by the current top two ranked players give us useful information on their profile. When examined independently, the tables show quite clear differences. Although Nadal does not dominate his opponents in the "aces" and "winners" categories and Federer has a lower first serve percentage than his opponents, both players win their matches. When

	French Open 2005		French Open 2006		Wimbledon 2006	
	Federer	**Nadal**	Federer	**Nadal**	**Federer**	Nadal
1st serve %		**D**		**D**		**D**
Aces	**D**		**D**		**D**	
Double faults		D		D	D	
Unforced errors		**D**		**D**		**D**
Winning % on 1st serve	D			D	D	
Winning % on 2nd serve		D		D	D	
Winners (including service)	**D**		**D**		**D**	
Receiving points won (%)		D		D	D	
Break point conversions (%)		**D**		**D**		**D**
Net approaches (%)	D		D			D
Total points won		D		D	D	
Dominance total	4	7	3	8	7	4

Table 1: Federer/Nadal matches in Grand Slam tournaments

Federer (2005/6)	**French Open** (n/11)	**Wimbledon** (n/7)	**US Open** (n/7)	**Total:** N/25
1st serve %	4	1	5	10
Aces	9	6	7	22
Double faults	8	4	5	17
Unforced errors	6	4	6	16
Winning % on 1st serve	10	7	7	24
Winning % on 2nd serve	10	7	5	22
Winners (including service)	11	7	7	**25**
Receiving points won (%)	11	7	7	**25**
Break point conversions (%)	4	5	5	14
Net approaches (%)	11	6	6	23
Total points won	11	7	7	**25**

Table 2: Federer's dominance

Nadal (2005/6)	**French Open** (n/14)	**Wimbledon** (n/6)	**US Open** (n/4)	**Total:** N/24
1st serve %	12	5	1	18
Aces	6	4	0	10
Double faults	11	3	4	18
Unforced errors	14	5	4	23
Winning % on 1st serve	13	4	3	20
Winning % on 2nd serve	13	6	4	23
Winners (including service)	6	5	2	13
Receiving points won (%)	14	6	4	**24**
Break point conversions (%)	10	5	1	16
Net approaches (%)	11	4	3	18
Total points won	14	5	4	23

Table 3: Nadal's dominance

comparing the two best players, one notices some constant features although their style of play is quite different. It appears that the winning player always dominates his opponent as far as the number of dominances is concerned. Nadal dominates Federer on clay with a total of seven and eight dominances respectively. Even though he is dominated by his rival in the "aces" and "winners" categories, these dominances cannot be considered as decisive on this surface. The fact that Nadal and Federer hold three and two specific dominances respectively (shown in bold in Table 1), whatever surface they play on, shows that they tend to play the same way whenever they meet each other.

DISCUSSION

The results obtained from these data cannot be transferred to players of a lower level without some caution. A higher number of matches and players would need to be studied before confirming this dominance theory. Other indicators might be necessary to describe more precisely the style of play at a less expert level. Any such proposal, we feel, requires a simple method to present the indicator, as well as its level of relevance, in relation to a target audience.

These initial findings suggest that the official statistics sheet should be viewed as indicative and read vertically, rather than horizontally. It would appear that it is the total number of dominances (for an eleven-indicator table) that characterises a player's domination, and not specific statistics. It should also be noted that a few of the statistics are in fact rather ambiguous. First of all, there is the "break point conversions" statistic: should we consider the number of break points earned, the number converted or the percentage? Similarly with the "net approaches" statistic, what is the most important: is it the number of points won at the net or the percentage of points won at the net in relation to the total number of net approaches? Opinions may differ depending on whether you are studying the player's evolution or the match itself and specific dominances.

This brief introduction to the methodology will hopefully allow for further developments. On the one hand, it can help describe the differences in styles of play or court surfaces while on the other, a more extensive study based on a larger number of matches would allow for better assessment of each statistic and its level of reliability.

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ITF LESSON PLANS FOR BEGINNER PLAYERS: LESSON 1

Level of player: Beginner (ITN 10.3 to ITN 8).
Game situation: Starting the rally with Serve
Tactical theme: Developing consistency in the serve

1. Hitting the ball
2. Hitting the ball over the net
3. Hitting it inside the service box
4. Serving inside the service box and second shot

Technical themes:

1. Serving stance
2. Ball toss
3. Impact
4. Impact and hitting the ball into the target area (service box)

Number of players: 8
Equipment: Red, orange, green (transition) and regular balls, and 23 in. and 25 in. racquets according to the level of the players (ITN 10.3 to ITN 8)
Courts: Availability to red, orange, and regular courts

DRILL 1-OPEN SITUATION

Goal: Players to play points with serve and return.
Player organisation/positioning: Pending the level of the players there are different options:

- ITN 10- 10.3: Create 4 mini-courts (red 'play tennis' courts and balls) using the court width. Two mini-courts on each side of the net with 2 players playing in each mini-court.
- ITN 8-9: Use the full court with orange or green 'play tennis' balls. Have 4 players on each side of the court. They play in pairs down the line. 2 pairs play close to the doubles tramlines and the other 2 closer to the centre of the court. Depending on their level, they start serving from closer to or further away from the net.
- Other options: 12 metre or 18 metre courts can also be set up (orange 'play tennis' court).

Player rotation: After 5 serve-return points, players change roles without rotating from one side of the court to the other. Ensure everyone has the chance to serve and play the same number of points. To ensure good rotations the players should have one serve.

DRILL 2-CLOSED SITUATION WITH BASKET FEEDING

Progression 1 a (Technical themes):

Create stations where students practice the technique of the serve. Station 1, Service stance, Station 2, Ball toss, Station 3, Impact, and Station 4, Impact and hitting the ball into the court.

ITN 10-10.3 players can use 4 mini courts (red 'play tennis' courts), with each mini court having a station, then rotations can be done by court ensuring each player gets to practice at each station.

ITN 8-9 players can use the full court but with two mini courts (half court down the line), starting with the two first progressions, and then progressing to the next two progressions once everyone has completed the same number of turns (orange or green 'play tennis' balls can be used). The players start in the court relative to their level of play, probably starting on the service line and then moving back.

Possible rotations include the following:

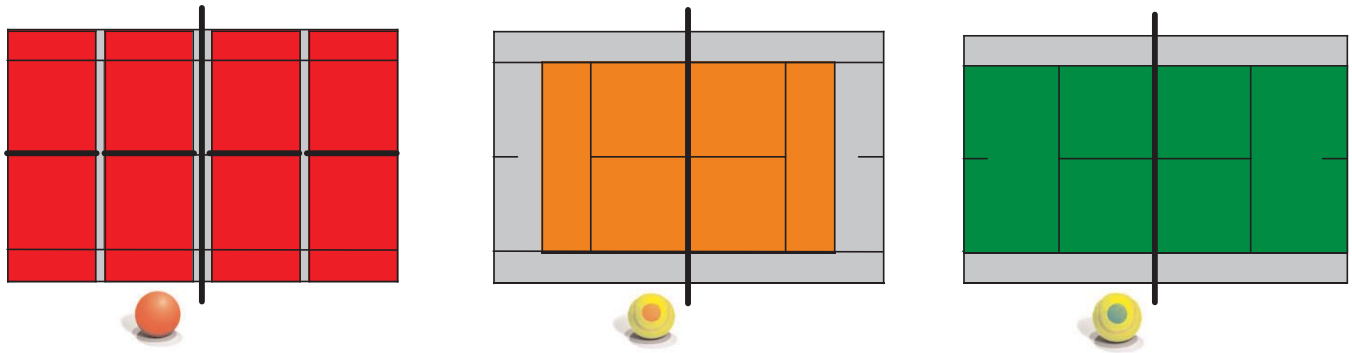
- Certain amount of time
- Certain number of repetitions
- Number of successful serves, from a technical or tactical perspective
- Certain amount of points played

ITF LESSON PLANS FOR BEGINNER PLAYERS: LESSON 1

Progression 1b (Tactical theme):
Create stations: Station 1, Hitting the ball, Station 2, Hitting it over the net, Station 3, Hitting it inside the service box, and Station 4, Hitting the ball inside the service box and then hitting a second shot.

ITN 10-10.3 players use 4 mini courts (red 'play tennis' courts), same as above.
ITN 8-9 players can use the full court and two mini court half courts and then same as above (using orange or red 'play tennis' balls).

Possible rotations as per previous drill.



For more information on recommended court sizes and equipment modifications for beginner junior and adult players visit: http://www.tennisplayandstay.com

DRILL 3-RALLY WITH COACH

For ITN 10-10.3 players use 4 mini-courts (red 'play tennis' courts), players serve and return with the coach playing on one of the courts, with the extra player possibly picking up balls, or doing a physical activity, keeping the score, creating a station where they will be able to practice their serve, against the fence for example. After 5 points, they get together to discuss the theme of the lesson. One side is serving and the other side returning. The side of the coach should be returning.

ITN 8-9 players can use 2 mini-courts, down the line (using orange or green 'play tennis' balls), having the players in two groups of 4 (with the coach making the 4th member in one of the groups). The 8th player or spare player could be doing a physical exercise or picking up balls, or an activity that relates to the theme of the lesson.

Possible rotations as per drill 2.

DRILL 4-OPEN SITUATION WITH POINTS

Players play points relative to their playing level and court size i.e. ITN 10-10.3-4 mini-tennis courts and ITN 8-9 using half court. For ITN 8-9 they could progress to using full court, but a good rotation system should be utilised, and use either orange or green 'play tennis' ball.

The point/scoring system could be one of the following formats:

- Individual scoring: Number of serves in, number of returns in
- Team/pair scoring: Number of serve-return patterns in
- Other options: Number of times players adopt a correct serving stance, toss the ball correctly and impact the ball with the strings
- Individual points
- Extra points given for tactical or technical proficiency
- King of the court

Differential Coordination and Speed Training for Tennis Footwork

By Dr. Ulrike Benko and Dr. Stefan Lindinger
(University of Salzburg)

INTRODUCTION

The demands on tennis players are many and very complex. However, this article will focus on coordination and footwork as fast and suitable footwork patterns (technique) are strongly linked to stroke technique and when combined correctly they should result in successful stroke execution. High quality conditioning training should first deal with the analysis of specific coordination performance requirements (Neumaier, 1999). As practical experience and empirical evidence shows, coordination training focusing on specific skills is more successful than general coordination training (Hirtz, 1995). The training concept proposed in this article has been developed, giving due consideration to the abovementioned factors, because in our opinion on-court footwork could be trained more effectively.

Coordination performance requirements in tennis are influenced by certain conditional performance parameters. Match (tennis) specific factors, especially speed and power, influence certain coordination skills. Additionally, a low level of speed endurance might have a negative effect on coordination execution during match play due to fatigue.

COORDINATION AND SPEED DEMANDS IN TENNIS

Psychological, or cognitive, speed (perception, anticipation, decision-making) is especially important as it determines ones ability to react and decide rapidly, and is a characteristic commonly found in top athletes. A good example is when a player hits a poor return. The server immediately finds the appropriate response, positions themselves inside the court attacks the ball, opening the court and finishing the point at the net.

Coordination speed is primarily seen as a fast reaction to the opponent's stroke (e.g. a powerful, explosive burst) and in response to a recognised or anticipated stroke (being in an optimal position to retrieve an attacking shot, moving to a passing shot, preparative actions, etc.). It is also evident when the player has to perform a stroke in a rapid manner due to time and/or situation pressure (e.g. perfectly placed forehand or backhand stroke [precision] on return of serve, etc.).

The aforementioned factors determine the optimal stroke execution speed for a given player in a given situation. The stroke execution speed is essentially characterised by the level of coordinative abilities (skills) in different tennis specific situations: balance during stroke (stable position), orientation on the court (opponent, ball), reaction speed (volley, return), rapid adaptation to the opponent's actions, linking of lower and upper body movements in difficult and complex situations, rhythmical stroke production, kinaesthetic differentiation (controlled force production) of lower and upper body.

The reception and processing of information (perception) by all sensory organs is very important for efficient coordination and for developing a high stroke execution speed or racket head speed. Thus, a high level of alertness with all sensory organs during a match is the basis for executing actions quickly.

Due to the complex and variable situations which occur during tennis play, players have to adapt constantly resulting in an extremely high level of match-specific pressure on stroke production (influenced by opponent, fatigue, court, optical efficiency, perception, etc.). This leads to the following crucial question: Is it possible for players to control and coordinate movement and stroke techniques while under constant pressure, or is it impossible to perform strokes and movement smoothly? It seems that this differentiates the great athletes from good athletes as the great are able to do this more often then the good athletes. Given that the combined recruitment of speed and coordination skills seem to be determining factors for performance, questions regarding ideal footwork and movement training arise.

DYNAMIC SYSTEMS APPROACH AND ITS ROLE IN TENNIS SPECIFIC COORDINATION TRAINING

The dynamic systems approach arose under the influence of non-linear dynamics, synergetics, the catastrophe theory, theory of complexity and neurophysiology. Since the early 1990's the theory has found great approval in sport science and has been integrated in daily practice. According to the dynamic systems approach, mechanical-technical explanations are outdated, especially in complex, unstable systems such as human beings. In relation to stroke production and movement patterns the key concept is lifelong differential learning and peripheral self-organising patterns instead of drill training and technical models!

The method of differential learning can therefore be used for tennis specific coordination and speed training. According to Schoellhorn (1999), an athlete's ability to extend their range of possible solutions, which is analogous to the occurring differences during biological adaptations, is a determining factor. When utilising this form of training the athlete has the possibility to elect which movement techniques/patterns they will use whether it be consciously and/or unconsciously. By performing possible "errors" in various combinations, the athlete will find their individual optimum movement pattern.

Differential learning (learning from differences) combines the knowledge of possible movement technique adaptations and compares the execution of movements within possible solutions to "errors". This method focuses on learning from differences through the use of varied exercises. Enforcing movement technique adaptations during the skill acquisition and automating phase should cause specific self-organising patterns in the athlete (Schöllhorn, 1999).

An essential characteristic of differential learning is the importance of information that is found in the transition between different movement patterns (e.g. the change between jump, sprint, step versions (Fig.1)).

PRINCIPLES OF DIFFERENTIAL TRAINING FOR TENNIS FOOTWORK

The following principles can be discussed in order to develop a specific training method for footwork in tennis:

1. The combination of new and uncommon exercises may lead to faster adaptations. The learner is forced to react more quickly to varying demands. The main idea of this

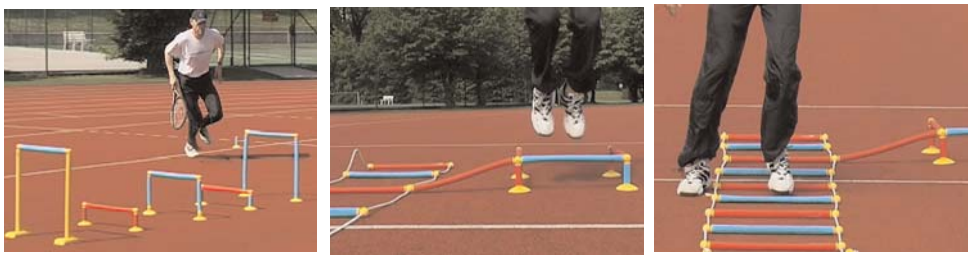


Fig. 1: Jump-sprint-step versions of footwork training

method of coordination training in contrast to drill training is: "repeating without repetition" (Neumaier, 1999; Bernstein, 1988). In "frequency-speed-training", versions of tapping exercises should vary (e.g. standing, seated, supine/prone positions, or tapping combined with extra tasks). Regular repetition of the same exercise may lead to stereotypical motions which can result in the stagnation of performance.

2. Repeat an exercise only until the quality of the movement is solid and stable.
3. In coordination training, various levels of difficulty need to be implemented (according to the performance level of the athlete) to create constant instabilities which are relevant in differential learning. Athletes should neither be overextended nor under challenged in order to guarantee optimal stimulus intensity.
4. Demanding, exercises are necessary not only to challenge athletes, but also to create fun and motivation, to help them to stay alert and consequently, to have a lasting training effect. It is easier for the system "player" to recall positive stimuli and furthermore, learning is more efficient.

CRITICAL LEVELS OF DIFFICULTY IN TENNIS SPECIFIC FOOTWORK TRAINING

How can tennis specific footwork training be modified to reach this critical level of difficulty, where the outcome is movement instability?

Regarding this question Neumaier's work on "Categories/Classes of coordinative demands/tasks" (Neumaier, 1999) is insightful, especially in terms of the dynamic systems approach. Using the categories detailed in figure 2 makes it easier to structure and characterise coordination training and the demands of a task.

The suggested model consists of two parts: information demands and pressure conditions (Roth, 1998).

1. INFORMATION DEMANDS (FEEDBACK DEMANDS)

This part establishes or defines (afferent) information demands that are related to exercise. Demands include the identification of essential and relevant information from different sensory organs. For example dynamic balance in tennis is dependent on the adequate processing of sensory information, kinaesthetic, tactile, vestibular and optical, and is assigned to information demands.

2. PRESSURE CONDITIONS (UNDER WHICH ATHLETES HAVE TO PERFORM)

The second part of this model enables a differential judgement of coordinative difficulty of the task. Furthermore manipulation of these variables results in an increase in the variety of exercises and allows for the critical task difficulty to be maintained.

From a methodological perspective, it is almost impossible to reduce or increase information demands and pressure conditions independently. Therefore when manipulating exercises it is common to vary both information demands and pressure conditions simultaneously.

Precision pressure

This involves increasing the demand on the player's ability to master controlled movements. For example more pressure regarding result precision (target precision) and/or process-precision (precision of execution) (Neumaier, 1999, p. 118). This type of pressure condition might not be linked directly to improving footwork, but is very important in combining footwork abilities with stroke production.

Time pressure

Time pressure, or speed demands, can either be created at the beginning of a movement (reaction speed) and/or during the movement (action speed). For example, different starting signals can be combined with ladder/agility patterns performed under time pressure, through the use of a stop watch.

Complexity pressure

Coordinative demands are increased due to increased task complexity as players have to process a greater number of successive or simultaneous demands. Simultaneous coordination is the increase of task difficulty by using simultaneous performance of an additional movement pattern. For example running through an agility circuit combining tennis specific tasks such as, bouncing a tennis ball with a racquet or simulating tennis strokes.

Combining successive movements and being able to change between different footwork patterns, characterises successive coordination and is another method of complexity pressure. As previously mentioned, much relevant and essential information is discovered by players during the transition between different movements. Possible combinations include various tapping exercises, combined with stepping, sprinting, and jumping tasks on the spot/through an agility ladder and/or jumping cones/hurdles.

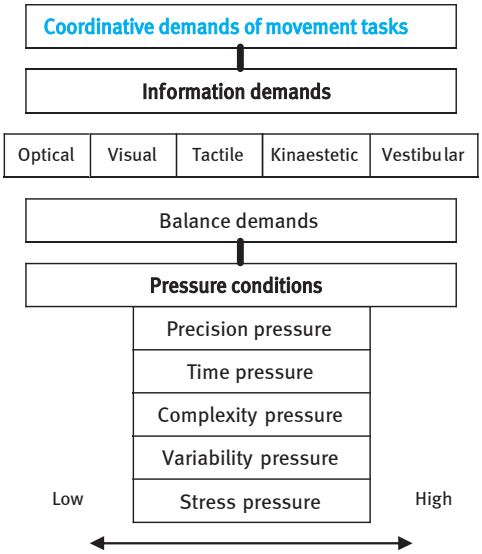


Fig. 2: Classes of coordinative demands: information demands and pressure conditions (Neumaier, 1999, p. 113).

Situation/Variability pressure

When performing movement tasks, the variability of the external conditions (environment) determines the orientation/proprioceptive demands (Roth, 1998). By varying the environmental conditions, anticipation can be either more or less difficult. The demand of a task is influenced by the complexity of a situation, according to the range and number of variable environmental characteristics (opponent, ball, light, wind etc.). These "principles of variation" in terms of general conditions, feedback (perception conditions) and movement, are strongly linked to pressure conditions and therefore have particular importance for footwork training.

Stress

Physical stress

There is a strong correlation between coordination and physical requirements. Therefore, coordination training should be performed, sometimes, when fatigued. It can easily be combined with specific speed endurance training. It should also be remembered that matches are often won by the player who moves better and whose game is more stable when fatigued.

Psychological stress

Coordination exercises should not only be performed under time pressure but also under competition stress (presence of opponent). By performing exercises with an opponent it increases the risk of failure (incorrect movement pattern/technique) or losing and develops competition character. This method is also known as "stress training".

The implementation of differential coordination and speed training in tennis will be covered in a continuation of this article in a future edition in 2007.

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On & Off-Court Functional Tests and Corrective Exercises

By Carl Petersen
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Well developed balance, lower core stability, strength and mobility are important to allow on-court movement and minimise the chance of injury from the acceleration and deceleration forces of on-court activities. Movements in tennis include sprinting, side-to-side running, cutting, twisting, sliding, and quick stops and starts (Pluim & Safran, 2004).

Whether you're getting your players ready for a tournament, on-court practice or off-court training, following the advice below will help you optimise both their off and on-court training time and also prevent injuries. This article outlines a few quick functional tests for lower body and core stability. Corrective exercises both off and on-court can be prescribed for lower body and core problems that are detected and included as part of a pre-play warm-up.

PROPER WARM-UP ON AND OFF-COURT (IN THE CLINIC OR GYM)

Some form of general warm-up should be done before attempting the quick functional tests. Slowly but methodically warming the body's tissues helps prevent injuries that may be caused by going too hard, too fast, too soon with cold, un-lubricated muscles and joints (Petersen & Nittinger, 2003). One of the main contributors to injury in the club player is the complete absence of any Pre-Play Warm-Up Routine (Petersen & Nittinger, 2006). The warm up should include exercises for upper and lower core as well as dynamic flexibility drills such as leg swings, high knees, high heels and carioca (crossover drills). In addition to completing a central nervous system or speed warm up a good muscle and tendon warm up will help get your athletes ready for the activity ahead. (See Anatomy of a High Performance Warm Up, ITF CSSR, Issue 40, 2006)

QUICK FUNCTIONAL TESTS - LOWER BODY

The following five quick functional tests (adapted from Celebrini & Petersen, 2006) have been compiled to make the player, therapist, coach and/or trainer aware of any obvious lower extremity, dynamic core stability and deceleration strength weakness or issues that may impact on the player's ability to train both on and off-court. They include:

Test A) Single Leg Stance
Test B) Repeated Single Leg Squat
Test C) Repeated Lunge
Test D) Flat Hop
Test E) Low Step Hop

These tests can be administered either in the gym or on-court once the player is adequately warmed up (light glow on the skin or wet underarms). The objective of these quick functional tests is to identify the presence of any lower core and extremity (lumbar / pelvis / leg) dynamic stability and strength issues that may need to be addressed before the player takes part in the training. They also help identify the presence of functional limitations that may predispose the player to developing overuse injuries or limit high performance training.

If a player, when observed subjectively, fails one or more of the tests then some form of planned alternative training should be implemented with the input of the strength and conditioning coach and/or therapist. The player's should also carry out the exercises outlined in the on and off-court corrective exercises section.

QUICK FUNCTIONAL STRENGTH TESTS

Test A) Single Leg Stance

Procedure:

- Stand with feet shoulder width apart and heels planted
- Keep eyes facing forward and shoulders square
- Place the hands together in front of the body at shoulder height with elbows extended
- Raise one thigh to 90 degrees flexion and dorsiflex the ankle (foot pulled up)
- Allow yourself to set then close eyes

Pass Criteria:

You are able to complete the motion and maintain balance for 10 seconds without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

- No hip shift
- Ankle and knees remain stable
- Stance foot remains flat on ground
- Hip does not thrust forward
- Lower back does not hyperextend
- Chin tucked in with trunk in neutral position

Fail:

You are NOT able to complete the motion and hold the position without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

Test B) Repeated Single Leg Squat

Procedure:

- Stand on one leg on flat ground or a step, keep heel planted
- Raise opposite leg up so knee is at 90 degrees and keep foot dorsiflexed
- Raise arms out in front to horizontal and hold hands together
- Keep eyes facing straight forward and shoulders square, do a single leg squat (45-60 degrees) up and down three times, then repeat opposite leg

Pass Criteria:

You are able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

- No hip shift
- Ability to keep knees tracking over toes
- Ankle remains stable
- Front foot stays flat on ground
- Hip does not thrust forward
- Lower back does not hyperextend

Fail:

You are NOT able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

Test C) Repeated Lunge

Procedure:

- Stand with feet shoulder width apart and heels planted
- Keep eyes facing straight forward and shoulders square
- Lunge forward onto one foot and back three consecutive times
- Repeat opposite leg

Pass Criteria:
You are able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.
- Ability to keep knees tracking over toes
- Ankle remains stable
- Front foot remains flat on ground
- Hip does not thrust forward
- Low back does not hyperextend

Fail:
You are NOT able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

Test D) Flat Hop Test

Procedure:
- Stand on flat ground with feet shoulder width apart and heels planted
- Keep eyes facing forward and shoulders square
- Bring one thigh up to 90 degrees hip flexion along with 90 degrees knee flexion and ankle dorsiflexion
- Place the hands together in front of the body at shoulder height with elbows extended
- Hop forward on flat ground and attempt to stick the landing.

NOTE: Do not do this test if your knees are already sore or you suspect lower extremity instability.

Pass Criteria:
You are able to complete the action without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.
- Ability to maintain the landing on one foot without hopping forward, backward or to the side
- Knee tracks over foot with no undue valgus (knee in) movement
- Ability to maintain a position of hip/knee flexion at 90 degrees and ankle dorsiflexion to neutral with non-hopping leg
- Chin tucked in with trunk in neutral position

Fail:
You are NOT able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

Test E) Low Step Hop (only to be completed if Test D is passed)

Procedure:
- Stand on a low step with feet shoulder width apart and heels planted
- Keep eyes facing forward and shoulders square
- Bring one thigh up to 90 degrees hip flexion along with 90 degrees knee flexion and ankle dorsiflexion
- Place the hands together in front of the body at shoulder height with elbows extended.
- Hop off the low step onto flat ground and attempt to stick the landing

NOTE: Do not do this test if your knees are already sore, you suspect lower extremity instability or you failed Test D.

Pass Criteria: You are able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.
- Ability to stick the landing on one foot without hopping forward, backward or to the side
- Knee tracks over foot with no undue valgus (knee in) movement
- Ability to maintain a position of hip/knee flexion at 90 degrees and ankle dorsiflexion to neutral on non-hopping leg
- Chin tucked in with trunk in neutral position

Fail:
You are NOT able to complete the motion without the presence of pain, abnormal tracking and movement, unusual stiffness or tension.

ON AND OFF-COURT CORRECTIVE EXERCISES

This series of exercises can be implemented as part of a more extensive warm up. They have been designed by the Fit to Play™ team to help players train on and off-court to improve their ability to successfully complete the Fit to Play™ - Quick Functional Tests. These exercises are not exhaustive and players are encouraged to work with their coach, therapist or strength and conditioning coach to augment and add to them. If the areas identified are not improved after the on and off-court corrective exercises a more detailed orthopaedic examination by a therapist or physician would be recommended.

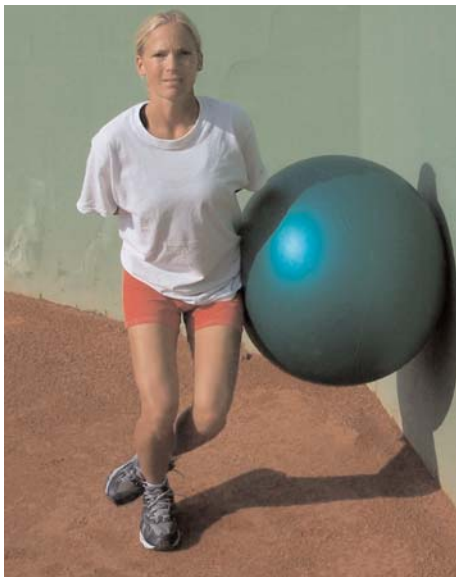
On-Court Balance Exercises:

Hold onto the fence or net and further warm-up the lower core with leg swings front and back, side to side and figure of 8's. Try some hurdlers high knees challenging your balance and warming up the hip by doing inside, straight and outside. Try 5-10 repetitions of each.

Off-Court Lower Core Stability

Physio Ball Wall Squats
- Start with the ball between your lower back and the wall.
- Switch on your core (pelvic tension) (McKechnie and Celebrini, 2002)
- Increase deceleration leg strength and stability by gradually increasing number of repetitions and depth of the squat.
- Start with 1-2 sets of 10 repetitions and increase to 2-3 sets of 20 repetitions. Keep knees lined up over toes. Progress to single leg squats when able.

Single Leg Squat (Ball at side or ball at back)
- Start standing on 1 leg leaning (60-70 degrees) against a ball placed at hip height or with the ball at your lower back
- Lift inside foot and place behind ankle of opposite leg
- Switch on your core (pelvic tension)
- Do a ¼ squat, then drive up into extension using gluteals and quadriceps
- Do 2-3 sets of 10-20 repetitions



Dynamic Hip Flexion and Ball Pull Downs
- Holding a Physio ball at above head height against the wall
- Start in a split squat position with one leg back and switch on the core
- Squeeze the ball lightly and pull down to chest height as you drive (flex) your knee up and across at waist height
- Now slide the ball up the wall as your leg goes back to the start position.
- Do 2-3 sets of 10-20 repetitions

Front step ups and cord diagonal
Strengthens front thighs and posterior shoulder.

- The player stands beside a low bench with 1 foot on the bench and holds a stretch cord in the opposite hand in front of the elevated leg
- Get them to switch on the core and keep shoulders back
- As they step onto the bench the stretch cord is pulled up and across the body
- They exhale as you step up onto the bench.
- This exercise can be done with or without weights in the opposite hand.
- Ensure that the step you are standing onto is low to begin with.
- Do 2-3 sets of 10-20 repetitions

CONCLUSION

Well developed lower core stability, strength and mobility is important to allow good court movement and minimise the chance of injury from the quick stops and starts, and deceleration forces in on-court activities. Performing the Quick Functional Tests on your players prior to training will help you detect any weak links in the functional chain. An on and off-court warm up that includes a balance, central nervous system and muscle tendon warm-up plus corrective exercises will help to improve performance. Furthermore, proper cool down and recovery strategies will help ensure that the physical and mental aspects of the recovery process are addressed.

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Coaching Players with a Disability

Dr Janet A. Young (Sports Psychologist, Australia)

It would be a natural response for us, as coaches, to feel somewhat apprehensive and cautious when first presented with the task of coaching an individual with a disability. I know I was when a mother approached me five years ago to coach her six year old son "John" who had been diagnosed with the condition "familial spastic paraplegia" also known as "hereditary spastic paraplegia". It was a condition that affected John's ability to move his legs such that he walked with the use of a walking frame on wheels. Without the frame, John had to be carried or would crawl.

While my initial reaction in developing a programme for John was to consider what I would do differently to address John's disability, I decided to focus on the key principles that I adopted in teaching any able-bodied individual. Namely, the sessions should be fun and John would be taught a variety of skills that allowed him to meet his needs. Accordingly, I set out to assess John's motivations for learning tennis and his abilities in relation to the requirements of the game.

In chatting with John, it was clear that he wanted to learn tennis in order to play with his school friends, have fun and beat his dad! I knew from this discussion that one of John's strengths was his desire and commitment to learn the game. It was also evident from a number of simple ball-throwing and catching exercises that John had developed throwing and catching motor skills.

Five years down the track John, now 11 years old, is still taking weekly lessons as he waits for another operation on his legs. He no longer uses a walking frame and his falls due to a lack of a sense of balance are now averaging one a month (from a high of 5-10 falls each lesson in the immediate period after John stopped using the walking frame). In terms of other skills, John can play a variety of shots (including an over-arm serve) and is able to approach the net after playing a short ball. We laugh and joke, as we argue over the score and whether balls are in or out, in our on-going series of best of 5-set matches. Rather than just wanting to beat his dad, John is now also desperate to beat the coach!

While it could be argued that I have taught John much about the game, I have also learnt a lot and enjoyed the journey immensely. My experience highlights a number of considerations that other coaches might adopt in teaching individuals with a disability. While these considerations apply to coaching any individual, they may be overlooked when working with disabled individuals (Hanrahan, 2003).

GENERAL CONSIDERATIONS IN COACHING PLAYERS WITH A DISABILITY

Treat the individual as a player with ability

The reason a coach is working with an individual is because that person wants to learn the game of tennis rather than because

that person has a motor, sensory or intellectual disability. Coaches should therefore focus on the abilities of the individual rather than on their disabilities. The question for the coach to address is "What does the player need to learn in order to improve their performance and enjoy the game?"

Assess the nature and degree of the player's ability

Rather than making generalised assumptions about a player (e.g. all individuals with cerebral palsy have the same amount of control of the movement of their legs), a coach should determine the specific characteristics of the individual. It is not necessary for a coach to start from scratch to develop effective techniques or methods - ask the player what they can, and cannot do, or what does and does not cause discomfort or pain. A coach may also wish to consult the player's parents or carer for relevant information if appropriate.

Set challenges not limits

In consultation with the player, a coach should develop a programme that embraces a series of new, yet gradual, challenges. Rather than setting limits to the progress a player might make, a coach should focus on equipping a player with additional skills in the on-going and dynamic process of matching a player's skills with achievable challenges.

Let the player experience a wide range of situations

Rather than trying to shield an individual from disappointment, frustration or failure when learning tennis, a coach's role should be to guide a player to develop a capacity to handle these. Avoiding difficult or unpleasant situations (e.g. loss of a match) is not the answer. It is appropriate for a coach to show sympathy to a player with a disability in situations when the coach would do so with an able-bodied individual.

Moving beyond these general considerations, I would like to relate some of the practical considerations a coach might adopt when working with a group of players with a disability. These have been adopted in a programme conducted by a local tennis club in our area. In this programme, which has now been running for 3 years, 15 individuals with psychiatric illnesses and intellectual disabilities have been receiving weekly tennis and fitness instruction. The success of the programme has been such that two of the individuals with a disability currently play pennant for the club and several regularly participate in the club's social activities.

Players, parents and carers can all benefit from participating in a tennis programme for players with a disability.

PRACTICAL CONSIDERATIONS FROM THE LOCAL CLUB

Make it fun

Learning tennis and getting fit should be fun activities. Forget calling the fitness component of a programme "Training" and re-label it "Fun Games" because that is what you do - play games such as touch football. In a similar vein, coaches can implement a range of entertaining and varied activities to teach the skills of the game (e.g., with the use of coloured cones as targets and complementing lessons of technique with a mixed doubles round-robin). Of course, not all of these activities need resemble 'real' tennis but may involve 'make-up' games (e.g., where players hit to each other in a circle, use soft foam balls rather than tennis balls or hit in pairs without a net). Time set aside for a chat, drink and lunch is a welcome finale to an enjoyable morning.

Be flexible

While a daily programme of activities is always prepared in advance of each session, a flexible approach to each individual player on the day is essential. For example, some individuals may be undergoing a course of medication that affects their ability to participate for a full session. In this and similar instances, coaches need to respond to the individual's needs and circumstances.

Involve the carers

The coach may consider inviting the players' carers to participate in some of the tennis, fitness or social activities. Their involvement in the programme can strengthen a willingness on their part to transport a player to the sessions, and indeed, for the carers themselves to encourage the players to be active and enthusiastic participants.

CONCLUSIONS

Working with players with a disability can be a most rewarding experience for all involved. Rather than avoiding the challenge, I encourage you to put up your hand and offer your services. It is comforting to know that if we stick to the key principles that we apply to teaching able-bodied tennis players, we will best serve the needs of those with disabilities. It is not necessary to think what we might do differently, but rather focus on what we do when we teach any player well.

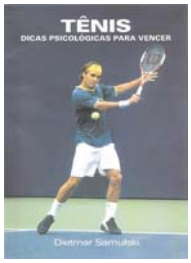
REFERENCE

Hanrahan, S (2003). Sport psychology and athletes with disabilities. In T Morris & J Summers (Eds.), Sport psychology: Theory, application and issues (2nd. Ed., pp.572-583). Queensland, Australian: Wiley.

Recommended Books and DVD

BOOKS

Tênis - Dicas psicológicas para vencer (Tennis - Psychological tips to win)



Author: Dietmar Samulski **Year:** 2006 **Language:** Portuguese **Pages:** 120 **Level:** All
ISBN: 85-905991-1-6

This book initially describes the psychological components of tennis play. It discusses 'flow', the importance of routines and the need for competition players to self-coach. The second section of the book describes the psychological abilities needed to win. Topics discussed include: Self-confidence, motivation, emotional control, mental strength and concentration, and routines. This book is well structured and has a good combination of science and experience based information.

For more information contact: sam@ufmg.br

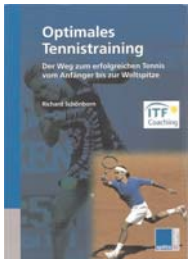
Herramientas para el entrenamiento psicológico deportivo (Tools for training sports psychology)

Author: Claudio Sosa **Year:** 2005 **Language:** Spanish **Pages:** 127 **Level:** All
ISBN: 987-43-8982-6

This book focuses on sports psychology for adolescent players. The author has worked with many of Argentina's top junior and professional players. In the book the author describes many of the techniques that he used with these players focusing on communication, concentration, motivation, self confidence and how to manage pressure situations. Overall, this book provides a good mix of research findings and personal experience to provide some good practical tools for working sports psychology with adolescent players.

For more information visit: www.sportsevolution.com.ar

Optimales tennistraining (Optimal tennis training)

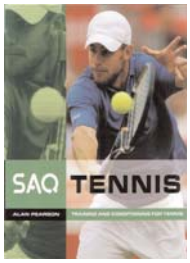


Author: Richard Schönborn **Year:** 2006 **Language:** German **Pages:** 247 **Level:** All **ISBN:** 3-938509-11-2

In writing this book the author has brought together a great amount of information about tennis training for advanced players. It takes an in-depth look at the technique of modern players as well as discussing other aspects of tennis play at an advanced level such as psychology, the periodisation of training and tactics. The illustrations and diagrams complement the text and help to explain some difficult concepts. The book also includes descriptions and diagrams of exercises that the author used with players such as Boris Becker.

For more information visit: www.spitta.de

SAQ Tennis (Training and Conditioning for Tennis)



Author: Alan Pearson **Year:** 2006 **Language:** English **Pages:** 278 **Level:** All **ISBN:** 0-7136-6453-3

SAQ Tennis provides a complete conditioning programme designed to help players at all levels to improve their game. The book features techniques that have been developed and used over many years by some of the world's leading coaches. This resource for coaches and players alike contains a wide range of easy-to-follow, clearly illustrated drills that will develop skills in all areas of tennis play and includes: The fundamentals - warming up, running form, warming down and recovery; Tennis-specific drills - movement patterns, shot-specific drills, pattern practices; and a complete tennis training programme.

L'entraînement physique du joueur de tennis (The physical training of tennis players)

Author: French Tennis Federation **Year:** 2006 **Language:** French **Pages:** 131 **Level:** All **ISBN:** 2-907-267-94-9

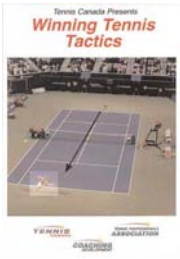
This book is another outstanding publication produced by the French Tennis Federation. The seven chapters discuss among other topics: 1. General principles of physical training, 2. Developing quality musculature, 3. Developing endurance, 4. Coordination and movement, 5. Testing, 6. Optimising performance, and finally chapter 7. discusses the periodisation/planning of physical training. The design, layout, format along with the use of diagrams and pictures makes this book very easy to read and understand.

For more information visit: www.fft.fr

DVDS

Winning tennis tactics

Author: Tennis Canada **Year:** 2006 **Language:** English **Duration:** 120 minutes **Level:** All



This is an excellent audio-visual tool for both coaches and players. The footage, which includes many of the world's top 20 male and female players, shows tactical situations in which players have made a good or bad decision. The reasoning for the decision is then explained by the concurrent use of a voice narration, directional arrows, highlighting of players positions and movements, slow motion footage and still shots. The DVD covers 4 areas of tennis play: 1. Building the point, 2. Finishing the point, 3. Staying in the point, and 4. Turning the point around - counter attacking. This DVD is highly recommended for coaches and players who wish to increase their tactical knowledge and as a tool for coaches to help coaches demonstrate tactical situations to their players.

For more information visit: www.tenniscanada.ca

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