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Tactical analysis in tennis: From its origins to the present

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ABSTRACT

Even though the first studies of tactical analysis are dated several decades ago, and new technologies have greatly helped to advance in this area, the practical application of this type of analysis has been carried out in a very rudimentary fashion and is subject to the coaches´ subjective criteria. This article, apart from providing a context and a historic perspective of tactical analysis, shows some of the tools that are currently available for this analysis and provides examples for clear and practical application

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INTRODUCTION

Tactical analysis is related to the sport´s strategic and tactic aspects. The strategy can be defined as the plan that is set up prior to competition, to maximize the players´ strengths and reduce their weaknesses, while minimizing the opponents´ strengths and taking advantage of their weaknesses (O'Donoghue, 2010). On the other hand, tactic is associated to decision making during play, on the basis of the options available and the risks and opportunities associated to each (Fuller y Alderson, 1990).

This analysis has traditionally been made in a non systematic way, on the sole basis of the coach´s direct observation during matches or training. This way of analysing tactics, as Murray and cols. indicate (2007) entails a number of problems related to the perception capability, the memory and interpretation of the observation of coaches, who convey biased information to the tennis players, and is interpreted totally subjectively. Therefore, there seems to be an apparent need to use observation and analysis methods to get objective data on which the information received by the coach, and later by the tennis players, can be based.

NOTATIONAL ANALYSIS

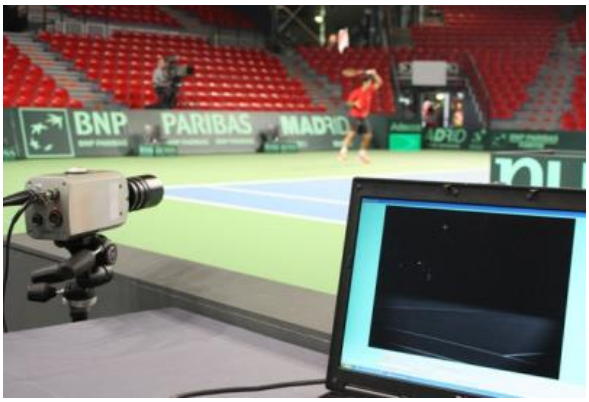
Notational analysis permits to record, in a reliable way, those indicators that are of interest to evaluate the tactical performance of players, in such a way that the information obtained by the coach and the athlete is much more accurate and precise (Martínez-Gallego, 2015)

As you will see later, the technologic advances and the incorporation of personal computers to notational analysis have significantly shaped its development and evolution. Thus, it is possible to differentiate between two types of analysis, manual notational analysis, and computer notational analysis.

Manual notational analysis

This kind of analysis was already used at the time of the Egyptians, and by means of symbols and hieroglyphs, they represented dance patterns and movements (Over y O'Donoghue, 2008). Later on, it was precisely dancing that was used as a basis for the development of a system of general notation for movement. In fact, the first system to analyse and record human movement was Labanotation, created by Rudolph Laban (Laban, 1975). As to tennis, the first manual system for notational analysis was carried out by Downey (1973). This system was used to record the strokes, the position on court, the result of the stroke, and the type of effect used in each stroke. Due to its complexity, both to record information and to analyze it, this system was seldom used in practice,

nonetheless, it was important for further research based on these ideas.



Manual notational analysis has been continuously used with simpler record systems which were more appropriate for the demands and possibilities of coaches. In fact, in spite of the appearance of new technologies, it is still frequent to find coaches making manual notations during match development.

Computer notational analysis

IT development and the technological advances over the last decades, have brought about a revolution in the concept of notational analysis, allowing for a more accurate and simpler way of recording information, facilitating the creation of data bases, providing the tools that make data representation more aesthetic, agreeable and intuitive, and thus, easier to understand for coaches and athletes (Murray et al., 2007).

At the moment, there are a number of devices and IT programmes that are being used more and more to analyze the tactical performance of athletes (Barris y Button, 2008). Likewise, the number of specific programmes on notational analysis in sport is greater and greater. IT programmes that help to perform this kind of analysis can be classified in two big categories: "tagging systems" and "tracking systems".

Tagging systems generally consist of a video player with an interface of buttons that can be defined and tagged by the analyst. Events introduced by means of buttons are synced with the video and stored on a data base, to be visualized later exporting the information to data bases for statistical analysis. Because of the flexibility of these programmes, it is possible to create an unlimited number of templates to analyse all aspects of the game. Some of these programmes are: Dartfish (TeamPro version), Focus or Longomatch.

Tracking systems are more complex systems, normally used by professional players or for professional events. By means of the images that have been captured by several cameras, these programmes create a vision in two or three dimensions. With these images, the programme, automatically or semi automatically, detects the position of the players and/or the ball at each instant. Then, the different kinematic variables are calculated. They can be related to tactical and physiological aspects. Hawk-eye, Amisco and Prozone are some of the commercial tracking programmes

CURRENT TACTICAL ANALYSIS STUDIES

Finally, and by way of example, we will mention some of the most recent studies related to tactical analysis that have used some of the tools described above, and that we think can be interesting due to their practical application: to coaching.

The first one was carried out by Reid, Morgan, y Whiteside (2016), they analyzed the differences between men and women in the Australian Open: the stroke dynamics and movement. The results are the following:

- The service was the stroke that showed more differences, men served faster, achieved more direct services, forced errors in the return, and won a higher percentage of points when serving.

- As to the return, women hit closer to the net, lower and flatter than men.

- The frequency of ground strokes was similar for both sexes, though men hit at a greater speed, flatter and a greater number of strokes landed on court.

- As to the distance travelled per point, there were no differences between men and women, though men showed higher average speeds when running.

Later, Kovalchik and Reid (2017) compared playing statistics and physical demand between professional and junior players, getting the following conclusions:

- Professional players had a greater advantage with service.

- Junior players got a higher percentage of break points.

- Generally, professional players achieved more power and accuracy in their strokes, this was particularly evident in service.

• Junior players served to the centre of the court twice as much as compared to professional players.

• In men, the physical load of professional players during matches doubled that of juniors, while junior women doubled the physical load when compared to professional players.

More recently, Martínez-Gallego et al. (2018) carried out a study with professional players. They analyzed the existing differences between winners and losers of points, on the one hand, considering volume and intensity of their movements, depending on their position on court, and, on the other hand, the differences between winners and losers of the games as to winners, unforced errors and effectiveness, depending on their position on court. The main conclusions drawn were the following:

• Winners of points used more offensive strategies, remaining longer time in offensive areas and forcing their opponents to run a greater distance and at a higher speed.

• When the losers of points were in offensive positions, they did not profit from that positional advantage, since they were too pressed by their opponents who made them move at a high speed.

• The winners of the games got a greater number of winners, and made less errors, and were more efficient than the losers.

• In defensive zones there were no differences as to the number of winners, however, the winners of the games made less unforced errors.

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