International Tennis Federation

COACHING & SPORT SCIENCE REVIEW

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

Editorial

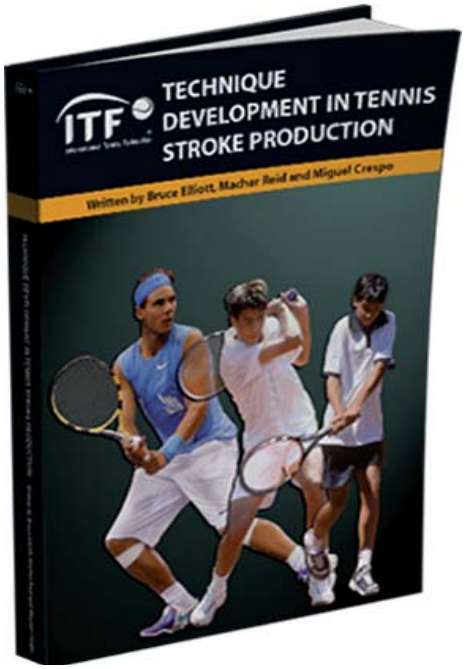
Welcome to issue 49 of the ITF Coaching and Sport Science Review, which is the final edition for 2009.

October saw the staging of the 16th ITF Worldwide Coaches Conference, with the theme 'Developing competencies for elite players and coaches'. Six hundred and seventy-nine coaches from over 110 countries participated in this year's Worldwide Coaches Conference by BNP Paribas which concluded on the 3rd of November in Valencia, Spain. The conference featured over 120 presentations, including keynote lectures, workshop sessions, free communications, poster presentations and for the first time virtual presentations from a series of renowned international speakers.

The five-day conference brought together leading experts in the area of high performance player development, tennis specific sport science and coach education to present on the latest developments in these fields. Key presentations included Bruce Elliott and Machar Reid (AUS) presenting on biomechanics; Alex Corretja questioned whether tennis is a team or individual sport; and Francisco Roig, who works with Rafael Nadal, gave a practical demonstration of working with elite performance players. Former French Open Champion Albert Costa was also a keynote speaker.

The conference was opened on Friday evening by ITF President, Francesco Ricci Bitti, RFET President, Jose Luis Escanuela, Joaquin Garcia, President of the Valencia Federation, Andres Sanzol, Director of the RFET Coaches Commission, and Ismail el Shafei, member of the ITF Board of Directors and Coaches Commission Chairman. During the Opening Ceremony, Ricci Bitti and El Shafei presented ITF Awards for Services to the Game to Ivan Molina of Colombia and Frank van Fraayenhoven of the Netherlands.

Apart from attending presentations from world renowned experts, participants enjoyed a social programme including an opening cocktail party, a closing dinner at the Alameda Palace and tickets to the Open Valencia 500 ATP tournament.

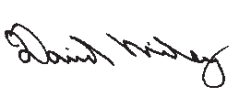


Several ITF meetings took place during the Conference including the ITF Coaches Commission, chaired by ITF Board Member Ismail El-Shafei and the ITF Sports Science and Medicine Commission, chaired by Dr. Brian Hainline. The ITF would again like to thank the Spanish Tennis Federation (RFET) for their hard work in assisting the ITF, as well as all the participants, speakers and ITF staff involved.

All of the presentations from the conference will soon be uploaded onto the tennis i-coach website (www.tennisicoach.com) and will then be available to all current 8000 members to view. The ITF Coaching Department is pleased to announce the launch of its new book at the Worldwide coaches conference in November 2009, the ITF Coaching Technique development in Tennis stroke production. Written by Bruce Elliott, Machar Reid and Miguel Crespo, the book aims to outline the mechanical basis of stroke development from a scientific perspective. For further information on this publication or any other ITF publication, please visit https://store.itftennis.com/

More courses are planned for 2009 including the 5 ITF regional conferences details of which will appear in the next issue. We look forward to seeing many of our readers in attendance.

We hope you continue to take advantage of the resources provided on the weblet http://www.itftennis.com/coaching/) and that you enjoy the 49th issue of the ITF Coaching Sport Science Review.



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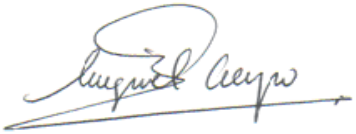

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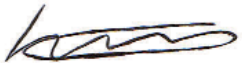

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Talent Development in Tennis – Speaking the Language

Paul Roetert, Mark Kovacs (USTA) & Miguel Crespo (ITF)

ITF Coaching and Sport Science Review 2009; 16 (49): 2 - 4

ABSTRACT

When delving into any kind of new or different field of study, one of the first things to do is to familiarize ourselves with the proper terminology. We likely wouldn't feel comfortable taking tennis lessons from someone who talked about "backstrokes" instead of "backhands" or who confused "rally's" and "volley's". We would certainly question the coach's credibility. This same concept is also true in the field of talent development as some confusion exists as to what it really is. However, it is very important for us, as tennis coaches, to understand not only the proper terminology but also the concepts behind them especially in relationship to developing our players properly. Let's take a look at what is currently available in the scientific literature related to this topic.

Key words: Talent, development, sponsorship, terminology.

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WHAT IS TALENT AND HOW DO WE IDENTIFY IT?

If we look up the word "talent" in the dictionary, we see the following definition, "a special and natural ability" and "a capacity for achievement or success". So how do we find the right athletes and attract them to tennis (talent identification) and once they're in the sport of tennis, how do we help them improve in a systematic way (talent development). It has been stated that it is pointless to select talent for a sport unless the talent has first selected the sport (Dick, 1992). In our experience, this may at least be partially true in that "motivation" or "desire to succeed" may be the most important factor in the development of expertise. However, most players get started in tennis with the help of a little push from a parent or other significant person in their life. Tennis has the added benefit, unlike sports like gymnastics and basketball, in that players of many different shapes and sizes can be quite successful.

Deliberate Practice and Deliberate Play

The theory of "deliberate practice" was developed by Ericsson et al (1993) and is based on the idea that proficiency in any domain is tied explicitly to the amount and type of training performed. Their research shows that many characteristics once believed to reflect innate talent are actually the result of intense practice extended for a minimum of 10 years. Deliberate practice is any activity designed to improve current performance, but it is not play, not work and not observing others perform. Practice is always relevant to performance, always effortful, and not inherently enjoyable (Starkes, 2000). Baker and Cote (2006), on the other hand, believe that the emphasis of structured, effortful training indicative of the early specialization approach may have forgotten an extremely salient factor in youth sport involvement – fun. They define "deliberate play" as activities in sport designed to maximize inherent enjoyment. Players can regulate tennis play by utilizing flexible rules adapted from the standardized rules of tennis. The immediate value of deliberate play is the motivation to continue to play tennis and the potential later value is that young players may develop the ability to process information from different sports situations. Davids (2000) states that time and amount of practice should not be viewed as the only constraints on skill acquisition. Issues such as hereditary influences and differences in motivation should also be considered. The fundamental issue may not be the number of hours of accumulated practice necessary to obtain excellence, but rather how to improve the quality of instruction in order to prevent future talents from wasting time during the various phases of the athletic career (van Rossum, 2000).

Chunking

We all know that top-level players look more efficient than beginners in the way they hit the ball. Part of the reason for this is that they have learned to group different components of their movement and swing from separate items into larger collections. This process is called chunking and allows players to collect sub-elements into a single unit (Schmidt & Lee,1999). This is also sometimes called a motor program.

Static versus dynamic tasks

A static task involves the performance a specific set of actions, typically in step-by-step progression (think following a recipe). For many areas this is vitally important. A surgeon needs a step-by-step approach to repair a ligament, and a carpenter needs to follow a specific order when building a staircase. This type of activity is benefited most by deliberate practice. Contrarily, dynamic tasks are a combination of static tasks sometimes in random order. Tennis is a sport that is a combination of static and dynamic tasks. Learning an open-stance forehand from a ball machine is a static task which can be practiced for hours and the athlete will improve the ability to hit the open-stance forehand. However, this is a vastly different ability than hitting an open-stance forehand at 5-5 in the third set against a player who hits with very heavy topspin on a slow clay-court.

Once a static skill is learned, research has shown that many individuals consciously or subconsciously avoid future deliberate practice; and instead choose to focus on well-entrenched activities which may limit their future improvements (Ericsson, Krampe et al. 1993).

Creativity

Experts in tennis are characterized by extraordinary creative behavior. Talented players display an individual performance in which creativity is paramount. Creativity can be defined as the ability to produce solutions to a given task that are both novel (original, unexpected) and appropriate (useful). Coaches should understand the importance of helping players develop their creativity by accessing existing knowledge at various levels of abstraction, combining previously separate concepts, and improving attentional skills under pressure situations (Memmert, 2009).

Practice variability (contextual interference).

Coaches should create practice environments that provide immediate performance of desired skills. However, in many cases the short-term benefits do not take into account the long-term benefits of various practice strategies.

When players attempt to learn two tennis skills (forehand and backhand), the coach usually structures the practice in blocks; forehands first until the player has mastered the skill and then backhands. However, motor learning research has shown that practicing skills using a random structure of the practice (hitting some forehands, then backhands, then forehands again, and so on) produces better long-term retention (as long as the basics of the strokes – grips and stroke pattern- have

been previously taught). This is called contextual interference. The combined practice of forehands and backhands generates some short-term interference (which can be understood as the degradation of performance) when compared to a blocked structure of the practice. This results in possibly more errors in the short term, but better skill acquisition over the long term. Research has supported this view in many sports including tennis (Douvis, 2005).

Birth month and talent identification

There is a bias (usually unintentional) in tennis rankings and selection for national federation teams, age-group squads, programs and scholarships for athletes that are physically mature for their chronological age. Athletes who are born in the first half of the year are usually the players who have greater results and are physically more impressive, relative to their peers. This results in many talented individuals not receiving enough attention from coaches and national associations at a young age because their results are less impressive than athletes who may be 6-12 months older and are physically more mature (Zmajic, 1996; Filipcic, 2001).

There is agreement among researchers and coaches that early talent detection and development is a vital component in the development of elite level athletes (Bouchard, Malina et al. 1997; Lidor and Lavyan 2002).

Most world class individuals, including athletes, were first encouraged to participate in their profession (sport) by the instigation or encouragement of a close family member (Bloom 1985; Lidor and Lavyan 2002). A very small percentage of world-class athletes were encouraged to participate in their chosen sport by a physical education teacher or sport coach (Lidor and Lavyan 2002). In some reports, as little as 20% of elite-level athletes stated that they pushed themselves to initially participate in their sport (Lidor and Lavyan 2002). It seems from the literature that it is nearly impossible for an athlete to achieve success at the highest levels without a supportive core family unit (Bloom 1985; Cote 1999).

The literature is inconclusive as to when the perfect age is for an individual to be exposed to their sport and how this age correlates with elite level performance (Lidor and Lavyan 2002). It is not necessarily imperative to initiate a structured training program at a very early age and in sports such as tennis late bloomers can still be highly successful (Bouchard, Malina et al. 1997; Lidor and Lavyan 2002). However, a clear difference was seen between elite and near-elite athletes in the amount of time they practiced and how many sessions they participated in per week during the initial three years of participation in a chosen sport (Lidor and Lavyan 2002). Individuals that achieved elite level sport success retrospectively stated that they performed more practice hours per week during the first three years in the sport as compared to near-elite athletes (Lidor and Lavyan 2002).

Single Sport Specialization versus Multiple Physical Activities

It has been argued by many researchers and coaches that participating in multiple sports or physical activities at a young age should be beneficial during later stages of talent development. This is due the learning effect on multiple motor skills including speed, agility, power stability, multiple varied movement patterns which allows the young athlete to develop a robust and well-organized schemata of movements (Schmidt and Lee 1999).

Motivation and effort

Intrinsic motivation is one of the greatest differences between elite and near-elite athletes. In one study, it was found that 87% of elite levels stated that they were more intrinsically motivated compared to only 32% for near-elite level athletes (Lidor and Lavyan 2002).

Research has examined players,' parents,' and coaches' perceptions of talent development in elite junior tennis and indicates that involvement in elite junior tennis is a team effort whereby players, parents, and coaches fulfill specific roles. Findings have also shown that parents and players are required to make sacrifices and that parents fulfill the most significant roles in terms of providing emotional and tangible support. However, they are often perceived as a source of pressure when they became over-involved in competitive settings (Wolfenden and Holt, 2005).

Further research with parents in the United States (Gould et al, 2008) has revealed that most parents are positive influences. They espouse an appropriate perspective of tennis, emphasized child development, and are supportive. In contrast, a minority of parents are perceived as negative, demanding, overbearing, and exhibit an outcome orientation.

Managing talent

It is important for the coach to understand that the talent of a player is a component of success, which will assist the player towards the main goal of becoming a better player. Talent is not a goal in itself, but developing talent is.

Managing talent is the ability to merge commitment with the strategic goals of the player and coach. Talent should not be the core concern of tennis programs. Rather, a strategy of a comprehensive long-term player development (LTPD), which combines the physical, mental, tactical and technical development of each player should be embraced.

Talent is worthless if kept in isolation, underdeveloped or overemphasized. Talent loses all its power if it is left without direction or guidance. Talent reveals all its value if it is "switched on" and aligned with the LTPD. By doing this, the coach will be able to develop all the competences needed by the player.

It is important to note, that when managing talent, coaches should be aware of the relevance of the so-called "intangibles". These include, but are not limited to; knowledge, skill (know how), intelligence, autonomy, responsibility, values, work-ethic, effort, respect, ability to learn, ability to adapt, innovation, creativity, and many others.

GUIDELINES FOR DEVELOPING TALENTED TENNIS PLAYERS

The role of a coach is to increase the on-court performance of his or her players. There are many methods, strategies and techniques to achieve improved performance, but all teaching and coaching must be based around the paradigm that the coach is a talent facilitator through learning and development – not a talent creator.

In order to effectively coach talented tennis players, the coach can work on the following aspects:

• Create an atmosphere of commitment, hard work and effort in which the climate is geared towards performance, co-operation and achieving the best each player can be.

• Build rapport with the players by using empathetic listening and understanding, and sharing common goals and beliefs that will help create a "performance culture".

• Develop awareness by helping players understand themselves using self-reflection and valuing the views of significant others.

• Motivate always. Keep the process, not the outcome relevant. Keep practices organized, purpose-driven and challenging. Help players enjoy and appreciate the values and rewards of the hard work. Encourage and reward hard work, discipline and dedication to the task.

• Generate the adequate confidence through a view of realism. Help them to "keep their feet on the ground" but raise their arms to "reach the stars".

• Communicate directly, effectively and openly. Listen closely to the players' needs. Ask a few more questions and mainly use open questions. Shift your behavior from giving advice to allowing the player to provide suggestions and take ownership of the practice sessions, drills and ultimately much of their tennis development.

• Provide specific, constructive and meaningful feedback.

• Help players to focus on their goals by creating the appropriate mindset in each situation. Concentration is often lost if talented players or their entourage focus mostly on short-term goals and forget the big picture.

• Encourage players to think and act by themselves. Make them responsible for the outcome of their actions.

• Offer empowerment, not advice, and be ready to accept the solutions generated by the players.

• Support players to learn other skills apart to those from tennis that will help them develop into great players (ethical behavior, respect to rules, sportsmanship, attention to detail, etc.).

• Be flexible and treat each player individually based on their needs, strengths and weaknesses.

• Understand when to be more directive or autocratic; when players do not have the necessary experience to make the decision, when under pressure situations, or when they do not have all relevant information.

• Use knowledge and technology in all its forms (information, research and innovation) to improve coaching that will directly benefit talented players.

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Teaching Tennis to Deaf Children: A Review of an Australian-based Program

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ITF Coaching and Sport Science Review 2009; 16 (49): 5 - 7

ABSTRACT

This article reviews a coaching program that was conducted with a group of Australian deaf children. The program is described and practical implications for coaches highlighted. The article concludes that the fundamental principles for successfully coaching deaf children - thorough planning and preparation, effective communication, making it fun, ability to adapt and cater for all abilities and patience and empathy - are consistent with general coaching principles.

Key words: Coaching, deaf children.

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INTRODUCTION

In hindsight, it was a unique and most rewarding experience for all participants. At the time, however, we wondered about the task ahead of us and our abilities to successfully teach tennis to a group of deaf children. In this article we share our experience, detail aspects of the program and its participants and highlight some of the effective strategies we adopted. In doing so, it is hoped that our experience will assist in breaking down barriers or concerns a coach may have about working with deaf children.

THE PROGRAM

Background

To further expand its Adapted Physical Education program, Victoria University (Footscray Park campus, Melbourne, Australia) sought a community group which had had little exposure to, or opportunity to play, tennis. Discussions with community partners revealed a local school for deaf children might welcome such an opportunity. Subsequent discussions were conducted with the school principal who supported the proposed program with open arms!

Participants

Eighteen Victoria University third-year Physical Education students enrolled in a 12-week adapted coaching unit to teach tennis to a group of eighteen deaf children. To prepare for the coaching sessions, the Victoria University students completed an Orientation to Tennis Coaching certification with Tennis Victoria and attended a series of 12 lectures on a range of topics relating to coaching persons with a physical and/or intellectual disability.

The deaf children (5 boys and 13 girls) in the tennis program were aged between 9 and 13 years. These children had had little, or no, tennis playing background prior to the introduction of the tennis program. A brief background as to each child's hearing loss, and any other, disability was provided by the school. While all children could access sign language (Auslan), a few had residual hearing and could access spoken language.

A school class teacher attended the weekly tennis sessions. She was available to interpret for the group if, and when, required as well as answer any queries about the school and its students.

Location and Facilities

The program was conducted at a School for Deaf Children that is located in an outer suburb of Melbourne, Victoria, Australia. Although the school only has one multi-use court and adjoining brick wall, it has considerable open grassed spaces and an indoor gymnasium and dance studio.

To best utilise the available space, portable tennis nets were placed across the multi-use court and over adjoining grassed areas. The indoor gymnasium was a welcome haven when outdoor temperatures reached over 40 degrees Celsius and the dance studio provided an interesting opportunity to work on some tennis skills as will be detailed below.

Format of Sessions

The sessions started with a group 'warm-up' consisting of 2-3 games (e.g., 'poison' ball, tunnel ball, 'octopus' tag, bean bag hunt etc). The aim here was to get everyone involved, moving and interacting, including the coaches. These games were designed to take approximately 10-15 minutes.

Following these games, coaches worked on a one-to-one basis with a deaf child who had been assigned in Week 1 of the program. The basis for allocation of each child to a specific coach for the series of lessons followed guidelines provided by the school (the school had requested male students be paired with male coaches given the school had no male staff members and doing so would provide a potential opportunity for male role modelling).

The individual one-on-one coaching segment of the sessions was designed to take approximately 50-60 minutes. Each session's content was at the discretion of the individual coach, having regard to each child's abilities, interests and goals. A lesson plan was developed each week by the coach, and following each session, a review was completed as to its effectiveness and shortcomings (if applicable).

The sessions concluded when the school bus arrived to take children home at 3.15 pm. This was followed by a 'debriefing' of all coaches at which time coaches shared their sessions' challenges and achievements with the group.

An 'Award Ceremony' was included in the final session in Week 12 when all children received an engraved medallion in recognition of their participation in the program.

KEY CONSIDERATIONS FOR COACHES WORKING WITH DEAF CHILDREN

At the conclusion of the series of sessions, coaches were asked what factors they considered important to ensure a safe, fun and productive session. The coaches' suggestions include the following:

Take an Individual Approach

Each deaf child is different with respect to his/her abilities to access different forms of communication (i.e., spoken, lip-reading, written and sign language) and his/her sporting abilities, goals and interests. It is important for coaches to seek this information from school teachers, parents and/or the child him/herself prior to, or at the start of, a program. Armed with the information, coaches have a sound foundation as how best to start communications with their deaf student and also develop, implement and evaluate a suitable series of lessons.

Prepare and Plan

Lessons generally run most smoothly when planned. It is much easier to adapt a plan than to work from no plan! Time spent in preparing a lesson is therefore time wisely invested. In planning their lessons, coaches are often best guided by the positive responses of children when provided with a fun lesson that is both challenging and safe and from which skill development can naturally occur.

Emphasise Correct Demonstrations

While verbal instruction is appropriate with some deaf children (e.g., those who can lip-read), visual demonstration of activities and skills is appropriate for almost all. Accordingly, demonstrations need to be simple and technically correct as many deaf children have an exceptional ability to mimic exactly what is shown to them. When verbal instruction is provided, this should be given prior to (versus at same time as) the visual demonstration to allow the deaf child to devote full attention to one stimuli/task at a time.

Incorporate Colour

The use of coloured cones, balls, hoops and other equipment can make activities more fun and achievable when a child's attention and interest are captivated. In most languages, the use of red and green flags signifies 'stop' and 'start'. Accordingly, the use of red and green flags can prove to be effective tools to attract a child's attention and also to signify the start or finish of an activity.

Remember to Smile

A smile is an universal way to welcome and give positive feedback and encouragement. The power of a smile should never be underestimated and even more so in an environment where deaf children are keenly 'reading', and responding to, a coach's facial expressions. Along with a smile, positive gesturing and body language from a coach can greatly facilitate a child's motivation to learn and try new things.

Make Eye-to-Eye and Face-to-Face Contact

A coach needs to be mindful to establish and maintain eye contact with a deaf child when communicating. Even if a coach asks an interpreter to sign for him/her, facing the deaf child when speaking is respectful and appropriate. A couple of scenarios for consideration are:

- When there is sun, ensure the deaf child's back is facing the sun to facilitate full view of the coach, racquet, ball and other individuals and objects
- If working with a group, call/signal the group in to give instructions and provide demonstrations (rather than attempt to communicate to children spread over a wide area)
- If wanting to attract a child's attention, it is appropriate to move to ensure the child is facing you and then tap him/her on the shoulder (rather than tap the child from behind which may startle or frighten)
- When speaking, use normal paced speech with clear and concise words. Avoid yelling as this may be interpreted by the deaf child as the coach being angry. In addition, those children with residual hearing or hearing aids may not be able to hear at that frequency

Be Willing to Learn Sign Language

The response from children to coaches who are willing to learn some sign language can be phenomenal. It can help generate an extra special bond between coach and child as well as assist understanding between the parties. Here the school was most helpful in providing a 'cheat sheet' of signs covering a range of tennis vocabulary/actions including 'tennis', 'serve', 'match', 'net', 'ball', 'racquet', 'court', 'bounce' and 'score', 'stand up', 'sit down', 'line up', 'try', 'good luck' and 'good'. Obtaining such a 'cheat sheet' should not be a difficult task for coaches with access to the internet.

Safety First and Foremost

Risk management is the responsibility of the coach. To this end, the playing area needs to be free of obstacles (e.g., loose balls and equipment) and activities and groups should be spaced to avoid collisions (e.g., when using the brick wall in ball throwing or hitting activities). Without the cue of sound, a deaf child relies heavily on the coach to alert to the wayward ball or person coming his/her way that may not be easily visible. Further, given some deaf children have balance and co-ordination difficulties, coaches should adapt activities where and when appropriate (e.g., warm-up games can be modified from running to walking activities to minimise the risk of children falling).

Patience is a Virtue

This saying is particularly true in circumstances when a coach may need to take additional time to provide instruction, demonstrate and check a deaf child's understanding of a task. Patience is also important in situations when a coach accesses an interpreter to sign for him/her – additional time is generally required when a third party is involved in communications. Awareness of and accepting that additional time and effort may be required when communicating with deaf children are essential attributes for a coach.

Encourage and Reward Effort

Coaches need to find ways to endorse the philosophy of 'have a go' and 'give it 100%'. It is not all about 'winning' and match/activity results but rather encouraging participation and having fun. Some suggestions here include:

- All attempts by a child to undertake and master an activity, regardless of its outcome, are positively acknowledged by a coach (e.g., with a big smile, thumb-up sign)
- Design activities where children have a realistic opportunity to feel good about their endeavours (e.g., if teaching a specific shot, place the

ball where the player has a good chance of making contacting with the racquet)

• Introduce an Award Presentation at the conclusion of a program when all children who participated are given recognition

It's Okay to Feel Apprehensive, then Lead by Example

At the beginning it is quite natural, and to be expected, to feel somewhat apprehensive about coaching a deaf child. Without being able to draw on one's past experience in working with deaf children, what should a coach anticipate and do? A coach should know that he/she is possibly not alone in feeling somewhat unsure or uncertain at such time. Such feelings will generally pass quickly as a coach throws him/herself into the challenge. A good 'rule' to remember is that if you have fun, the deaf child will most likely do the same. So commit to being a positive role model and mentor and lead by example. Enjoy your own lesson and your enthusiasm will most likely be contagious!

'Think Outside the Square'

Sometimes coaches can be limited by their own creativity. Do not be afraid to think laterally, adapting selected features of one's coaching environment. As noted above, a dance studio was available at the School for Deaf Children. This presented an opportunity for two of our 'musically inclined' coaches to conduct dance and movement sessions for their two deaf children to improve the latters' footwork for tennis. The coaches put together a selection of music with the children sensing the music's pulse and beat through vibrations in the sprung floor. There was great fun for all, with the children following the coaches' enthusiastic dance and movement routines in front of mirrors that lined the sides of the studio.

Conclusion

There is no doubt that coaching deaf children presents challenges. But what must be remembered is that many of these challenges are common across all coaching situations. What is unique about coaching deaf children is the range of the communication methods that might be most appropriate including sign language, lip-reading, gesturing and miming (Hanrahan, 2003). Notwithstanding this consideration, 'coaching is coaching' such that the principles of coaching deaf children are consistent with general coaching principles (e.g., Martens, 2004) and coaching athletes with a disability principles (Coaching Association of Canada, 2005). Thorough planning and preparation, effective communication, making it fun, ability to adapt and cater for all abilities and patience and empathy are key elements for all good coaches.

The coach who has the opportunity to teach deaf children is very fortunate as it offers the potential to grow the coach. It is hoped that some of the suggestions above will provide the 'winning formula' in guiding a coach to focus on fun, the deaf child's abilities and efforts and what can be achieved in a safe environment. Our experience in working with the School for Deaf Children was a 'winner' for everyone involved. It can also be yours but it may require a pro-active approach to introduce tennis to this specific group of player which has, to date, often been overlooked by the tennis community.

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Grand Slam men's singles tennis 1991-2009 Serve speeds and other related data

Rod Cross (University of Sydney) and Graham Pollard (University of Canberra)

ITF Coaching and Sport Science Review 2009; 16 (49): 8 - 10

ABSTRACT

Data from men's singles at the four Grand Slam events is presented to show how the game has been changing over the last ten years or so. The biggest change has been the increase in serve speed at the French Open. The average first serve speed is now about the same at all four events. Serve speed continues to increase at all events, as does the number of aces, while the number of double faults is decreasing. It is clearly harder to serve an ace on clay, despite the comparable serve speeds. Data is also presented on the % of tie-break sets, games per set and points per game.

Key words:Tennis, serve speed, aces, tiebreaks, statistics.

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INTRODUCTION

The evolution of the game of tennis at the highest levels can be analysed in terms of statistical data for each of the four Grand Slam events held each year in Melbourne, Paris, London and New York. Data are available in several different formats, including set scores published for each of the 127 matches played in men's and women's events, and temporary data made available on the tournament web site during and shortly after each event. The latter data includes, for example, the average serve speeds for each set and match, the number of aces and double faults, and the number of points won by the opposing players.

We have collected together a large amount of men's singles data spanning the period 1991 to 2009 and present the data in this paper to show the trend over the years in parameters such as serve speeds, aces, double faults, the percentage of sets reaching a 6-6 score, games per set and so on. Some of the data shows clear differences between the four events, reflecting differences in surface pace or ``speed'' of the four court surfaces. The French Open is played on a relative slow clay surface, Wimbledon is played on faster grass courts and the US and Australian Opens are played on medium speed hardcourts.

Several previous studies (1, 2, 3) have reported trends in men's and women's tennis up to the year 2000, but there is very little published data after that time. The earlier studies indicated that the speed of the game was increasing at a steady rate, particularly in men's tennis, and that measures might need to be taken to counter that trend. A larger tennis ball was trialled by the ITF for a short period in an attempt to reduce the speed of the game, but the larger ball was not popular with professional players and was not used in Grand Slam events. Since 2000, average serve speeds have continued to increase but now appear to have reached almost the same plateau value at all four events. Despite the increase in serve speeds, and a remarkable decrease in the number of double faults, the probability of the server winning a point has remained relatively constant over the years (except at the French Open) reflecting an increase in the ability of opponents to return high speed serves.

SERVE SPEED

The average first and second serve speeds in men's singles tennis, since 1999, is shown in Fig.~1. Data were recorded by one of the authors (RC) during 1999-2001, in 2004 and again during 2007-2009. Serve speeds are not recorded for every match, due to the fact that radar guns are not employed on every court. The 1999-2001 data were averaged over 38 to 136 players at each event (19 to 68 individual matches from round 1 to the final) while the 2007-2009 data were averaged over 28-30 players in 2007, 60-156 players in 2008 and 150-196 players in 2009. Players proceeding from one round to the next were included more than once in the match averages.

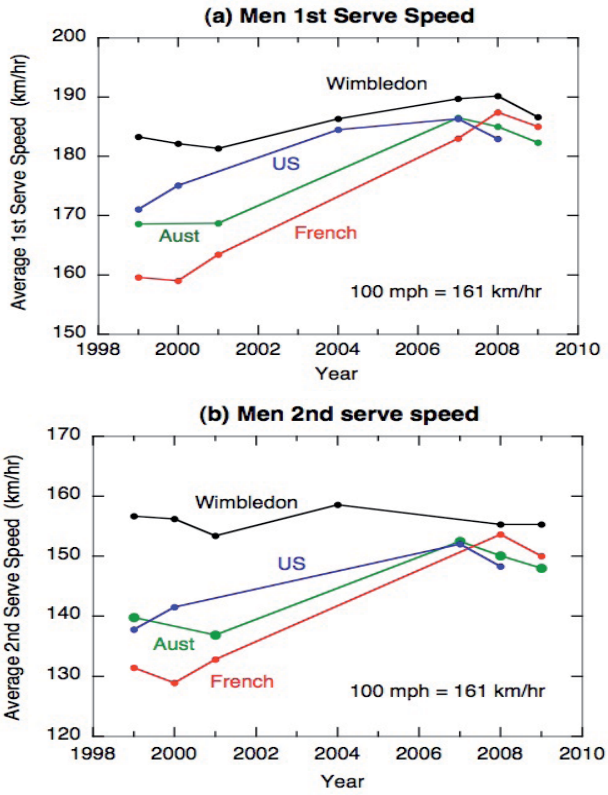

Figure 1. Average 1st and 2nd serve speeds, men's singles, 1999 to 2009.

The largest change has been the increase in the average first and second serve speeds at the French Open during the period from 2000 to 2009. Around 2000, most players at the French Open sacrificed serve speed in order to apply a greater amount of topspin to the ball. There were a few notable exceptions. In 1999, Safin served at an average speed of 191 km/hr at the French Open. The next fastest player served at 177 km/hr. Safin served many more aces than any other player. In 2000, Philipoussis served at an average speed of 197 km/hr at the French Open. Since about 2006, all players serve at about the same speed at all four events, some having an average first serve speed over 200 km/hr. For example, Roddick's average first serve speed at his most recent events were 204 km/hr (US Open, 2008), 201 km/hr (Australian Open 2009), 197 km/hr (French Open, 2009) and 200 km/hr (Wimbledon, 2009), averaged over at least four rounds at each tournament.

Table 1. Average 1st serve speed, V1, and average height, H, for N match winners and N match losers in each Grand Slam event in 2008 or 2009

Event	Aust	2009	French	2009	Wimb	2009	US	2008
	W	L	W	L	W	L	W	L
N	82	82	98	98	75	75	73	73
V1 km/hr	184.1	180.6	186.7	183.3	187.7	185.5	184.0	181.1
SD (V1)	8.9	10.9	9.3	10.3	9.5	8.8	10.0	10.2
H (cm)	187.1	185.1	186.1	185.1	186.8	185.4	187.5	185.6
SD (H)	5.7	7.2	6.6	6.7	6.9	6.6	5.8	7.3

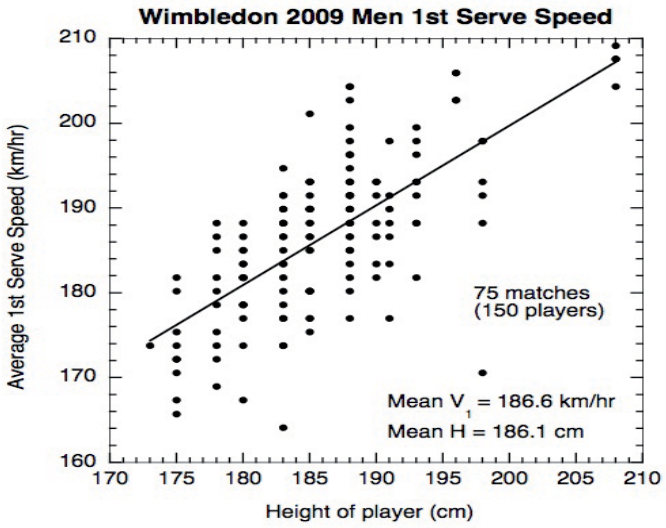

Figure 2. Average first serve speed vs player height at Wimbledon, 2009. The straight line is a linear fit to the data, showing that serve speed (in km/hr) is about equal to player height (in cm) on average.

The distribution of first serve speeds during 2008-2009 was essentially the same at all four events, as indicated in Table 1. Match winners are typically one or two cm taller than their opponents and serve 2-4 km/hr faster on average. Serve speed is related to player height, as shown in Fig.~2 for the 2009 Wimbledon event. The best linear fit to the first serve speed vs player height data, for all four Grand Slam events, shows that the average first serve speed for any given player, in km/hr, is close to the numerical value of the player's height in cm. The average height of players has not changed significantly since 1999 when the mean height in men's singles was 185.5~cm at Wimbledon (N = 60), and 186.4~cm at the Australian Open (N = 78). The corresponding mean heights ten years later were 186.3~cm for match winners (N = 4 x 127 = 508 players, including all four events) and 185.0~cm for match losers (N = 495 players). The mean heights listed in Table 1 are for the smaller sub-group of the more highly ranked players whose serve speeds were measured.

ACES

The total number of aces served in all 127 matches at each event is shown in Fig.3, over the period 1991 to 2009. About 28,000 points are played at each event each year, so a total of 2,000 aces at any one event corresponds to one ace on average every 14 points. Alternatively, about 17,000 first serves at each event are successful, so about one good first serve in eight, on average, results in an ace. However, the percentage of good first serves resulting in an ace can be quite variable for any given player, from one match to the next.

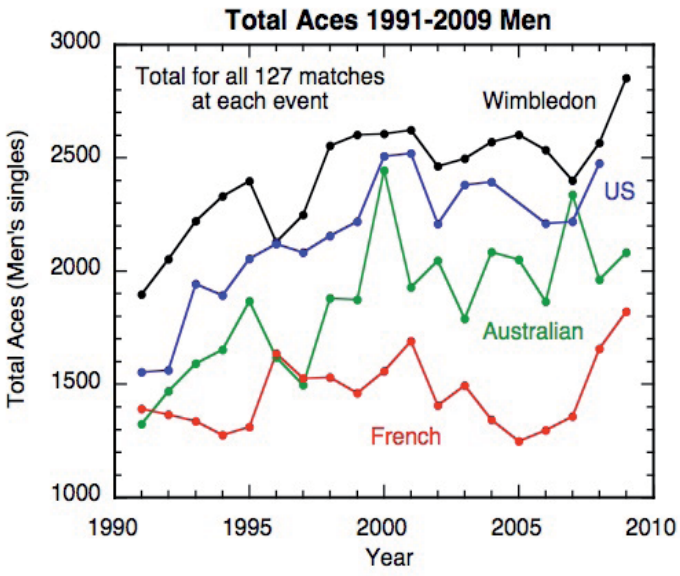

Figure 3. Total number of aces at each men's singles event, 1991-2009.

Aces are more common at Wimbledon and least common at the French Open, reflecting the relative speeds of the different court surfaces.

The increase in the number of aces at the French Open since 2005 can be attributed to the increase in serve speed during that time, but the number of aces at the French Open is still well below the number of aces at Wimbledon. Given that the serve speeds at these two events were about the same in 2008 and 2009, it is clear that the speed of the court surface has a strong effect on the number of aces served. Conversely, if the serve speeds at each event are about the same, then the number of aces can be interpreted as a simple indication of the speed of the court. In that respect, the Australian Open surface is slower than the US Open surface, which is now almost as fast as the grass courts at Wimbledon. The relatively large fluctuations in the number of aces each year at the Australian Open may reflect differences in court speed arising from the fact that the courts are resurfaced each year with a new coat of acrylic paint mixed with fine abrasive particles. The speed of the court can therefore be adjusted by choosing specific abrasives.

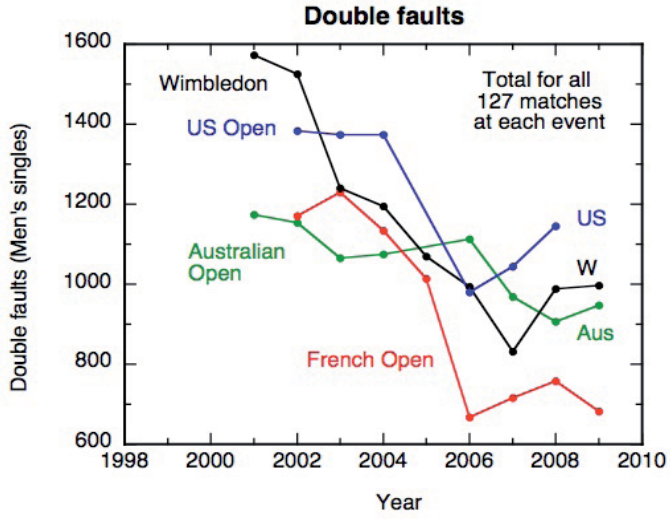

Figure 4. Total number of double faults at each of the four men's singles events, 2001-2009.

The total number of double faults, summed over 127 matches at each event, is shown in Fig.~4 for the period 2001-2009. The decrease in this period is remarkable, and presumably indicates that players have improved their ability to serve more accurately as well as at higher speed. One of the best servers in this respect is Federer. In one match

at the Australian Open in 2008 he served 39 aces and one double fault. It is now very common for the best players to serve many more aces than double faults.

TIEBREAK SETS AND OTHER 6-6 SCORES

A set that reaches a 6-6 score generally indicates that the players are fairly evenly matched. The result is usually decided by a tiebreak game, unless it occurs in the fifth set where the set is won by the player winning two games more than his opponent (eg 8-6 or 9-7 etc). At the US Open, the fifth set is decided by a tiebreak game if it reaches a 6-6 score. The percentage of men's singles sets reaching 6-6 in each Grand Slam event is shown in Fig.~5 for the period 1995-2009. The percentage is largest at Wimbledon, indicating that it is more difficult for a player to break an opponent's serve when playing on a fast court.

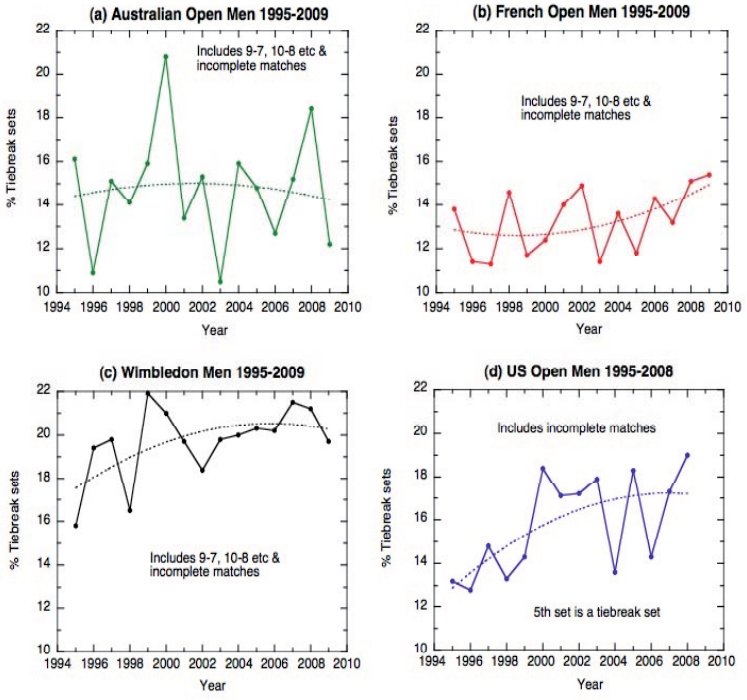

Figure 5. Percentage of sets reaching a 6-6 score, over the period 1995 to 2009. Dashed lines are quadratic fits to the data.

The International Tennis Federation (1) analysed the results of 55,000 sets for men, from 1968 to 1998 and found a gradual increase in the number of tiebreak sets over the whole 30-year period. It was concluded that there was an increasing dominance of the serve over time, on all court surfaces, and that the nature of the game had changed significantly since the old, wood racquet era. Since the year 2000, the percentage of sets reaching 6-6 has remained relatively steady, except for a gradual increase at the French Open. The latter increase is presumably due to the increase in serve speeds at the French Open during that time.

Some 6-6 scores occur because each player wins six service games in a row without dropping a serve, while other 6-6 scores occur because each player loses the same number of service games during the set. At Wimbledon about 75% of 6-6 scores result because neither player loses his serve. At the Australian, French and US Open events, about half of all 6-6 scores result from the opposing players breaking serve an equal number of times.

POINTS PER GAME AND GAMES PER SET

Figure 6 shows, for men's singles matches during the period 2001 to 2009, the number of games per set and the number of points per game, determined from the total number of sets, games and points played in all 127 matches at each event.

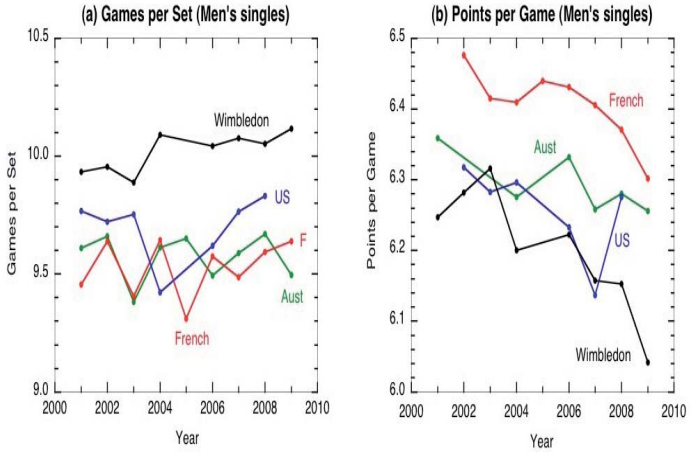

Figure 6 Games per set and Points per game for men's singles 2001-2009.

Given that it is more difficult to break serve at Wimbledon, the average number of games in a set is larger at Wimbledon than at the other events, while the average number of points in a game is smaller. The number of games per set has remained relatively constant at each event during the 2001-2009 period, but the number of points per game has decreased by about 3% over the same period.

The average number of sets in a match varies from 3.55 to 3.85 at all four events with no clear differences between events and no clear trends over the years. At each event there are typically 60-70 three-set matches, 30-40 four-set matches and 20-28 five-set matches. The number of sets in a match appears to depend more on the luck of the draw than on the court surface.

CONCLUSIONS

Analysis of data from the men's singles event at the four Grand Slam events shows that the nature of the game of tennis is continuing to change. Serve speeds are now higher than they have ever been and the number of aces continues to rise. Remarkably, the number of double faults has been decreasing over the last ten years. The number of tiebreak sets is largest on the grass courts at Wimbledon, but has remained relatively constant at all events over the last ten years, except for a gradual increase at the French Open. Likewise, the number of games per set remains largest at Wimbledon, due to the faster court surface, but has remained relatively constant at each event over the last ten years.

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Fit to Play™ & Perform –Core Travel Training

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ITF Coaching and Sport Science Review 2009; 16 (49): 11 - 13

Abstract

This is a Core Stability Training program for travelling players based on our Fit to Play™ & Perform DVD series. Players can maintain and improve upper and lower core stability with functional exercises that work on the muscle slings in closed and partially closed kinetic chain movements. These exercises are versatile, practical, transportable, and affordable. They can be used by a variety of different age groups including junior and senior players.

Key words: Core stability, Functional strength, Stability Balls, Stretch band resistance, Travel.

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INTRODUCTION

Training for tennis requires the body to move in and rotate around three different planes of motion at the same time. Unfortunately most machine based exercises often involve or isolate a single joint and only allow movement in one plane of motion. Try designing a core training routine that can be easily followed when travelling that works both the upper and lower core muscle systems at the same time. Upper and lower core strength training provides a stable three-dimensional power platform from which the extremities can work during multi-planar, multi-joint, and multi-muscle activities that involve acceleration and deceleration forces (Petersen, 2006).

Using a stability ball and stretch bands to do exercises that challenge your balance will help keep you Fit to Play™ & Perform. Training this way strengthens the core (trunk) muscles in all directions of motion and makes use of functional exercises. These exercises are versatile, practical, transportable, and affordable and work on upper and lower core stability. We prefer to use the term 'stability' rather than 'strength' because strength is just one component of the dynamic stability required (Brukner & Khan, 2007).

Many muscles attach to the 'lower core' lumbo-pelvic-hip complex and spine and the 'upper core' spine, ribs and scapular region. When activated and recruited properly the stability of the upper and lower core forms the foundation for other movements. The first muscle to be recruited prior to any upper and/or lower body movements is the tranversus abdominus. Normally it fires in pre-anticipation of any movement but with dysfunction there is a timing delay and studies have shown that without efficient and optimal recruitment, subsequent spinal dysfunction can occur (Richardson & Jull, 1995).

Benefits of Core Stability Training (Adapted after Petersen et al., 2006)

- Improves posture, muscle strength, and combines the upper and lower core.
- Improves joint and muscle position sense (kinesthetic awareness), helping to center the joint and absorb stress..
- Improves stability in a functional hip-extended position.
- Improves ability to counter-rotate upper and lower torso and extremities.
- Improves dynamic balance and movement efficiency.
- Adds additional force vectors of resistance to traditional training methods.
- Helps to improve athletic performance.
- Helps the body to be able to react to unexpected events.
- Training on an unstable surface trains balance reactions and coordination at a subconscious level, facilitating these reactions to become automatic.

These exercises are versatile, practical, transportable, affordable and strengthen the upper and lower core (trunk) muscles in many directions of motion. They will provide a big payoff for sports like tennis that require movements involving rotational and deceleration strength in a hip extended position. Following are some selected exercises from our Core Stability DVD series Fit to Play™ & Perform. Try to do 3-4 different exercises 2-3 sets of 10-15 repetitions every second day when on the road and progress as you develop more stability.

Warm- Up First

Before starting this or any exercise routine do some light dynamic warm-up exercises like leg swings, high knees and crossover runs. Add a rotational component to your warm-up by doing alternating open stance rotations holding the stability ball.

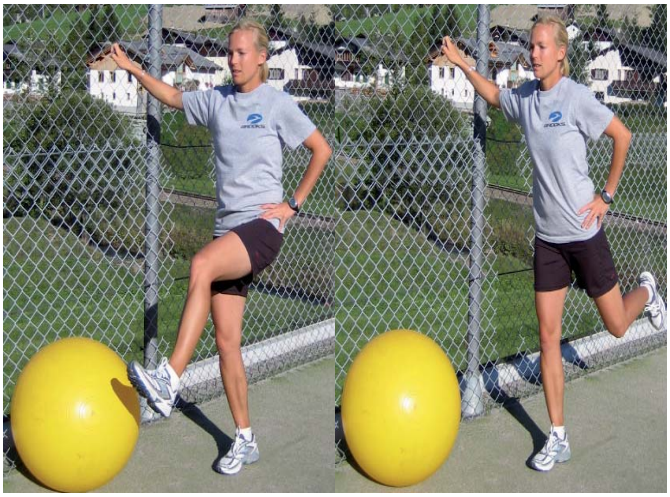

Figure 1 and 2. Leg Swings. Do 2 sets of 10 leg swings front & back, side to side & figure of 8's.

Figure 3 and 4. Torso Rotation. Warm up torso rotation and challenge balance with these open stance rotation drills. Do 2 sets of 10 repetitions per side.

Figure 5. Seated Shoulder Diagonal Pull. Sit on a stability ball and lift one leg to challenge balance. Then do shoulder diagonal pull exercises in different positions improve upper core stability.

Figure 6. Sit Downs. These exercises work the abdominal muscles eccentrically. Sit on a stability ball with knees together and feet apart. Now lean back to 45 degrees engaging your abdominals to slow your descent and then pull you back up.

The upper & lower core muscles are connected by muscles that attach in groups of functional slings from the hips through the pelvis and torso to the shoulder girdle. They help to provide a stable platform for the extremities to work off of and protect your entire back and pelvis against injury during activity. By doing exercises with balls and stretch bands that challenge balance can augment the stability of these functional slings.

Figure 7 and 8. Ball & Band Squats. Squat while squeezing a small ball between your knees and doing a diagonal arm pull or external rotation to connect the upper and lower core muscle groups.

Figure 9 and 10. Hip Hikes. Start in a split squat position with the stability ball above your head. Squeeze the ball and pull down as you drive one knee up and across your hip. This works the anterior oblique sling system.

Figure 11 and 12. Single Leg Squat (ball side). Challenge hip strength, stability and balance with this difficult exercise.

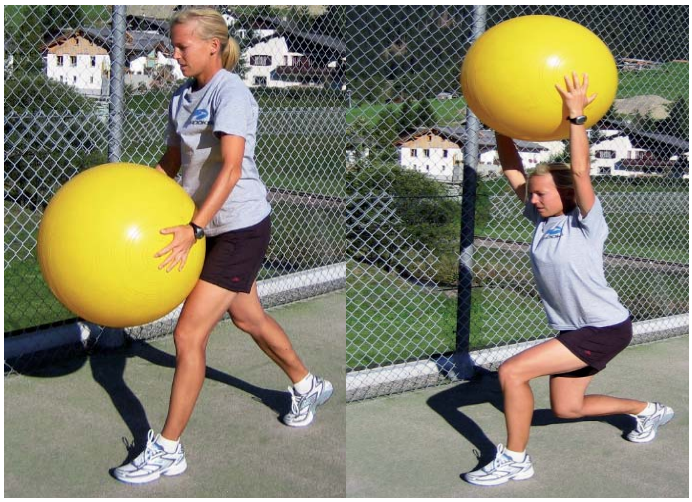

Figure 13 and 14. Split Squat with Shoulder Flexion. Start in a splits squat position with a stability ball in hands as you squat down raise into shoulder flexion while squeezing it firmly between hands..

Stretch Band & Ball Precautions

• For individuals new to exercise, see your physician.

• When using resistance tubing, ensure it is of high quality.

• Avoid placing stretch bands or stability balls near heat or in direct sunlight.

• Avoid sharp objects and jewellery

• Start gradually and get a feel for the ball and resistance of the stretch band before progressing or increasing the tension.

• Regularly inspect stability ball and stretch band for wear and tear and replace as appropriate.

• Ensure that stretch cord is securely fastened.

Cooldown

Should include some light stretches immediately after the workout. Then later on try stretching all muscle groups used in the strength routine. Be sure to key in on those that tend to get short and stiff like the hamstrings, hip flexors, calves and pectorals. Static stretches prior to exercise did not prevent lower extremity overuse injuries, but additional static stretches after training and before bed resulted in 50% fewer injuries occurring (Hartig & Henderson, 1999). Get your players to try holding each stretch for 60 seconds and repeat 2-3 times. Past research found that the group that performed 60 second stretches produced no better results than the group that performed stretches for only 30 seconds and subsequently proposed that 30 seconds is the most effective time period to hold a static stretch (Bandy & Irion, 1994).

However over 25 years of practical experience has made me realize that most athletes told to hold a stretch for 60 seconds will probably hold for only 30 seconds.

Figure 15 and 16. Whirlpool Stretches. By stretching in a whirlpool you get the added stretching benefit of the heat and the recovery benefit of the underwater massage.

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Standardized Testing of Forehand and Backhand Groundstrokes in Tennis through a Bird's Eye Perspective

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ITF Coaching and Sport Science Review 2009; 16 (49): 14 - 16

ABSTRACT

There is evidence in the tennis literature showing that angular momentum about the longitudinal body axis has an important impact on the ball velocity in groundstrokes. However, the angular momentum about this body axis has been so far only estimated with time consuming 3D-video analyses through an examination of the maximal angular displacement of the shoulder axis towards the baseline. In contrast, a simple and inexpensive method is introduced to examine this angular amplitude about the longitudinal body axis from a bird's eye view. Six girls and twelve boys between 10 and 12 years with different tennis expertise participated in the study. Forehand and double-handed backhand strokes from the baseline were videotaped for a kinematic analysis. While maximal trunk rotations reached average angles of 105 degrees in forehand strokes and 120 degrees in backhand strokes highly significant correlations between ball velocity and the trunk rotation (forehand strokes: r = 0,65 and backhand strokes: r = 0,76) were found. This result shows that the trunk rotation is clearly more important for the backhand than for the forehand stroke. Other angular displacements (trunk torsion and racket orientation) did not prove to be as important for the stroke velocity.

Key Words: Angular momentum, trunk rotation, kinematic analysis, bird's eye perspective.

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INTRODUCTION

Angular momentum about the longitudinal body axis generated by the players' stroking pattern plays an important role in the acceleration of the tennis ball during the contact phase in the baseline strokes (Bahamonde & Knudson, 1998; Knudson, 2001; Bahamonde & Knudson, 2003; Elliott, 2006). Although there are some indications in the literature about its particular importance for the different stroking techniques (e.g. Reid & Elliott, 2002) it is still open to what extent the angular momentum is influencing performance in the forehand and the backhand in general (Bahamonde & Knudson, 2003). In addition, an analysis of the angular momentum through biomechanical methods remains to be a complicated procedure. Up to date, respective studies on the trunk rotation in tennis were pursued with time-consuming 3D-film analyses while using the angular displacement between the shoulder alignment and the baseline as an estimate for the amount of angular momentum (e.g., Elliott et al., 1997). While study by Elliott and colleagues had a real game situation as the main objective, coaches and tennis players find it useful to examine trunk rotation for a regular skill testing under standardized conditions as well. For that purpose, online-information rather than time-intensive 3D-analysis is required. We have used a video camera from a bird's eye position right above the player to match the requirements for an online-information system. The same idea was used by Elliott and co-workers (Elliott at al., 2002) to measure the shoulder alignment in cricket fast bowling. However, Elliott and co-workers examined the shoulder alignment towards the longitudinal body axis as a main incentive while the testing criteria of our study related to the shoulder alignment and the racket orientation towards the baseline.

For the standardization of our performance test, subjects were asked to return tennis balls played by a ball machine towards the centre of the baseline with forehand and back strokes in alteration. While ball velocity was used as a criterion measure, we analysed trunk rotation and racket orientation towards the baseline as dependent measures.

METHODS

Six girls and 12 boys (10 to 12 y, 152 ± 6 cm, 39 ± 6 kg) participated in the study. Their expertise in tennis varied from belonging to the regional best players, the local best players or they merely played in kids tennis teams while ranked among the first two team positions. All subjects were easily mastering the two groundstroke techniques.

The video recordings were done on an indoor court with a wood-frame roof construction. Forehand stroke and double-handed backhand strokes were recorded through a firewire cable on a laptop hard drive and evaluated with a film analysis software (SIMI Reality Motion System, Unterschleissheim, Germany) consecutively. The video camera (Sony VX-1000E, shutter opening time 1/5000 s with 50 frames/s) was attached to the roof construction 4,5 m above the middle of the baseline and perpendicular to the court surface. A remote control was used to operate the camera. An evaluation area was calibrated with the size 3,50m x 3 m.

While the tennis balls were played towards the subjects with a ball machine with approximately 7,3 m/s (average across five frames before the racket contact) at 0,4 to 0,5 balls per second, players were asked to hit the balls down the line towards a circular target areas (1,5 m diameter) in the corner of the opposite court. Fig. 1 shows a sketch of the experimental setup. A total of 15 forehand strokes and 15 backhand strokes were evaluated. Forehand strokes and backhand strokes were played in an alternating sequence. For both stroke techniques the six most precise trials concerning the target area were used for the statistical analysis. For each trial, video material was analysed between five frames before the first appearance of the tennis ball in the video image until the first frame after its disappearance. For each trial and depending on the individual movement velocity, 400 of the 500 ms of the video recording were analysed.

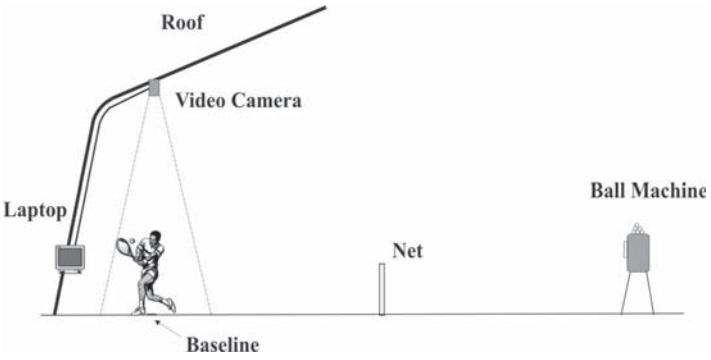

Figure. 1 Experimental Setup.

Only the players' angular information regarding trunk rotation and racket orientation was collected throughout each trial. For the trunk rotation, the maximal angle between the shoulder alignment and the baseline was evaluated. For the racket orientation, the maximal angle between the racket midline and the baseline was examined (Fig. 2).

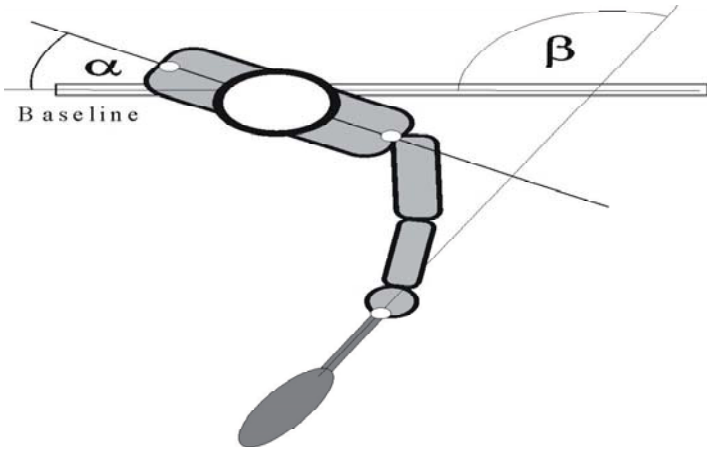

Figure 2. Backswing angles evaluated: maximal trunk rotation (a) and racket orientation (b) towards the baseline.

While the racket midline was captured by a digitization of the racket top and the racket grip white circular markers were attached to the shouldertops to indicate the shoulder alignment. Only the perpendicular projections of the lines captured through the above point were evaluated by our method of analysis.

Aside from the angular information on the players stroking performance, the tennis ball velocity after the racket contact was analysed as a criteria for the correlation analysis. While the outgoing tennis ball velocity after the racket contact was calculated as the mean for all frame-to-frame velocities after the racket contact until disappearance of the ball on the video images, the incoming tennis ball velocity was analysed along the passage of the ball up to the racket contact for a control.

For the statistical analysis, mean values, standard deviations, and coefficients of variation for each subject concerning the six trials for the forehand stroke and the backhand stroke were calculated. Further on, individual mean values were used to calculate group mean values. Individual mean values were also used to test for Pearson correlations coefficients between the angular displacements and the tennis ball velocity. Finally, multiple correlation coefficients were calculated to determine the variance in the tennis ball velocity explained by the angular stroke performance data. The level of significance was set to 0,05. All statistical calculations were executed with SPSS V12.0.

Results:

All mean values and standard deviations for the outgoing ball velocities and angular displacements evaluated are listed in Tab. 1. A mean tennis ball velocity of 28,9 m/s was found across all subjects tested. Maximal velocities for individuals were found to reach up to 38,9 m/s for the forehand stroke. For the backhand stroke, mean tennis ball velocities across all subjects were found at 28,1 m/s. Maximal velocities for individuals were found at close to 50 m/s for the backhand stroke. For a comparison, ball velocities of about 66,7 m/s for adult players with an average skill level are reported in the literature while playing the balls at 25 m/s to the subjects with a ball machine (Mavvidis et al., 2005).

Two typical examples for the amplitude of the countermovement in a forehand stroke (left side) and a double-handed backhand stroke (right side) are shown in Fig. 3, both depicted from a female local class player. While the player reveals a somewhat open stance in the forehand stroke a rather closed stance can be seen in the backhand stroke. Both images nicely illustrate how far the trunk is rotated towards the baseline.

The group mean for the maximal shoulder alignment versus baseline across all subjects was found to be 104 degrees for the forehand stroke with more experienced players showing larger trunk rotations. For a reference, Bahamonde and Knudson (2003) report values of about 100 degrees. While difference in the scatter of the data were found across all subjects, individuals themselves performed their strokes in a relatively consistent manner (mean coefficient of variation across all subjects: 5,4 percent). Moreover, a highly significant correlation coefficient was found between the maximal amplitude of the trunk rotation and the tennis ball velocity (r = 0,65). This measure was calculated for the individual means across all subjects.

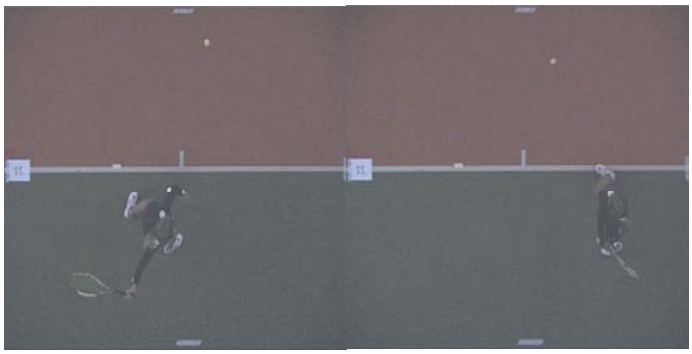

Figure 3. Backswing movements of an arbitrarily selected subject. Video frames show the approximate maximal amplitude in the trunk rotation in a forehand stroke (left) and a backhand stroke (right). Both frames are taken at about 150 ms prior to ball contact.

For the backhand stroke, the overall mean comes to approximately 121 degrees which is almost 20 degrees more than in the forehand stroke (see Fig. 3). Again, more experienced players showed larger trunk rotations. For a comparison, Elliott and co-workers reported values of 127 degrees (Elliott et al. 1989; Elliott & Christmass, 1995). As for the forehand stroke, little individual variation in the maximal trunk rotation across all subjects was observed for the backhand stroke as well (mean coefficient of variation: 5,4 percent). As for the relationship to the tennis ball velocity, a highly significant correlation with the maximal trunk angle was found (r = 0,76). In other words, 58 percent of the variance observed in the ball velocity may be attributed to the trunk rotation measure. In Fig 3., two video frames are showing the maximal amplitudes in the trunk rotation of an arbitrarily selected female subject for a forehand stroke and a backhand stroke. In Fig. 4, the angular displacements for the trunk rotation and the racket orientation are shown for the same subject performing a forehand and a backhand stroke. The traces reveal, that the player exhibits a maximal trunk rotation of about 115 degrees towards the baseline. It seems that she would remain in that position for a short time. At ball contact (see arrow), the shoulder alignment is almost in parallel to the baseline. The same is true for the racket, whereas no pause prior to the ball contact is seen. As compared to racket orientations observed in the studies by Elliott and co-workers (Elliott et al., 1989; Elliott & Christmass, 1995) with rackets almost parallel to the baseline our subject shows an even more pronounced racket position. For the backhand stroke, the maximal amplitude in the trunk rotation (about 125 degrees) and the maximal amplitude in the racket orientation (about 140 degrees) are observed approximately 150 ms prior to ball contact. At the instant of ball contact, the shoulder alignment as well as the racket midline are rotated towards the baseline by approximately 45 to 50 degrees.

Aside from the subject shown in Fig. 3 and Fig. 4, mean values for the maximal racket rotation were found at about 140 degrees for the forehand stroke and 130 degrees for the backstroke across all subjects. There was a tendency showing larger maximal racket rotations in the more experienced tennis players. The correlation between the racket orientation and the ball velocity across all subjects was found to be significant with r = 0,52 in the forehand stroke and a highly significant r = 0,66 for the backhand stroke.

In addition to bivariate correlations, multiple correlations were used to estimate the compound meaning of the trunk rotation (estimated by the shoulder alignment versus the baseline) and the racket orientation (estimated by the racket midline versus baseline) for the stroke velocity. As much as 43 percent (adjusted 35 percent with Multiple R = 0,66) of the variance in the stroke velocity was explained for the forehand technique. For the backhand stroke, a considerable 64 percent of stroke velocity (adjusted 59 percent with Multiple R = 0,80) was explained by the above predictors.

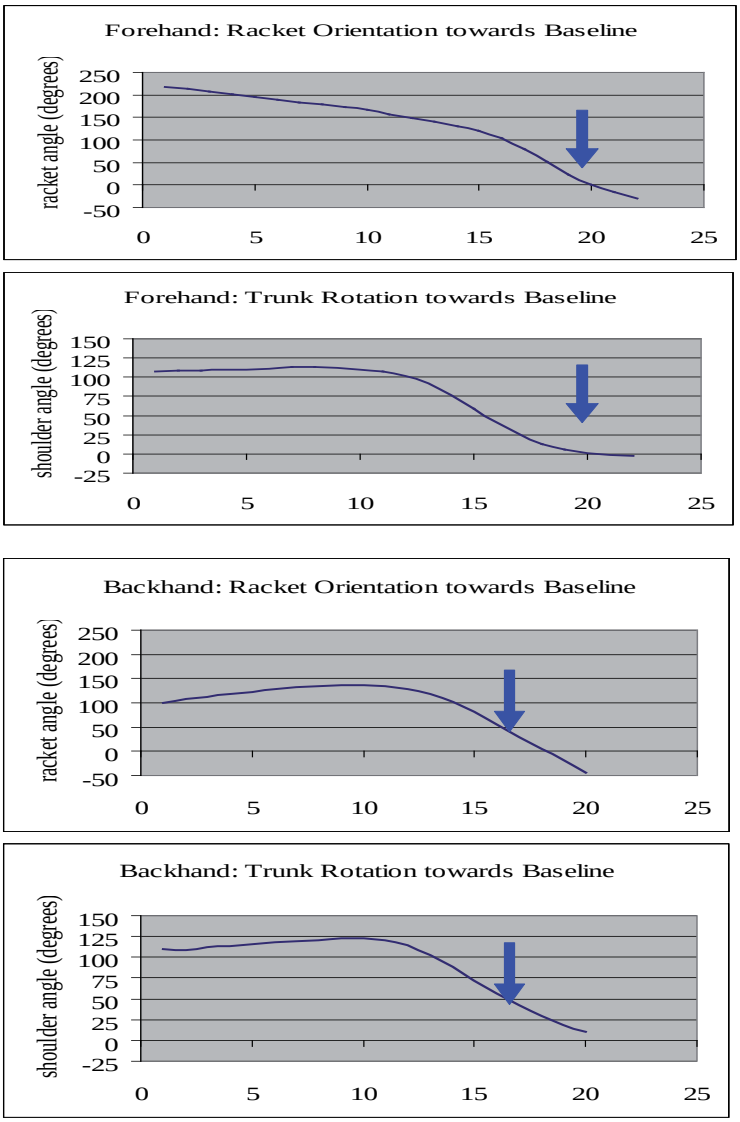

Figure 4. Angular displacements in the forehand stroke and in the backhand stroke for the trunk rotation and for the racket orientation. Arrows indicate the approximate point in time for the ball contact.

Discussion and Implications:

Our study showed that standardized testing of forehand and backhand groundstrokes maybe be easily achieved through a bird's eye perspective. Most important, our study clearly revealed the trunk rotation to be larger and far more important for the double-handed backhand stroke as compared to the forehand stroke. Although the different meaning of the trunk for the two stroke techniques was already assumed in the review by Bahamonde und Knudson (2003:69) our relationships were much larger than reported in the study by Knudson and Bahamonde (1999). However, this observation might be due to a sampling effect. As the subjects in Knudson & Bahamonde study should be considered as a homogeneous subgroup with little interindividual variation our subjects should be thought of as a rather heterogeneous sample favouring larger correlation coefficients. Nevertheless, all results on the relationship between the trunk rotation and the stroke velocity should be interpreted such that much emphasis should be paid for this movement feature for the teaching of beginners as well as for the training of advanced tennis players.

It may be surprising, that 10 to 12 year old tennis players do show a backswing movement comparable to experienced players examined in other studies. However, it has to be kept in mind that a laboratory setup with a ball machine was used rather than a real game situation. Therefore, stroke production was somewhat easier in our study as compared to a competitive setup. Moreover, while pre-teenage players do show similar maximal backswing amplitudes in the forehand and in the backhand the swing dynamics should be considered as well. In addition, incoming balls were played at a moderate speed such that participants could properly set up. Presumably, they would change their backswing pattern when faster incoming balls were to be played. Therefore, a challenging test to evaluate the backswing movement should encompass at least three different velocities and frequencies for the incoming balls. We predict that highly skilled players will be able to keep their backswing amplitudes in high-speed test situations rather than players with less tennis expertise.

While the bird's eye perspective offers new insight to the players stroking patterns, the method itself deserves some notice. For the trunk rotation, Elliott and co-workers (Elliott et al., 2002) did show substantial differences between a 3D-analysis and the bird's eye perspective for the time course of the cricket fast bowling movement. However, main differences were found for the beginning and the end of the throw only when bowlers should a somewhat slanted body posture. In contrast, at backfoot impact, associated with a rather upright body posture, a strong correlation was found between the thorax alignment and the three- (r=0,97) and the two-dimensional (r=0,87) shoulder alignment estimations. In other words, with an erect rather than a slanted body posture trunk rotation may be well estimated through a bird's eye perspective.

SUMMARY

The trunk is the largest segment of the human body with the largest moment of inertia. Therefore, it can generate tremendous amount of angular momentum about all body axes. The angular momentum about the longitudinal body axis is of particular importance for the stroke production in the tennis groundstrokes. This study showed how trunk rotation can be evaluated through a standardized test to estimate the amount of angular momentum about this principal body axis. A video analysis through the bird's eye perspective is suggested to gain useful information for practise and for a technical analysis. Moreover, this system can be used as for an online feedback to a learner. Our data showed the trunk rotation to be larger and far more important for the double-handed backhand stroke as compared to the forehand stroke.

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Breathing to Manage Anxiety in Tennis

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ITF Coaching and Sport Science Review 2009; 16 (49): 17 - 18

ABSTRACT

This article describes how although anxiety leads to muscular tension which in turn inhibits tennis performance, learning to breathe correctly can control the physiological effects of somatic over-arousal. The difference between shallow and deep breathing is explained, and clear and specific advice is given on how to breathe deeply from the stomach.

Key words: Anxiety, breathing control, breathing exercises.

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CASE STUDY

John stands just behind the baseline, waiting to receive serve. He is 5-3 down. He can almost hear his heart beating; he is still trying to catch his breath from the previous point. His shoulders feel stiff; his grip on the racquet feels painfully tight. He has lost the bounce in his feet and the idea of 'split-stepping' is far from his mind.

The serve approaches. At the last moment, flat on his feet, his attention overly narrowed due to his ever-rising anxiety, John misjudges the flight and bounce of the ball. At the last second, he sticks out an arm and manages to make a late and weak connection with the ball, which flies low into the net. Game, Set and Match to his opponent.

Anxiety and Performance

Does this scenario sound at all familiar? I am sure it will to many of you. Anxiety and stress are universal, parts of everyday life. We have all felt anxious or stressed at some point – to be anxious is to be human. Anxiety is part of our evolutionary past (Buss, 2005), as it is for all animals; necessary for survival, anxiety triggers the 'fight or flight' response. That is, in situations of potential danger – real or imagined - anxiety prepares the body to confront or 'fight' the danger or to run away and take 'flight'.

When somatic anxiety is excessive, it will inhibit performance. High levels of arousal and anxiety lead to increased muscular tension. As tennis success depends heavily on muscle co-ordination, high levels of anxiety can impede physical performance and cause a player to tighten up and become over-tense. Muscular tension, even at low levels, can interfere with co-ordination, resulting in poor performance (Aggelousis et al, 2001), for example: a poor or incomplete backswing and follow-through with a shot hit either too long and out or too short leaving our opponent an easy attacking winner.

Muscular tension can make our legs feel heavy and our feet 'stick' to the ground, resulting in slow reactions and poor or clumsy footwork, leaving us either too far away or too close to the ball when we swing.

Muscular tension can cause tightness of breath as our breathing becomes too rapid and shallow, meaning that we tire easily, especially after a long rally, after running to the net to meet a drop shot or racing to the back of the court to retrieve a lob

If the match is close and goes to a tie break or a third set, we may have expended so much unnecessary energy through nervous tension in our muscles that we tire and fall at the crunch points.

I am sure all of us have experienced at least some of these difficulties. Every player, regardless of ability and experience, will have felt tension in their shoulders and arms whilst serving, especially at important points in the match – 30-30 in a game, 4-4 in a set, when serving to close the set or at match point – leading to a serve wide, long, into the net or the dreaded double fault.

Have you noticed how double faults seem most likely to occur at crucial and deciding moments in a match? Have you observed how one double fault in a game can so often lead to two or three in succession? That is the result of muscular tension. The serve is technically the most difficult skill to learn and is often the difference between winning and losing, especially in a game between two evenly matched players. Like any skill, under pressure that which is most difficult, least mastered or most recently learnt is the first to fail.

One quick and easy way to manage our anxiety on court is to learn the skill of breathing control to reduce the impact of somatic over arousal.

Breathing Control

We breathe on average 20,000 times every day (Mosby, 2009). Although breathing is natural, something we do without thinking, awake or asleep, a great many people breathe incorrectly. In fact, when asked to take a deep breath, most people do the exact opposite and take a very shallow breath. Typically, whilst taking a deep breath, they raise their shoulders and suck in their stomachs. Essentially, this only uses the top part of the lungs.

Often, people find that they are breathing too fast, which can actually lead to a condition called hyperventilation. Hyperventilation is rapid or deep breathing, usually caused by anxiety, in which fast, shallow breathes rid the body of carbon dioxide too quickly, affecting health (Bradley, 2007).

Shallow breathing does not give the muscles and brain the amount of oxygen needed to function correctly. Shallow breathing can create muscular tension, tiredness, interfere with athletic activity and produce aches, pains and illness.

Learning to breathe deeply initiates the activity of the parasympathetic nervous system and elicits the relaxation response, reducing stress and impacting positively on general health.

Deep breathing can relieve all types of aches and pains, from headaches to backache, from stomachaches to chest pains. Deep breathing allows the blood pressure to return to a normal level; it releases the body's natural feel good hormones (endorphins).

Learning how to breathe correctly has in certain studies been linked to lowered blood pressure, reduced symptoms of depression, fewer hot flushes in menopausal women, increased fertility and even a reduction in cancerous cells.

Are you a shallow or deep breather?

There is an easy exercise to do to identify whether you are a shallow or deep breather. Place your left hand against your lower abdomen and your right hand on your chest. Breath out completely. Now take a deep breath. If the hand on your stomach moves out when you breathe in and the air seems to flow in easily to the bottom of your stomach, you are breathing deeply. If when you take a breath, the hand on your stomach moves in as your stomach pulls in, and the hand on your chest moves out as your diaphragm expands, you are breathing too shallowly.

Breathing exercises

Deep breathing is the simplest and most basic method of relaxation. Often, the first sign from our body that we are becoming stressed is when we start to breathe rapidly with shallow breaths. This can often then lead to increased palpitations.

Taking deep, slow breaths reduces the heart rate, slowing it down and therefore reducing physiological arousal. Deep breathing helps relax the muscles in the shoulder and neck. It can provide an opportunity to focus attention away from the stress of the game. Deep, slow breathing can be an immediate, accessible and powerful way of reducing physical anxiety on-court during a match (Peden, 2007). It is also very helpful to utilise this at the break between games.

One of the best things about breathing exercises is that they are quick and easy to do; they can be done at any time and in any place without drawing the attention of others to what you are doing.

1. Breathe out deeply, contracting the abdomen.
2. Breathe in slowly as you expand the abdomen.
3. Continue to breathe as you expand the chest.
4. Continue to breathe in as you raise up your shoulders towards your ears.
5. Hold the breath for a count of 3.
6. Breathe out slowly for a count of 6.
7. Relax the muscles of your shoulders and chest completely.
8. Repeat 3 or 4-times until there is a sensation of calmness.
9. At the same time, it is helpful to focus on positive self-talk.

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The Game-Based Coaching Methodology – An Investigation of Principles and Practice.

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ITF Coaching and Sport Science Review 2009; 16 (49): 19 - 20

ABSTRACT

This article outlines findings from a recent ITF-backed small-scale study of the 'Game-Based' coaching methodology. The article presents a background to the introduction and launch of the methodology, together with a discussion of critical aspects of the pedagogy. Specific recommendations are presented in terms of possible strategies for further developing the implementation of this coaching initiative.

Key words: Game-Based, Play and Stay, Coaching Methodology, Pedagogy.

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INTRODUCTION

In an effort to promote the new 'Game-Based' methodology worldwide, the ITF launched the Play and Stay campaign at their Annual General Meeting in 2007. A year later at a dedicated Play and Stay seminar in London, they reported that the project had already had a huge impact worldwide with 80+ nations signed up and actively participating, comprehensive website support developed, and substantial promotion at major events such as Grand Slam tournaments and Davis/Federation Cup. Training courses had been run in over 40 nations with 1,300 coaches trained.

Despite these successes there is evidence (albeit largely anecdotal) that the game-based methodology needs to overcome some particular hurdles. The ITF themselves for example recognised at the 2008 seminar that:

"Most coaches worldwide are not using slower balls and smaller courts in their lessons with starter players".

The question logically arises therefore as to the extent and effectiveness of the adoption of the game-based approach by coaches around the world. With a weight of evidence supporting its implementation and the development of the sport so reliant on its success, it is crucial that challenges and obstacles be identified and addressed. With this in mind, an attempt was made in recent months to gather some information on the new methodology as it exists in current practice.

In January 2009 therefore, a sample of coaches from around the world was asked to participate in an ITF backed small-scale research assignment. Their task was to complete two sets of coaching lessons with two different groups of players. Unknown to the coaches was the fact that one of the sets of lessons provided to them was designed using the 'game-based' methodology, while the other set was modeled closely on the 'traditional' methodology. With eight countries represented by the participating coaches, the results provided a snapshot of current opinion on the merits and challenges of the game-based approach.

RESULTS

The sample of players with which coaches implemented the study covered a broad range of abilities (from ITN 4 to ITN 10), with the bulk being at the higher end of the ITN scale. This provided an opportunity to primarily assess the application of the game-based approach with beginner and intermediate players.

The general outcomes to the end-questionnaire showed a strong level of support for the game-based lessons, with 11 out of 12 comparison questions eliciting 'probable' or 'definite' identification of the game-based methodology as the preferred approach from every coach. Only one question provided a degree of support for the traditional approach – "Which group showed the most improvement technically?"

In assessing the extent to which either set of lessons mirrored the usual approach of the coach, the results indicated that the game-based lessons provided a closer match than did the traditional. While coaches reported a preference for the game-based approach in their usual coaching though, there was still a high level of reported application of the traditional approach.

Of particular interest however was the fact that despite the wide variation in the standard of the players involved and the strong support for the game-based approach from participating coaches, almost every coach taking part reported using full courts, full racquets and standard balls during the study. This would certainly reflect the anecdotal concern that the game-based approach is not being entirely embraced to the extent that it might be and that further steps may need to be taken to encourage a fuller adoption of the strategy.

MOVING FORWARD

The results of this recent study when combined with data readily available, suggest that a number of key obstacles lie in the path of universal implementation of the game-based approach. If we wish to truly promote tennis as a sport worth playing, if we hope to enable our juniors to develop to the best of their ability, and if we want to improve the enjoyment players derive from learning and playing our sport, it is evident that as a tennis community we need to take positive steps towards resolving the shortcomings in our current strategy. Primarily…

(A) Increasing the use of modified equipment.

This point was clearly made at the ITF Play and Stay seminar in 2008 and so it was disappointing to note that one year later in this specific study, every single coach reported using full courts and standard balls when completing most of their lessons (despite the fact that many of the players involved were beginners). Follow-up interviews with participating coaches identified three main reasons for this:

- Lack of availability of the required equipment.

- Concern that tournaments were not using the modifications and so players might not be properly prepared if they used smaller courts and softer balls in training.

- Belief that using full equipment at a younger age provided a greater likelihood of long-term success.

While the major distributors are readily capable of providing the necessary equipment, this research over recent months has identified a specific problem experienced by beginner coaches in particular. Many of the coaches interviewed (primarily those working with beginner players) coach only on a part-time basis and so do not have any arrangement or account with an equipment supplier. In addition, since they may be working with players of other standards as well, and may be limited to a restricted budget for equipment, they inevitably purchase balls that can be used with all of their groups – i.e. standard balls.

The acceptance that constraints in finances and storage may be an important consideration for coaches (particularly the part-time coaches who may be working primarily with our starter players) requires that a different solution be considered. Targeting resources at clubs and schools (rather than at coaches) in terms of encouraging purchase of the modified equipment, might reap greater rewards for example. The main problem is not that coaches don't want to use the modified equipment – just that many of them aren't in a position to buy it, store it or transport it.

(B) Matching competitive play with practice.

Linked to the lack of use of adapted equipment mentioned above, is the clear problem of competitive tennis for starter players still taking place on full court and with standard balls. Thankfully the fantastic 'Tennis 10s' initiative is being rolled out internationally and should go a long way towards solving this problem. A standardization of competitive events for young players will ensure that the coaches working with these players will be far more inclined to prepare their charges in the appropriate manner.

Individual, high-pressure, 'knockout' style events are therefore incompatible with the Play and Stay strategy and are probably best avoided (even if the correct modified equipment is used). Since the aim of the initiative is about far more than the individual result, team based events with multiple matches and increased opportunities for success are likely to be far more effective. Creating the conditions that change competition from an intimidating, isolated and largely unsuccessful experience, into a team building and dynamic environment with healthy exposure to a variety of outcomes, represents the most appropriate standard.

(C) Clarifying 'How'.

While a fantastic array of resource information exists in relation to the game-based approach, much of this seems to focus on what the game-based approach is - i.e. the differences between it and the traditional method.

Follow-up interviews with coaches in this study however highlighted the fact that substantial doubt existed about how to implement the methodology. Coaches were all familiar with the general concept but were unsure as to how this should translate into their lesson planning. Some thought they were implementing a game-based approach when they weren't and others were implementing the correct strategy but almost entirely by accident. It would seem that a continuation of the current ITF training initiative for coaches is the logical solution to this problem, offering the opportunity for participants to clarify how best to plan programmes and lessons for their players.

(D) Perception that technique is being left behind.

The misconception that technique is not addressed while employing the game-based approach was apparent in the feedback received for this study and also in many of the informal follow-up interviews that took place. This view of the game-based approach as something to be employed when a player reaches a certain standard highlights a fundamental lack of understanding of the pedagogy. As we have seen from much of the existing literature, the starter player stands out as the ideal participant in a game-based lesson (in terms of enjoyment, experience of initial success, and likelihood of returning to play again). Unfortunately while many coaches accept the need for lessons to meet these criteria, their willingness and/or ability to implement the appropriate plan does not live up to this aspiration.

In particular, the confusion seems to stem from a belief that game-based lessons are entirely 'open' in nature and therefore that players of lesser ability, if unable to play full points, may become disheartened and frustrated. The solution to this problem again lies in the domain of coach education. Firstly, the challenge is to increase the awareness of coaches about the true nature of a game-based lesson, clearly identifying the 'hourglass' format that enables the lesson to be 'closed' at certain times for skill development, followed by an 'opening' to reintroduce the game situation.

CONCLUSION.

The natural human reluctance to change combined with a healthy skepticism towards new ideas, has left many coaches unsure of how best to proceed. And while much of the resource content offered to them has been driven by definitions, explanations and comparisons, there is a need for a different type of education. The emphasis now needs to be on why a change to the new system is so important and on how lessons can be constructed so that everything the coach wishes to teach can still be covered, but in a far more efficient learner-centered manner.

There is no doubt that the promotion of the game-based and Play & Stay philosophies is a crucial assignment effecting not only the enjoyment of players everywhere, but also the general development of the sport. The evolution of coaching from the traditional approach to these newer strategies will be a long-term and ongoing project, requiring constant attention and amendment. The willingness on the part of the governing body to identify and implement new methods for pursuing the ultimate goal will be a critical factor in determining overall success.

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Indicator of depth for the return of serve

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ITF Coaching and Sport Science Review 2008; 16 (49): 21 - 22

ABSTRACT

The analysis of the ball toss in service during competition matches of eight professional women players, with an average WTA ranking of 67,13 (s = 29,38) was meant to find perceptive indicators that facilitated the anticipation on the return of service. The findings have presented predictive values that stated that the height at which the player tosses the ball predicts the service depth. This paper discusses the relevance of this indicator for the return of service.

Key Words: Anticipation, perception, indicators, depth, return.

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INTRODUCTION

The action of anticipating the ball in high speed situations requires an elaborate response in a short time; due to the constant evolution of the sport, it is a very interesting and important issue, both in didactic books as well as in scientific articles and specialized magazines as this one (Crespo, Reid, and Quinn, 2006; Crognier and Féry, 2005; Huys, Smeeton, Hodges, Beek, and Williams, 2008).

It appears to be very concrete, but its complexity becomes evident when we observe that in order to anticipate, it is possible to start either from the physical and psychological preparation or from the technical, tactical or strategic aspects.

When discussing perception of technique at a functional level, we mean perception of movement, where some changes in the stimulus values let player adjust their response in a faster way. Roca (2006) states that these stimulus values generate other stimuli and response values. This is defined as perceptive indicator.

This pilot study carried out with eight professional players (average WTA ranking 67,13, s = 29,38), targets ball toss in service during official competition, assuming that we could provide perceptive indicators on the service to facilitate anticipation on return.

Two dimension footage and predictive statistics were used. Findings were really surprising because not only did they show that ball toss provided different information for a player during a tournament (Zawadzki, Roca, and Vallejo, 2008), they also provided significant transversal values for all the group. (Zawadzki and Roca, 2008). This paper discusses these last values.

Perceptive indicator of depth

The findings were related to the depth of the service of women players, with special attention being paid to the relationship between the instant in which the ball leaves the player´s hand and the beginning of the flight of the toss. Considering this relationship we have been able to predict 84% of the services, since the higher the ball was released, the shorter the service, and the lower, the deeper, (Figure 1), regardless of speed or type of service (first of second).

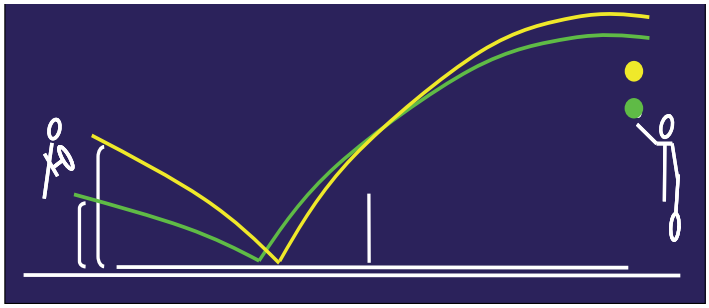

Figure 1. Perceptive indicator of depth for service return: In green, the lower the ball is released, the deeper the service will be, in yellow the reverse situation.

Besides, as Figure 1 shows, it is important for the return to notice the different heights at which the ball is hit, this will determine the depth of the serve, a fundamental concern.

The importance of the indicator of depth

Considering that the relationship we are setting explains a single aspect of the perception of the return, and that besides, this is related to other aspects that are also relevant, we will explain some basic implications on the technical and strategic actions of the return of serve.

Bollettieri (1995) recommends shortening the preparation of the return depending on the variation of the speed of service. It is therefore important to take into account the height at which the service lands, and therefore, the depth of the bounce. A poor preparation may bring abour two initial problems, presented in Figure 2.

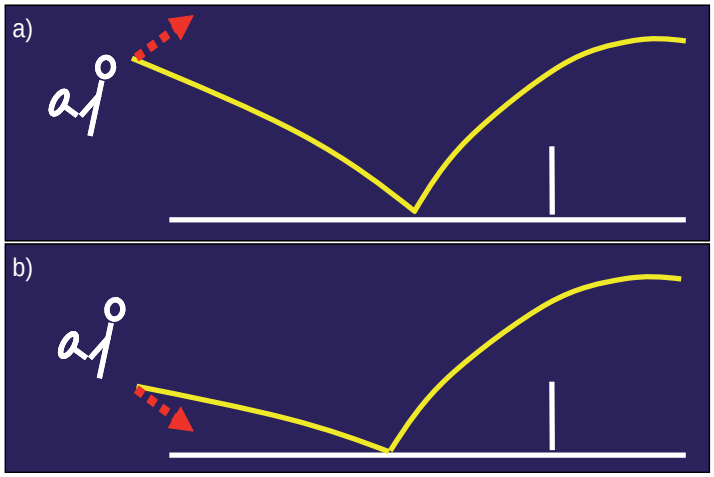

Figure 2. Basic problems in the preparation; in a) the result of a lob return, and in b) a return directed to the ground or the net.

These problems might involve directly losing the point, putting the player in an emergency. In the case of advanced players, this probably helps to explain the reason for blocked returns and the sudden changes in spin and speed in their other strokes during the match.

Coming back to the indication of depth, the ups and downs in performance is conditioned by other important factors: let us consider two different services with the impact point at the same height, but because they differ in spin and speed they bounce with different depths, causing the same problem as shown in Figure 3a.

A second variation of the bounce could happen if two different services, hit at different heights, were just as deep, as shown in Figure 3b.

The application of the indicator of depth

Evidently, what is important in return, is to know as early as possible, the angle of the flight of the service in order to begin an efficient anticipation, so for the time being we are unable to answer.

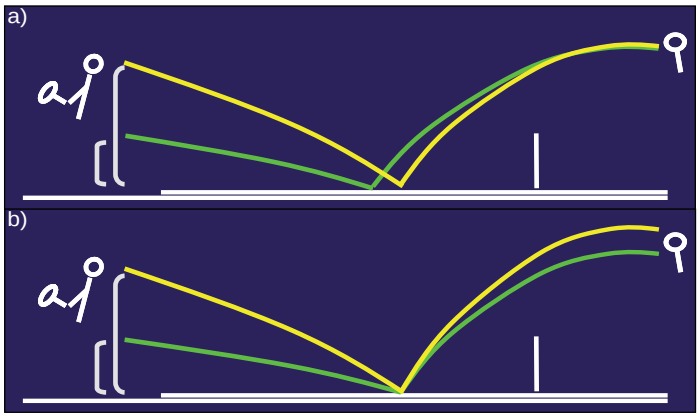

Figure 3. In a) variation of the height for return according to the depth of the bounce , and b) the same variation resulting from the variation of the impact height in service.

But when watching professionals, it is possible to define two different types of common strategies: 1) those who get into the court to return; normally fast court players, who consciously or not, reduce this opening angle as well as the height angle resulting from the bounce. This indicates that these players can benefit from the relevant perceptive indications of the opponent´s service; and 2) the players that go back to gain time to return, usually clay court players. It is obvious that, on the other hand, they have more court to cover for a successful return.

Normally, this strategy is more common in clay because it allows for a more aggressive return and adds pressure to the opponent.

But when the player chooses this second strategy on fast courts, we ask the following questions: is it because of the certainty of a better return or simply because they are not able to anticipate their opponent´s service ? Or, is it both?

The least we can say is that the findings of the research presented in this paper set a limit to some factors that impact on the return of serve and help us increase our knowledge to prepare training and competition plans to improve this stroke that is so important in modern tennis.

Acknowledgments

To the research and tuition departments of the Catalan Tennis Federation (FCT), the Real Federación Española de Tenis (RFET) and the International Tennis Federation (ITF), represented by Josep Campos, David Sanz and Miguel Crespo, for their institutional support, and the Agency for University Help (AGAUR) and the Cataluña National Institute of Physical Education (INEFC) for funding this research. (DOGC 5010-16/11/2006).

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The Keys to Muscle Weight Gain for Tennis Players

Page Love (USA)

ITF Coaching and Sport Science Review 2008; 15 (49): 23

ABSTRACT

This paper reviews the facts on muscle weight gain. It provides key measures in the calculating a player's diet and questions for coaches and players to discuss. The article also focuses specifically on nutritional facts related to carbohydrates, proteins and fats associated with increasing muscle growth.

Key Words: Nutrition, weight gain, suppliments.

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TOP TEN WEIGHT GAIN TIPS

1. Plan on at least three full meals and two snacks each day.

2. Never skip meals, and try not to go more than three hours without eating.

3. Choose high-calorie side dishes like starchy beans, peas, or couscous.

4. Double or triple the portions of carbohydrates or proteins at meals (for example, have 3 cups of pasta or rice instead of one, or have a 6-oz. can of tuna rather than a 3-oz. can).

5. Drink a minimum of three cups of milk per day. Consider a fourth portion of dairy in the form of yogurt or a milkshake made with ice milk or ice cream.

6. Consider adding a milkshake or weight gain supplement (like Ensure®, Nutrament®, Boost®, or Gatorade Recovery Shake® to a meal). Add other foods to the shake/drink, like a banana, some peanut butter, dried milk powder, or chocolate syrup.

7. Drink a cup or two of darker juices each day, like grape or cranberry juice.

8. Eat your foods first and sip beverages during meals. Finish most of the volume of beverages at the end of meals.

9. Consider adding high-calorie toppings to foods, like parmesan cheese, other grated cheeses, chocolate syrup, peanut butter, nuts, and dried milk powder.

10. Do not use diet foods; instead, maximize your calorie intake by using regular butter, salad dressings, cream cheese, sour cream, and so on.

KEY WEIGHT GAIN FOODS

Carbohydrates

Grains: granola bars and energy bars, biscuits, cornbread, donuts, muffins, croissants, scones, cookies, cake, most bakery items made from traditional recipes

Fruits: canned fruit in syrup, fruit juices (100% fruit, darker coloring like grape and cranberry), bananas, raisins, most dried fruits

Vegetables: tomato or carrot juices, avocado, olives, potatoes (especially sweet potatoes), peas, corn, squash (winter), starchy beans, creamy vegetable soups

Proteins

Dairy: whole milk, cottage cheese, yogurt with fruit, ice cream, milkshakes, cheeses, sour cream, cream-based soups, puddings, custards, most whole dairy products

Meats: dark chicken meat, canned tuna or salmon in oil, steak, ribs, regular hot dogs, salami, bologna, pepperoni, nuts, omelets, eggs

Fats

Creamy dressings, real butter, peanut butter, cream cheese, nuts, avocado, olives, sauces, real cream.

The tennis socio economic activity in France

Emmanuel Bayle and Lionel Maltese

ITF Coaching and Sport Science Review 2008; 16 (49): 24 - 25

ABSTRACT

With almost 5000 positions equaling full time employment in the French Tennis Federation, (FFT), and its network (mostly technicians, 3300 are involved in training and entertainment), and with 26000 voluntary directors working for a time that represents the « equivalent of full time workers » of approximately 6000 positions, apart from the thousand tennis related positions, tennis is a game that has also become an industry… and an industry of no minor importance considering also the benefits for education, health and social relations involved. In general, and since the '90s, leisure and sport event economic development have been subject to a strong economic growth in France and in the world, while the practice and purchasing of tennis equipment have been considered, during these last fifteen years, as an economic activity that has reached its mature stage, and, for some, it is beginning to decline. However, in France, tennis is still the second sport as regards practice with a federation license and media exposure, and it is the first tennis equipment market in Europe. So the question is whether this sport still has a real socioeconomic development potential. If so, what actions can be projected? In economics, the word sector is used to understand and explain the structure and work of a sector of activities, in our case, a sport: tennis, and to understand its weight and its influence.

Key Words: Economic activity, impact, innovations, prospective, strategies.

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INTRODUCTION

While there are more and more statistic papers related to the sport (please read the data provided by the statistic mission of the State Sport Secretary), there is very little research or study to analyze the socioeconomic impact of a sport; however, it is possible to read some golf related outlines (2007), and horse riding (2006). Both, economists and specialists on sport statistics center their analysis mostly on practice, employment, sport tourism and events, and even on the impact of these different dimensions. (Barget 2002, 2006).

One of the great peculiarities of the sport as a market has to do with its intrinsic capacity to exist in the multiple and diverse sectors of the activity. This is the reason why the economic aspect can be really broad and have a huge impact on the creation of economic value and social benefits. Economists as well as national and international statistics usually differentiate:

• the essential aspect of the activity which includes practice and events;

• all tennis related activities, court construction, builders, manufacturers and distributors of tennis equipment, then, the media, the sponsors, and marketing agencies, emerging sectors such as sports gambling and videogames, to name just a few.

The diversity, the quantity and the importance of the different subsectors are important for tennis socioeconomic potential, as well as for its related activities and its appeal.

THE THREE BIG TYPES OF SUPPLIES

Tennis global supply and demand can be analyzed considering the following "production" lines: the products, the services and the sport events (consumption experiences).

There exist tennis related products in the textile and shoe industry, the indispensable equipment (racquets, balls, strings, bags…). Sales in this market follow the fashion trends1, and amount to 300 million euros a year (Journal du net Economie 2007). There are other associated products like drinks and energizing and nutrition products or treatment and health products. (…). This is a highly diversified sector, as far as suppliers is concerned, with different leaders according to the type of product. In other words, unlike other sports, there is no strong global concentration of supplies but an atomization of each product type. As to distribution, in tennis, there are some peculiarities with the presence of the great general distributors of sport products together with the specialized distributors of licenses and clubs. This can perhaps be considered as the first strong symptom of potential in terms of proximity.

Unlike the event market, product and practice markets have been stagnant for about fifteen years in spite of the technologic innovations and marketing contributions from the companies. (Sport première, 2007).

The services can enter the market as « Business to Consumer » (« B to C ») and « Business to Business » from the company to the company customers (« B to B »). As to personal services, the clubs of the federations are in the first place, followed at a distance in volume of activity and employment by the specialized recreational centers (Forest-Hills…) and the renowned excellent centers devoted to specific expertise for the highest levels. (Team Lagardère, whose business volume amounts to 9 million euros for 27 employees, the Mouratoglou center…). The FFT club, a leading service provider, offers multiple possibilities to its consumers, with an almost unique range of sport services from mini-tennis to junior club competition and tennis for adults, internal and external tournaments, individual and team tournaments for all levels and ages with different kinds of entertainment, restaurant services and multisport courses during the school holidays.

As to "B to B", services can be characterized by tennis sponsorship market either at a local (club and local competitions), regional (professional events) or national and international level (Roland Garros and BNPP Masters in particular). The supply is quite diverse in this case, and it can be personalized depending on the communication needs of the company and the communities: classic sponsorship (visibility), activation – participation of the sponsors on the development or organization of the events (interactivity), public relations ("B to B" relational proximity), ticket office ("B to C" relational proximity).

The experiences include sport event consumption; when considering the population in France, it is comparatively, the most productive country in the world as far as organization of ATP, WTA and ITF events. Sport experience consumption happens in stadiums (indoors and outdoors. France is a bit outdated as regards facilities, so its main actors (FFT and Canal Plus Events) are currently working on the revamping of Roland Garros stadium and on a new project for a new stadium in Lyon. The evolution and the development of sport events are marked by the support of the media as well as the information and communication technologies which have helped the classic television rights and new actors and markets to develop specifically for tennis as a sport. The new video umpiring system, ("Hawk Eye"), the direct scoring and statistics go straight from the umpire´s palm to be distributed through the different media (internet, TV, commentators, press…), on site shows are retransmitted by the internal and external media of the event (wide screen, closed circuit television), internet in particular (official sites , sport and tennis portals, federation sites) event sites, internet

television). It is this way that a whole range of new experiences crop up together with a new commercial axis to add to the communication products that the event organizers offer.

In this experience centered axis, it is possible to introduce at least two complementary dimensions which match the sport event with other types of entertainment in the stadiums, thus strengthening and enlarging consumption with a logic similar to that of the American leagues (NBA, NFL, MLB y NHL).

Análisis of the characteristics of the activity

The socioeconomic specificity is related to the importance of the FFT at the core of this activity. Its strategic positioning has contributed to capturing an important part of the recreational and event related activities mainly in relation to Roland Garros (RG) and to a lesser extent, to the BNPP Masters. It is due to the 112 million euros generated (with a 40% margin), that RG granted the FFT a business volume of 152 million euros in 2007, -an amount that has slowly been increasing in the last thirty years- and 36 leagues (21 million euros allocated in 2007).

The "Chatrier model" (Bayle, 2005) of the years 1970-1980 encouraged this success which stands on three pillars:

• RG, a promotion and funding tool for federated tennis;

• a top level training activity that is almost unique in the world for its performance,

• a professionalism of the federation network with which the FFT efficiently helps its clubs through its leagues.

The model has been adjusted in these last fifteen years with a fourth key element that was developed in relation to new learning methodologies (mini-tennis and tennis evolving pedagogies, adult tennis programs) improving the conditions of reception and activity at the clubs (courts, club house). In spite of the real success of mini-tennis programmes in particular, there seems to be a recreational activity potential to be exploited at the clubs, which are still very concerned (too?) with the competitive aspect but lack professionalism in development and services on the different tennis related aspects: education, insertion, disabilities, tourism, sport in the companies.

The current evolution of tennis market shows the presence of a new operator with the generic strategy of the Lagardère group, which develops a "sports" polo (3rd world operator in sport marketing). This group seems to be a new competitor in top performance level for the FFT (with the Lagardère Team) and event related activities (with the Canal Plus Event strategy). This competition, with a concentration of tennis related event market, generates a new challenge for the FFT and the tennis elites.

"A sport for all": where does its appeal stem from?

Thus, tennis is a very diverse sport which can be exploited at different levels, from practice to product consumption, services and sport experiences. The historic tennis association between the FFT and BNP Paribas provides an excellent example since the BNP Paribas´ decision to make a strong investment to support tennis (some 30 million euros per year) can be explained in different ways: its mixed character (first mixed sport in practice with a license), the power of diversity, the international dimension and, above all, the proximity which can be developed with customer related strategies from the global (Roland Garros, Davis Cup, Fed Cup, great ATP tournaments) to the local level (clubs and licenses and local events).

The socioeconomic activity of French tennis is highly attractive from the point of view of market diversity and the development potential at all levels for the actors in the sport. Finally, the virtuous circle of the activity develops around six main pillars: "Leisure-Fashion-Fun-Association-Professionalism-Service", which can generate a new tennis dynamics through charismatic celebrities and emblematic results such as Grand Slam, Davis Cup and Fed Cup titles.

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New ITF Publication - TECHNIQUE DEVELOPMENT IN TENNIS STROKE PRODUCTION

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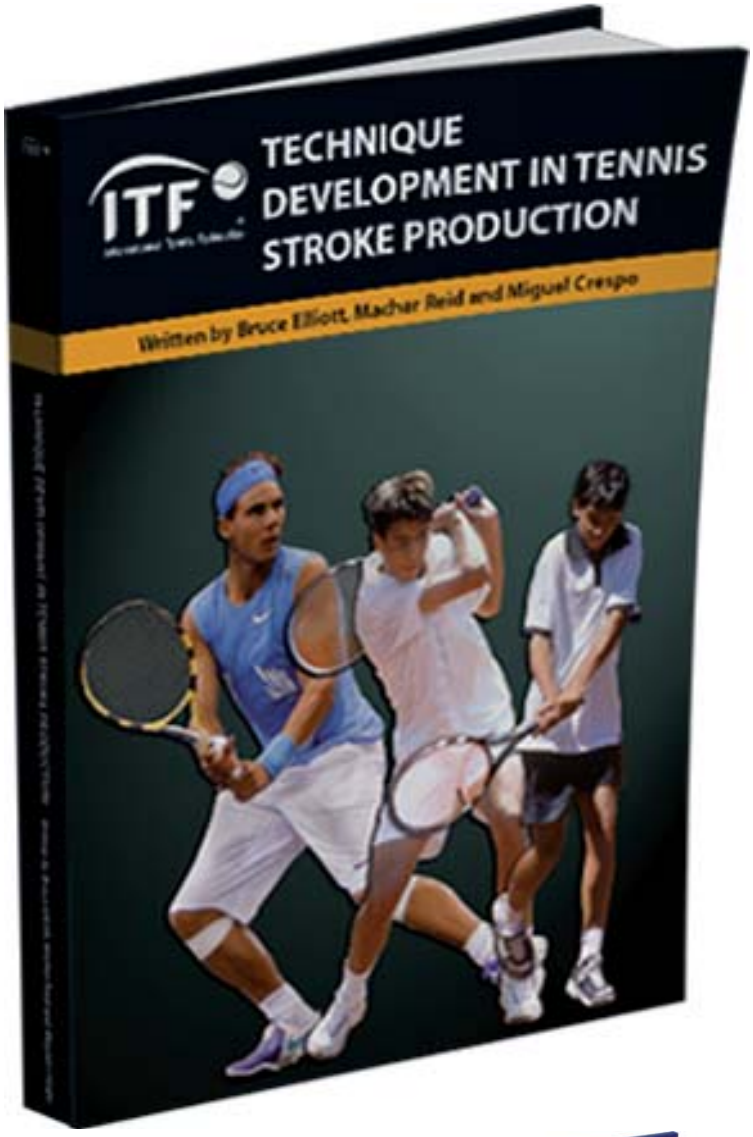

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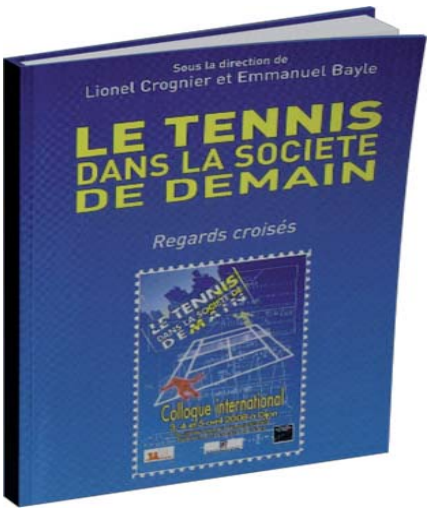

Tennis in tomorrow's society ("Le tennis dans la societe de demain) Editors: Lionel Croigner and Emmanuel Bayle **Year**: 2008 **Language:** French **Pages**: 482 **Level**: All levels

"Tennis in tomorrow's society" is the proceedings book of the Intenational Colloquium organised by the Faculty of Sport Sciences – UFR STAPS and the French Tennis Federation from the 3rd until the 5th of April 2008 in Dijon (France). The book has different sections on promotion and development with 15 articles on economy, sponsorship, marketing, and events; education and learning with 12 articles on player development, coaching and development programmes, and teaching methodology; training and performance with 21 articles on performance evaluation, training and muscular fatigue, perception and movement control, and social and psychological factors. The goal of the book is to contribute to and update of the knowledge of the world of tennis. Each author provides a particular view of the topic covered creating an excellent resource for all those interested in the future of the game. **For more information visit:** http://www.priceminister.com/offer/buy/89922134/crognier-lionel-le-tennis-dans-la-societe-de-demain-regards-croises-livre.html

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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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Website: www.itftennis.com/coaching
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