

Tactical performance in soccer: The importance of choosing and properly applying tactical assessment tools

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HIGHLIGHTS

- This paper highlights that the performance indexes of FUT-SAT and TSAP assessment tools did not present significant correlation.
- It is extremely important the correct choice of the assessment tools to be used, considering their characteristics and limitation, as well as their relation with tactical content to be emphasize during learning process.

ABBREVIATIONS

CB	Conquered balls
DTPi	Defensive TPI
FUT-SAT	System of Tactical Assessment in Football
GTPI	Game TPI
IE	Efficiency index
LA	Place of Action in the Game field
LB	Lost balls
NB	Playing a neutral ball
OTPI	Offensive TP
OB	Offensive balls
PB	Volume of Play
PD	Performance Score
QR	Quality of tactical actions TPI
	Tactical Performance Index
RA	Actions Outcomes
RB	Received balls
RP	Core Tactical Principles performed
SS	Successful shots
TSAP	Performance Assessment in Team Sport

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BACKGROUND: Several tactical assessment tools have been proposed to evaluate players' tactical performance in more representative contexts.

AIM: Investigate the associations between the results from different tactical assessment tools, TSAP and FUT-SAT, in youth soccer players.

METHOD: Twenty-seven male U-11 soccer players participated in the study (mean age = 11.02 ± 0.78 years). The players' technical-tactical performance was analyzed using the Team Sports Performance Assessment Procedure - TSAP. The players' tactical performance and behavior were assessed using the Football Tactical Assessment System - FUT-SAT. Pearson's correlation test was used to analyze the association between the performance indexes obtained through both assessment tools.

RESULTS: With the results obtained, it was possible to verify that both assessment tools' performance indexes did not present a significant correlation.

CONCLUSION: Through these results, it is possible to conclude that it is extremely necessary for the correct choice of the assessment tools to be used, considering their characteristics and limitations, as well as their relation with tactical content to be emphasized during the learning process.

KEYWORDS: Soccer | Assessment tools | TSAP | FUT-SAT

INTRODUCTION

The analysis of the tactical context in soccer is an important demonstration of the player's perception of the environment in an attempt to adjust his/her actions according to the emergence of the game's demands.¹ Players and team's cooperation and opposition in the search for space management during the performance of specific tasks directly

affect the contextual dynamics of a soccer game and players' decision making.² These relationships are highly unpredictable in the game context, requiring players to have a high level of perception of relevant sources of information and calibration of their actions based on a set of individuals, task, and the environment constraints.^{1,3} In this sense, the soccer game has a complex nature, resulting from the amount of constraints in the game and the randomness of the situations/problems that players and teams need to face.⁴

Determining soccer players' tactical understanding is an important aspect of analyzing game performance, since a better tactical understanding helps players adapt their actions (intra-personal and interpersonal coordination) to the problems that emerge in the game context. However, we need to use appropriate assessment tools to evaluate the soccer player's tactical performance. Researchers and coaches have been looking for a reliable and consistent tool for tactical assessment, supporting the implementation of a player-centered and game-based teaching and training process.^{5,6,7} For this, it is necessary to establish precisely the relationships between the evaluated and trained contents.⁸

Among the assessment tools validated for tactical assessment, we highlight both the *Performance Assessment in Team Sport* (TSAP) and the *System of Tactical Assessment in Football* (FUT-SAT) tools.^{9,10,11} The TSAP was developed by Grehaigne et al.¹⁰ to be applied in a pedagogical context. The assessment's focus is the performance of technical-tactical actions (specific skills) in a tactical context of play.⁹ In TSAP, players' actions are evaluated only with ball possession, providing a set of performance indicators, such as Volume of Play, Efficiency Index, and Performance Score. Despite not considering players' action without a ball possession, TSAP has an important advantage, which is the possibility of being applied in different team sports, such as soccer, basketball, and handball.¹⁰

The FUT-SAT assessment tool is another important instrument frequently used in scientific research and in a professional context (soccer clubs, youth academies, etc.). This assessment tool was validated by Teoldo et al.¹¹ and aims to assess the players' tactical performance and behavior in representative contexts. The FUT-SAT allows analyzing, evaluating, and classifying the offensive and defensive tactical actions performed by soccer players with and without the ball possession based on core tactical principles. With the support of software developed specifically for this instrument, this tool provides a more assertive assessment based on the ball's and the player's positioning and movement. The FUT-SAT provides important indicators, such as the Tactical Performance Index (TPI), as well as the quality/efficiency of the tactical behaviors performed by the players.⁵

Although both instruments evaluate player's tactical performance, it is difficult to determine the choice of the most appropriate tool to assess young soccer players since this choice is crucial for the planning, systematization, and application of a player-centered and game-based teaching and training process. These assessment tools can support coaches and researchers in monitoring players' tactical development, providing training contexts more adjusted to the players' intrinsic dynamics.¹² Therefore, this study aimed to investigate the associations between the results obtained from different tactical assessment tools, TSAP and FUT-SAT, in youth soccer players. The present study hypothesizes that both instruments can provide divergent results since both were developed to evaluate different tactical contents. Thus, throughout the teaching and

training process, it becomes essential to understand better which instrument to use to objectively monitor players' tactical development, considering the tactical contents to emphasize during the training sessions.

METHODS

Twenty-seven U-11 (11,02 ± 0,78 years) men youth and recreational soccer players participated in this study. A brief explanation of the study procedures was provided. Only the players whose parents signed the free and informed consent, previously approved by the Ethics Committee in Research with Human Beings (N. 41423415.5.0000.5020), participated.

Tactical Analysis

To evaluate players' tactical performance, we used two assessment tools: *Performance Assessment in Team Sport* (TSAP) and the *System of Tactical Assessment in Football* (FUT-SAT).

System of Tactical Assessment in Football (FUT-SAT)

The FUT-SAT protocol is performed during a 3vs3 small-sided game, played in an area 36 meters length by 27 meters width, in which each team has three players plus the goalkeeper, who defends a goalpost with 6x2 meters. The test lasts four minutes, respecting all soccer official rules, except for the offside rule.⁷ After the teams' composition, the players received numbered vests and were allocated in pre-defined positions for the start of the game, seeking to facilitate further analysis. Players received a brief explanation of the test and were subsequently given 30 seconds for test adaptation.

The aim was to evaluate players' tactical actions (with and without possession of the ball) according to the ten core tactical principles of football, five of which are offensive (Penetration, Offensive Coverage, Width and Length, Depth Mobility and Offensive Unit) and five are defensive (Delay, Defensive Coverage, Balance, Concentration, and Defensive Unit) (for more details on the definitions of each principle, see Teoldo et al.¹¹).

The games were filmed using a digital video camera (Lumix DMC-FZ200, Panasonic Australia) to analyze the players' tactical actions. The digital videos were transferred to a computer and analyzed through *Soccer View* 1.0 software, specific for FUT-SAT test, which allows the projection of spatial references on the playing field, facilitating the rigorous evaluation of players' positioning and movement. Subsequently, the data were recorded in a Microsoft Office Excel 2007 spreadsheet (Microsoft® Corporation, USA).

The game analyzes were performed in reference to the test observation protocol that takes into account four factors: i) Core Tactical Principles performed (RP), ii) Place of Action in the Game field (LA), iii) Quality of tactical actions (QR) and iv) Actions Outcomes (RA).² From this analysis, the Tactical Performance Index referring to the tactical principles, game phases (Offensive TPI [OTPI]; Defensive TPI [DTPI] and game (GTPI)) were used. The higher the value of OPTI, DPTI and GTPI, the better the player's tactical performance will be. For the calculation of the indices, the following equation was used:

$$\text{Tactical Performance Index (TPI)} = \sum \text{tactical actions } ((RP \times QR \times LA \times RA)) / \text{amount of actions}$$

Performance Assessment in Team Sports - TSAP

The TSAP, proposed by Gréhaigne, Godbout and Bouthier¹⁰, was used to analyze players' technical-tactical performance. In the TSAP, such players actions with ball possession were recorded: i) Conquered balls (CB); ii) Received balls (RB); iii) Playing a neutral ball (NB); iv) Lost balls (LB); v) Offensive balls (OB); and vi) Successful shots (SS). Subsequently, for each player, the following indicators were calculated: i) Volume of Play (PB), this being the amount of times the player obtained possession of the ball, that is, the sum of the totals of CB and RB ($PB = CB + RB$); ii) Efficiency index ($IE = (CB + OB + SS) / (10 + LB)$); and iii) Performance Score ($PD = (IE * 10) / (PB / 2)$). Regarding the mentioned indexes, the higher the value, the better the players' tactical performance.

Data and reliability analysis

Kolmogorov-Smirnov test was used to verify the data distribution. Pearson's correlation coefficient was used to express the correlation between the variables obtained through the FUT-SAT and TSAP tests. According to Hopkins¹³, the magnitudes of the correlation coefficients (90% confidence interval) were considered trivial ($r \leq 0.1$), small ($0.1 < r \leq 0.3$), moderate ($0.3 < r \leq 0.5$), large ($0.5 < r \leq 0.7$), very large ($0.7 < r \leq 0.9$) and almost perfect ($0.9 < r \leq 1.0$). The significance level of $p \leq 0.05$ was adopted. In addition, players were classified in two ways: i) using the Tactical Performance Index (IPTJ) obtained from the FUT-SAT as a criterion; ii) using the Performance Score obtained from the TSAP as a criterion. They were then organized into three groups: Group 01, composed of the nine players with the best performances; Group 02, composed of the nine players with intermediate performance; Group 03, composed of the nine players with the worst performance in the tests. Thus, the relative frequency was used to verify the percentage of players classified in the same groups, considering the ranking of players obtained by FUT-SAT and TSAP. The SPSS software was used to perform statistical tests. To analyze data reliability, the observer trained for three months to use both instruments. Cohen's Kappa coefficient was used to calculate reliability. The value of 0.902 and 0.946 was found for the inter and intra-observer analysis, respectively.

RESULTS

Table 1 shows that mean, and standard deviation values are presented from players' tactical performance obtained through both assessment tools used (T-SAP and FUT-SAT).

Table 2 presents the associations between the performance indicators obtained through both assessment tools (T-SAP and FUT-SAT). It is possible to highlight only significative associations between performance indicators obtained by the same assessment tools, not observing significative relations between performance indicators from both instruments.

Table 1. Descriptive values (means and standard deviations) of performance indexes obtained by FUT-SAT and TSAP.

Descriptive Values		
OTPI	Mean	39,7478
	Standard deviation	7,83371
DTPI	Mean	34,0444
	Standard deviation	4,8399
GTPI	Mean	34,5393
	Standard deviation	3,87367
Volume of Play	Mean	7,5185
	Standard deviation	3,15461
Efficiency index	Mean	0,248
	Standard deviation	0,17347
Performance Score	Mean	6,2393
	Standard deviation	2,86429

Table 2. Pearson correlation between performance indicators from both assessment tools FUT-SAT and TSAP.

CORRELATIONS							
		OTPI	DTPI	GTPI	Volume of Play	Efficiency index	Performance Score
OTPI	Correlation	-	-,387* (moderate)	,682* (large)	,140	,257	,231
	<i>p</i>	-	.020	<.001	.416	.131	.175
DTPI	Correlation	-,387* (moderate)	-	,136	-,152	-,027	-,099
	<i>p</i>	.020	-	.428	.376	.877	.565
GTPI	Correlation	,682* (large)	,136	-	,100	,208	,180
	<i>p</i>	<.001	.428	-	.562	.224	.295
Volume of Play	Correlation	,140	-,152	,100	-	,510* (large)	,856* (very large)
	<i>p</i>	.416	.376	.564	-	.001	<.001
Efficiency index	Correlation	,257	-,027	,208	,510* (large)	-	,881* (very large)
	<i>p</i>	.131	.877	.224	.001	-	<.001
Performance Score	Correlation	,231	-,099	,180	,856* (very large)	,881* (very large)	-
	<i>p</i>	.175	.565	.295	<.001	<.001	-

* The correlation is significative at *p* level of $p \leq 0.05$; OTPI: Offensive Tactical Performance Index; DTPI: Defensive Tactical Performance Index; GTPI: Game Tactical Performance Index

Table 3 presents the information regarding the percentual of players grouped according to the results obtained from FUT-SAT and TSAP. Thus, we highlight that only 44,4% of players were grouped as skilled players (Group 01) using both instruments.

Moreover, 55,5% of the players were classified as less skilled players (Group 03) from results obtained both by FUT-SAT and TSAP instruments.

Table 3. Percentage ratio between Game Tactical Performance from FUT-SAT and Performance Score from TSAP.

<i>Players' tactical level</i>	<i>Nº</i>	<i>%</i>
<i>Group 1</i>	4	44,4
<i>Group 2</i>	4	44,4
<i>Group 3</i>	5	55,5

DISCUSSION

The present study aimed to investigate the associations between the results obtained from different tactical assessment tools, TSAP and FUT-SAT, in youth soccer players. The results obtained highlighted no significant associations between performance indicators from both assessment tools (TSAP – Volume of Play, Efficiency index, and Performance Score; FUT-SAT – OTPI, DTPI, and GTPI). It was also possible to observe that a high percentage of players was grouped differently regarding their tactical level, considering their results in both tests. Thus, the assessment tools must be selected carefully to plan the training of the tactical demands for young soccer players. The possibility of establishing a connection between the results of the evaluations and the contents taught in the training sessions is one of the main characteristics that a test must have, allowing its systematic use and the performance of evaluations that help to monitor the teaching process and the player's development.⁵ These characteristics are important to make a decisive contribution to the players' developmental process, which allows for a better methodological orientation of the teaching and training process.

The evaluation is essential during the teaching and training process in soccer.¹⁴ However, it is necessary to consider each assessment tool's characteristics and potential, as well as the periodicity in their application.^{5,15} Considering the findings of this study and other previous research, we can highlight that these assessment tools possibly evaluate different tactical content,¹⁵ demanding caution in using both instruments in the teaching and training process in soccer. Thus, below we highlight some important aspects to consider when choosing the tactical assessment tools for young soccer players.

First about the specificity of the assessment tools. TSAP has the characteristic of evaluating individual performance concerning the technical components (specific skills) and tactics of each player in situations of the offensive phase, considering players' actions with ball possession.⁹ This strategy is based on composite variables (Volume of Play, Efficiency Index, and Performance Score) in an attempt to weigh actions taken according to the context and specifics of the game.⁵ On the other hand, FUT-SAT allows the assessment of offensive and defensive tactical behaviors performed by players (with and without ball possession) based on the core tactical principles of the soccer game.¹¹ In this sense, intending to evaluate the players' technical-tactical performance with the ball, considering the players' specific skills, the TSAP will be the most suitable. At the same

time, the FUT-SAT can be used in cases intended to assess/monitor players' tactical behavior through the performance of core tactical principles.

Second, the players will be evaluated, considering the intentionality of the coach and staffs. The TSAP is recommended for players over 12/13 years old and the ball actions analyzed are the conquered balls, received ball, neutral ball, lost ball, offensive ball, and successful shot.^{9,16} As for the FUT-SAT, although its use with players of different age groups is possible, once it focuses on the analysis of the players' tactical actions, the authors suggest that the instrument should be applied with players who have already reached cognitive maturity (11/12 years of age) since they can already think abstractly.^{9,17} Thus, the trivial/small non-significant associations can be explained by the players' lower age here analyzed.

Third, the evaluation criteria for each instrument are different. While FUT-SAT primarily uses pre-defined and validated criteria in previous studies, TSAP uses some open criteria, that can be adapted according to the sport and the context in which it will be used.¹⁵ In addition, the TSAP was validated in the school context and used the results of players' actions. In contrast, the FUT-SAT was validated in soccer clubs and academies contexts, considering the relationships of their actions with the actions of the other teammates and opponents, depending on the ball's location. Therefore, the assessment tool's choice must also be based on the evaluation criteria of each instrument, considering its application in similar contexts used in validation studies.

This study has important limitations, such as the low number of games analyzed and its application in players from different competitive categories. Studies of this nature, with a larger sample size, carried out with a larger number of players and applying other instruments validated, can help us better understand which instruments can help coaches better plan, apply, and evaluate the teaching and training process in soccer.

CONCLUSION

With this study, it was possible to conclude that there were no significant relationships regarding the players' tactical performance of the players obtained through both assessment tools (FUT-SAT and TSAP). These results show the need for an intimate relationship between the contents from both the assessment instrument and the contents to be emphasized in soccer's teaching and training process. Through the results obtained, we suggest that FUT-SAT may be more appropriate in soccer when coaches need to emphasize and monitor the core tactical principles in their teaching and training process. On the other hand, TSAP may be more appropriate for coaches who intend to emphasize and monitor individual technical-tactical actions.

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