ORIGINAL ARTICLE

https://doi.org/10.6063/motricidade.20533

Comparison between Under-13 and Under-15 Soccer Players in Small-Sided and Conditioned Games

Davi Correia da Silva[1]*, Ítalo Bartole Resende[1], Fabrício Vasconcellos[2], Gibson Moreira Praça[3], Israel Teoldo[1]

ABSTRACT

The present study aims to compare players' tactical behavior and performance in Small-Sided and Conditioned Games when playing against opponents from different age levels (Under-13 and Under-15). Participated in this study 93 players from U-13 (n=42) and U-15 (n=51) teams, who performed 7,416 tactical actions. The instrument used was the System of Tactical Assessment in Soccer (FUT-SAT) to analyze players' tactical actions. Descriptive statistics and independent *t*-tests and Mann-Whitney were used considering the value of $p<0.05$. Results indicated that the players in the U-13 age level obtained a better percentage of success in the movements supporting the player in possession of the ball, and the U-15 players performed more movements that allow the team to defend in unity. In addition, players of both age levels performed similarly, although U-13 players suffered more fouls and won more throw-ins or corner kicks, whereas the U-15 age level was more effective in regaining possession of the ball but suffered fewer attacks to their goal. It was concluded that the players of the U-15 age are more compacted compared to the U-13 players. Besides, both age performances were similar even though the players of the U-15 age level were more effective.

KEYWORDS: Task Constraint, Sports Training, Tactical.

INTRODUCTION

The soccer game is characterized by a relation of cooperation and opposition between the players as actions are performed through the confrontation of the teams (Kannekens et al., 2009). During the game, teams seek to organize and balance in the playing field to generate disorganization and imbalance in the opponent's actions and consequently perform in the play (Silva et al., 2019). Thus, since this organization results from tactical actions through positioning and movements of the players (Teoldo et al., 2017), the tactical component is considered essential for sports performance (Serra-Olivares et al., 2016).

Given the importance of the tactical component in soccer and the relations of cooperation and opposition in the game, some scientific research has sought to investigate players' tactical behavior in the context of confrontations between different opponents (Gonçalves et al., 2016). The literature indicates that for a team to reach the top rank in a competition, players need to show regularity in their tactical actions in the games (Maleki et al., 2016). Therefore, when facing different opponents, players must adapt to new game contexts (Garganta & Gréhaigne, 1999). Correspondingly, the literature reports that champion teams in small-sided and conditioned games (SSCGs) tournaments have adapted better to the different opponents throughout the games (Silva et al., 2019). These authors reported that the players of the champion teams performed more tactical principles that help circulating the ball in width against the runner-up as well

[1]Núcleo de Pesquisa e Estudos em Futebol, Universidade Federal de Viçosa, Viçosa, Brazil
[2]Laboratório de Estudos em Futebol, Instituto de Educação Física e Desporto, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil
[3]Centro de Estudos em Cognição e Ação, Departamento de Esportes, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.

*Autor Correspondente: Universidade Federal de Viçosa, CEP 36570-900, Viçosa, MG, Brazil. E-mail: davizirt@hotmail.com
Conflict of interests: Nothing to declare. Funding: This study was funded by the State Department of Sport and Youth of Minas Gerais (SEESP-MG) through the State Act of Incentive to Sports, by FAPEMIG, CNPQ, FUNARBE, the Dean's Office for Graduate and Research Studies and the Centre of Life and Health Sciences from the Universidad Federal de Viçosa, Brasil. This study was financed in part by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.
Manuscript received at 07 06, 2020; Accepted at 26 10, 2020

as more tactical principles that showed a more direct style of play against the third-placed teams. A direct style of play is an attacking style that drives players to attack the goal in a more direct fashion instead of a possession style of play.

Therefore, it is possible to observe changes in tactical actions depending on the opponent in competitions made of small-sided and condition games, usually performed in training sessions. In the context of player development, it is common to witness confrontations between teams or players of different age levels as training activities, which can lead to changes in tactical behavior mainly because of the typical characteristics of this behavior per age groups (Clemente et al., 2020; Fernández-Espínola et al., 2020; Teoldo et al., 2010).

According to Américo et al. (2016), who assessed players from U11 to U15 age levels, the effectiveness of tactical behavior tends to increase as players get older, except the U15 age level, which sharply dropped compared to other age levels. Some other studies showed that collective tactical behavior is also influenced by age (Olthof et al., 2015; Clemente et al., 2020). For example, Olthof et al. (2015) demonstrate that older players maintained a higher average distance and occupied a greater area on the field when compared to younger players in the small-sided games. More recently, Clemente et al. (2020) found that the area occupied by U15 players was greater than the one occupied by U13 players. However, the distance between the centroids of these players was similar, as there was no statistically significant difference.

However, Teoldo et al. (2010) compared the tactical behavior of soccer players and did not find significant differences between players of U13 and U15 age levels, which indicates that the behavior presented by the players of both age levels was similar. The authors also mentioned the older players obtained better performance related to offensive movements in support of the player with the ball.

Although these studies point out similarities and differences in the tactical behavior and performance of players from different age levels, all of the assessments were performed with teams composed of players of the same age level (e.g., U13 players vs. U13 players). Thus, there is a lack of information on the comparison between players of different age levels when they play against each other because there has been no study investigating the tactical behavior and performance of players from different age levels playing one against the other (U13 players vs. U15 players). It is then suggested to investigate confrontations between players of different age groups as it is an important methodological strategy that can enrich the teaching-learning process and training in soccer.

Hence, it is observed that the literature does not provide enough information for coaches to plan the use of oppositions between players of different age levels during the teaching-learning process and training activities, especially with respect to the ten core tactical principles of the game (Teoldo et al., 2009). These principles consist of standards of behavior that lead players to solve problems that emerge in the play, which the literature recommends initiating its teaching and learning from 12 years of age (Teoldo et al., 2017). The present study aims to compare the tactical behavior and performance of players in SSCGs when playing against opponents from different age levels (Under-13 and Under-15).

METHODS

This study was approved by the Human Research Ethics Committee under the protocol CAAE - 48139515.3.0000.5153. The ethical procedures followed the Helsinki declaration and Resolution norms nº. 466/2012 of the National Health Council (CNS). The study was conducted with the consent of the club legal officer and the player's guardian, who filled a free and informed consent form as well as an agreement form.

Participants

The participants consisted of 92 players of the Under 13 (n=42, M_{age} = 13.07 years, SD = 0.55) and Under 15 age levels (n=50, M_{age} = 14.76 years, SD = 0.60). The U15 players presented body mass and height values (54.27 ± 8.12 kg body weight, 1.66 ± 8.63 m height) significantly higher than U13 players (45.70 ± 8.73 kg of body mass, 1.58 ± 10.85 m of height), respectively, p <0.001; r =0.469 and p =0.003; r =0.308.

Players from both age levels performed 7416 tactical actions in 18 small-sided and conditioned games (SSCGs). They were selected amongst players from three different Brazilian clubs affiliated to the *Federação Mineira de Futebol,* which compete at the regional level. As a sample inclusion criterion, players should be participating in systematic training with a frequency of three times or more per week.

Data collection instrument

The instrument used to assess the players' behavior and tactical performance was the System of Tactical Assessment in Soccer (FUT-SAT), validated by Teoldo et al. (2011). The system consists of a field test, which is played with the following configuration: Goalkeeper + 3 vs. 3 + Goalkeeper, and is applied in a reduced playing field of 36 meters in length and 27 meters in width during four minutes. All games were filmed for further analysis.

After the field test, the instrument allows the assessment of players' tactical actions, with and without the ball.

This evaluation is based on the ten core tactical principles of the soccer game, which five of them are playing during the offensive phase (when the team has the ball): (i) penetration, progression movements of the ball carrier toward the goal and/or the opposing bottom line, (ii) offensive coverage, movements of support to the ball carrier, (iii) depth mobility, movements of players between the last defender and goal line, (iv) width and length, movements for use and expansion of the effective game space, and (v) offensive unity, movements that allow the teams to attack in unity. The five other principles are performance in the defensive phase (when the team does not have the ball): (i) delay, movements of direct opposition to the ball carrier, (ii) defensive coverage, movements of support of the player who directly opposes the ball carrier, (iii) balance, movements that ensure defensive stability in the area of the ball dispute (iv) concentration, movements that increase the goal protection and facilitate the recovery of the ball possession, and (v) defensive unity, movements that allow the team to defend in unity (Teoldo et al., 2009; Teoldo et al., 2017).

The system consists of two macro-categories (Observation and Outcome) and seven categories (Tactical Principles, Place of Action in the Game Field, Action Outcome, Tactical Performance Index, Tactical Actions, Percentage of Errors, and Place of Action Related to the Principles). The number of tactical actions and the quality of tactical principles achievement were considered to assess the tactical behavior. In turn, the values provided by the Tactical Performance Index (TPI) were considered to assess the tactical performance. The calculation of this index considers the performance of the principle (PP), quality of principle performance (QP), place of action in the game field (PA), the action-outcome (AO), and the number of tactical actions, below:

$$Tactical\ Performance\ Index\ (TPI) = \frac{\Sigma\ tactical\ actions\ (PP \times QP \times PA \times AO)}{number\ of\ tactical\ actions}$$

Materials

A digital camera SONY® model HDR-XR100 was used to record the games. This camera was positioned in elevation and in the diagonal between a sideline and a goal line. After recording, the video material was digitally inserted into a portable computer (DELL® laptop model Inspiron® N4030 Intel Core ™ i5) via USB cable and converted into an "AVI" format using the Format Factory® software. The Soccer Analyser® software was used for image processing and game analysis. This software allows the insertion of dynamic and static spatial references that enable an objective analysis of the behavior and tactical performance of soccer players based on the realization of the core tactical principles of the soccer game.

Data collection procedure

For the FUT-SAT field test, the soccer players were divided into teams composed of one player from each positional role: defender, midfielder, and forward with the aim to balance the level of performance across the teams. Thus, players were only assigned a team regarding their level of performance and field position, disregarding the level of biological maturation or the experience (calculated in years of practice). A U13 team would only play a U15 team once. All games were played on natural grass fields. All players received numbered vests from one to six to facilitate the analysis. For the test application, the players were asked to play according to the official rules of the game (including the offside rule). Thirty seconds were granted before the assessment for the players to familiarize themselves with the test. The coaches did not provide any instruction or encouragement to the players during the test, and several size-five balls were placed next to the field to quickly replace a ball the moment another left the limits of the SSCGs.

Statistical analysis

Descriptive statistics (mean and standard deviation) were used to characterize the sample. The Kolmogorov-Smirnov tests (to assess the data distribution), the independent *t*-test (for the variables that presented normal distribution), and the Mann-Whitney test (for the variables that did not present normal distribution) were used. The software used for data analysis was SPSS version 22.0, and the significance level adopted was p <0.05. The Pearson's r effect was calculated and classified as low (<0.29), medium (0.30-0.49), and high (> 0.50) according to the calculation performed using the formulas for the independent *t*-test (a) and the Mann-Whitney test (b), respectively (Cohen, 1992):

$$r = \sqrt{\frac{t^2}{t^2 + df}} \quad (a)$$

$$r = \frac{Z}{\sqrt{n}} \quad (b)$$

Reliability

The equivalent of 10.68% of the total actions was reanalyzed for reliability, for a total of 792 tactical actions. The number of reanalyzed actions is higher than the reference number (10%) proposed in the literature (Tabachnick & Fidell, 2001).

A 21-day interval was observed before the intra and interobserver reliability analysis. Cohen's Kappa test was used to calculate reliability (Robinson & O'Donoghue, 2007). The results revealed an intraobserver reliability value of 0.813 (standard error= 0.059) and an interobserver value of 0.813 (standard error= 0.063), being classified as "near perfect" by the literature (Landis & Koch, 1977).

RESULTS

Table 1 shows that the behavior of players of the U13 age level has shown a better percentage of success in movements of support to the ball carrier (Offensive Coverage) compared to the players of the U15 age level. Players of the U15 age level have made more movements that allow the team to defend in unity (Defensive Unity) compared to the players of the U13 age level. However, these results present an effect size classified as low as specified in the statistical calculations.

Table 2 shows that players of the U13 age level obtained similar performance to their pairs of the U15 age level.

Table 3 indicates that the outcome of the actions performed by the U13 players resulted in more fouls, corners, or throw-ins in the offensive phase and suffered more strikes on goal from the opponents in the defensive phase, compared to players of the U15 age level. On the other hand, in the defensive phase, U15 players regained more ball possession compared to U13 players. However, these results present an effect size classified as low as specified in the statistical calculations.

DISCUSSION

This present study aimed to compare the tactical behavior and performance of players in Small-Sided and Conditioned Games when playing against opponents from different age levels (Under-13 and Under-15). The results showed that U13 players achieved the best percentage of success movements

Table 2. Mean and standard deviation of the Tactical Performance Index (TPI) in the confrontation between players of U13 and U15 age levels

TPI	U13	U15	p	r
Offensive				
Penetration	57.40 ± 21.22	52.54 ± 25.46	0.354	0.011
Offensive Coverage	52.12 ± 15.70	49.67 ± 16.85	0.266	0.115
Depth Mobility	46.23 ± 19.15	46.56 ± 21.25	0.820	0.023
Width and Length	41.88 ± 11.68	42.30 ± 8.53	0.841	0.002
Offensive Unity	54.77 ± 19.95	51.16 ± 17.56	0.366	0.010
Defensive				
Delay	29.89 ± 10.26	31.47 ± 12.26	0.485	0.072
Defensive Coverage	36.30 ± 15.74	37.39 ± 20.19	0.804	0.003
Balance	30.73 ± 11.03	31.30 ± 11.31	0.806	0.002
Concentration	28.62 ± 10.81	31.22 ± 15.60	0.795	0.026
Defensive Unity	33.27 ± 8.63	33.27 ± 8.23	0.997	0.000
Total				
Offensive TPI	48.21 ± 11.26	46.90 ± 9.16	0.682	0.042
Defensive TPI	31.50 ± 5.26	32.23 ± 4.63	0.475	0.007
Game TPI	38.18 ± 6.04	36.92 ± 4.81	0.267	0.012

Table 1. Mean and standard deviation of the number of actions and percentage of success in the confrontation between players of U13 and U15 age levels

	Number of Actions				Percentage of Success			
	U13	U15	p	r	U13	U15	p	r
Offensive								
Penetration	3.55 ± 2.70	3.02 ± 1.99	0.464	0.075	31.94 ± 27.92	25.36 ± 20.24	0.441	0.079
Offensive Coverage	8.72 ± 4.27	7.13 ± 3.95	0.065	0.192	41.97 ± 22.12	32.95 ± 18.90	0.031	0.223
Depth Mobility	2.20 ± 2.60	2.17 ± 2.19	0.587	0.056	23.33 ± 29.18	20.65 ± 20.84	0.818	0.023
Width and Length	12.22 ± 5.12	12.34 ± 6.42	0.923	0.001	41.70 ± 21.79	38.69 ± 20.22	0.658	0.045
Offensive Unity	5.45 ± 3.97	5.23 ± 3.60	0.903	0.012	34.28 ± 26.88	32.14 ± 23.31	0.931	0.009
Defensive								
Delay	7.17 ± 3.07	6.71 ± 3.00	0.619	0.051	39.79 ± 22.44	31.70 ± 19.37	0.108	0.166
Defensive Coverage	2.05 ± 1.78	1.67 ± 1.54	0.355	0.095	25.83 ± 24.15	22.46 ± 25.14	0.372	0.092
Balance	6.55 ± 4.06	6.39 ± 3.02	0.814	0.024	29.33 ± 22.88	28.69 ± 18.31	0.811	0.024
Concentrantion	4.55 ± 3.05	4.34 ± 2.86	0.920	0.010	33.12 ± 25.70	32.42 ± 22.09	0.831	0.022
Defensive Unity	12.10 ± 4.25	14.56 ± 5.67	0.027	0.025	40.65 ± 17.81	49.33 ± 26.20	0.080	0.020
Total								
Offensive	32.15 ± 8.87	29.91 ± 7.91	0.220	0.014	52.83 ± 20.57	46.07 ± 16.42	0.063	0.192
Defensive	32.42 ± 8.03	33.69 ± 8.33	0.690	0.041	54.65 ± 17.21	56.12 ± 19.11	0.711	0.004

to offensive supporting the player with the ball whilst U15 players performed more movements that allowed the team to defend in unity. Also, there was no difference in tactical performance during a confrontation of the U13 against U15. Otherwise, players of the U13 age level suffered more fouls, won more corners and throw-ins in the offensive phase, and suffered more shots at their own goal in the defensive phase compared to the players of the U15 age level. In the defensive phase, the U15 players regained more ball possession compared to U13. However, all results present an effect size classified as low as specified in the statistical calculations.

The U13 players were more likely to accomplish correct movements to support the player with the ball in the offensive phase, which facilitates the tactical-technical responses of the player with the ball and reduces the opponent's pressure on him (Teoldo et al., 2017). In turn, players of the U15 age level made more movements that allow the team to defend as a whole: these movements indicate that they were able to reduce the spaces between the lines during the defensive phase. These movements are characterized by the unitary concept of defense, which seeks to ensure an organization capable of coordinating defensive movements outside the center of play (Teoldo et al., 2017). These results do not corroborate the findings of Teoldo et al. (2010) since the authors do not report differences in the tactical behavior of players in U13 and U15 age levels. However, it is important to highlight the study by Teoldo et al. (2010) did not compare the tactical behavior of the players in confrontation, which can generate different motivations for playing.

Therefore, the factor that may explain the greater frequency in movements that allow the team to defend as a whole is the moment in which the U15 players are going through their teaching-learning and training process of the core tactical principles of the soccer game. According to the literature, it is recommended that core tactical principles should be incorporated in training from the U13 age level, which is the age associated with a greater capacity of abstraction, promoting the accomplishment of all the movements of the mentioned principles (Teoldo et al., 2017). Thus, U15 players have more experience in training that favors the accomplishment of more complex movements outside the center of play.

Additionally, Américo et al. (2016) recommend that the teaching of tactical principles should occur gradually. Therefore, players in the U13 age level must experience teaching principles that occur within the center of play and the principles of width and length, concentration, and balance (near the center of play). At the same time, players in the U15 age level must experience the principles of depth mobility, offensive unity, and defensive unity that are further from the center of play (in addition to principles in and near the center of play). In this regard, U15 players may have played more movements that allow the team to defend in unity due to the phase in the teaching-learning process and training and the consequent experience in specific soccer training, to the detriment of confronting with young players.

On the other hand, besides experience in training tactical principles, players in the U15 age level are more likely to have participated in competitions and/or matches considered relevant, as in rich in tactical content and competitive (Ford et al., 2012). According to Kannekens et al. (2009), participation in such relevant competitions and matches are factors that influence players' behavior. In addition to these experiences, another factor that may explain the capacity to compact shown by the U15 players matches the finding of Philippaerts et al. (2006), who demonstrated that older players tend to perform better in the defensive phase because the

Table 3. Mean and standard deviation of the action outcomes in the confrontation between players of U13 and U15 age levels

Action Outcomes	U13	U15	p	r
Offensive				
Shoot at goal	3.02 ± 2.57	2.80 ± 1.75	0.659	0.045
Keep possession of the ball	21.71 ± 8.48	20.37 ± 6.75	0.398	0.009
Earn a foul, win a corner or throw-in	2.00 ± 1.32	1.45 ± 1.20	0.023	0.235
Commit a foul, five away a corner or throw-in	1.90 ± 1.33	1.84 ± 1.17	0.821	0.023
Loss of ball possession	3.23 ± 1.75	3.19 ± 1.77	0.575	0.058
Defensive				
Regain the ball possession	3.02 ± 2.08	3.82 ± 1.92	0.025	0.232
Earn a foul, win a corner or throw-in	1.95 ± 1.20	2.29 ± 1.34	0.179	0.139
Commit a foul, five away a corner or throw-in	1.45 ± 1.27	1.78 ± 1.25	0.140	0.153
Ball possession of the opponent	22.90 ± 6.87	23.70 ± 8.09	0.957	0.005
Take a shot at own goal	3.42 ± 1.96	2.60 ± 2.23	0.008	0.273

physical component is more developed compared to their younger peers. In line with this, Andrade and Teoldo (2015) argue that older players tend to take advantage of defensive tactical performance because defensive movements require more of the physical component compared to offensive ones.

Specifically, in terms of performance, the fact that U13 players do not present differences in tactical performance compared to U15 players should be considered as a positive point for the teaching-learning process and training of players in this age group. Considering the direct confrontation between the age levels, players of the U13 age level may have maintained the performance due to the motivation in performing their actions in a context of greater difficulty. Therefore, this can be a substantial factor for younger players to be able to raise their performance levels throughout the training process since the literature indicates that motivation is a preponderant factor to raise sports performance (Forsman et al., 2015).

Furthermore, the fact that there are no harmful consequences to the performance of U13 players implies that they are able to play their older peers, and therefore coaches can submit them to direct confrontation games. This is justified because players could maintain performance similar to their older counterparts, resisting the constraints imposed by their opponents despite the physical disadvantages (Andrade & Teoldo, 2015), even if U15 players are taller and heavier than the U13's. Inversely, this confrontation may be interesting to provide new experiences to the U15's because they train with other players besides those who compose their team. This acquisition of experience can be beneficial for U15 players' performance (Ericsson, 2008).

In terms of action outcomes, the consequent compaction that U15 players presented through the movements that allow the team to defend in unity may have hindered the offensive actions performed by the U13 players, who lost more ball possession and suffered more shots at their own goal. This result is similar to findings in the literature that show that the reduction of spaces between defensive lines can cause a technical-tactical and psychological pressure on players who accomplish offensive actions and subsequently cause more losses of ball possession (Garganta et al., 2013). Besides, these results corroborate the findings in the literature, which indicate that compaction between the lines tends to contribute to the defensive organization because reducing the available space for the opponent increases the probability for them to commit errors and thus generates an increase in the defensive efficiency (Maleki et al., 2016, Teoldo et al., 2017).

Therefore, the fact that players in the U13 age level are lower and lighter than U15's may have been the reason why these players suffered more fouls or won more throw-in and corners. Thus, to use direct confrontation between age levels in the teaching-learning and training process, the coach can consider the following aspects. First, U15 players will be better able to perform their actions that require abstract thinking (outside the center of play) compared to U13 players (Teoldo et al., 2017), besides the physical advantages they have over their younger peers (Andrade & Teoldo, 2015). Therefore, the coach can use this training feature to provide U13 players with actions that require abstract thinking when confronting their older counterparts, or inversely, offer the U15 the opportunity to improve their effectiveness in terms of action outcome. Also, coaches could use direct confrontation between age levels to include and/or fix specific content in the teaching and learning process, such as rehearsed combinations of play or behavior patterns so that they can perform them in a more complex context. It is also worth noting the importance of the confrontation between age levels during the transition periods, such as when U13 graduates to the U15 age level the following year.

In terms of practical application, the use of confrontation between age levels may be relevant when the structural conditions available for training do not provide proper training for all players in the same age levels. In this case, this confrontation would facilitate the use of the space for activities involving two age levels simultaneously. Besides, as mentioned previously, such confrontation can be a useful tool in the process of transition between age levels and potentially lead to a significant improvement in the young soccer players' training due to the interaction of players with differences in performance levels (Machado et al., 2019).

The results of this research can contribute to coaches, researchers, and professionals involved in the soccer teaching-learning and training process in terms of understanding the use of confrontation between age levels. Although the results of this research contribute to the progress of the studies related to the tactical component and the constraints manipulation, some limitations must be observed. The contents taught were not investigated to verify if the teaching of tactical principles is being used according to what is recommended in the literature. Also, the players' practice time in systematized training and associated activities, as well as the players' motivation during the task, were not investigated. This information could explain better the results, but it is suggested that further research was conducted to investigate the comparison between age levels, using different age groups from those assessed in this study to understand how players and teams perform their actions in confrontation between different age levels.

CONCLUSIONS

It is concluded that direct confrontation games between the U13 and U15 age levels lead players to compress more the team compared to the players of the U13 age level. However, players performance in both age levels is similar despite the differences found in the outcomes of the tactical actions: U13's earned more fouls, won more throw-ins or corners in the offensive phase, and suffered more shots at their own goal in the defensive phase whereas U15's could regain more ball possession in the defensive phase.

Practically, controlling and assessing the tactical component in this type of confrontation may favor the players' training process regarding the use of this manipulation by technical staff members. Therefore, in situations of club's structural conditions limitations in which two age levels have to accomplish the training in the same space, or in situations of transition between the one age level to the next, the use of this confrontation can be a positive alternative.

REFERENCES

Américo, H., Cardoso, F., Machado, G., Andrade, M., Resende, E., & Teoldo, I. (2016). Analysis of the tactical behavior of youth academy soccer players. *Journal of Physical Education*, *27*(1), 2710–2719. http://dx.doi.org/10.4025/jphyseduc.v27i1.2710

Andrade, M., & Teoldo, I. (2015). Como a eficiência do comportamento tático e a data de nascimento condicionam o desempenho de jogadores de futebol? *Revista Brasileira de Educação Física e Esportes*, *29*(3), 465–473. http://dx.doi.org/10.1590/1807-55092015000300465

Clemente, F., Castillo, D., & Arcos, A. (2020). Tactical analysis according to age-level groups during a 4 vs. 4 plus goalkeepers small-sided game. *International Journal of Environmental Research and Public Health*, *17*, 1667. http://dx.doi.org/10.3390/ijerph17051667

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155-9.

Ericsson, K. A. (2008). Deliberate practice and acquisition of expert performance: a general overview. *Academic emergency medicine*, *15*(11), 988-994. http://dx.doi.org/10.1111/j.1553-2712.2008.00227.x

Fernández-Espínola, C., Robles, M. T. A., Fuentes-Guerra, F. J. G. (2020). Small-sided games as a methodological resource for team sports teaching: a systematic review. *International Journal of Environmental Research and Public Health*, *17*(6),1884. http://dx.doi.org/10.3390/ijerph17061884

Ford, P. R., Carling, C., Garces, M., Marques, M., Miguel, C., Farrant, A., … Williams, M. (2012). The developmental activities of elite soccer players aged under-16 years from Brazil, England, France, Ghana, Mexico, Portugal and Sweden. *Journal of Sports Sciences*, *30*(1), 1–11. https://doi.org/10.1080/02640414.2012.701762

Forsman, H., Gråstén, A., Blomqvist, M., Davids, K., Liukkonen, J., & Konttinen, N. (2015). Development of perceived competence, tactical skills, motivation, technical skills, and speed and agility in young soccer players. *Journal of Sports Science*, *34*(14), 1-8. https://doi.org/10.1080/02640414.2015.1127401

Garganta, J., & Gréhaigne, J. (1999). Abordagem sistêmica do jogo de futebol: Moda ou necessidade? *Movimento*, *5*, 40-50.

Garganta, J., Guilherme, J., Barreira, D., Brito, J., & Rabelo, A. (2013). Fundamentos e prática para o ensino e treino do futebol. In F. Tavares (Ed.), *Jogos desportivos coletivos: ensinar a jogar* (pp. 199–263). Porto: Faculdade de Desporto da Universidade do Porto: Centro de Estudos dos Jogos Desportivos.

Gonçalves, B., Marcelino, R., Torres-Ronda, L., Torrents, C., & Sampaio, J. (2016). Effects of emphasising opposition and cooperation on collective movement behavior during football small-sided games. *Journal of Sports Sciences*, *34*, 1346–1354.

Kannekens, R., Elferink-Gemser, M. T., & Visscher, C. (2009). Tactical skills of world-class youth soccer teams. *Journal of Sports Sciences*, *27*(8), 807–812. https://doi.org/10.1080/02640410902894339

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*(1), 159–174.

Machado, J. C., Barreira, D., Teoldo, I., Travassos, B., Júnior, J. B., Santos, J. O. L. D., & Scaglia, A. J. (2019). How does the adjustment of training task difficulty level influence tactical behavior in soccer?. *Research quarterly for exercise and sport*, *90*(3), 403-416. http://dx.doi.org/10.1080/02701367.2019.1612511

Maleki, M., Dadkhah, K., & Alahvisi, F. (2016). Ball Recovery Consistency as a Performance Indicator in Elite Soccer. *Revista Brasileira de Cineantropometria e Desempenho Humano*, *18*(1), 72–81. http://dx.doi.org/10.5007/1980-0037.2016v18n1p72

Olthof, S. B. H., Frencken, W. G. P., Lemmink, K. A. P. M. (2015). The older, the wider: on-field tactical behavior of elite-standard youth soccer players in small-sided games. *Human Movement Science*, *41*, 92–102.

Philippaerts, R., Vaeyens, R., Moreno, J., Van Renterghem, B., Matthys, D., Craen, R., … Malina, R. (2006). The relationship between peak height velocity and physical performance in youth soccer players. *Journal of Sports Sciences*, *24*(3), 221–230. https://doi.org/10.1080/02640410500189371

Robinson, G., & O'Donoghue, P. (2007). A weighted kappa statistic for reliability testing in performance analysis of sport. *International Journal of Performance Analysis in Sport*, *7*(1), 12–19. https://doi.org/10.1080/24748668.2007.11868383

Serra-Olivares, J., Clemente, F. M., & González-Víllora, S. (2016). Tactical expertise assessment in youth football using representative tasks. *SpringerPlus*, *5*, 1301. http://dx.doi.org/10.1186/s40064-016-2955-1

Silva, D. C., Costa, V. T., Casanova, F., Clemente, F. M., & Teoldo, I. (2019). Comparison between teams of different ranks in small-sided and conditioned games tournaments. *International Journal of Performance Analysis in Sport*, *19*(4), 608-623. http://dx.doi.org/10.1080/24748668.2019.1643598

Tabachnick, B., & Fidell, L. (2001). *Using multivariate statistics: International Edition*. London: Pearson Education.

Teoldo, I., Garganta, J., Greco, P., & Mesquita, I. (2009). Tactical Principles of Soccer: concepts and application. *Motriz*, *15*(3), 657-668.

Teoldo, I., Garganta, J., Greco, P., Mesquita, I., & Afonso, J. (2010). Assesment of tactical principles in youth soccer players of different age groups. *Revista Portuguesa de Ciência do Desporto*, *10*(1), 147–157. http://dx.doi.org/10.5628/rpcd.10.01.147

Teoldo, I., Garganta, J., Greco, P., Mesquita, I., & Maia, J. (2011). System of Tactical Assessment in Soccer (FUT-SAT): Development and preliminary validation. *Motricidade*, *7*(1), 69–83. https://doi.org/10.6063/motricidade.7(1).121

Teoldo, I., Guilherme, J., & Garganta, J. (2017). *Training football for smart playing: On tactical performance of teams and players*. Curitiba: Appris