



Issue 85

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Editorial

Luca Santilli & Miguel Crespo 

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Welcome to issue 85 of the ITF Coaching and Sport Science Review. Tennis activities all over the world are still being affected by the COVID-19 pandemic. In these challenging times, our thoughts are with everyone who has been directly affected by the pandemic. This is a special issue on 10 & Under tennis with an emphasis on early stages (4–6-year-old players), which includes contributions from all over the world.

The ITF Education pillar part of the 2021- 2024 ITF Development strategy is currently delivered through three main educational resources: the ITF Academy, the ITF eBooks, and the ITF Coaching and Sport Science Review. Through its education pillar the ITF is setting and raising professional standards for tennis education as a truly global sport.

The ITF Academy is the online educational platform from the ITF, and it was officially launched in March 2019. It is an essential tool for continued professional development that the ITF puts at the service of its member nations to elevate the quality of tennis education worldwide. The ITF Academy is directed towards coaches, players, parents, and all interested in increasing their tennis knowledge. The ITF Academy is an integral element of the “blended learning” methodology already implemented in all ITF certification courses, with the combination of online courses and face-to-face delivery of courses providing an improved experience.

Today the ITF Academy has over 210,000 users from 221 nations. During COVID-19 registration numbers increased significantly because users had more time to engage with the ITF Academy. Specifically new to the ITF Academy this year are the players and parents’ sections, the on-line tutor training courses, the blended delivery of all the courses, as well as the organisation of the ITF World Coaches Conference by BNP Paribas. Next year we will be launching a new section of the ITF Academy dedicated to tennis managers, as well as a self-evaluation tool for users. The ITF Regional Coaches Conferences will also be delivered through the ITF Academy. Currently there are more than 1300 content items and 165 online courses available in 8 languages. We have already delivered more than 160 blended education programmes in more than 30 countries. 46% of users are female and English is the most used language. Europe is the region which has more users, and the mobile is the device preferred by close to 55% of the users.

In addition to the courses and resources available on ITF Academy, the ITF eBooks app offers more than 150 publications in 13 languages. Many of these publications, such as the ITF Advanced Coaches Manual, are available for free in your mobile and tablet for both Android and IOS devices.



The ITF Coaching and Sport Science Review is the official coaching and sport science publication of the ITF. Since the first edition in 1993, around 800 articles have been published covering a range of topics such as biomechanics, tactics, psychology, physiology, strength and conditioning, business, and more. Articles contain the most up-to-date scientific knowledge, written by experts in the field. The journal, which is published quarterly, is also available in the ITF Academy.

The goal of the ITF’s Recognition of Coach Education Systems is to assist member nations in becoming self-sufficient in delivering their coach education, by achieving several criteria for quality standards set by the ITF Coaches Commission. Today, there are a total of 57 nations which have their coach education system recognised by the ITF. 16 at gold level, 9 at silver, 22 at bronze and 11 at white.

The ITF assists all member nations, those who are recognised receive assistance to keep their status and maintain their self-sufficiency. In the case of nations that do not have their coach education recognised yet, the ITF assists them in the implementation of the programme by sending tutors, training local tutors, providing resources, and delivering the courses at all levels with the goal of being gradually self-sufficient. This positive trend shows clear evidence on how ITF is helping nations to develop and be self-sufficient in coach education.

The ITF Education resources are research and evidence-based and are at the service of the tennis community. It's our mission to assist all those interested in tennis in producing more and better players, therefore we encourage you to share and communicate our resources with those you interact with.

The ITF World Coaches Conference by BNP Paribas enjoyed its most successful staging yet on 5-7 November, with over 1750 participants from 151 nations taking part in the first virtual edition of the event, which saw a 32% attendance of female coaches. The biennial conference, which has been held on 22 occasions since its inaugural staging in Florida in 1982, regularly attracts over 600 participants from across the globe. As a virtual event, the showpiece of the ITF's Education Programme was able to reach a far broader audience.

A high-profile and expert cast of speakers added the stardust to the 2021 edition, with the likes of Martina Hingis, Feliciano Lopez and Judy Murray all delivering presentations alongside other industry leaders in tennis coaching, coach education, player development, sport science and participation. Hingis, Lopez and Murray were just three of the 64 speakers across the three-day conference, providing a host of insightful contributions across a broad range of topics

The ITF continues to support 142 active National Associations that are involved in the ITF Junior Tennis Initiative (JTI). Brunei Darussalam, Ethiopia and Somalia have become active JTI nations during 2021, with Somalia joining for the first time. The ITF Development Officers continue to meet regularly with their National JTI Coordinators, organising virtual conference calls each quarter throughout the year. All National Coordinators were invited to virtually attend the ITF Participation Webinar, the 3rd ITF World Participation Conference and the 22nd ITF World Coaches Conference in order to ensure that they are up to date on ITF activities in participation and education, as well as importantly use these opportunities for their continuous professional development.

In November, the 2nd National JTI Coordinator Global Workshop was held virtually, across two sessions with 163 attendees from 106 nations in attendance. All National Coordinators must now complete the 'Understanding the JTI' and 'Safeguarding in Tennis' courses on the ITF Academy prior to any subsidy being processed by the ITF to their National Associations.

The ITF has created an online digital Toolkit for National Associations to generate pre-defined print and digital promotional assets. These assets can be used to promote JTI activities and Tennis Festivals, with some nations using the Toolkit to creating assets for promoting education courses. All active JTI nations have access to the ITF Toolkit and their specific national JTI logo, with all users required to be nominated by their National Association through an online nomination form.



The ITF Development Officers continue to monitor the level of activity across the JTI, both at the grassroots level and within junior performance tennis. National recreational tennis activity is being tracked regularly to monitor the various restrictions imposed by governments due to the pandemic. The delivery of tennis activity (including competition) within Primary Schools continues to be affected in many countries.

The JTI reporting is critical to monitoring and measuring the impact and the return on investment. A purpose-built online web-application is being tested, with further developments being integrated to ensure that all active JTI nations are able to use the platform for the 2022 JTI reporting process. The platform will become a hub for all JTI nations to supply their programme insight direct from their coaches and schoolteachers and will become an important development assessment tool for the ITF Development Officers when meeting with the nations.

As for the ITF World Tennis Number (WTN), in 2021 the focus has been on sharing good quality data with 60 priority nations, while allowing any other nation to fast track their data integration. The aim is to enable us to reach a critical mass of player data ready for our first ITF WTT Juniors pilots. The player data & match results data for 43 nations is currently being validated, loaded, and initialised.

At the same time work continues to support ITF nations in successfully activating the ITF World Tennis Number using an extensive promotional and branding toolkit of launch resources. As each nation launches, the project team are developing a customised plan that can be applied to different profiles of nations to encourage successful adoption by tennis players and providers. Additionally, Regional Launch plans have been implemented in the Pacific, Central America and South America with nations working closely with ITF and Regional Associations for a smooth and effective implementation. The development of an automatic translation mechanism for different languages and alphabets has been implemented in our first nations with good results. ITF are also using advanced processes to ensure a player provided by many nations has one unique account with combining all of their match records.

Project milestones include the following: 135 Nations have signed to participate in the project, representing 86% of global players. 10 Nations are Live or Testing ITF World Tennis Numbers. 43 Nations have shared their national player and match data, a total of 1.8 million Player Records and 15 million match records have been validated and loaded. ITF Academy offers three educational courses on ITF WTN including on how the Numbers are calculated by the ITF algorithm. ITF World Tennis Numbers are public in Great Britain, Ireland and Singapore. 4300 ITF Junior Player Profiles have ITF World Tennis Numbers on itftennis.com. ITF World Tennis Number is used as a supportive entry criterion to 2021 ITF World Junior Tennis Finals (14U) and JDC & BJKC Junior (16U) Finals as well as a supportive entry criterion to 2021 ITF Seniors World Championships

In 2022 National Associations will be able to offer exclusive ITF World Tennis Number website sign ups directly to their player customers. Registrations will be open and WTN applications can be made straight to the website for all National Associations that wish to benefit from this service. ITF WTNS will be used at ITF World Tennis Tour Juniors Events in Q2 2022. Subject to approval by ATP and WTA, it is planned that the WTN will then be used as a method of acceptance in World Tennis Tour professional tournaments.

The ITF Digitalisation Grant Programme is designed to help our member Nations introduce digital resources. These resources will enable Nations to find more cost effective and efficient ways to manage their operations and provide more people with the opportunity to play tennis. Eligible nations may apply for funding to support predefined IT projects that are outlined in the programme's guidelines. The programme opens for applications on a yearly basis and priority is given to projects that assist National Association integration with the ITF World Tennis Number. Since the programme launched in 2018 the ITF has awarded \$395,000 to 47 nations including \$108,000 for the 16 successful nations in 2021.

We would like to encourage new submissions to the ITF CSSR. Full guidelines for acceptance and publication of articles can be found in the most recent issue page on the ITF Academy. Finally, we would like to thank all the authors for their contributions, as well as all of those who sent in proposals. We hope that you enjoy reading the 85th edition of the ITF Coaching and Sport Science Review.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Skill transfer through multi-sport play: A tennis and hockey example

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ABSTRACT

The concept of “skill transfer” is introduced with the sports of ice hockey and tennis as examples. Skill transfer is addressed with a backdrop and understanding that it is based on existing concepts that have been researched significantly over the past few decades. They include Physical Literacy, Early Sport Specialization and Long-Term Athlete Development. Specific commonalities and skill benefits are highlighted. This purpose of this inclusive approach is to provide coaches with a catalyst to better understanding of the benefits of skill transfer in light of learning physical activities through two sport examples on multiple surfaces.

Key words: skill transfer, multi-sport play, commonalities.

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INTRODUCTION

Over the past few decades much has been written about the construct of Physical Literacy (Aspen Institute, 2015; Durden-Myers and Whitehead, 2018; IPLA, 2014; Roetert et al 2017). Understanding this construct is important because people who are physically literate have the competence, confidence and motivation to enjoy a variety of sports and physical activities. As a result, they are more likely to stay active throughout their lifetime (Roetert, et al. 2017). The definition of Physical Literacy, as determined by the International Physical Literacy Association is as follows: “Physical literacy is the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life” (IPLA, 2014). In other words, physical literacy should be considered a journey, not a destination, which means you can spend your whole life developing it. This is an important principle to keep in mind for both coaches and sport scientists. Fortunately, several different countries, sectors of society and sports organizations have started endorsing this concept (Aspen Institute, 2015).

In addition, the topic of Early Sport Specialization has also received deserved attention (Jayanthi et al, 2013; LaPrade et al 2016). Although youth sport participation offers many benefits, an overemphasis on competitive success, often driven by an additional misguided over-emphasis on goals of elite-level travel team selection, collegiate scholarships, Olympic and National team membership and even professional contracts, has seemingly become widespread. This has resulted in an increased pressure to begin high-intensity training at young ages. Such an excessive focus on early intensive training as well as competition results at young ages, rather than skill development, can lead to overuse injury and burnout (DiFiori et al 2014). As it relates to junior tennis tournament scheduling as well as maximizing future performance and minimizing injuries, late specialization and intensive training may be the most optimum path towards



Figure 1. Learning Balance and Coordination Skills.

healthy elite level success. This does not necessarily mean that the volume of training should be increased. Specific weekly amounts of training, annual amounts of competition, and match volumes within tournaments, as well as physical and biomechanical evaluations should be included in making decisions regarding junior competitive tennis players’ development. This responsibility belongs to coaches, as they are often the most influential group that determines the amount of necessary training and competition (Jayanthi et al, 2013).

A third topic that has also come to the forefront in the last few decades is Long Term Athlete Development – LTAD (Balyi et al, 2018) and its U.S. focused derivative, the American Development Model (ADM, 2021). LTAD is based on the premise that kids and adults will become active, stay active, and some even reach the greatest heights of sport achievement if they do the right things at the right times.

In other words, what can be accomplished at each stage of human development to give every child the best chance of engaging in lifelong, health-enhancing physical activity? For those athletes with drive and talent, there is a seven-stage framework which guides the participation, training, competition and recovery pathways in sport and physical activity (Balyi et al, 2018; Higgs et al, 2019). Recent research shared by Till et al (2021) provides coaches with a framework on what can be planned and delivered within a coaching session, across multiple ages and stages of development and in multiple contexts. In the early LTAD work, sports were categorized into two groups: early and late specialization. This created a lively debate in tennis regarding the timing of specialization. As work was done across more than 60 sports, Higgs et al (2019) identified further categorization occurred to guide the creation of athlete development frameworks. Specifically, a group of sports including tennis and ice hockey were categorized as 'early initiation-late specialization' highlighting their high level of technical and tactical skill combined with long-term development of physical capability.

These three above-named concepts are inter-related and a thorough understanding of each can play a vital role in an athlete's success at all levels of development. With that in mind, we hereby introduce an area that thus far has received less attention in the literature which is the idea of sport related "skill transfer". Skill transfer, similar to the more often referenced and related topic of talent transfer, currently lacks an evidence-based direction and approach in the scientific literature. We believe that further research into the understanding of skill transfer is needed in order to develop an evidence base for this concept. It is important to understand that the three topics of LTAD, Early Sport Specialization and Physical Literacy form an important backdrop to the concept of Skill Transfer from one sport to another (Collin et al, 2014; MacNamara & Collins, 2015). In that context, this article provides a brief example of skill transfer between two seemingly unrelated sports, tennis and ice hockey. The article is written from the perspective that the sport of hockey may provide an excellent preparation for tennis success for a variety of reasons hereby outlined. Although the athletes highlighted achieved their great accomplishment status a number of decades ago, the concepts outlined in this article still hold and many young athletes continue to benefit from the cross-over experience.

AN ELITE SPORT EXAMPLE OF SKILL TRANSFER FROM HOCKEY TO TENNIS

Although tennis and ice hockey appear as very disparate sports, quite a few players' names can be brought up as it relates to playing both ice hockey and tennis in their formative years. As an example, many of the male Swedish tennis players are known for growing up playing both sports. Joakim Nystrom, who grew up in Skelleftea, a town in the Northeastern part of Sweden was an accomplished junior hockey player, yet gave up playing the sport at a higher level once tennis became a better way to pay the bills and see the world. Bjorn Borg, who grew up just outside of Stockholm and a winner of 11 Grand Slam singles titles, also was an outstanding junior ice hockey player. Although growing up in different parts of the country, both played ice hockey from a very young age, similar to a number of other Swedish tennis players who became successful professionals.

Even more amazing is the skill transfer at the highest levels of competition in hockey and tennis, featuring Jaroslav

Drobny and Ion Tiriac. Drobny was a star center in the Czechoslovakian ice hockey league, leading the Czech National Ice Hockey Team to a Gold Medal at the 1947 World Championships and a Silver Medal in the 1948 Olympic Games played at St. Moritz, Switzerland. Drobny showcased his talents by scoring nine goals in eight games during the Olympics (ITHOF, 2021). In addition to his hockey skills, as a singles tennis player, he won the French Championships (now called the French Open Championships) in 1951 and 1952 as well as Wimbledon in 1954. Overall, he reached 13 major finals in Grand Slam events including singles, doubles, and mixed doubles. Tiriac, was an excellent ice hockey defenseman representing his native Romania at the 1964 Winter Olympics which were held in Innsbruck, Austria. Shortly after that, he switched to tennis, reaching the Davis Cup finals several times in the late 1960s and early 1970s. He also captured a Grand Slam tournament title by winning the doubles event at the French Open in 1970 with his partner Ilie Nastase.

COMMONALITIES

Physical: Both hockey and tennis involve the concepts of balance and control while tracking the puck or ball and moving towards an anticipated target in space where the puck/ball is predicted to be. This type of movement involves additional physical skills such as agility, strength, timing and coordination. Being aware of all these factors is all the more complicated because one or more opponents and teammates (i.e. doubles in tennis) are also moving. Therefore, spatial awareness becomes a key component of moving in space (Roetert et al, 2017). Stopping, starting and receiving skills are shared elements that cannot be overlooked by players in both sports. Finally, although tennis is often played on hardcourt surfaces, clay court- and grass court surfaces can also be found and allow for sliding movements not dissimilar to skating on ice especially when the skate is sliding sideways to stop or to allow for a change of direction. In fact, many similar muscle groups are employed in all of the above-named skills. These are reasons that make hockey as a team sport, and tennis as an individual sport good partner sports.

Affective: Based on learning how to develop the necessary skills to explore speed, balance, decision-making and body control with opponents and partners, players will build the belief in their ability to perform a particular activity or skill. This is called self-efficacy. When players develop self confidence in one sport and approach an activity that has similar skill requirements, it heightens their self-efficacy which increases the motivation to excel. The very nature of being off-balance, hitting the ball from different areas of the court and often changing directions puts players in a position where they learn about managing control over their balance and thereby self-confidence. Skating and shot-selection skills can help provide this sense of balance as well as decision-making process. Having developed a competent degree of physical literacy, properly mastering movement patterns and confidence on ice, tennis becomes a sport that can be equally meaningful and motivating. As importantly, the early exposure of a team sport, such as hockey, can provide a great platform from a social perspective, prior to, or throughout the learning stages of tennis development (Balyi et al, 2018).

Cognitive: Social emotional skills that influence one's behavior in tennis, an individual sport and hockey, a team sport, can vary greatly. Thus, athletes are better able to gain broader perspectives and hone their skills at managing

emotion, showing empathy, and setting and achieving goals. As Stanec (2021) advised “encouraging youth to participate in two sports with different cultures and traditions, can help them broaden their worldview which leads to many social and emotional benefits, including relationship skills and social awareness”. For example, dealing with adversity and problem-solving can lead to a stronger ability to cope with the inherent stresses of both sports. This in turn can foster greater self-reliance which can allow players to become better leaders and mentors in a variety of sports settings.

Table 1
Key Commonalities and Transferable Skills between Tennis and Ice Hockey.

Analytical Reasoning:	The ability to take in information to recognize patterns of play, in both sports. This is done in dynamic environments often switching rapidly between offensive and defensive situations. These cognitive developments serve athletes well in both sports.
Anticipation:	Learning where the puck/ball is going to be based on the position, skills and typical patterns of play of the opponent.
Balance:	Emphasizing balance and control of movements while sliding (clay and grass court tennis) or running at different speeds when athletes are first introduced to these environments is key.
Decision Making:	Hockey is a game of high speed decision making based on anticipating patterns and speed of movement to propel a puck to a specific place where the teammate can get to it. Tennis requires high speed decision making to propel the ball where the opponent cannot get to it. Same skill-different purpose!
Footwork:	Controlling footwork, edging of the skate, cross-over of feet and rapidly changing direction, are critically important in hockey and directly transferable to developing tennis players.
Foundational Movement Skills:	Applying foundational movement skills in new situations will help in addressing decision-making in game/match situations.
Psycho-behavioral:	These learned skills and behaviors include: Commitment and determination, Self-confidence, Coping skills, Focus and discipline, Goal setting, Motivation, Realistic performance evaluation.
Speed and Agility:	Stopping, starting and changing direction all happen on a regular basis in both sports. These multi-directional skills form the basis for learning how to control your center of gravity in balanced as well as unbalanced positions.

RECOMMENDATIONS FOR TENNIS COACHES

- Tennis facilities may want to look towards hockey programs to find athletes that have developed the physical and cognitive skills which can form the foundation for tennis technical skills to be built upon.
- Tennis programs can make a connection with ice hockey programs to work together for off-ice training to advance hockey skill development.



Figure 2. Building Relationship Skills.

- Although this article focused specifically on the relationship between ice hockey and tennis, other forms of hockey could (and should) also be considered. These include, field hockey, street hockey and roller hockey.
- Children participating in both sports benefit from a wider range of fun and diversity in their development as athletes. Instead of extra training in one sport which risks burn-out and chronic injury, tennis and hockey can be developed through the other sport thus finding the sweet spot of fun and sport development (Aspen Institute, 2015; Jayanthi et al 2015; Jayanthi et al, 2018).

CONCLUSIONS

Although played on different surfaces, the sports of ice hockey and tennis have a lot more in common than many people would expect. Certainly, the case can be made that other individual and team sports share commonalities and transferable skills that might set players up for success, however tennis and hockey are both tremendously dynamic sports combining repeated multi-hour physical exertion and the skill of hitting a ball/puck with controlled force using an implement. In addition, opponents are battling fatigue to outwit each other in a game of strategy. These elements should be considered as benefits. Foundationally, there is a need for tennis players to develop and continuously improve their physical literacy in developing the competence, confidence, desire and motivation to enjoy sport.

The four highlighted players in this article all started early with hockey as their early team sport and ended up focusing on tennis as their individual sport (ITHOF, 2021). We recommend future research to investigate if this is a best practice model. Very important is the time of specialization to ensure early intensity does not rob athletes of long-term success. Therefore, in the development framework ‘early initiation-late specialization’ encourages athletes to develop skill through multiple sport activities prior to specializing in one sport. Thus it is important to understand the connection between ice hockey and tennis where the list of commonly shared concepts and skills transfer very well from one sport to another.

CONFLICT OF INTEREST AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Self-talk optimizes the positive effects of mental imagery in service learning for beginners

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ABSTRACT

The aim of this exploratory study was to test the effects of a combination of mental imagery (imagining oneself serving) and cognitive self-talk (instructions for serving) on the percentage of success and the technical quality of the serve of young beginner tennis players during a one-week training course, with the aim of providing practical recommendations to coaches. The results show an additional improvement in service performance when mental imagery is combined with self-talk.

Key words: service, mental imagery, self-talk, beginner.

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INTRODUCTION

Mental training techniques are frequently used by mental trainers, coaches, and players as strategies to improve learning and performance (Hall & Fishburne, 2010). Among these techniques Motor Imagery (MI), which can be defined as a conscious process of mentally simulating a technical gesture (e.g., a forehand) or a sequence of actions such as doing a serve-volley (Robin et al., 2007), is one of the most frequently used strategies in racket sports (Cece et al., 2020) because it can improve the performance of both experienced (e.g., Dominique et al., in press; Guillot et al., 2013) and novice (e.g., Mamassis et al., 2005) players. In particular, MI can improve the gestural technique, which has a fundamental role in tennis (Hegazy et al., 2015). Indeed, the greatest "danger" for a tennis player is to learn a "bad" technical gesture that it will be very complex to "unlearn" (Hegazy, 2012). This is why coaches pay particular attention to the quality of the technical execution and its optimal development, in particular by giving feedback and generally verbal instructions to carry out sequences of actions such as the serve for example (Schönborn, 2000). Thus, having memorized these instructions, the players will be able to "repeat them to themselves" before carrying out these actions by using the "self-talk focused on technique" or instructional discourse, which, just like MI, has shown its effectiveness in tennis, particularly in serving (Malouff et al., 2008). Self-talk thus represents what players say to themselves, expressed in the form of a small inner voice or in the form of verbalizations out loud (Theodorakis et al., 2000) and whose content can serve at least two functions: cognitive (i.e., verbalizations with an attentional focus directed towards the technique and movements adequate to the task) or motivational (i.e., discourse dealing with self-confidence, the increase of effort, the optimization of energy deployed, or favoring a positive mood)

As recent work has shown the beneficial effect of combining MI with self-talk on players' self-efficacy (Dohme et al., 2019), the aim of this exploratory study was to assess the effects



of a combination of MI and cognitive self-talk, focusing on instructions to serve, on the performance and technical execution quality of the serve in novice players conducting a one-week club course.

METHOD

Twenty-four beginner tennis players (M = 9.8 years old, 10 girls and 14 boys), who participated in a one-week tennis course at the Amicale Tennis Club, (Gosier, Guadeloupe, France) voluntarily participated in this experiment. They were randomly divided into 3 groups: Imaging, Imaging-self-talk and Control. Consent to take part in the study was obtained by the parents or tutors of the players. Ethics approval to conduct the research was obtained by the University of Antilles.



PROCEDURE

The players performed five 1.5-hour sessions during which, after a standardized warm-up, they were asked to serve 10 times, with intermediate balls, changing sides each time. The Control group received no instructions other than verbal instructions on the steps to serve. The Imagery group was instructed, before each service ball, to imagine (in the third person) serving successfully to the "correct" service box. The Imagery-Self-talk group was instructed to repeat the instructions to themselves internally during the IM. The daily practice time for the service was approximately 15 minutes.

During the first session, the players performed a pre-test: 10 serves with intermediate balls. The percentage of success, the speed of the balls (with a radar) and the technical quality (scores of 6 items: starting position, ball toss, backswing arm-racket movement, forward swing arm-racket movement, contact point and follow through movement noted with a scale from "0" mediocre to "7" excellent) of each service were recorded and evaluated by federal and state certified coaches (for a similar procedure see Atienza et al., 1994) On the 5th and final day of the course, the players completed a post-test identical to the pre-test.

RESULTS

Statistical analysis performed on the speed of the serves showed no significant difference between the services of the groups: Control (M = 42 km/h), Imagery (M = 45 km/h), Imagery-self-talk (M = 46 km/h) at pre-test and post-test and between them.

On the other hand, the players in the Imagery and Imagery-self-talk groups improved the percentage of success of their serves between the pre-test and post-test by (16.5% and 15%) respectively, whereas the players in the Control group did not differ statistically (see Figure 1).

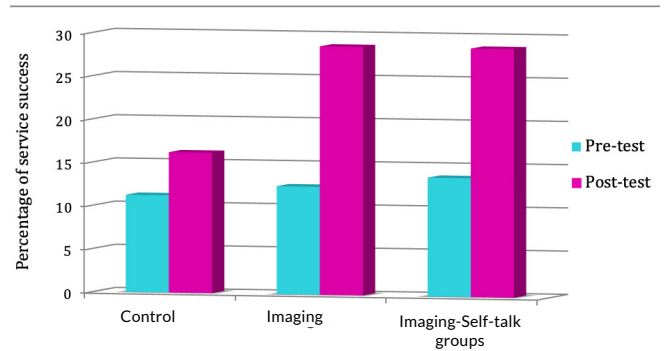


Figure 1. Percentage of successful service completion for the Control, Imagery and Imagery-Self-talk groups in the pre- and post-test.

Finally, the players in the Imagery-self-talk group improved the technical quality of their service between the pre-test and post-test and got better scores than the participants in the Control and Imagery groups on the post-test (see Figure 2).

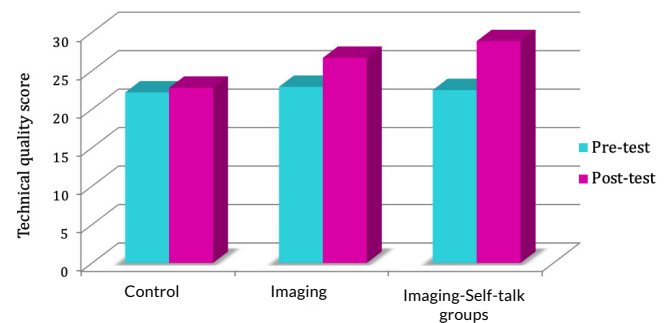


Figure 2. Technical quality scores of services performed by the Control, Imagery and Imagery-Self-talk groups in the pre- and post-test.

DISCUSSION

This experiment was conducted to evaluate the effects of the combination of self-talk and/or MI on the serving performance of young beginner tennis players. The results show, firstly, a significant improvement in the percentage of successful serves in the MI group while the performance of the control group remained stable. These results confirm those of studies that have shown positive effects of MI used in addition to real practice on serving performance (Desliens et al., 2011; Dominique et al., 2021; Guillot et al., 2013; Mamassis, 2005). Secondly, the results of this experiment show that participants who used self-talk during MI not only had a significantly higher percentage of success than the Control group, but also obtained better scores on the quality of the technical execution of the services than the participants of the Imagery group. These original results, confirm the value of using technique-focused self-talk (Malouff et al., 2008) and combining this technique with MI (Dohme et al., 2019).

CONCLUSION

The results of this exploratory study, carried out during a one-week training programme, show that MI improves technical execution and the percentage of successful serves, and that self-talk based on personalized instructions optimizes its positive effects. We recommend coaches to combine real practice with mental imagery and self-talk especially when they have short intervention periods such as during a training course.

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CONFLICT OF INTEREST AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)



Preliminary kinematic analysis of the serve in 10 and under players

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ABSTRACT

The serve is a fundamental stroke to win a match at a high level. From a long-term player development perspective, it is necessary to know the biomechanical learning stages of this stroke. However, the scientific data concerning the biomechanics of the serve have focused on the 12&U, 14&U, 16&U, 18&U and +18 categories. The objective of this study is to propose a preliminary kinematic analysis of the serve in children aged 10 and under (10&U) to provide benchmarks for coaches regarding the teaching of the serve in younger players.

Key words: service, performance, biomechanics .

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INTRODUCTION

At a high level, the serve is the most important shot of the game, as it allows the player to dominate the opponent and win the rally quickly (Whiteside et al., 2013). Its effectiveness can influence the player's performance, the outcome of the point and the result of the match. Players who win the match, make fewer double faults and outperform their opponents in 1er serve percentage (Hizan et al., 2011). The percentage of total points won and points won after the first serve are determining factors in the junior game (Kovalchik & Reid, 2017). If a player expects to have success at a high level on the junior and then the professional tour, learning to serve from the first years of practice (7&U, 9&U, 10&U) is very important. However, the serve is a complex shot whose execution can pose real problems to young players. For example, research has shown that in the 10&U category on green court the success rate is the lowest for the serve (Fitzpatrick et al., 2018). Therefore, when training these young players, the knowledge related to the technical execution of this stroke is paramount to provide guidance to coaches. However, data in the scientific literature regarding the biomechanics of the serve have focused on the 12&U, 14&U, 16&U, 18&U and +18 categories (Fett et al., 2021; Fleisig et al., 2003; Hernández-Davó et al., 2019; Touzard et al., 2019; Whiteside et al., 2013). Data for the 10&U category are very limited (Durovic et al., 2008). Therefore, the aim of this study is to describe different kinematic parameters of the 10&U serve.

METHOD

Six departmental level players, two girls and four boys, participated in this study (age: 9.3 ± 0.8 years; height: 136.0 ± 5.8 cm; mass: 27.8 ± 3.8 kg). The study took place on a "green" court (24 m x 8.23 m) equipped by a motion capture system comprising 23 optoelectronic cameras (Oqus 7+, Qualisys System, Gothenburg, Sweden). The players were asked to serve 3 first flat serves in the serve box. The players and their rackets were equipped with reflective body markers (Figure

1). The ball speed was measured with a radar (Stalker Pro II+, USA). 16 kinematic parameters were calculated to describe the biomechanics of the serve (Table 1).



Figure 1. Position of front and back markers.

RESULTS

The players hit the serves with a ball speed of 94 ± 10 km/h and a maximum racquet head speed of 93 ± 9 km/h. The 10&Us showed a maximum rear knee flexion angle of $134 \pm 10^\circ$ and a front knee flexion angle of $121 \pm 12^\circ$. The internal angles of maximum flexion were $83 \pm 5^\circ$ for the rear ankle and $82 \pm 9^\circ$ for the front ankle. The speed of maximum extension was 508 ± 108 %/s for the rear ankle and 478 ± 100 %/s for the front ankle. The speed of maximum extension of the rear knee was 366 ± 153 %/s and 489 ± 160 %/s for the front knee. The maximum rear hip velocity was 1.3 ± 0.2 m/s, and 0.9 ± 0.3 m/s

at the front hip. The maximum longitudinal hip rotation speed was 493 ± 154 %/s. The children flexed their trunk at a maximum speed of 286 ± 45 %/s. At the level of the dominant upper limb, 10&U year olds reached maximum elbow extension velocities of 1003 ± 403 %/s, wrist flexion of 1472 ± 155 %/s and shoulder internal rotation of 1668 ± 668 %/s.

DISCUSSION

Ball speed is an indicator used in training to characterise the level of expertise of players and to evaluate the efficiency of their serves (Fleisig et al., 2003). Our results showed that the serve of 10&U players is about 60 km/h slower than that of 16&U players (Fett et al., 2021) and about 90 km/h slower than that of +18 professional players (Fleisig et al., 2003). Although these differences are largely related to the maturation of physical abilities from childhood to adulthood (Kovalchik & Reid, 2017), there are kinematic parameters that may account for the lower ball speed observed in 10&Us.

The serve follows a proximo-distal sequence during which the movement starts with the proximal segments. At the start of the kinematic chain, our results showed that 10&Us flex the front knee more than the back knee (121 ± 12 ° vs. 134 ± 10 °). The maximum extension speed of the front knee was greater than that of the back knee (489 ± 160 %/s vs $366 \pm$

153 %/s). For older age categories (12&U to adult), players do the opposite by increasing the flexion and then the extension speed of the back knee (Fett et al., 2021; Whiteside et al., 2013). Our results therefore demonstrated a still immature rear knee thrust in 10&U departmental level players. It can be hypothesized that this immature thrust is associated with an overly long stretch-shortening cycle of the lower limb resulting in dissipation of stored elastic energy having the effect of limiting the extension velocity produced by the lower limbs (Whiteside et al., 2013). Conversely, our results showed a more mature action at the ankles in 10&U as the maximum extension velocity of the rear ankle was approximately 30 %/s higher than that of the front ankle.

At the trunk level, the maximum longitudinal hip rotation speed of 10&Us was similar to that of older players (Fett et al., 2021; Fleisig et al., 2003). In contrast, the maximum trunk flexion speed of 10&Us was lower than that of 16&Us (Fett et al., 2021). This result suggests that 10&Us favour longitudinal rotation of the trunk to create speed instead of the lateral trunk or shoulder over shoulder rotation, which is still not very effective because the leg thrust is still immature at that age. These two actions of the trunk (flexion and lateral tilt) thus constitute axes of progress to be considered during adolescence.

Table 1

Comparative table of the different parameters measured according to the age categories 10&U, 12&U, 16&U and +18.

Parameters	Our results	Fett et al, (2021)	Whiteside et al, (2013)			Fleisig et al, (2003)
	10&U	16&U	12&U	16&U	+18	+18
Ball speed (km/h)	94 ± 10	151 ± 20	/	/	/	Men: 183 ± 14 Women: 149 ± 14
Maximum racquet head speed (km/h)	93 ± 9	/	108 ± 11	148 ± 11	155 ± 11	/
Internal angle of maximum rear knee flexion (°)	134 ± 10	102 ± 10	93 ± 10	93 ± 8	92 ± 8	/
Maximum internal angle of flexion of the front knee (°)	121 ± 12	108 ± 16	105 ± 10	115 ± 7	111 ± 8	/
Maximum rear knee extension speed (%/s)	366 ± 153	518 ± 102	/	/	/	/
Maximum front knee extension speed (%/s)	489 ± 160	447 ± 99	/	/	/	800 ± 400
Maximum internal angle of flexion of the rear ankle (°)	83 ± 5	/	/	/	/	/
Maximum internal ankle flexion angle (°)	82 ± 9	/	/	/	/	/
Maximum rear ankle extension speed (%/s)	508 ± 108	/	/	/	/	/
Maximum front ankle extension speed (%/s)	478 ± 100	/	/	/	/	/
Maximum rear hip speed (m/s)	$1,3 \pm 0,2$	/	$1,8 \pm 0,2$	$1,9 \pm 0,1$	$2,3 \pm 0,1$	/
Maximum speed of the front hip (m/s)	$0,9 \pm 0,3$	/	$1,4 \pm 0,2$	$1,5 \pm 0,1$	$1,7 \pm 0,1$	/
Maximum longitudinal hip rotation speed (%/s)	493 ± 154	424 ± 96	/	/	/	440 ± 90
Maximum trunk bending speed (%/s)	286 ± 45	493 ± 71	/	/	/	/
Maximum elbow extension speed (%/s)	1003 ± 403	1564 ± 327	1147 ± 185	1592 ± 191	1524 ± 144	1510 ± 310
Maximum wrist flexion speed (%/s)	1472 ± 155	1071 ± 299	1164 ± 189	1581 ± 184	1911 ± 264	1950 ± 510
Maximum shoulder internal rotation speed (%/s)	1668 ± 668	2029 ± 332	1288 ± 365	2165 ± 373	2000 ± 297	Men: 2420 ± 590 Women: 1370 ± 730
Maximum longitudinal shoulder rotation speed (%/s)	585 ± 144	/	/	/	/	870 ± 120

The dominant arm joints contribute strongly to speed production (Tanabe & Ito, 2007). The maximum elbow extension speed of 10&Us is comparable to that of 12&Us (Whiteside et al., 2013). In contrast, there is a significant deficit between the 10&Us and 16&Us, indicating minimized elbow involvement at younger ages. Thus, our results support the hypothesis of (Whiteside et al., 2013) that younger players employ a less ascending pre-impact racket trajectory than that used by older players, potentially explaining the differences in ball speed between these age categories.

The internal shoulder rotation velocity of the 10&Us is higher than that of the 12&Us obtained by Whiteside et al., (2013) but is significantly lower than those obtained by the 16&Us, 18&Us and +18s (Table 1). The same is true for the maximum wrist flexion speed. These results provide a better understanding of the reduced ball speed in 10&Us insofar as it has been shown that shoulder internal rotation and wrist flexion speeds are the main contributors to linear racquet head speed (Tanabe & Ito, 2007).

PRACTICAL APPLICATIONS

The results of this study provide some practical recommendations for coaches of young players. After the age of 10 (12&U and 14&U categories), biomechanical work to improve the serve technique can be oriented on the action of the back knee. The aim is to progressively bring the young players to bend the back knee more to store a certain amount of elastic energy in the quadriceps and then to produce an explosive extension of the back knee that will allow them to efficiently engage the upward projection of the back hip and the rotation actions of the trunk (trunk flexion and shoulder over shoulder rotation) and the upper limb (elbow projection and internal rotation of the shoulder). Thereafter, targeted and adapted muscle strengthening work during adolescence (16&U, 18&U and +18) will allow to optimize segmental and joint rotation speeds such as rear knee extension, shoulder internal rotation, elbow extension or trunk flexion.

CONCLUSIONS AND WAY FORWARD:

This study shows that the 10&Us perform immature actions of the back knee, elbow and shoulder during the serve compared to older age groups, which helps to explain their reduced ball speed performance. In contrast, the ankle and longitudinal hip

rotation actions were found to be biomechanically already in place. Future work is needed to determine whether scaling the environment (court size, net height) to the morphology of the 10&Us would facilitate serve learning, improve their performance, and result in biomechanical parameters closer to those measured for older age groups.

CONFLICT OF INTERESTS AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Coaching children 10 and under with a disability in a multi-sport program

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ABSTRACT

This paper reports on a review of an Australian-based physical activity program (including tennis) for children 10 and under with a disability. Key features of, and strategies in, this program are highlighted. Implications for coaches to provide inclusive and modified programs for children 10 and under are discussed.

Key words: children, disability, inclusion, adapt.

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INTRODUCTION

The Program

Victoria University in Melbourne, Australia, conducts a physical activity program for children with a disability (including physical disability, intellectual disability, vision impairment and hearing impairment). The program started in 2005 and, to date, over 1500 children have attended. Currently, the majority of children in the program are aged 10 years and under and they participate in a range of modified activities including tennis (introduced in 2011), soccer, volleyball, netball, bowling and other minor games that focus on fundamental movement and gross motor skills including catching and throwing.

The program is organised and managed by the three authors of this paper with the invaluable coaching assistance of first-year university students who are enrolled in the Inclusion and Diversity in Physical Education unit. Since 2018, the program consists of four blocks of bi-weekly sessions of 60-minute duration conducted on four basketball courts in an indoor facility close to the university campus. In the first session, groups of 4-8 children (generally from the same school class) with 4-6 coaches are formed. The groups usually continue throughout the block of sessions (but can change due to absences, group and individual needs and Covid-19 lockdowns for example). The children who participate in the program attend Special Developmental schools in the Western suburbs of Melbourne.

Sessions

The sessions follow 'game-sense' principles (i.e., games versus drills) and start with a group warm-up game (e.g., Follow the Leader or Captain's Treasure), followed by a set of 3-6 activities. These activities are developed, modified and adapted to address the interests and abilities of the children. Examples include relays of passing beanbags on a small racquet and rolling coloured balls with small racquets/bats around cones. To conclude a session, a group warm-down game (e.g., throwing plastic balls on a large multi-coloured parachute) is conducted.



Purpose

The purpose of this paper is to report on a review of this award-winning program. Specifically, what are its key features and strategies adopted that facilitate a safe, fun, engaging and inclusive program?

PARTICIPANTS

The three authors of this paper, all academic staff members and coaches at Victoria University, participated in a review of the program. The first two cited authors (above) developed the program in 2005 and have since managed its delivery. The third cited author joined the program in 2018.

PROCEDURE

Prior to reviewing the program, ethics application was sought but was not required as no data was collected from a third party.

The reviewers/authors were requested to review the program over the last four years when it moved to a neighbouring indoor sporting facility. The reviewers were requested to identify the program’s key features, and associated strategies, focusing on the children aged 10 and under who participate in tennis activities.

The reviewers independently made a list of the program’s key features and strategies adopted based on their own observations and feedback received from the coaches/first-year university students and the carers/school teachers who accompanied the children to the program.



The reviewers’ lists of features and strategies were then shared and discussed. Common items were identified and discrepancies between reviewers consensually validated (Patton, 2002).

RESULTS

The results of the above procedure are shown in the following table.

Table 1
Key Features and Strategies.

Key Features	Key Strategies
Engaged and well-prepared coaches focus on participation and fun in a range of non-competitive activities and games	<ul style="list-style-type: none"> • Coaches expect, and accept, there might be initial apprehensions and nervousness when first coaching a new group • Coaches consult with each other, and source relevant material (e.g., Special Olympics Games for Children), to prepare detailed session plans that include at least 6 different activities and 2 ‘back-up’ activities and safety considerations • Coaches draw on the children’s individual abilities and interests to develop session plans • Coaches are prepared to adapt planned activities; possible modifications are planned in advance • Coaches conduct ‘mock’/trial sessions with fellow coaches and address feedback • Coaches encourage and reward participation (score-lines etc have little meaning)
Conditions are safe, inviting, accessible and inclusive	<ul style="list-style-type: none"> • Coaches conduct a thorough examination of all (including playing) accessible areas prior to sessions • Coaches are mindful of distancing between individuals/groups and adopt modified, light and easy-to-use equipment • Coaches assume responsibility to ensure equipment is stored in bins if not being used • Drink- and rest-breaks are included • Carers are consulted about medical conditions that may impact on a child’s participation where appropriate • Children are accompanied by a carer for bathroom visits
Sessions are activity- and participant-focused, engaging and fun	<ul style="list-style-type: none"> • Coaches lead a variety of activities (not just tennis-related) of ‘short’ duration and are ready to modify/adapt activities to retain interest and ensure participation • Children (and/or their carers) are asked what activities they like • Familiar and enjoyed activities are often repeated (with or without minor modifications) • Coaches adopt novelty, tactile and colourful equipment where possible • Fun group warm-up and warm-down activities ‘book-end’ each session
Communications are predominantly visual and all are clear, encouraging and easily understood	<ul style="list-style-type: none"> • Demonstrations replace instructions and coaches may adopt flash cards, visual aids and pictures to illustrate activities and behaviours when necessary (e.g., jumping) • Coaches lead the way and actively participate in the activities (vs acting solely as an observer) • Lots of smiles, encouragement, positive body language and laughter replace the coaches’ spoken words!
Individual differences in abilities and interests are addressed to ensure all children can participate and ‘have a go’	<ul style="list-style-type: none"> • Time is devoted to getting to know each child and their interests and abilities • Information from carers/school teachers about a child’s interests and abilities is sought if children are not joining or enjoying activities • Activities match children’s interests and abilities with a one-on-one interaction (if sufficient numbers of coaches available) or coaches adopt ‘zones of activity’, grouping children with similar abilities and interests to do the same activity
Coaches expect, and are prepared, to adapt activities to retain interest and attention and to ensure the activities suit the skill level of each child	<ul style="list-style-type: none"> • Coaches accept changes to planned activities during sessions are likely to be required and prepare accordingly with ways all activities can be modified or new ones added • Debriefing sessions for coaches are conducted after sessions when ‘success stories’ and ‘challenging situations’ are exchanged • Coaches are encouraged to keep reflective journals detailing insights gained from sessions

DISCUSSION

This paper reports on a review of an Australian-based physical activity program, where tennis is one of the activities, for children 10 and under with a disability. The key features of, and strategies adopted in, the program that were identified in the review (Table 1) are inter-related and linked. Collectively, they support the importance for coaches to be inclusive in the delivery of activities and to encourage children to 'have a go' and 'have fun'.

We suggest the features of, and strategies adopted in, the program are not 'revolutionary' or surprising. Nor are they exclusive to programs for children with a disability. Rather, they endorse well-recognised sound coaching principles including inclusion, preparation, fun, safety and engagement (Martens, 2012). Further, the factors and strategies identified complement the existing literature on coaching children with a disability that advocates everyone should be able to participate in sport and physical activity in a welcoming and inclusive way regardless of ability, prior knowledge and skill level (e.g., SportAus, n.d).

Our program's format to include a variety of games and activities across a number of sports is also consistent with research (e.g., Cote et al., 2009; Sleiman, 2019) supporting a multi-sport and multi-activity approach (versus early specialisation) for long-term developmental and other psychosocial benefits for children.

Implications for coaches

The authors of this paper suggest coaches may wish to:

- Review their own programs to ensure these provide welcoming opportunities for children with a disability to participate
- Adopt the list of key features and strategies in Table 1 as a checklist when reviewing their programs. We believe our list could be 'a good starting point' when reviewing other programs for children 10 and under and provide clues for practical and effective implementation

- Review the composition of their programs for children 10 and under to include a variety of games and activities (that can be readily modified) across a range of sports in addition to those that relate just to tennis

CONCLUSION

This paper highlights a number of practical considerations for coaches when working with children 10 and under with a disability (refer to Table 1). Importantly, coaches need to respect and address each child's unique abilities and interests; be well-prepared but willing to adapt and modify; keep activities 'short and sharp'; be mindful of safety; give lots of smiles, encouragement and feedback; and prioritise fun, enjoyment and participation. The program is testament to what can be achieved with a special group of children who are often overlooked by coaches.

CONFLICT OF INTERESTS AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Emotions in young tennis players: A new tennis-specific scale

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ABSTRACT

This article describes the development of the “Scale Perception Emotion Tennis” (SPET). This scale tries to contribute to the understanding and assessment of responses related to the inadequate management of emotions in tennis competition. It delineates how the SPET tool could represent a first step in the direction of increasing the awareness of the players and could be used by the coaches to compare their perception of the player’s emotions with the one of their athletes.

Key words: scale, emotions, tennis questionnaire, test SPET.

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INTRODUCTION

Emotions are multifaceted subjective feelings reflecting expected, current, or past interactions with the environment and play a fundamental role in human adaptation and performance by improving sensory intake, detection of relevant stimuli, readiness to behavioral responses, decision-making and interpersonal social interactions (Robazza & Ruiz, 2018). These beneficial effects enhance human health and performance in any endeavor. For many years, sport psychologists have been concerned with the study of the deleterious effects of stress and anxiety purported to the main factors in the failure of performers to fully and effectively use their skills (Robazza, 2006).

These aspects are present in tennis, too, where the self-efficacy degree to cope with the match tasks influences the emotions and their perception (Costa et al., 2015). For this reason, the matches arouse both in the audience and in the players an enormous emotional involvement; the young tennis players are often forced to deal with strong emotions that tend to affect their performance negatively. Anxiety, sadness, fear and anger are emotions felt very often, and young players in comparison with professional players are less able to understand and explain these oppressive feelings, and cope with them effectively during the tournament.

The interest in the emotion field first appeared within the Italian Tennis Federation many years ago, but took shape in a research project which started in 2016 when the mental staff of the R. Lombardi Institute, under the direction of Michelangelo Dell’Edera and coordinated by Antonio Daino, put forward the “ABC of Emotion Project”. This project was designed to investigate the emotions connected to the competitive context in regarding players of national level Under-12 (Daino & Uberti, 2014). This work, conducted on 30 selected (best) Italian tennis players (balanced by gender, age, and level of play), revealed that, asking the young tennis players to list the emotions they usually experience on-court, 70% of them started with negative emotions as a first response (anxiety, anger and fear), while only 30% reported positive emotions (joy, happiness and serenity). This may be attributable to the fact that, in youth sports, excessive emphasis is placed on result instead of fun, which conversely should be a fundamental element in these phases of sport (Merkerl, 2013).

For these reasons, a tool was developed to detect and measure these feelings with the goal of using this knowledge to teach how to manage the emotions. It is called the “Scale Perception Emotion Tennis” (SPET) and could be established thanks to a self report questionnaire. The goal of this questionnaire was to determine the more dominant emotional aspects while performing competitive tennis.

The purpose of the following research was to monitor ideas, thoughts, beliefs, and emotional experiences in relation to tennis performance in the different age groups, levels and genders using the new proposed scale. This information would therefore be useful not only in improving the players’ emotional awareness, but also in promoting the self-regulation of the emotions perceived during the matches.

METHOD

Participants

The questionnaire was proposed to 136 participants, 93 male and 43 female, with an average age of 20.27 years old, with SD 8.6, and grouped in 4 different groups based on each specific tennis role (coaches, Under-16 Italian national team players, Under-16 competitive tennis players and Under-16 amateurs).

Table 1

Mean and SD of the 4 groups.

	Num.	Mean	SD
Coaches	55	28.90	7.09
Italian National Team Players	29	15.89	1.84
Competitive Tennis Players	25	12.84	1.74
Amateurs	27	14.25	2.24

Questionnaire

The "Scale Perception Emotion Tennis" (SPET) was administered in the post-game interviews of the players between 2012-2014 with the Italian Tennis Federation mental trainers, and produced a first version of 30 items in total. This version was revised to have a final version with 20 items, using only those aimed at investigating the specificity of tennis emotions. The questionnaire evaluated 3 different areas: Emotions, Thoughts and Behavior and it made up of the following items.

1. Competing makes me feel at ease and energised.
2. My performance gets better while playing in front of a crowd.
3. I tend to perform better during practice than during competitive matches.
4. I am very afraid of losing the match.
5. I hop on my toes to keep active and activated.
6. I use a breathing technique to better adjust to the pressure of a match.
7. I cannot stand the pressure of the third set and can't wait for it to end.
8. I keep my fingers crossed not to play against certain players.
9. I am able to focus and not get distracted even during clutching moments.
10. I play my best tennis during tough matches.
11. I feel too much tension during a match.
12. My opponents play best when they are playing against me.
13. I am able to release tension between points.
14. I am able to control my anger after an unforced error.
15. I get stuck on clutching points.
16. My timing gets worse when I am under pressure.
17. I am able to relax and calm down during breaks between matches.
18. I play better during competitive matches than in practice.
19. I am overwhelmed by my thoughts.
20. I miss opportunities due to indecision.

The players were then asked to answer, thinking about what they felt during the tournament matches, indicating for each item, on the basis of a four-point Likert scale, if that feeling was perceived "always", "often", "sometimes" or "never". For the assessment, an increasing or decreasing score was then assigned, from four to one, depending on the orientation of the specific question.

Procedure

The participants, in groups, were invited to answer to the questionnaire, being as sincere as possible, since the test was absolutely anonymous with no right/wrong answers.

Statistical Analysis

Data analyses were performed using Statistica 8.0. The variables normality distribution was evaluated with the Shapiro-Wilk test and, since the variables results were not normally distributed, nonparametric tests were run for Groups Comparison and Cluster Analysis. Thresholds of significance were set at $p < 0.05$.

RESULTS

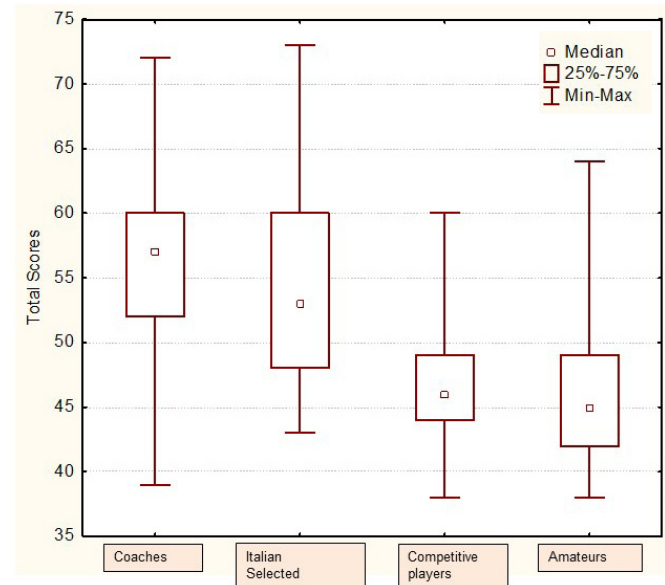


Figure 1. Total score comparison in the four groups.

Kruskal-Wallis analysis shows that groups differed of the total score at the questionnaire (Fig.1) [$H(3, N=136) = 47,67597$ $p = ,0000$]. Moreover, Mann-Whitney U Test comparisons show some differences between groups [Coaches vs Competitive Tennis Players ($Z: 5.08$; $p: 0.000$); Coaches vs Amateurs ($Z: 5.37$; $p: 0.000$); Italians Selected vs Competitive Tennis Players ($Z: 3.96$; $p: 0.000$); Italians Selected vs Amateurs ($Z: 4.27$; $p: 0.000$)], with the exception of Coaches vs. Italians Selected comparison ($Z: 1.16$; $p: 0.245$) and Competitive Tennis Players vs Amateurs comparison ($Z: 0,43$; $p: 0.781$).

According to the k-means data, the scree plot (Fig. 2) shows the two-cluster solution with 76 subjects in cluster 1 (Coaches and Italians Selected) and 60 subjects in cluster 2 (Competitive Tennis players and Amateurs).

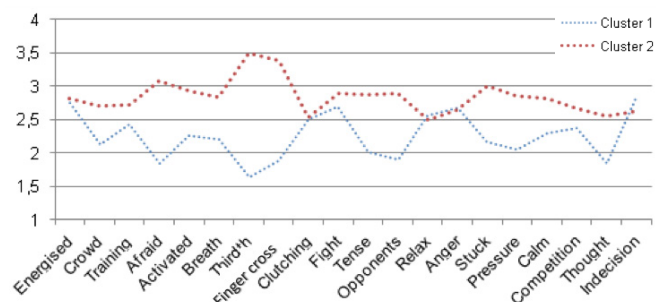


Figure 2. Plot of Means for each cluster.

Table 2

Means and SD of the two clusters for each questionnaire's item.

			Cluster 1		Cluster 2		Mann-Whitney U Test	
			Mean	Std.Dev.	Mean	Std.Dev.	Z	p-level
1	Energised	E	2,75	0,75	2,82	0,60	0,55	0,580
2	Crowd	T	2,12	0,88	2,71	0,88	3,57	0,000
3	Practice	T	2,43	0,87	2,72	0,74	2,18	0,028
4	Afraid	E	1,85	0,80	3,08	0,69	7,17	0,000
5	Activated	B	2,27	0,90	2,93	0,85	3,92	0,000
6	Breath	B	2,20	1,02	2,84	0,92	3,49	0,000
7	Third	T	1,63	0,88	3,49	0,64	8,48	0,000
8	Finger crossed	T	1,88	0,98	3,39	0,75	7,28	0,000
9	Clutching	T	2,50	0,72	2,54	0,77	0,39	0,696
10	Tough	B	2,70	0,87	2,89	0,76	1,13	0,254
11	Tense	E	2,02	0,85	2,88	0,73	5,33	0,000
12	Opponents	T	1,90	0,66	2,89	0,78	6,32	0,000
13	Relax	B	2,57	0,79	2,49	0,70	-0,79	0,423
14	Anger	B	2,68	0,93	2,64	0,90	-0,14	0,886
15	Stuck	E	2,17	0,76	3,00	0,59	5,88	0,000
16	Pressure	E	2,05	0,81	2,86	0,76	5,14	0,000
17	Calm	B	2,30	0,79	2,82	0,87	3,28	0,001
18	Competition	B	2,38	0,94	2,66	0,84	1,77	0,075
19	Thought	T	1,85	0,94	2,55	0,89	4,05	0,000
20	Indecision	E	2,83	0,89	2,62	0,78	-1,22	0,220

As shown in Table 2, the two clusters differ in 13 items, 6 of them related to the area of thoughts (items 2, 3, 7, 8, 12, 19), 4 to the emotions (items 4, 11, 15, 16) and 3 to the behaviors (items 5, 6, 17).

DISCUSSION

This study shows how the awareness of one's own emotional experiences, the ability to recognize them in the court, to accept and manage them to obtain an effective performance seems to be more influenced by the expertise and the tennis skills rather than the players' age and gender. Moreover, these differences are in the area of thought, most likely because they make the difference in the emotional management between expert and less expert players. For the latter group small differences have been found in the behaviors to manage these difficulties, especially to release one's tension between the points rather than controlling anger after an unforced error.

The second cluster, that is the one composed of non-professional tennis players, reported more negative emotions such as tension, fear, pressure, and getting stuck. And most likely, for this reason, they perform different by behaviors to release tension and stay calm, such as breathing and activation.

These observations, according with the Laborde and colleagues review (2015) on the Emotional Intelligence in sport, could suggest that the ability to recognize and effectively manage emotions in the field may be associated with physiological stress responses and successful psychological skill usage, like the functional thought.

For these reasons, since these skills are trainable, starting paths of literacy, recognition, awareness and then training will be necessary, will provide an increase in mental and emotional skills (not only tactics and technique), allowing the young players an optimal growth not only in tennis, but also as human beings.

CONCLUSION

In conclusion, the SPET tool represents a first step in the direction of increasing players' awareness and could be used by the coaches to compare their perception of the athletes with the one of their athletes, discussing about what happens on the court. Further studies should confirm the validity of the scale, as well as exceeding the limits of those groups which are not homogeneous by gender and level.

However, SPET can also help sport psychologists to choose the best emotional training for each specific player, helping him/her to work on the emotional dimension that is most lacking during the match (awareness of emotions, thoughts or behaviors). The correct understanding of the assumptions that are in the minds of our children and athletes is an indispensable premise for an effective intervention and could help us create court-exercises allowing the athlete to experiment and manage their emotions.

CONFLICT OF INTERESTS AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Transversal competences in primary education through tennis

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ABSTRACT

The main objective of this article is to raise awareness of the potential of tennis at school, more specifically in Primary Education, for the treatment of important aspects such as academic performance or physical-motor affective, emotional, and social development. In this sense, we present, as an example, games to develop cross-cutting themes at school from the area of Physical Education, such as gender equality, education for peace, education for responsible consumption and sustainable development, as well as education for health.

Key words: mini-tennis, school, values, sustainability.

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INTRODUCTION

In relation to the practice of tennis at an early age and its introduction at school, Wang (2016) stressed the important role of mini-tennis in the educational system, not only increasing the interest of students in this sport, but also boosting the development of its teaching at a higher level. However, although tennis presents some difficulties to be adequately developed in Physical Education sessions at school, due to its technical and organizational complexity, facilities, and material..., there are different proposals that have provided effective solutions to positively overcome them (Fuentes et al., 2020; Fuentes, 2013, Sanz et al., 2004).

Currently, authors such as Tsuda, Ward and Goodway (2018) presented a set of knowledge to be acquired consisting of 13 tasks framed in the four stages of game development of Rink (2012), defining the main contents to be addressed in Physical Education classes of Upper Primary Education, relying, among other proposals and initiatives, on those carried out by the United States Tennis Association (USTA), in the case of the Net Generation Quickstart, which have suggested the use of an important variety of modifications aimed at facilitating the learning of tennis by children: use of short rackets, use of smaller sized courts and nets, slow bouncing balls... Thus the USTA (2021) noted that 48% of children participating in their school tennis programs obtain an average "A" school grade, 73% have not misbehaved in school, or 82% volunteer in their communities:

In relation to all the above, sport in the school context and, therefore, tennis as well, are an excellent means to intervene on various problems of our educational-social environment towards an adequate physical-motor affective, emotional, and social development of schoolchildren (Fraile & De Diego, 2006). In this context, a study conducted by Araújo, Soares and Fuentes (2014), based on a tennis program at school aimed at children aged 9-11 years old, students of a public school, who presented a low academic level, being at social



risk by residing in a neighborhood with a high rate of violence, showed significant benefits at the affective and learning level. Thus, the results of this study, in which the students received tennis lessons of 45 minutes twice a week for three months, reflected a greater mastery and taste for tennis, greater self-esteem and self-image, as well as an improvement in the affective and behavioral relationships of the children who participated in the program.

Linked to the above, several initiatives have been developed to promote cross-cutting themes, such as values, from the area of Physical Education. Thus, Fuentes and Martínez-Patiño (2021) suggested the importance of this area as an ideal context for the development of the values of Olympism, describing an educational action called "Racket Day". In this activity, more than five hundred Primary School pupils from different schools participated simultaneously in an activity in which the aim was to promote different racket sports through games in five rotations. These games combined sports learning and development of values, the students must

achieve five tokens (the five Olympic rings), each representing a sport and a value through their active participation in each game.

For example, in Spain, the Organic Law 3/2020 of 29 December (LOMLOE) establishes that students in Primary Education (6-12 years old) will work on gender equality, peace education, education for responsible consumption and sustainable development, as well as health education, including affective-sexual education. Likewise, special attention will be paid to emotional education and education in values, as well as to the promotion of meaningful learning for the development of transversal competences that promote autonomy and reflection.

Therefore, the main objective of this article is to offer a vision of the great possibilities of tennis in the school context, in general, and in Primary Education, in particular, to contribute effectively to a better academic performance or the physical-motor, affective, emotional and social development of students.

PRACTICAL PROPOSAL

In this section, we offer several examples of original games or games adapted from Fuentes, Müller and Furlaneto (2020), to develop cross-cutting themes through tennis taking into account the great importance of attitudinal work and the acquisition of values from an early age, as well as the opportunities offered by tennis to develop work focused on them. These games are originally framed in the area of Physical Education in schools, although they are considered equally interesting to be carried out in other contexts.

Gender equality

- In mixed teams, players try to hit 12 balls in a row without missing, being mandatory that, of the four, each time a different boy or girl hits the ball, so each one must hit 2 balls. Games can be introduced in the ball game, for example, each time the ball is hit, a phrase representing gender equality must be said out loud, for example "Girls and boys are equal in their studies" or "Boys and girls are equally brave", and the phrases cannot be repeated in each attempt. When 12 points have been scored, any of the boys or girls can say aloud a sentence that includes sexist stereotypes, for example "Girls have to wear earrings and bracelets" or "Boys have to defend girls". From one of the latter phrases, everyone can try to win the point, although they also have the option of continuing to cooperate and saying gender-equal phrases and therefore scoring points. The game can be played in reverse, starting by trying to win the point by saying phrases that contain sexist stereotypes and if a boy or girl says a gender-equal phrase, points are added, and the game is played collaboratively.

Peace education

- Doubles competition. The boys and girls try to create their own rules of play for their matches; if the four of them do not agree on what the rules should be, they will vote on each proposal; in the event of a tie, a draw is made, for example, rotating the racquet if there is a tie between two, and depending on which side comes out, the one that has been favoured by the draw will



prevail. Finally, after the corresponding matches with the approved rules, all the students, with the presence of the teacher as moderator, must propose rules and vote them, until reaching a common competition regulation for all the students.

- In a cooperative stroke exchange situation, before hitting the ball to the opponent's court, qualify the partner with a positive adjective about his/her personality, trying not to repeat any of them during each rally: brave, fair, kind, polite, friendly, patient, nice. A variation can be to introduce individual or pair competition and the moment someone misses a shot or repeats an adjective during the same point, he/she loses the point. You can also set up rallies or matches in which after a player says a positive adjective, for example, "hard-working", the partner must say the opposite, "lazy".

Education for responsible consumption and sustainable development

- As a warm-up, run at a slow pace; each student with a sheet of newspaper makes a "ball", players pass the ball one to each other in pairs each time with a different hand and in the most varied ways possible; individually or in pairs, they play coordination games, such as passing it behind the back, between the legs, throwing it up in the air, turning on oneself and catching it before it hits the floor.... Next, they use the newspaper itself to place the sheets folded in half on rubber bands placed, for example, from one basketball basket to another, to be used as a net for the development of the class. Afterwards, at the end of the session, students should take the papers to the recycling bin.
- Carry out games, using cones as lines and the mentioned net/rubber, which allow us to quickly vary the width and length of the fields if we want to work on tactical concepts such as depth, opening angles... through hitting. Likewise, we can raise the net (more time for the ball to fly) in games in which we consider it appropriate for the children to have more reaction time to return the ball... Through these types of games, we want the children to appreciate and value that it is not only possible to work with little material, but also that sometimes the use of certain pedagogical resources can offer organizational advantages and, in certain cases, it can even be more useful to use them to work on certain aspects of the game than other more conventional material.



Health education

- Delimit with cones or draw, for example, with chalk, a pyramid in each part of the court, coinciding its base with the net, representing the "nutritional pyramid" of the ideal healthy consumption frequency depending on the type of food. The pyramid will be divided into four zones: the first zone, the closest to the net and, therefore, the widest, representing flours, cereals and water (4 balls: 4 points), the second zone related to vegetables and fruits (3 balls: 3 points), the third zone related to dairy products, fish, meat, eggs and legumes (2 balls: 2 points) and the fourth zone, corresponding to the vertex of the pyramid, related to fats and sugars (1 ball: 1 point). The students will be distributed in each lane individually or in pairs and will exchange shots in a collaborative way. Each child must score 10 points. To be considered valid, each student must say out loud the name of a food within the area of the pyramid to which he/she sent the ball, without repeating names; for example, if he/she sends the ball to the second area, say "strawberries". Thus, to achieve the goal each child must send four balls to zone 1, three to zone 2, two to zone 3 and one to zone 4 (total: 10 points). Depending on the level of mastery of the students, for example, they will have 10 attempts to achieve the goal without having to follow a specific order of sending the balls to the different zones, or even, to increase the difficulty, it may be mandatory to send first the four balls to zone 1, then three to zone 2, and so on.

CONCLUSIONS

Tennis practiced at an early age has proven to be an effective tool to improve school performance and physical-motor affective, emotional, and social development of schoolchildren who practice it. Considering all the above, it is advisable to implement the game at school since it is very useful to be developed in Primary Education (6-12 years), by using the sport as a cross-cutting theme to work on aspects such as gender equality, education for peace, education for responsible consumption and sustainable development, as well as health education.

CONFLICT OF INTEREST AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)



Interdisciplinarity and tennis in primary education

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ABSTRACT

The aim of this article is to show solid scientific and pedagogical bases that justify the importance of introducing tennis in Primary Education, so that, from the area of Physical Education, the acquisition of skills linked to other areas is encouraged through this sport. Thus, the great contribution of comprehensive models to the teaching of tennis, or the benefits that tennis practiced in a played way brings in the executive functions of children who practice it, is based. Finally, a practical proposal is proposed, based on different interdisciplinary games, to be developed from the area of Physical Education to other areas of the school (mathematics, foreign language...), although also applicable in other contexts, such as clubs or tennis academies.

Key words: mini-tennis, school, comprehensive models, cognitive functions.

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INTRODUCTION

Faced with traditional teaching models, focused on acquiring a mastery of technique to later apply it to the real context, in the eighties a group of teachers emerged in England, especially at Loughborough University, who proposed a new way of teaching-learning sports, the "comprehensive model", in which the learning of skills, decision making and understanding should be inseparable aspects of the execution itself (Fuentes, 2013). In relation to the above, different methodological approaches and practical proposals arise focused on teaching tennis at early ages, characterized by a game-based teaching, where the understanding of the fundamentals of the game and the development of basic tactics must precede the mastery of technique (Fuentes and Gusi, 1996; French Tennis Federation, 2000; Brechbühl and Anker, 2000; Turner, Crespo, Reid and Miley, 2002; Sanz, Julián, Fuentes and Del Villar 2004; Torres and Carrasco, 2005; Fuentes et al, 2005; Unierzysk and Crespo, 2007; Fuentes, 2009; Fuentes, 2013; Fuentes et al. 2020; Fuentes, Muller and Furlaneto, 2020).

Thus, compared to traditional methods of teaching tennis, Unierzyski and Crespo (2007) state that the teaching of this sport has undergone major changes in the last 15-20 years, having suffered very little progress in previous decades, which clearly dominated a traditional methodology focused almost exclusively on technique or the production of the different strokes without a real understanding of the nature of the game.

Today, the International Tennis Federation proposes a teaching model based on play and tactics through the "Play & Stay" campaign, where the manipulation of the practice elements (racket, ball and playing space) allows greater interaction between players from the early stages (ITF, 2007). In this sense, different works have shown the interdisciplinary



potential of tennis in the early stages of development to acquire skills in different areas of education (Fuentes, Muller & Furlaneto, 2020), as well as to provide important benefits at the physical, psychological and social level in children who practice it (Araújo, Soares & Fuentes, 2014).

In relation to the above, the results of the cross-sectional study conducted by Ishihara et al. (2017) showed significant improvements in executive functions (inhibitory control and working memory) and physical fitness in children aged 6-12 years, regular tennis players, after participating in a program based on cognitively engaging tennis activities (coordination training and game-based exercises). The study concluded that longer duration of game-based exercises correlated positively with inhibitory control and physical fitness, while coordination training was associated with better working memory. The results of another study by these same authors, Ishihara et



al. (2017), similarly conducted with children aged 6-12 years, showed that playing tennis and practicing isolated tennis skills improve children's executive functions more than watching television, with game-based tennis lessons appearing to be more effective in improving such executive functions than a more traditional technique-based approach. In the same line of research as the two aforementioned studies, Ishihara et al. (2018) conducted a study with the aim of evaluating the effects of 12 months of frequent tennis practice in children and children aged 6 to 11 years on executive functions, as well as the relationships between moderate to vigorous daily physical activity (MVPA), physical competence and enjoyment of playing tennis with executive functions, showing the results that frequent tennis playing facilitates working memory, with increases in MVPA being associated with greater cognitive flexibility. In addition, changes in physical competence and enjoyment of tennis were positively associated with better inhibitory control, working memory and cognitive flexibility.

On the other hand, the results of the study carried out by Rym et al. (2019), conducted with 5-6 year old boys and girls, divided into two groups (group with two years of experience playing tennis and sedentary group with no previous experience in any type of sport) showed that at certain times of the day the peak of postural performance, the peak of attentional abilities and the greater visual input to maintain balance were only found in the group with experience in tennis. In addition, tennis players were more stable and more attentive than sedentary players.

As an example to contextualize the practical proposal that will be presented later, in the context of Spain, the Organic Law 3/2020, of 29 December (LOMLOE), which will come into force in the academic year 2022-2023, structures Primary Education in three cycles of two years each, starting with the First Year of the First Cycle (6 years), organized in the following areas: (a) Knowledge of the natural, social and cultural Environment -Nature Sciences and Social Sciences-; (b) Artistic Education -Plastic and Visual Education, and Music and Dance; (c) Physical Education; (d) Spanish Language and Literature and, if any, proper Language and Literature; (e) Foreign Language; (f) Mathematics. To these areas, Education in Civic and Ethical Values will be added in some of the courses of the third cycle.

Considering all of the above, the main objective of this article is to present scientific and pedagogical foundations that support the suitability of introducing tennis in Primary Education for the development of competences from the area of Physical Education to other areas of the curriculum.

PRACTICAL PROPOSAL

In this section, considering, as reflected in the introduction, the undeniable physical, psychological and social benefits of playing tennis at an early age, as well as the great potential of the comprehensive model for better learning and interdisciplinarity with other areas of education, we propose, as an example, different games, some of them original and others adapted from Fuentes, Müller and Furlaneto (2020). These games are initially proposed to be developed in the context of the school Physical Education Area, but also, why not, in other areas of action, such as clubs or tennis academies.

Knowledge of the natural, social and cultural environment

- Three students on each side of the court, working together, must pass the ball to the third touch (each student only one touch), trying to keep the ball in play as long as possible, trying to achieve a record. The student who passes the ball to the other side of the court must say out loud the name of a city, for example "Madrid" and the student on the other side of the court, when returning the ball, will say the country in which the city is located (Spain), not being able to say more than four times in a row cities of the same country. If a name is left unsaid or a name is repeated during the same exchange, the count is stopped. Make variants using historical characters, types of food, groups of animals...

Art Education

- In teams of six children each, using a variety of tennis equipment (rackets, balls, boats, covers...), each team will have 3 minutes to invent a situation without being heard by the other teams, each team will have 3 minutes to, without being heard by the other teams, invent a situation that recreates, for example, a famous painting, or a film, or a song... After the preparation time, each team will have to perform the representation (for example for a maximum of 30 seconds) in front of the others, who will try to guess what it is about, and the team that performs must keep a ball in play for at least two touches per child (12 touches) before finishing the performance.

Spanish Language and Literature

- In doubles formation, cooperating in the exchange of strokes, each child, before passing the ball to the opposite side, must say aloud a verse of a short children's poem (El gallo despertador -by Gloria Fuertes-, Adiós Sol -by Federico García Lorca-...) until they recite it completely. The poem may have been previously passed on to the children, learnt or perfected during the tennis class itself..., it being essential that the children understand its meaning and progressively achieve better diction and interpretation.

Foreign Language

- Students should exchange shots in collaborative ways. When the teacher verbalizes a preposition of place in English - "on" (on), "over" (over), "in" (in), "under" (under), "between" (between), "in front of" (in front of)... - the children should, individually or in pairs, invent a situation playing with the place, area, height... The children should, individually or in pairs, invent a situation by playing with the place, area, height, etc. of the shot that expresses this preposition, being able to use a preparatory touch with

the racquet to the ball before hitting it to the other side of the court to allow more time to make the right decision.

- Divide each side of the court into four zones numbered from 1 to 4. In a collaborative stroke exchange situation, each student, before his partner hits the ball from the other side of the court, must imitate an animal with sounds and gestures, and the partner must say the name of the animal that is being imitated, preceded by the number of the zone, for example, if a cat is imitated and the player goes to zone 2, he must say in English "dos gatos" (two cats).

Mathematics

- Doubles matches, where each player, before hitting the ball to pass it to the opponent's court, must say out loud a number (for example 5), a child of the other pair before hitting the ball will say another number (for example 4) and the next child who has to pass the ball will have to say the result of adding the first and second numbers, that is "9", and the point can be lost both for missing the shot and for not doing the sum correctly. Subsequently, for example, the subtraction can be introduced or even the addition can be made if the hit is above the waist or the subtraction if it is below the waist.

CONCLUSIONS

The use of the "comprehensive model" for teaching tennis at an early age has provided, compared to traditional approaches, in addition to a better knowledge of the game from the beginning and, therefore, provide a more playful and motivating environment, important benefits at the physical, psychological, and social level in its practitioners. It is considered appropriate to enhance the important benefits at the level of executive functions of children who learn and practice tennis by playing, using for this purpose methodologies that integrate interdisciplinary work associated with different educational areas, such as mathematics, foreign language, or art education.

CONFLICT OF INTEREST AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Cognitive and emotional characteristics of tennis players in the discovery stage (4 to 6 years old)

Lucía Jiménez

Global Tennis Team, Spain.

ABSTRACT

The imprint that the coach leaves on a child in their first interactions with the racquet is crucial and determinant in how the child will experience the sport in later stages. Through this article we will expose the cognitive and emotional characteristics that we consider that the coach should know to contribute to a full tennis, social and emotional development of their students. All of them accompanied by suggestions for application to the court sessions.

Key words: emotions, experimentation, enjoyment.

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INTRODUCTION

Different former professional tennis players have shown the importance that the first coaches had in their sporting careers (e.g., Court and Laver), how they transmitted them with their example a way of living sport, competition, life... This deep imprint is sometimes overlooked, or even underestimated the importance of the child's experience at such a young age, reducing the objectives of this stage to acquire basic technical notions and "having a good time". However, being fun and enjoyment, different things by the way, priority objectives at this age, the breadth of enriching experiences and learning can be very broad, and this depends on the training and resources at the psychological and emotional level of the coach.

While the stages of initiation (10 years and older), improvement, competition... are well documented at a psychological level (e.g. Crespo, 2010; Samulski, 2006; Young, 2015), this, the Discovery stage is sometimes a mystery of which, as experienced coaches, we sense characteristics of the children, and yet, we do not know more specific aspects of their evolution, which can lead to approaches too advanced (or too little advanced!) for their age.

"The most important period in life is not college, but the first of all; from birth to the age of six." Maria Montessori.

A field of reference from which to nourish oneself to acquire training at an early age is that of Education, and in recent years educational trends have gained great recognition which, although they have been fully developed in different countries since the beginning of the 20th century -and sometimes earlier-, it is in recent years when they are experiencing greater prominence. We refer to the respectful pedagogies implemented in Active Schools whose line of intervention is based on positive discipline and respect for the evolutionary stages of the child, such as Waldorf Pedagogy, Montessori, Reggio Emilia, Pikler... These pedagogies, together with



the new discoveries of neuroscience and the experimental research of psychologists and teachers of education pioneers in their field (e. g. Piaget, 2001), provide characteristics and modes of intervention that are useful in order to apply them in mini-tennis classes.

COGNITIVE AND EMOTIONAL CHARACTERISTICS FROM 4 TO 6 YEARS OLD:

This is the emotional stage par excellence, a key moment for experimentation and sensory development. At this stage they learn to name emotions and to know their own processes. They want to learn by doing if possible by themselves, exploring the environment through their senses. Thus, environmental learning and stimulation (not overstimulation) are crucial (Bilbao, 2015; Montessori, 1915/2014; Ostroski, 2016; Siegel & Payne, 2012; Steiner, 1924). This means that from birth, the child is exploring the world, moving from a closer contact with his mother, to a more social interaction. From the age of 3-4 years, the child begins to interact more with peers as well as with adults other than parents. This openness to the

world is complementary to the fact that they spend a great deal of time playing with themselves and often do not feel like sharing games or material. This information is fundamental because knowing that it is part of their development leads us not to force acts that do not correspond to their age, since in many cases it is a matter of projections of the adult on the child ("e.g.: You must always share all your toys!"). Remember, the best example is action, as we behave with them and talk to them, so we will generate certain dynamics and ways of acting that they will absorb and eventually reproduce. This leads us to another important characteristic, their interest in imitating and their great capacity to learn by observation. Finally, highlighting the evolution in their emotional and cognitive world given the great development of language that has taken place by then, the child is able to name emotions, understand them, contextualize them and, fundamentally, experience them (UOC, 2021).

Note: We cannot reduce the evolution of the little ones to marked and static ages because each child has a particular rhythm, so we will take as a reference these characteristics that, we insist, can be given before or after in time.

LIMITS AND NORMALITY

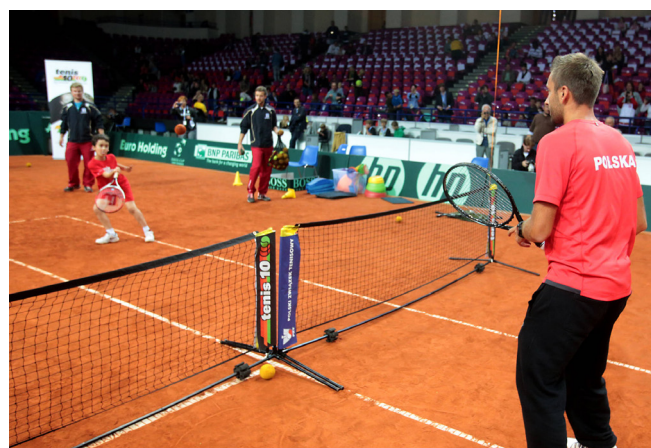
A characteristic from the earliest years is the constant search for limits by children and adolescents. They ask, through their actions, to be told or tested how far they can go. A tennis lesson is a space of coexistence in which to harmonize moods, desires and rules within a given time. In this sense, limits and certain rules - few and clear - are important, as they save time and energy. In line with positive discipline, being kind and firm. Their participation in the establishment of certain rules is, in turn, fundamental, as they begin to develop a common vision, which looks out for the good of the whole.

On the other hand, what we understand as normality and what we take for granted is not so clear in early ages. If you want greeting, asking how you are, picking up, listening, empathizing, accepting and/or persisting for a goal, to be a natural part of your players, create that seed in your classes, now is the time.

RECOMMENDATIONS AND PRACTICAL APPLICATIONS

"Don't worry if your students don't listen to you, they are watching you all the time". modified by M^a Teresa of Calcutta

- Open and close the sessions with a ritual (and name it!): A fun way to establish the phases of a session (warm-up, main part, cool down) is through rituals that define the transition from one phase to another, the beginning and the end of a class are good times for children to learn to be in contact with their body, their sensations, how to relax, activate ... in addition to creating spaces for interaction with turns of speech or action, which give rise to basic social dynamics that will generate an inertia for later stages. Remember that it is now when the "normal" is established, and the "normal" is not stipulated externally, you create it in your sessions through the dynamics that you carry out.
- Make circles when communicating: It's an organized and equitable way of interacting that leaves an imprint on the subconscious (everyone at the same distance, everyone equally important).



- Go to where they are: Avoid shouting or raising your voice, for your sake and theirs.
- Bend down and look them in the eyes: It is a basic form of respectful communication, show them with your example the importance of eye contact and feeling listened to. It is one of the fundamental differences between contact with human beings or mobiles/computers.
- Communicate/make your request in a calm and collected tone. Remember that you are their best example.
- Establish, if they are comfortable, a gentle contact, a gesture of complicity (a ritual "bump", a hand on the shoulder showing appreciation...).
- Give them time to finish what they are doing with dedication. These are their real learning moments.
- Use practical, visual examples. Remember that they learn primarily by observation, not by word of mouth.
- Recognize their achievements: At this age they already perceive themselves as "capable or not" of achieving what they set out to do; let's try not to condition them with our preconceived ideas or limitations, let's build a mentality of confidence and openness to experimentation, beyond the result.
- Involve the family. Tennis is a collective sport that is practiced individually. If you involve the family in your philosophy of tennis, how they can give it continuity from home... learning will increase exponentially.
- Reach out your hand and invite action.

A space for reflection

Having read some basic characteristics of children of this age, you can reflect on the following:

- What could I do in my classes that I haven't tried yet?
- Have I left out, forgotten, omitted... any important ideas?
- How could I improve my classes to make them even more complete or creative?
- How would I like to be remembered? And to remember your first years in tennis?

CONCLUSIONS

We are in the stage in which the first contact of boys and girls in a tennis class takes place, what happens here and now will leave a mark that will influence the rest of their years in the sport. It is a very special and beautiful moment in their development, their creativity is sky high, and they are full of energy. To plan fun, enriching sessions, open to social interaction and experimentation, welcoming all the emotional range that invades them is a challenge that the coach can enjoy enormously, it is a matter of organization, training, and illusion.

CONFLICT OF INTEREST AND FUNDING

The author declares that she has not any conflict of interest and that she did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Motor coordination and its implications on teaching tennis to three to six-year-old children

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ABSTRACT

The practice of coordinative exercises contributes not only to develop technique but also to improve decision-making quality during the game. This study presents practical possibilities to stimulate motor coordination applied to three to six-year-old children during tennis classes. The methodological proposals of the Ball School and Universal Sport Initiation focus on a general education of the individuals and defend the so-called “playing to learn” and “learning while playing”. This way, implicit learning is stimulated considering the perception of children and the conditions/restrictions of the tasks performed during practice.

Key words: children, tennis, coordination, perception.

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INTRODUCTION

Considering the context of practice of coordinative activities with children at a beginner's stage in tennis in Sweden, around the 1980s, researchers in this field brought to light the applicability of practice for a consequent development of sports technique. Furthermore, and based on contemporary teaching models for sports, it became possible to understand, and then possible to prove, that stimulating the practice of coordinative activities contributes to developing technique and quality of decision-making in game context (Mazzardo et al., 2020).

This previous statement makes sense when comprehending that coordination is the main base of motor intelligence (Roth, Kröger & Memmert, 2017; Hirtz, 2007). Complex moves are executed quickly, in different ambients, and under adverse pressures (Starosta, 1990) that, in a more specific context, sort out sports tasks. In order to exemplify it, we have the following situation that happened in 2014, during the second round of the Roger Cup, in Toronto, Canada. Novac Djokovic was beating Gaël Monfils 6-2. At 3-3 of the second set, they interchanged eleven balls, and after hitting a volley over his body, Monfils moved back by re-hitting the ball between his legs, which is a move of extreme skill, based on a wide repertoire of motor coordination, not to mention his jumps in search of precise volleys.

METHODOLOGICAL PROPOSALS THAT STIMULATE MOTOR COORDINATION

The teaching-learning-training process of sports has evolved and presented great modifications for the last thirty years, optimizing the rise of methodological proposals of “playing to learn” and “learning while playing”. “Playing to learn” and posteriorly “learning while playing” demand coaches to introduce their students the games that stimulate perception of relevant signs, ones that will gradually improve their motor

execution, their coordination, as well as groups of sports skills (Greco et al., 2015), that promotes creativity and complexity increase in search of solutions. In these teaching models, we considered the non-linear nature of learning (Otte et al., 2021) and types of implicit and explicit learning. It is necessary that coaches must know the person (apprentice) and manipulate the task and the ambient to promote situations of long-lasting and meaningful learning in the context of sports practice (Nitsch, 2009).

Methodologic proposals that offer contents related to motor coordination applied to teaching tennis to children are the Ballschule Heidelberg, the Ball School, in Germany (Kröger & Roth, 2003; Roth & Kröger, 2011) and Iniciação Esportiva Universal, the Universal Sport Initiation, in Brazil (Greco et al., 2015). Both stimulate children to learn implicitly. The advantages in this teaching process correspond to development of creativity, long-lasting learning, and motivation to practice, once they learn by executing activities based on their own cognitive comprehension (Greco et al., 2017).

Overall, the Ball School and the Universal Sport Initiation propose a long-term teaching-learning education, in which a three to six-year-old age range is considered in preschool, followed by universal phases one (from eight to ten years old) and two (ten to twelve years old). There are some differences regarding schedule between these two methodologies, possibly because of differences in social and cultural contexts considering Brazilian (Universal Sport Initiation) and German realities (Ball School). Both make use of a progression of contents named ABC, which are based on the game capacity and motor learning.

As the text focus is to optimize motor coordination applied to the teaching of tennis, here is the development proposal through content B – motor constraints. Through sensory organs, analyzer/perception (afferent pathway) and external

pressures (efferent pathway), activities are proposed from simple to complex, easy to difficult, and known to new. It is important to highlight that the number of elements (one or more balls, racket substitution), teammates and/or adversaries must increase as the child develops. We recommend the constant use of the racket, taking weight proportion and size in comparison to the child into account. Considering a task proposed by coaches, the child notices stimuli (visual, tactile, optical, and kinesthetic) and is put under constraints/restrictions of pressure (time, precision, complexity, organization, variability, and physical strain/stress) (Figure 1). From this stimulus come the affordances, which is, the way/personal interpretation as each individual comprehends what to do to solve/execute the task (Greco et al., 2020).

Time pressure	Tasks to minimize time or maximize speed of execution.
Precision pressure	Tasks that one must be as precise as possible.
Complexity pressure	Tasks to solve several demands successively, sequentially, and one after another.
Organization pressure	Tasks to overcome simultaneous demands, double tasks.
Variability pressure	Tasks to solve demands under different ambient and situational conditions.
Physical strain/stress	Tasks to solve demands under psychic and physical strain/stress conditions.

Figure 1. Definition of coordination pressure conditions. Source: Roth, Kröger & Memmert (2017).

PROPOSAL OF ACTIVITIES APPLIED TO MOTOR COORDINATION

As to illustrate the referred proposal of contents applied to motor coordination, we presented three examples of practice with the rightful explanation of which perceptions are stimulated and which are the conditions/restrictions and pressures of each one.



Description: Several students form a circle and stand the racket on the floor with its head down, and handle up. As the coach signals, and according to previous guidance, students must turn left or right, attempting to control the racket balance of another teammate before it falls down.

Pressures:
Time: control static balance of the racket before it falls down.

Analyzer/perception:
Visual, acoustic, vestibular and tactile.



Description: In pairs, students stand four meters away from each other. By using one ball, student A passes a ball thrown from bottom to top to student B. B waits its bounce on the floor and picks the ball using the T-shirt (as a kangaroo pouch).

Pressures:
Time: student must pick the ball before its second bounce.
Precision: throw the ball aiming the target (teammate's T-shirt).

Analyzer/perception:
Visual, tactile and kinesthetic.



Description: Students A and B, from a 2-meter distance from each other, must lead a ball on the floor with the aid of the head of the racket, keeping it vertically as they perform the cone slalom drill. Student B must touch student A before getting to the last cone slalom.

Pressures:
Time: A must complete the cone slalom drill before being reached by student B.
Complexity: leading the ball as they perform the cone slalom drill.

Analyzer/perception:
Visual, tactile and kinesthetic.

Complementarily, click the following QR code to visualize further examples of recorded activities related to motor coordination development.



CONCLUSIONS

The application of game tasks that include aspects of perception and challenges to be overcome collaborate to develop motor coordination, favor children to establish internal and external relationships with the situations to be solved in this context. While playing tennis, relevant signals exposed, such as speed of actions and high precision of techniques demand players to acquire an education based on coordinative stimuli since the beginning of the practice.

CONFLICT OF INTERESTS AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





The contribution of tennis to motor literacy from 4 to 6 years of age

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ABSTRACT

Tennis contributes to the motor literacy of its practitioners from the early stages of training. The adaptation of equipment, space and methodology should allow the athlete to learn in a simple way and close to their skills that are in the process of progressive development. General and specific coordination play a relevant role in all this process as they will allow the athlete a greater and better ability to adapt and resolve new learning situations, and this can be facilitated with multisport practices. We must also consider the social and emotional aspects that accompany any process of improvement in tennis, respecting the rhythms and learning styles of each athlete.

Key words: motor literacy, mini-tennis, sports initiation.

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INTRODUCTION

This article focuses on the initiation to tennis in the stages of four to six years. This is a stage of child development in which the development of coordination skills begins, the lateralization process and the body scheme is assimilated.

We start from the reference of the publication of the book "Tennis Base - Mini Players" (Rocca & Campos-Rius, 2020), which brings together methodological orientations of tennis in the stages of initiation with a broad and globalizing vision considering the motor literacy and long-term development of the athlete.

The proposal recognizes key aspects such as motor literacy, the role of coordination in the training of the athlete and the adaptation of the material, space, and methodology in the process of teaching and learning tennis, and the social and emotional aspects of the teaching and learning process.

MOTOR LITERACY IN THE INTRODUCTION TO TENNIS

The introductory stage of tennis should initiate motor or physical literacy which, according to Whitehead (2010), is "the motivation, confidence, physical competence, knowledge and understanding to sustain physical activity throughout life".

At this stage it is very important to know what are the characteristics of young athletes and work together in coordination with the activities done in children's physical education carried out in educational centres (Solanelas, Campos & Morejón, 2000; Buszard, Reid, Masters & Farrow, 2016; ITF, 1998; Hebert, Landin & Solmon, 2004; Luiz, Rodrigues & Aparecida, 2019; Sánchez-Alcaraz, 2013; Temple & O'Connor, 2005; Tomov & Ivanov, 2012; Torres & Carrasco, 2005).

Therefore, as stated by several authors (Avilés, Campos & Abarca, 1996; Crespo, 2002; Douvis, 2005; Elderton, 2009; Goodway, Ozmun & Gallahue, 2019; Sanz, 2012; Zetou, Koronas, Athanailidis & Koussis, 2012), it is important to provide children with varied experiences that foster creativity through discovery and experimentation with the material, their own body and the practice space.

The multisport practice in teaching is a very valid means for the development of general coordination to be able to generate transfers between different sports and racket sports to end up in the practice of tennis (Letort, 2002). It can be raised from different criteria: variants of tasks, with diverse material and with limitations in the execution of the actions to be performed (Aznar, 2014; Fitzpatrick, Davids & Stone, 2017; Sahan, Erman & Ertekin, 2018; Sanz, 2017).



Figure 1. Experimenting with the material and the playing space.

THE ROLE OF COORDINATION IN THE TRAINING OF THE ATHLETE

Of particular importance is the work on general dynamic coordination through walking, running and jumping as the most effective skills; and quadruped, crawling and climbing as less effective skills, as well as propulsion and transport (Temple & O'Connor, 2005).

As per the specific dynamic coordination, when we incorporate the ball, different body segments and/or extremities can intervene. In this case, to improve the eye-hand coordination we should work on throws, catches, drops, hits, and drives; and when the lower limbs are involved, we will work on hits, deflections, drives and stops. In eye-head coordination we work on deviations, driving and stops (Figure 1).

The proposal of motor circuits allows the children to be in constant movement, the time of motor commitment is high, and the learning can be greater.

ADAPTATION OF THE EQUIPMENT, THE SPACE, AND THE METHODOLOGY

Several authors (Letort, 2002; Crespo, Reid & Miley, 2004; Vesseaux, 2003) state that a child is not a miniature adult. This is why the literature provides evidence on the need to adapt the demands of adult tennis to the possibilities of the child, and this is observed in the size, weight and shape of the rackets, balls, dimensions and shapes of the playing space, and the aspects related to communication and the teaching methodology (Hammond & Smith, 2006; Kachel, Buszard & Reid, 2015; Dillard, 2003).

The shape of the playing field and its dimensions, as well as the modification of the height and location of the net or obstacle to overcome are elements that facilitate learning in different situations and allow the global vision and the sense of the game.

Goodway, Ozmun & Gallahue (2019) describe what the general characteristics of athletes in formative stages are: on a cognitive level, the imagination they possess, the facility to express thoughts and ideas verbally, and their eagerness to investigate and discover; on an affective developmental level, egocentrism, and fear of novel situations; and in relation to motor development, they tire quickly.

At a methodological level, rows are reduced or eliminated, baskets are not used, and balls are not thrown in a repetitive way. By doing this, it is possible to work at the same time with many children by using the stations, with self-throwing and working in pairs or small groups.

The initial parts of the sessions are planned without racquet to work on displacements and mobility; the throwing of balls with both hands to targets at ground level and hitting with racquet to different targets is encouraged.

Progressively, when the children have more skill and precision, you can ask them to hit the ball while moving towards the net and then over it, emphasising the importance of touching the ball softly, without excessive power, and setting targets at a short distance.

RED BALL GROUP



HAND THROWS

Allow children to begin throwing with both hands to master the direction, the necessary momentum, and prepare to make a similar motion with the racquet.



RACQUET DRIVING

Instruct them to carry the ball near their body, on the ground. In this way, they can also be left to explore ways of taking the racket, which they will adjust to their need and comfort.



PUSH WITH THE RACKET

If we ask them to push the ball towards a target with the racket, they will be working not only on the direction, but also on the orientation of the body at impact.



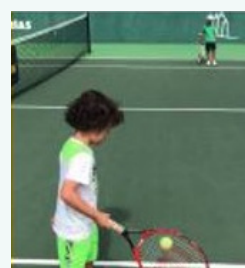
LET IT BOUNCE AND HIT

By letting them throw their own ball to hit a forehand, we are teaching them how to position themselves to hit, crossing the free arm (shoulder rotation), and gain autonomy from a very early age.



HIT IN THE DIRECTION OF THE COACH

Giving them a target will always keep them focused on the shot they are going to hit and learn to control their shots from the start. Every ball they hit should have a target and a meaning.



INTERACTION WITH PEERS

Having always worked with control of direction and power, the interaction between partners will be facilitated. Tennis is a sport of exchanges, the sooner we achieve this, the sooner our students will be able to feel they are PLAYERS.

Figure 2. Coordinative skills in the early stages.



Figure 3. Equipment adaptation during play.

SOCIAL AND EMOTIONAL ASPECTS OF THE INITIATION STAGE OF TENNIS BETWEEN THE AGES OF 4 AND 6 YEARS OLD.

From the perspective of attention and emotions, it is necessary to know the children, to understand the language we should use with them, for how long to talk to them, what kind of skills and abilities we can work on, and which ones we can't to avoid frustration.

Tennis is taught and trained as a group but is competed individually. During the sessions, the coaches give instructions, but during the matches, they cannot talk to the players. In other words, we train in a different way than we compete. That is why it is important that the player knows how to understand the game (Sánchez-Alcaraz, 2013). To achieve this, it is necessary that they first know their capabilities, develop their skills, and then focus their attention on mastering the tools that facilitate their task.

We must try to ensure that every child who starts to practice this sport experiences joy in doing it, feels capable and is part of a group.

The work should be progressive, based on three key concepts: fun, creativity, and dynamism.

- Fun: it is essential that the children find in the classes a space for relaxation and happiness. But always, the activities carried out in search of fun must have a useful basis and content.
- Creativity: we should know how to exploit it, and allow children to express themselves freely within the proposed activities. Do not robotize, allow exploration, create different situations so that the routine does not cause boredom. The coaches should also do the activities, propose new and challenging exercises, both for themselves and for the pupils.

- Dynamism: classes should be very active. Repetitive exercises, focused on technical gestures, tend to bore children, and make the session lethargic. Stations, motor circuits, cooperative work, etc. There are many ways to keep the students in constant movement.

On the other hand, all tasks should be adapted to the individual abilities of the players. That is to say, do not set the same objectives for the whole group. Do not let a difficulty become a frustration.



Figure 4. The recreational and social component in the initiation to tennis

CONCLUSIONS

It is important to emphasize the need to put the athlete at the centre, especially in the early stages of their involvement in tennis. Motor literacy must allow them to practice our sport for many years, and this is easier when they have a good multi-sport motor base that supports the specific skills of tennis.

The adaptation of the sport to the athlete (and not the other way around) allows learning to be richer, deeper, and longer lasting. And the mastery of methodological aspects that facilitate environments and climates of attention, continuous improvement and fun will also allow the development and training to be more efficient and effective.

CONFLICT OF INTERESTS AND FUNDING

The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Practical coaching applications for children in the four to six-year-old range: Perspectives from the USTA's American Development Model

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ABSTRACT

The principles discussed in this article have been designed for junior players of all ages and abilities, and therefore, are translational to 10 and under tennis. These are the same principles that are represented in the USTA's American Development Model (ADM). The theory behind the principles will be relayed and then practical applications will be put forward that are pertinent to 4-6-year-olds and speak to long-term athletic development. The overall premise of the ADM is to attract, engage, and retain young players and keep them playing for a lifetime.

Key words: 4-6 year olds, long term development, American Development Model.

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INTRODUCTION

The use of modified tennis equipment has been present in the United States for decades. The intensity in its outreach to engage more ten and under players started in conjunction with the ITF's launch of the Play and Stay campaign in 2007 (ITF, n.d.). The United States Tennis Association (USTA) began with a pilot project named 36/60 based on the dimensions of red and orange courts. That pilot became the impetus behind the Quickstart program, which gained some momentum for a few years. Presently, programming that uses modified court sizes and equipment is simply referred to as 10 and Under Tennis (Davies, 2017; Gould et al., 2016).

In 2017, the USTA launched a new youth platform named Net Generation. It presented a solution to the lack of a digital platform for any parent or player to find local tennis programming or instruction (Davies & Morris, 2018). The value proposition of coaches becoming a Net Generation-Certified Provider had two primary benefits. First, coaches could become SafePlay approved for no cost, which was an unprecedented benefit for parents and players (USTA, n.d.-b). SafePlay approval signified that coaches underwent a background check to ensure they had no criminal history involving children. Second, coaches would have access to a myriad of innovative resources such as curricula, videos, and marketing materials (USTA, n.d.-a).

The application of modified tennis equipment was an integral part of the Net Generation Curriculum (USTA, n.d.-a). Coaches assume different roles and responsibilities based on the audience. Three coach profiles served as the basis for curricular development: industry-certified coaches, community coaches (non-certified), and K-12 teachers (Davies & Morris, 2018). The purpose of the curriculum was to empower coaches to use modified equipment to attract, engage, and retain diverse



populations and promote lifetime play. The emphasis on modified equipment was predicated on the ITF's evidence-based research findings that highlighted the top 6 benefits of modified equipment: more fun, more success, better learning, smarter tactics, better technique, and safer play (ITF, 2018).

The USTA has always been a proponent of using Long-Term Athletic Development (LTAD) principles in its outreach programs, including competition (Balyi et al., 2013). A USTA-appointed task force created a tennis-specific American Development Model (ADM) to make a close connection between LTAD and modified equipment (Davies, 2020). The development of sport-specific ADMs was a United States Olympic and Paralympic Committee (USOPC) challenge issued to National Governing Bodies (NGBs) across the USA. Its guiding principles are age and stage-appropriate development and key definitions to ensure sport-wide continuity (USOPC, n.d.).

As part of Net Generation, curricula have been created following established competencies for each stage of a modified equipment program. By having competencies for each stage, coaches can guide their athletes as they take their personalized journey to the yellow ball. The use of modified equipment is an influential component of introducing the game of tennis to beginner and intermediate players of all ages for the USTA's ADM. A comprehensive approach was taken when putting the curricula together to engage coaches of all profiles from PE teachers, to non-certified coaches, and certified coaches (USTA, n.d.-a). The progressions in play with modified equipment are also represented in competition. Team competitions are available in all three ball colors with sanctioned tournaments available in orange and green. For developmental reasons, no 10 and under events offer rankings points.

With that being stated, there has been little attention paid to children between four and six. Thus, the purpose of this article is to address the above-mentioned principles of 10 and under tennis-specific to those younger years. The theory behind USTA's ADM will serve as a guide to relay practical applications that equally pertain to these earlier years of entry into tennis. One of the overall premises of the ADM is to attract, engage, and retain younger players by using developmentally-appropriate strategies that will keep them playing for a lifetime. New players between the ages of four and six can also benefit from the ADM's proven methods, but specific considerations must be applied.

PERCEPTIONS OF YOUTH SPORT PARTICIPATION

Before delving into principles, it is necessary to provide a contextual background of youth sport participation in the USA. In 2018, the USTA's ADM development began by assembling a task force that represented diverse backgrounds. The first step was to invite youth sports expert stakeholders to share insights on what would bring future success to tennis. It quickly became apparent that tennis lacked theoretically-proven strategies at the beginning stages of a young athlete's journey. The popularity of basketball, soccer, American football, and baseball required tennis, and other sports for that matter, to redesign an approach to ensure growth.

Additionally, four different sport NGBs shared valuable insights. USA American Football, the USGA, USA Lacrosse, and USA Ice Hockey provided much guidance (USA Football, n.d.; USA Hockey, n.d.; USA Lacrosse, n.d.; USGA, n.d.). All four had either completed or were going through the process of creating an ADM. Much value was obtained by understanding the processes undertaken from other sports that were eventually applied to a tennis-driven ADM.

Another valuable stakeholder was The Aspen Institute. During the process of building the tennis ADM, they launched eight groundbreaking principles from their Sport for All, Play for Life Playbook (The Aspen Institute, 2015). The institute felt that these principles, called the 8 Plays, could reimagine youth sport. Three of the Plays resonated with the task force to such a degree that they served as fundamental themes. They were encouraging sports sampling, design for development, and thinking small. As a result of those mentioned above and invaluable stakeholders, the early part of 2019 saw the creation of a tennis-specific ADM that represented a framework for individualized success to support a lifelong love of tennis. The tennis ADM's seven integral principles are universal access and opportunity, multi-sport participation,

developmentally-appropriate play, parent education, athlete-centered fun, a clear developmental pathway, and education for coaches and officials. Some of these principles will be addressed in this article and contrasted with tennis participation among four to six-year-old children. Therefore, each section will begin with a theoretical principle from the ADM, followed by a practical applications subsection.

ADM PRINCIPLES AND PRACTICAL APPLICATIONS

Universal Access and Opportunity

The concept of universal access and opportunity is a staple of both the ADM and the USTA. As an NGB, the emphasis is on making sure playing tennis is safe, accessible, local, and affordable. The goal is that everyone, regardless of race, color, religion, age, national origin, ability, socioeconomic status, sexual orientation, or gender identity, has access to the benefits of tennis. The aim is to create an inclusive framework for all children to have access and opportunity to experience the benefits of physical activity and be on the pathway to playing the game on their own terms.

Practical Application:

Successful coaches should be hyper-aware of how to integrate tennis into a younger child's daily physical activities. Finding access and opportunity in the four to six-year-old space can be challenging. But, a great place to start is at local pre-schools and elementary schools (public and private). Most school administrators are open to partnering with local organizations to bring innovative opportunities to students. Community and stakeholder involvement is a crucial element of school and student achievement. Thus, there could be opportunities with the schools to volunteer and help the physical education teacher deliver tennis during one or a series of classes. If there is a before or after school program, that could also be an appropriate avenue. Once a rapport is established with school personnel, tennis-oriented activities could be sent home to parents. Becoming that conduit between the parent and child to provide physical activity through the lens of tennis play and having fun is a beautiful opportunity to showcase how families can play together.

Multi-Sport and Multi-Activity Participation

The second principle is how young athletes can follow a multi-sport or multi-activity approach. A multi-sport approach that can include tennis contributes to building athletes in a holistic manner. The mission of the USTA's ADM is to attract, engage, and retain more athletes and keep them playing tennis for a lifetime. Recently, early specialization has become problematic and is symbolic of sport professionalization over the last two decades. A proven solution for developing better athletes at a younger age is to promote sport sampling. Participation in sport sampling has also proven to contribute to better-performing athletes and longevity in physical activity.

Practical Application:

Kids should be encouraged to play other sports, and parents must be made aware of the benefits of this strategy. Research has identified that kids who participate in multiple sports have increased physical capacity, better motor skills, remain in sports longer, and have a more significant opportunity to build

social and emotional skills (Roetert et al., 2018). Parents will appreciate a coach being more concerned about their child's holistic development when playing multiple sports. This proven multi-sport approach is how coaches can help children develop appropriately. Incorporating other sports activities in tennis lesson plans such as soccer skills, throwing a football, or dribbling a basketball will increase athletic development and overall fun. This is especially important for children at much younger ages who are still developing in many ways. Tennis facilities can also form partnerships with other sports. Cross-promotion with other programs can engender meaningful coach collaboration opportunities that benefit both the coach and child. Sport specialization, if desired, should ideally occur after the age of 12 and after playing multiple sports (Popkin et al., 2019).

Developmentally-Appropriate Coaching and Play

Relationship building with the player is crucial for their development. Evaluation and analysis of a new child is a primary first step in quality coaching. Children develop at different rates and times, which requires a basic understanding of growth and development to establish standards of coaching delivery. Even more consideration in four to six-year-olds should be given to this area due to more significant variances in development. In the tennis industry, often, programs are organized by age categories. This is done for the ease of marketing, socialization, and organization. However, two five-year-old children standing side by side will not have the same developmental readiness. There are many factors to understand how coaches should offer developmentally-appropriate coaching to four to six-year-olds, and there is a definite need for more research in this area. Nevertheless, great coaches should emphasize understanding an athlete's developmental level instead of their age. Hence, rapport establishing is a keystone of any great teacher.

Practical Application:

Due to the even shorter attention spans of children aged four to six, much emphasis should be placed on learning how to promote more engagement. Simple techniques such as using quick transitions, prior organization, high energy, and creative equipment that appeal to younger audiences can be helpful. Seeking more information on differentiation of instruction, multiple intelligences, and emotional intelligences can enhance a coach's ability to pivot to another game plan if breakdowns occur (Dufour & Marzano, 2011). Ensuring they are engaged and active is crucial to having a great first experience and retaining them in the sport. A great example of sound programming is the Net Generation Red Ball Curriculum for this age category. Six lessons comprise the Pre-Rally unit (USTA, 2017). It is full of activities that guarantee high levels of engagement, are developmentally appropriate, and allow for progressions and regressions. Creative coaches can even further modify some of those activities and use foam balls, which are larger, safer, and easier to hit.

Parent Education

Parent education aims to provide the information needed to guide healthy and appropriate tennis development. The USTA's ADM website and information within were written with parents in mind. They are vital resources for coaches to further enhance a child's enjoyment, motivation, and overall positive development. The ADM ensures that all information



about tennis development is inclusive and accessible through various outlets, including, but not limited to, digital platforms and tennis programming. As the NGB of tennis, it is the USTA's responsibility to share philosophy, directionality, strategic plans, and tools needed to assist diverse communities and to grow the sport of tennis to keep people playing for a lifetime.

Practical application:

The challenge with parent education is making sure that the information received is both palatable and learner-centered. Parents desire to see their children involved in programs that have a reputation of being the best. Yet, there are few tennis programming options for younger children due to some of the mitigating factors prior stated. Four to six-year-old children have not been exposed to many organized sports programs and, therefore, will still be early in their decision-making regarding what they deem fun. Programming that appears fun, engaging, and cost-effective will be appealing to parents. However, a pamphlet or one-page document explaining the ADM principles will have a powerful effect on a parent's perception of a particular program. It is also recommended to schedule parent meetings that are intended to share information and promote meaningful discussion. During meetings, coaches can also share skill development activities that can be done at home. By showing organization and a desire to communicate with parents, they will indubitably appreciate the extra effort offered by a coach period as it is commonplace for younger-aged programming to be less strategy and theory-based.

Fun and Athlete-Centered

The ADM emphasizes creating a fun, positive, and engaging atmosphere within an inclusive team culture rather than focusing on wins and losses. The definition of "fun" may change as participants advance in ability and skills, but a standard emphasis on making the process positive and enjoyable is essential. Youngsters also enjoy being team members, so the more they are in groups while participating, the better. At the primary level, in the American public education system, "centers" are a critical part of pedagogy (O'Grady, 2013). Young children will be accustomed to being in groups and moving from one activity to another. Sport commitment models and theory are typically based on developing practical applications to enhance enjoyment (Balyi et al., 2013; Cassidy et al., 2004; Cote et al., 1995; Deci & Ryan, 2000). The USTA's ADM also aligns with this simple notion.

Practical Application:

A practical way to create an environment full of enjoyment in the four to six-year-old space is by simply talking about "fun." Coaches should make constant references to the fun aspects of each part of the lesson. They should also ask the players frequent questions about what is fun. By ascertaining what fun means to the child, coaches can reflect on ways to make subsequent lessons more fun-oriented while still focusing on skill development. Due to their budding and variant levels of cognitive development, they might not know what enjoyment means. Attempts at seeking alternative ways to ask them this information should be part of lesson planning. Another simple suggestion is to ask them what game they would like to play, which enhances relationship building.

CONCLUSIONS

There is little academic research in coach education and player development for children six years old and younger. However, the ADM for tennis addresses all ages and stages of development along anyone's tennis journey. Therefore, practical ideas were presented in this article to address ways to enhance programming for children between the age of four and six. The central notions presented were universal access to tennis, promotion of playing multiple sports, using developmentally appropriate coaching methods, parent communication and education, and the overemphasis of fun. A final recommendation is for coaches worldwide to create communities of practice to share ideas and best practices. Until there is more empirical research that can be included in coach certification programs to serve this niche age group better, collaboration can prove beneficial for the creation of further best practices.

CONFLICT OF INTERESTS AND FUNDING

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RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)





Cornerstones of teaching tennis for children aged four to six years

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ABSTRACT

The first tennis training stage, which usually takes place between four and six years of age, cannot simply follow an adult training regime with quantitatively reduced loads. Training should account for children's cognitive, emotional, social, physical and motor development. This article highlights the cornerstones of early tennis teaching, including fundamental motor skills, which help to develop more complex motor actions, and motor abilities, especially strength fitness, which determines posture, jumping, running and throws. This is achieved through fun plays and games, which should include various coordination tasks providing motor experiences and develop more complex actions in future. The suggestions featured in this article may be of great interest to coaches working with children, as they relate to some of the core aspects of working with players in the fundamental stage of tennis development.

Key words: motor experiences, fun games.

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INTRODUCTION

The initial stage of tennis training involves the completion of specific goals that differ from those expected from youth or adult players (Pankhurst and Balyi, 2004; Smith 1990). The first few years are devoted to whole-body training, which lays the foundation for the subsequent stages of training and specialisation (Pankhurst and Balyi, 2004). In recent years, both parents and sports club managers have been expressing interest for children to take up tennis training at an increasingly early age (Payne and Issacs, 2016). Sometimes football or martial arts units recruit even 2- or 3-year-olds. This trend is an encouragement to consider starting tennis training even as early as 2 years of age. However, this requires coaches working with the youngest players to be able to combine in the training process the goals related to tennis performance, the parents' interest and, most importantly, the needs of the participating children.

Coaches working with children must be familiar with the manifestations of early childhood development and be able to use this knowledge to build the foundations for the future stages of tennis training and account for a child's cognitive, emotional, social, physical, and motor development (Payne and Issacs, 2016). One of the principles related to coaching 4-6-year-olds to implement is that children are not miniature adults (Smith, 1990). Consequently, child coaching cannot simply follow a training regime designed for adults with quantitatively reduced training loads.

Furthermore, coaches should take the long-term perspective into account, because once children reach biological maturity, i.e. after several years of training, the tennis they will participate in will be much different from the one they are familiar with now (Spengler, 2014; Balyi et al., 2013; Malina,



2010). The aim of this article is to highlight the cornerstones of teaching tennis at the early stage (4-6 years old) based on developmental considerations.

MOTOR DEVELOPMENT OF 4-6-YEAR-OLDS

Motor development "is the process through which a child acquires movement patterns and skills" (Malina et al., 2004). The preschool period involves rapid motor development due to a high sensitivity to stimuli related to the undertaken physical activity. Children are highly sensitive to learning new basic motor skills. The rate of development also differs between individuals, sometimes amounting to even as much as 18 months (Payne and Issacs, 2016). During this period, motor development is strictly connected with physical, emotional, cognitive and social development (Kuzik et al., 2020; Payne and Issacs, 2016).

Four-year-olds are similar in stature to three-year-olds, with a large head, long trunk, short limbs and inefficient feet. Their muscles are still weak. They also fatigue fast and are unable to perform intense physical effort for long periods of time. Large muscles are better suited for physical exercise; and due to the ongoing innervation and myelination of the hand muscles, 4-year-olds display a low level of fine motor abilities (Owczarek, 2001).

They can jump and hop fairly fluently, often spontaneously and intuitively combining these movements with walking and running. Their throwing performance also increases: children begin to combine the preparation phase with the main phase, and they enjoy throwing both at a distance and at a target (Payne and Issacs, 2016). Furthermore, they are able to catch a ball thrown by the coach with good precision, typically using the trunk. Five-year-olds develop at a considerably higher rate. Thanks to the maturation of the central nervous system, children's movements become harmonious and increasingly more precise and efficient (Unierzyski et al., 2019; Gallahue et al., 2012).

The ability to maintain balance also improves significantly (Unierzyski et al., 2019). Five- and six-year-old can throw from the forward lunge position, while six-year-olds show a much better grip. Six-year-olds are also able to balance excitation and inhibition processes, which leads to improved agility and dexterity, as well as focus on the performed task (Unierzyski et al., 2019).

FUNDAMENTAL MOTOR SKILLS

Fundamental motor skills (FMS) can be defined as "an organized series of basic movements which include a combination of movement patterns of body segments" (Gallahue et al., 2012). They are the building blocks for the development of more complex skills. FMS categories include locomotor (e.g. running and hopping), object control (e.g. catching and kicking), and stability (e.g. balance and body roll) skills (Hulteen et al., 2018; Gallahue et al., 2012).

A rich base of motor skills allows children to quickly adapt to changing conditions and is crucial in learning new skills in sport. Conversely, development based on early specialisation, contrary to a well-rounded building of motor skills, may cause injuries, burnout, loss of motivation, and reduced physical activity over lifetime, which is frequently a result of a limited movement skill set (Myer et al., 2016; Goodway and Robinson, 2015).

STRENGTH FITNESS

In addition to activities fostering the development of motor skills, junior tennis training should build strength fitness. Strength fitness is a global term that includes the phenotypes or observable characteristics of muscular strength, muscular power and local muscular endurance (Faigenbaum and Bruno, 2017). Many authors agree that an appropriate level of strength fitness is indispensable for correct jumping, running, throwing, and kicking and for a correct posture (Faigenbaum et al., 2018; Faigenbaum and Bruno, 2017).

However, throughout the years there have existed numerous fears and misinformed concerns that strength training could be harmful for the developing skeleton and result in bone injuries. They have not been supported by scientific reports



or clinical observations (Lloyd et al., 2013). Today, the consensus statement on building strength allows, or even encourages, developing muscle strength in children, as long as basic safety and strength fitness training guidelines are followed (Faigenbaum et al., 2016; Lloyd et al., 2013). This is particularly important considering the growing physical inactivity among children in recent years, which means that children do not spontaneously build their strength during play at home or outside.

In the case of tennis, training of 4-6-year-olds can revolve around mimicking the movements of animals, e.g., the crocodile, frog or snake. Thus, following the 'talk the child's talk' principle by referring to animal movements with a proper exercise technique can help to creatively paint a picture of the desired movement patterns (Faigenbaum and Bruno, 2017).

FUN GAMES

The most popular activities for building skills and abilities in tennis training with 4-6-year-olds are fun games due to the fact that plays and games (tag games, arrangement games, throwing games ect.) are the basic form of children's physical activity (Payne and Issacs, 2016). Children want to have fun and make friends. Playing lets them learn from their surroundings through activity and exploration. Fun is accompanied by positive emotions. Unfortunately, plays and games are often selected randomly for sports training programmes.

Selecting tasks for junior tennis training must allow children to build both basic and fundamental motor skills based on a well-thought-out programme. Plays and games should not be reduced to time-filler tasks; rather, they should develop motor abilities and teach children about the movement of the body. Plays and games allow children to familiarise themselves with the properties of their bodies and learn to move with varying speed and directions and throw at a target and at a distance, as well as develop their grip.

They primarily build motor coordination, thus improving spatial orientation, differentiation, lateralisation, rhythm, balance and reaction time, which are all extremely important aspects of a tennis player's development (Motor Skill Learning PE Teaching System for 3-7-Year-Olds, 2019). Plays and games require children to choose colours or shapes and assess spatial configurations; they also help to improve observation and prediction skills, often under time pressure. Plays and games

also teach children to deal with victory or defeat and to make independent decisions. They are an indispensable part of child-friendly exercise programmes aimed at developing the skills and abilities of a future tennis player. The initial stage of training often includes building motivation for playing tennis. Plays and games that are fun can produce a lasting willingness to participate in sports classes. Coaches play a major role in the organisation and selection of plays and games. They build upon their knowledge, creativity, passion, perseverance, long-term thinking and sense of humour to fully implement the training goals relevant to a given stage.

MOTOR EXPERIENCES AND VERSATILITY

Small children do not specialise in any particular activity; rather, they are versatile, and are curious about the diversity of their surroundings. This means that coaches should create situations that foster the acquisition of complex motor experiences. This includes exercises carried out on various surfaces, using balls of different weight, texture, size or shape, as well as bouncing tennis balls while turning around, hopping, and standing on one leg or on Bosu balls. The importance of motor experiences for physical, social and brain development of a child is fairly often underappreciated.

Applying movement in the shape of specifically-matched games and exercises is a means to create a 'neural network' (Johnstone and Ramon, 2011). A child's constant exploration of the surrounding world is expressed in the brain as an ability to create new neurosynaptic junctions or prune redundant ones. Their number decreases with the child's age, and the pruning results in 20 billion of junctions disappearing every day starting at the age of 2 years until adolescence due to the brain removing inactive junctions to make room for active ones. Everyday activity, including movement, is key to enhancing brain junctions.

The brain uses nerve cells from different regions to perform complicated motor tasks and achieve the desired effect. For example, playing a tune, riding a bicycle or hitting a ball requires activating cell junctions located in various parts of the brain (Hansen, 2021; Lelonek, 2019; Voss et al., 2010). The period of preschool education gradually reaches the stage of preschool balance called the golden period, which is characterised by excellent harmony between moves and ease of learning activities with a complicated coordinative structure. Fine moves are repeated and preserved. A child acquires the ability to collect and preserve motor experiences, thus creating muscle memory, additionally followed by the ability to derive pleasure from motor achievements, which increases the motivation to learn new moves.

Early-childhood motor experiences enable the formation of development pathways for more complex motor activities in later years. For example, 2-4-year-olds playing with a balloon will in future translate into the ability to catch a ball, and later still, to hit a ball with a racket. This is made possible by the building of perception and learning to assess the trajectory of an object during early childhood. Thus, the transition to the most advanced levels of motor skills relies on an early development of selected fundamental motor skills based on motor experiences (Hulteen et al., 2018). In turn, the development of motor experiences benefits from the use of variable, diverse tools, equipment, starting positions in exercises, methods of conducting sports classes and task variety. This approach is crucial for the long-term athletic development and lifelong physical activity (Lloyd et al., 2013).

CONCLUSIONS

Tennis training of 4-6-year-olds must be versatile. The aim is to build a baseline of motor skills, strength fitness and motor fitness, which will in future be applied in more advanced physical activities and sports training. This can be achieved by the use of a rich variety of fun but well-thought-out plays, games and exercises in order to immerse children in many different task-based situations and allow them to acquire motor experiences. Only with this enjoyable yet deceptively easy method can the well-prepared coach lay a foundation for the development of a future tennis player. Fostering long-term player development using the aforementioned cornerstones is the only possible way to achieve both the needs of a child and the long-term aims of tennis training.

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The authors declare that they do not have any conflict of interest and that they did not receive any funding to conduct the research.

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CONTENIDO ITF ACADEMY RECOMENDADO (HAZ CLICK ABAJO)





Building foundations for the future: A case study with LTA Youth

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ABSTRACT

This article discusses modern challenges experienced when developing tennis players including low levels of physical literacy. It then outlines the needs of a young child and learning strategies that can be used. A brief overview of some practical strategies for engaging early years participants, using a player-centred approach, are shared using examples from LTA Youth with explanations of how each exercise integrates key principles to attract and retain early years participants.

Key words: learning strategy, early years, attraction, player-centred.

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A CHALLENGING SPORT AND PHYSICAL ACTIVITY CONTEXT

Physical activity has been linked to better psychological well-being and improved physical health among children and adolescents, but studies have shown that sedentary time increases for all children between ages 6-11yrs (Jago et al., 2019). A project in children's physical literacy in the UK revealed a 6.2% decline in measures of balance, 19.7% decline in aiming and catching, 15.8% decrease in manual dexterity and 18.1% deterioration in overall physical development (Hart, 2015).

Alongside declining physical activity, studies have shown that 79% of Generation Alpha (age 5-9yrs in 2020) engage in a wide and extensive variety of television programmes, films, videos, music, and games (Beano, 2019). These games and videos are designed to engage young audiences through colourful, stimulating, and playful gamification concepts.

The decline in children's levels of physical activity and physical literacy presents a serious challenge for tennis because our sport is a complex coordination sport that requires a higher degree of skill when compared to many alternative activities. The above challenge sets a clear direction for the future of tennis and coaching; on-court programmes need to continuously evolve to meet the demands of the future participant; a participant that brings low levels of coordination coupled with an expectation for highly stimulating and fun activities.

It is critical that tennis coaching curriculums rise to this modern-day challenge by developing innovative, engaging environments for children that develop better physical literacy in tandem with long-term technical, tactical, physical, and psychological competence for tennis.

EFFECTIVE LEARNING STRATEGIES AND DELIVERY PRINCIPLES FOR EARLY YEARS

Early years children are like sponges with a high degree of neuroplasticity that allows for coaches to literally 'wire and sculpt' brains and movement patterns (Johnston et al, 2001). This exciting stage of tennis coaching presents huge opportunity if the right strategies are employed.

Player centred approach

To compete with challenges with digital screen times and video gamification, consider using stimuli, learning aids and activities that create an enriching environment like a playground or reception classroom. A fully child-centred philosophy will see tennis adapted to fit the needs of the child, as opposed to the child having to adapt to fit the needs of the adult game of tennis.

Importance & benefits of play

Play is crucial to the learning and development of children in the early years (Fleer, 2021). Children in these early years (4-6) are curious, like to explore, investigate and are creative. They therefore need opportunities to investigate, satisfy their curiosity, explore the environment (inside and outside of the play area) to extend their sense of wonder, experience success and develop a positive attitude towards learning. Play is therefore purposeful, and it can only truly be play when the child has chosen what to do, where and how to do it, a child-determined approach (Smidt, 2010).

Harnessing imagination, storytelling & analogy

The environment that we plan, set-up and create needs to allow young children to utilise their imagination through a shared ownership of the narrative, which helps them engage for longer periods. The use of effective storytelling and analogy from the coach in sessions can aid learning and mastery in early years coaching. Practically speaking, this

may mean a tennis ball becomes a 'meteorite' for a session with early years. Hitting a ball over the net onto a rubber spot could be described as a 'frog landing on a lily-pad.' Research has shown that use of analogy learning is an effective learning and motor development strategy (Masters & Maxwell, 2004).

Know their world

Investing time and energy getting to know the world of a child can help engagement and learning. For example, understanding key characters from their favourite programmes, films and cartoons can stimulate interest and a sense of familiarity within tennis.

Skill based (not technical/model-based) coaching

Early years sessions need to move away from traditional model-based coaching which can undermine long term skill development (Reid et al., 2007). Instead, sessions should expose kids to a full 360 experience of their surroundings, for them to organise their bodies to their surroundings and adapt to learn implicitly. Practically speaking, the direction of the racket face and how to hold the racket (on the handle) is in most cases all the technical input an early year's child should have.

ADDRESSING THE NEEDS OF THE PRE-SCHOOL CHILD

LTA Youth is a programme created to help more children enjoy the benefits of playing and staying in tennis, whatever their age, gender, ability, disability, or background. It has been developed to be fun, inclusive, and competitive, with specially designed progressive coaching and content that will help develop children aged 4-18 years.

LTA Youth: Stages

Approximately 1.25 million children aged 4-15yrs play tennis once a month in the United Kingdom (LTA, 2021). To facilitate the attraction of more early year's participants into the game of tennis, the LTA Youth programme introduced a 'Blue' stage which precedes the red-orange-green-yellow ball framework. LTA Youth Blue stage is designed for children who are approximately 4-6 years old to develop their fundamental movement skills and have greater success at red ball tennis and beyond.

LTA Youth: Principles

1. Having fun
2. Active and engaged
3. Appropriately challenged
4. Making decisions
5. Developing skills
6. Looks and feels like tennis

LTA Youth Competencies

To ensure all-round development, LTA Youth competencies span six integrated domains. More specific learning outcomes that support the development of these higher-level descriptors are included in each exercise.



Image 1. The six integrated competency domains within LTA Youth presented as part of a parent facing resource.

PRACTICAL EXERCISES: EARLY YEARS ACTIVITIES (LTA YOUTH BLUE STAGE)

Warm up: Meet & Greet

In this exercise, children are required to shout their name between repetitions. As a progression, the group needs to call out each player's name. Using names is a valuable social competency. Alongside this, players are required to make multi-directional movements around the purple balls on the outer perimeter and return to the middle. Coaches can describe the task using principles of imagination and analogy here to maximise engagement for early years participants. For example, instead of "run out to the blue ball and back," children can be encouraged to "take off in their spaceship and orbit a planet."

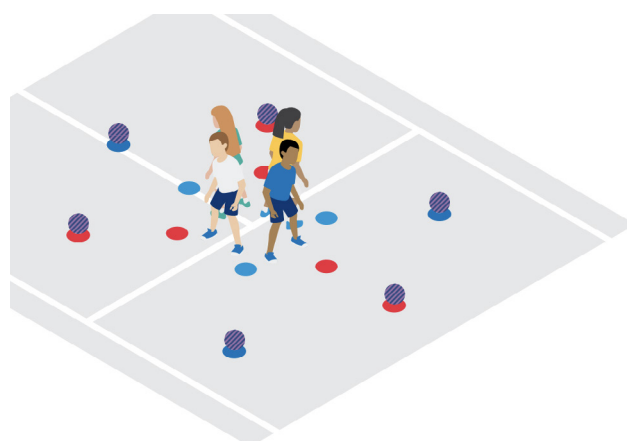


Image 2. The layout of meet and greet warm up is designed to challenge multi-directional and short movements, similar to those needed in tennis.

Body and ball: Roll and Recover

In this exercise, children work in pairs to practice sending and receiving a larger ball along the floor. They are also developing basic reactions and how to adopt an athletic stance. Use of storytelling might see a coach describe the task as “creating a large snow man by rolling a snowball.” Storytelling that is relevant to a child’s world, at that time, is key to engagement.

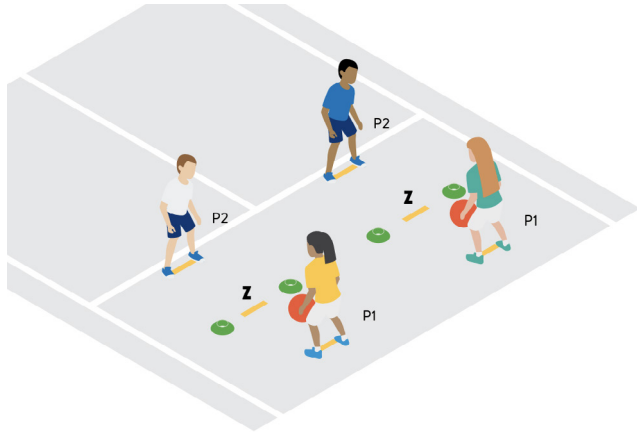


Image 3. Roll and recover exercise set up is designed to challenge send and receive skills of the early years participant.

Racket & Ball: Tennis Wizard

In this exercise a coach uses a version of floor tennis to guide players through an exciting obstacle course, whilst teaching fundamental technical skills including ‘contact point in front of shoes.’ Kids will use both dominant and non-dominant hands to build skill for both forehand and backhand. If standing on the red spot, they use their right hand. If standing on the blue spot, they use their left hand. Coaches can undertake this exercise with less equipment. However, this obstacle course aligns with the principle of ‘player- centred and child centred environment’ using lots of stimulating obstacles and hurdles, much like a playground environment.

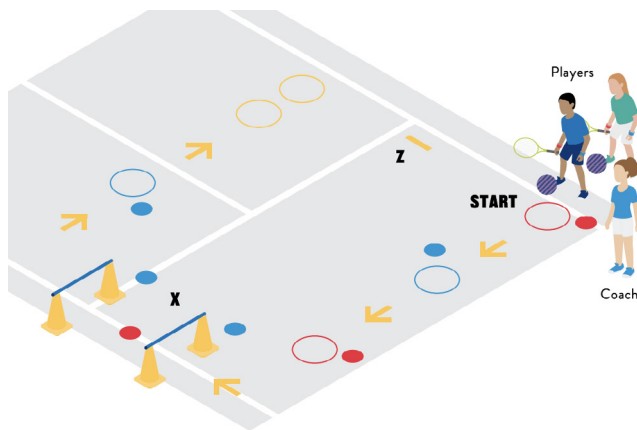


Image 4. Tennis wizard is a variation of floor tennis where extra hurdles and challenges are integrated to develop and stimulate skills.

Game: Tennis Towers

In this exercise the players start to experience the over-arm throw (serve development) whilst also building ball control for groundstrokes. Part one of the exercise involves moving the ball along the floor with a racket in hand. Coaches can harness imagination by explaining the ball is a dog and it needs to go for a walk, where the racket is the dog lead, for example. Each player can choose which set of hoops (far or near) to throw the ball from. The presence of options within the exercise builds in practice variability as well as providing decision making opportunities for children - a principle of LTA Youth. The object of the game is to knock over the yellow towers (cones). Again, coaches can harness a child’s imagination by creating a fictional narrative to accompany the exercise.

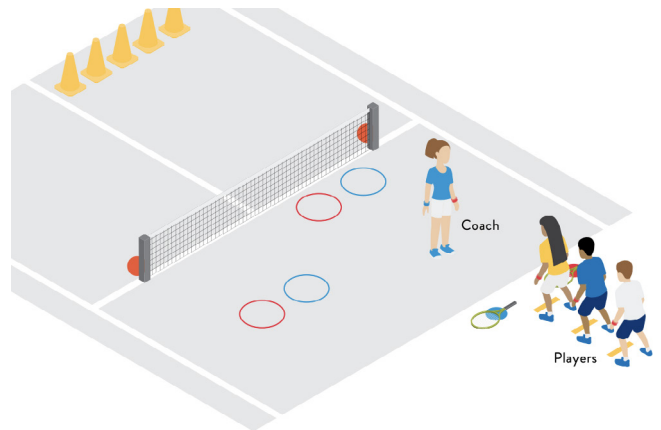


Image 5. Tennis towers is a fun exercise introducing over-arm throw whilst also testing skills already covered in the previous three parts of the lesson.

CONCLUSION

Attracting and retaining the future generation in tennis will be a significant challenge. It will require purposeful session design that is underpinned by sound learning strategies for young children. This article has highlighted a selection of recommendations through the lense of LTA Youth to help coaches with their delivery to this key audience. It is hoped that coaches utilise and apply these principles and techniques to lay foundations for future years, ages, and stages.

CONFLICT OF INTEREST AND FUNDING

The authors declare that they have no conflicts of interest and did not receive any funds to write this article.

Authors Note: LTA Youth on-court content was created collaboratively by the LTA, active British coaches and MultiSkillz experts from Coach2Competence.

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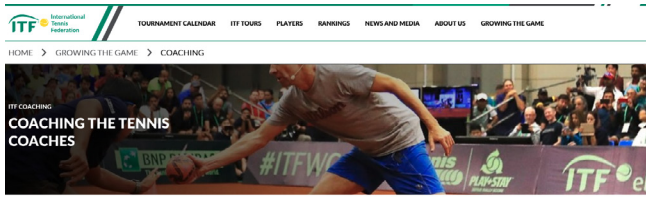
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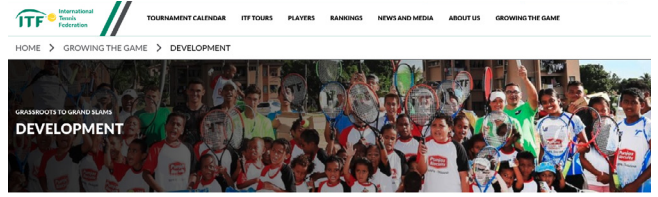


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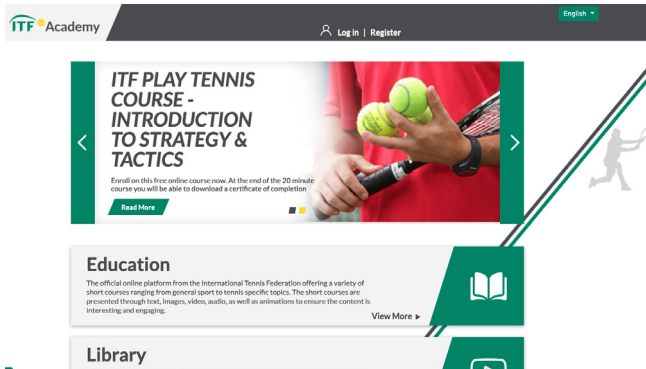
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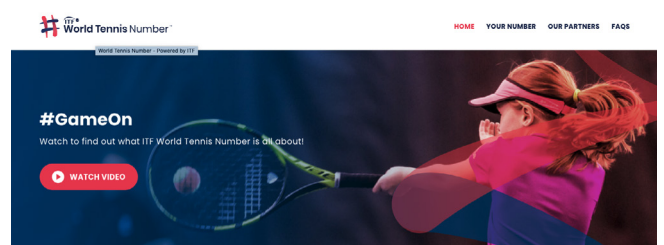
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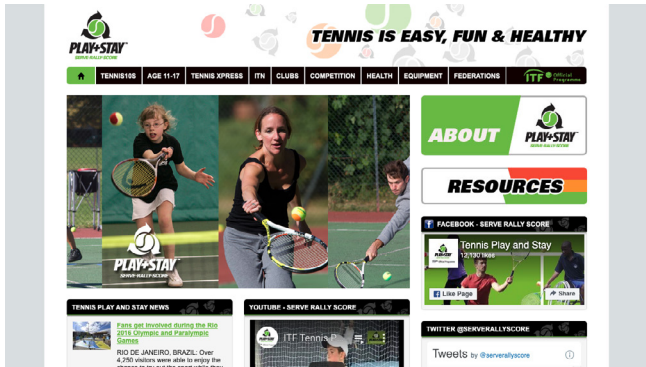
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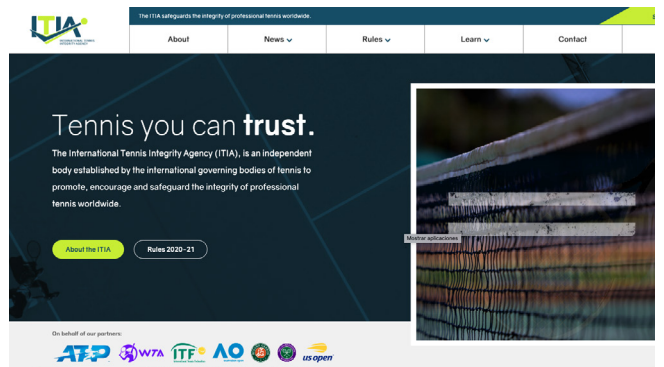
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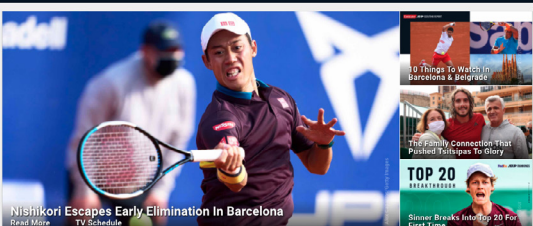
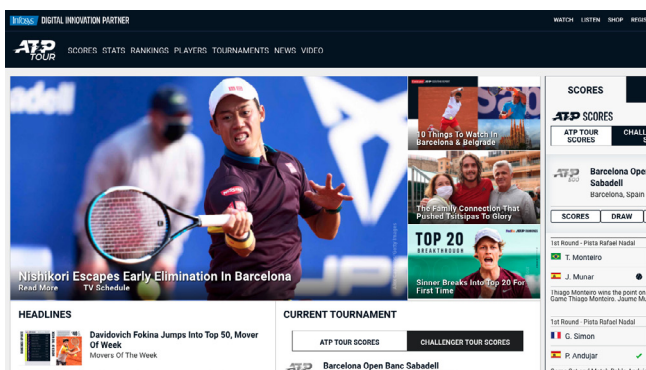
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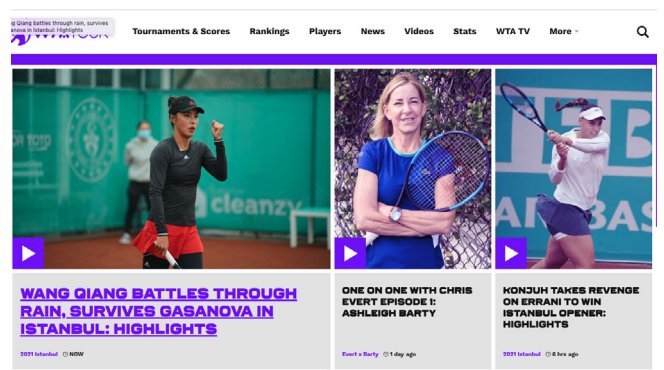
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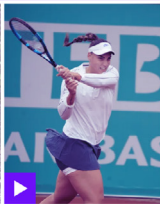
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