



Proposal for the early development of coordination skills in tennis players

David Sanz (ESP) and Jaime Fernández (ESP)

ITF Coaching and Sport Science Review 2016; 69 (24): 8 - 9

ABSTRACT

Among the different characteristics of the comprehensive development of a tennis player, there is an important one, its multi phase component. Above all, one of the bases of motor development during the maturity process of the player, has to do with coordination skills. It is considered that the development of coordination is an essential element in the developing stages of young tennis players, therefore, it should be part of the content of the programme from the very first stages, if it is expected for players to reach a competitive level. This article offers a number of guidelines and examples to improve and develop these coordination capabilities.

Key words: Coordination capabilities, motor development, nervous system maturation.

Received: 10 March 2016

Accepted: 14 June 2016

Corresponding author:

David Sanz

Email: david.sanz@rfet.es

INTRODUCTION

Coordination in tennis represents an indispensable capacity to optimize player performance (Born, 1999). Although it is true that tennis is a multiphase sport (König et al., 2001; Fernandez-Fernandez et al., 2009), technique is considered as one of the most important and determining qualities to reach top performance. This technical component, that has to do with the correct execution from the mechanical point of view, needs adjustment of the different body segments in space and time, to be able to hit the ball. This way, for the correct technical execution of the movement, one of the basic biomechanical principles applied to tennis will be taken into account (Elliott, 2006), the principle of coordination of partial impulses, that entails correct and timely participation of the body segments to perform a certain movement. This implies moving towards the ball, adjusting before hitting, hitting the ball and recovering after impact. In this sense, coordination will allow for the necessary adjustments in the development of the other conditioning capabilities (strength, endurance, speed and flexibility) to be able to perform the technical movements as efficiently as possible, both from the mechanical and the physiological point of view. In fact, we could associate the development of coordination capabilities to being competent in the sport activity, sport competency being the command of a repertoire of relevant responses to situations, that in many cases, are new, and highly uncertain for the player. (Bernstein, 1967) highlighted the importance of understanding how the human system was able to integrate so many different behaviour units. This is what we know as degrees of freedom. So, during learning, there are coordination synergies or structures that provide solutions to the problems, and in fact, they solve motor tasks in different way, each time they occur (Schmith, Wisberg, 2008).

As to the upper structures of the central nervous system, coordination will imply an improvement in the efficiency of information processing and the possibilities of the subject to look for adaptations and solutions to the problems in uncertain situation as tennis practice. (Bourquin et al., 2003) points out that in tennis, a sport of high uncertainty, only players who manage to get the maximum neuromuscular (technical skill) and energetic (physical condition) adaptation, by means of varied and stimulating training, will be successful at the top level. In fact, we know that coordination is determined by the correct

functioning of the nervous and locomotor system, that is, the moment we suffer a transient, (stress, fatigue), or permanent (injuries in the nervous system) problem, our coordination may suffer the impact.

In this sense, coordination could be defined as the ability of the body, or one of its parts, to perform in an orderly, harmonic and efficient sequence, a certain movement or action.

The different classifications of coordination skills present different numbers of capabilities that make up these coordination capabilities. We have adopted the classification of 7 components, in line with (Meinel, Schnabel, 2004).

DEVELOPMENT OF COORDINATION CAPABILITIES

As expressed before, the work of these skills must start at an early age since it is at this time in life when the nervous system is easier to format (Souto, 1997; Piaget, 1993). Actually, coordination evolves parallel to the development of the person, and is conditioned by biological aspects (the structure of the nervous system), and by learning, and by the level of motor experiences the individual is subject to. Thus, the individual acquires the nervous and muscular maturity to be able to control their own bodies (crawling, walking, climbing) from the first years. During this stage, coordination development will be closely linked to the correct structure of the body, as well as the knowledge and control of their own bodies. (Hirtz, 1987) points out that coordination skills should be trained during childhood and adolescence as an "additional technical training". In most sports, technical training is not enough to learn and incorporate new skills, specific exercises are necessary to facilitate the development of the technique, so, there are studies with theories concerning the coordination requirements for each sport (Neumaier, 1999). In the case of tennis, (Mantis, 1997) states that the skills that most contribute to the development of a good service in young players are body coordination, reaction time and accuracy in the strokes.

Most coordination disturbances happen between birth and the 4th year, that is why it is important to provide a stimulating and caring environment all along this maturation process. Most coordination improvements happen between 4 and 7 years of age, even though they will continue evolving. In fact, condition capabilities, as strength and speed, improve after puberty, thus enhancing coordination skills. The International Tennis

Federations (ITF, 2003) provides a very didactic and useful guide with the parameters to be enhanced, depending on the age of the player. (Bourquin et al., 2003) proposes this table (Table 1), which summarizes the development of the subjects and a guideline for coordination work.



Age: 4-6

Children between 4 and 6 years must develop a number of simple motor skills (running, jumping, throwing, hitting, aiming, rolling, etc.), in order to get a good foundation and optimize learning stages and improve their future efficiency.

Age: 7-10

As to children between 7 and 10, the priority is to improve the following skills: reaction, speed, space analysis and coordination under pressure. The latter should be practised with competitive or timed exercises. It is key to keep the quality of the exercise during competition.

Age: Girls, 11-12, Boys, 10-13

Motor learning is optimal at this stage. This is the best age for coordination training. The main characteristic of this stage is that the child improves control and combination, and analysis skills, as well as the reaction speed and rhythm. Therefore, training will focus on its development. At these ages, children can perform "Double task" exercises.

Puberty

Puberty brings about morphological changes and growth varies between 8-10 cm. This fast growth may interfere with coordination, and impact on the fine motor skills in particular. It is important to do simple exercises and consolidate and improve movement execution and techniques that have already been learnt.

Adolescence and later stages

During adolescence, the potential to learn techniques and movements is maintained, particularly in boys. It is during these periods that coaches can observe a general stability in the motor activities of their players.

PRACTICAL PROPOSAL OF EXERCISES TO DEVELOP COORDINATION SKILLS

We propose a number of exercises, by way of example, to work the different coordination skills, and some basic methodological orientation for this work.

Orientation

Exercises with balloons. The player has to try to keep 2-3 balloons in the air. The racket can be added to control the balloons, and the player will be told in which order to hit the balloons, depending on the colours.

Differentiation



Exercises with balls of different sizes, and pressures: bouncing a basketball with one hand and a tennis ball with the other one. Rallies to set zones with balls of different pressures.

Balance

Balance exercises on unstable surfaces, like a Swiss ball, balance platforms... Exercises can become more specific like hitting from these surfaces.

Rhythm

Exercises with a skipping rope, combining different supports. Exercises on the agility ladder. using cones at different distances.

Reaction

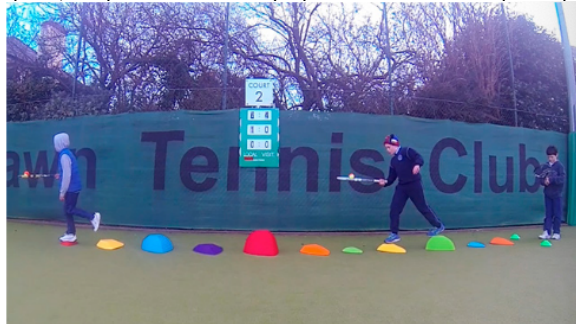
Exercises including different starting positions and different stimuli. Throwing and receiving balls with unpredictable bounce effects (z balls).

Combination of movement

Exercises in which the player performs a "double task", that is, two different functions at the same time, for instance, bouncing a ball on the ground with one hand, while going through the agility ladder in a certain sequence, and without losing control of the ball that is bouncing.

Transformation or change

It is an exercise in which the player adapts to the situation, for example, the coach feeds from the basket with different height, speed, depth... and the player must constantly adapt.



CONCLUSIONS

The important role of coordination skill development must be considered among developing players. Beginning from the early stages of tennis player development this will be especially key due to the relationship with the maturation of the nervous system.

In conclusion, both the coach and the physical trainer must lay emphasis on coordination work, in order to optimize the technical movement skills for tennis strokes and sprinting. (Forcades, 2003) also recommend improving all coordination skills, even though it may be necessary to work hard on kinaesthetic differences and reaction capabilities, which seem to be of utmost importance for our sport, a solid foundation of these skills will further aid in the long term athletic development of tennis players.

REFERENCES

- Balyi, I. and A. Hamilton, Long-term athlete development, trainability and physical preparation of tennis players. *ITF Strength and Conditioning for Tennis* (49-57). London, ITF Ltd, 2003.
- Bernstein, N., *The coordination and regulation of movements*. New York: Pergamon, 1967.
- Born, H.P., *La mejora de la forma física y de la coordinación en jóvenes tenistas*. *ITF Coaches Review*, 1999(17).
- Bourquin, O., *Coordination. Strength and Conditioning for Tennis*. Reid M, Quinn A, and Crespo M, eds. London, England: ITF, 2003: p. 71-77.
- Elliott, B., *Biomechanics and tennis*. *British journal of sports medicine*, 2006. 40(5): p. 392.
- Fernandez-Fernandez, J., D. Sanz-Rivas, and A. Mendez-Villanueva, *A Review of the Activity Profile and Physiological Demands of Tennis Match Play*. *Strength & Conditioning Journal*, 2009. 31(4): p. 15-26
- Forcades, J., *El entrenamiento integrado en el tenis. Planificación del Centre de Tecnificació Esportiva de les Illes Balears*. Conferencia en las Jornadas de Tenis de la Academia Sánchez- Casal., 2003.
- Hirtz, P., *Lo sviluppo delle capacità coordinative nell'età scolare e possibilità del loro miglioramento*. Roma. *Didattica-del- movimento* 1987: p. 51-52: 52-58
- König, D., et al., *Cardiovascular, metabolic, and hormonal parameters in professional tennis players*. *Medicine & Science in Sports & Exercise*, 2001. 33(4): p. 654.

- Mantis, K., *Strategy evaluation of singles tennis matches in girls under 18 years old*. *Exercise and society journal of sport science*, 1999. 21: p. 64-62.
- Meinel, K., and Schnabel, G, *Teoría del movimiento*. Editorial Stadium SRL., 2004.
- Neumaier, A., *Koordinatives Anforderungsprofil und Koordinationstraining*. En: H. Mechling & A. Neumaier (Hrsg.), *Reihe Training der Bewegungskoordination Köln: Sport und Buch Strauss.*, 1999.
- Piaget, J., *La psicología de la inteligencia*. 2003: Crítica.
- Schmith, R., Wisberg, C., *Motor Learning and Performance: A Situation-Based Learning Approach*. Champaign, IL: Human kinetics, 2008.
- Souto, J., *Las capacidades coordinativas y su trabajo específico para el tenis*. *Apuntes*, 1997. 11(2): p. 18-19.

RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)



Copyright (c) David Sanz and Jaime Fernández 2016



This text is under a [Creative Commons BY 4.0 license](#)

You are free to Share - copy and redistribute the material in any medium or format - and Adapt the content - remix, transform, and build upon the material for any purpose, even commercially under the following terms:

Attribution: You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

[CC BY 4.0 license terms summary](#) [CC BY 4.0 license terms](#)