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Individual tactical effects of finishing at three mini-goals instead of one regular goal during small sided games in youth soccer players.

Efectos tácticos individuales de finalizar en tres miniporterías en lugar de en una portería reglamentaria durante juegos reducidos en futbolistas jóvenes.

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Abstract

The aim of this investigation was to determine the effects of modifying the number and type of targets on the individual offensive behavior during small-sided games (SSGs) in youth soccer players. A total of 20 youth elite players (age: 13.9± 0.6 years; weight: 53.2±5.6 kg; height: 1.6±8.3) performed a training game in form of 5vs5 players + 1 floater (excluding goalkeepers) under two different formats: 1) finishing at one regular goal and goalkeeper (RG) and 2) finishing at three mini-goals without goalkeeper (3MG). The sample comprised 1056 individual possessions for which six technical tactical indicators were evaluated by means of observational methodology. Descriptive and comparative analyses revealed that 3MG games created a context where players of all playing positions received the ball in more advanced field zones, under less defensive pressure, and performed fewer dribbles than during the RG games. Also, regression logistic analyses showed how players had lower odds of performing passes to progress vs to possess (Odds ratio= 0.577; 95% confidence interval: 0.427-0.779; $p<0.05$), as well as registered higher odds to achieve a positive outcome in their actions (Odds ratio=2.143; 95% confidence interval: 1.488-3.086; $p<0.05$) during the 3MG format. This study shows that finishing at one regular goal increases the defensive pressure on the ball carrier and the implementation of more penetrative actions such as dribbles and passes to progress, in comparison with finishing at three mini-goals.

Keywords: soccer coaching, tactical skills, representative training, football, constraints-led approach.

Resumen

El objetivo de esta investigación fue determinar los efectos de modificar el número y el tipo de porterías sobre el comportamiento ofensivo individual durante juegos reducidos (SSG) en jugadores de fútbol base. Un total de 20 jugadores jóvenes de élite (edad: 13,9± 0,6 años; peso: 53.2±5.6 kg; altura: 1.6±8.3) realizaron un juego de entrenamiento en forma de 5vs5 jugadores + 1 comodín (excluyendo porteros) bajo dos formatos diferentes: 1) finalizando en una portería reglamentaria con portero (RG) y 2) finalizando en tres miniporterías sin portero (3MG). La muestra estuvo compuesta por 1056 posesiones individuales para las cuales se evaluaron seis indicadores técnico-tácticos mediante metodología observacional. Los análisis descriptivos y comparativos revelaron que los juegos de 3MG crearon un contexto donde los jugadores de todas las posiciones recibieron el balón en zonas del campo más avanzadas, bajo menos presión defensiva y realizaron menos regates que durante los juegos de RG. Además, los análisis de regresión logística mostraron que los jugadores tenían menos probabilidades de realizar pases para progresar vs para poseer el balón (Oportunidad relativa= 0.577; 95% intervalo de confianza: 0.427-0.779; $p<0.05$), así como registraron mayores probabilidades de lograr un rendimiento positivo en sus acciones (Oportunidad relativa=2.143; 95% intervalo de confianza: 1.488-3.086; $p<0.05$) durante el formato 3MG. Este estudio muestra que finalizar en una portería reglamentaria aumenta la presión defensiva sobre el jugador con balón y la implementación de más acciones penetrantes como regates y pases de progresión, en comparación con finalizar en tres miniporterías.

Palabras clave: entrenamiento de fútbol; habilidad táctica; entrenamiento representativo; fútbol, enfoque basado en constreñimientos..

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Introduction

Small sided games (SSGs) are a modified format of the soccer match play that include lower number of players and a more reduced pitch size than the real game (Hill-Haas, Dawson, Impellizzeri and Coutts. 2011). This reduced version of soccer not only maintains a high level of representativeness (Bergkamp, den Hartigh, Frencken, Susan and Meijer, 2020) but also allows coaches to introduce new rules and formats to modulate the tactical constraints that players face during the training tasks (Ometto et al., 2018). Because of their high usefulness and popularity, the research studies on SSGs have increased exponentially in the last decade (Clemente, Alfonso, and Sarmento, 2021) contributing to a better understanding of the specific tactical, physiological and biomechanical characteristics of different formats of SSGs.

Due to this exponential importance, one of the current key roles of soccer coaches and fitness coaches is to manipulate the constrains of SSGs according to the tactical learning aims (Davids, Araújo, Correia and Vilar, 2013), as well as the physical stimuli required for players according to the team´s periodization. Within these constraints, modifying the scoring mode is one of the common strategies used by coaches to design different formats of SSGs Sarmento, Clemente, Harper, Costa, Owen and Figueiredo, 2018). In fact, previous research has shown that using small goals or different type of scoring can increase the physiological impact in comparison to the regular goals and goalkeepers (González-Rodenas, Calabuig and Aranda, 2015; Köklü, Sert, Alemdaroğlu and Arslan, 2015).

Tactically, some studies have observed how changing the type or number of targets in SSGs can help players face different problem-solving situations and search for original solutions Praça, Andrade, Bredt, Moura and Moreira, 2021). In this sense, the increase on the number of scoring targets modulates the information that players use to explore possibilities for action over the game (Davids et al., 2013; Travassos, Gonçalves, Marcelino, Monteiro and Sampaio, 2014) For example, Travassos et al. (2014) observed that the amplification of the information on a three-scoring target SSG led the emergence of higher distances between teams and an increase on the time that teams displayed on lateral corridors and defensive sectors, in comparison to the one regular target SSG. In the same vein, Praça et al. (2021) observed that the progression to the target rule, in which teams should take the ball to the opponent's endline to score points, led players to a more exploratory behavior, especially in the width axis, in comparison with the SSG with regular rules.

Despite the relevant and initial findings of previous research, very few studies up to date have focused on analyzing the effects of modifying the scoring mode on technical and tactical behavior in youth soccer players. The existing studies have mainly analyzed the collective behaviors of teams based on positional data (Travassos et al., 2014; Castellano, Silva, Usabiaga and Barreira, 2016) not including the analysis of individual or position-specific tactical demands. Thus, more research is necessary to understand the tactical reasons behind designing SSG with different type of targets, rather than using regular goals and goalkeepers, also exploring their possible impact on individual tactical development. For that purpose, systematic observation has been shown to be a suitable methodology for analyzing tactical behaviors in soccer (Preciado, Anguera, Olarte, and Lapresa, 2019) because it permits the inclusion of categorical data from the qualitative evaluation of different dimensions of match performance, what may improve the ability to describe soccer play actions (Anguera and Hernández-Mendo, 2013).

Therefore, the aim of this investigation was to determine the effects of modifying the number of targets on the individual behavior and performance during SSGs in youth soccer players.

Methods

Participants

A total of 20 elite youth players (age: 13.9 ± 0.52; weight: 53.2±5.6 kg; height: 1.6±8.3; years of experience: 6.2 ± 0.8) from an American professional academy participated in the study. The key inclusion criteria were to be an official player of the academy and to be fully prepared physically to sustain the physical demands of the SSGs. In this manner, tryout players and players undergoing a preparation process after injury were excluded from the study.

Thus, the participant players were scouted and selected for their technical and tactical abilities to be part of the U14 team belonging to a Major League Soccer club. Regarding their competitive level, this team participated in the highest-level competition for their age in the United States of America, called "U.S Soccer Development Academy" and organized nationally by the United States Soccer Federation. The U14 team trained three days per week and played one official match during the weekends for a total of thirty matches per season.

The style of play of the team was characterized by its offensive emphasis, highlighting tactical principles such as having the ball possession, building up from the back, switching the point of attack, overlapping, and creating high number of goal scoring opportunities. Based on this style of play and its key principles, the training sessions used to implement representative learning designs (Passos and Davids, 2014) for the players to improve their decision-making process by practicing real and opposed tactical situations.

The sample included 1056 individual ball possessions (IBP) that players performed during the SSGs. The participants, parents, and the club were informed about the research procedures and provided written informed consent. This study followed the ethical standards for study in humans as outlined in the Declaration of Helsinki. The soccer exercises were part of the normal routine training sessions of the team and no invasive, individual, or identifiable measures were performed to obtain the data.

Small sided games

The players performed the same type of SSGs (5vs5+1 floater, excluding goalkeepers) under two different formats considering the type of finishing: 1) Regular goals (RG) and 2) Three mini-goals (3MG) (Figure 1). The SSGs were performed two times per week for a period of four weeks as part of the normal training sessions of the U14 team. In total, players performed sixteen games of five minutes.

The SGGs were performed following a standardized warm-up protocol of two phases of five minutes each. In the first phase, players performed dynamic mobility with exercises that included jumps, dynamic stretching, changes of direction, sprints, etc. In the second phase, players performed a passing exercise that was focused on passing and running with the ball with speed and accuracy.

All the training sessions took place in the spring season (months of April and May), during the same hours (7.00 p.m.), on the same artificial turf surface. The SSG were recorded with one digital camera (Panasonic HC-V180) from an aerial perspective (Fleay, Joyce, Banyard and Woods, 2018; González-Rodenas, Aranda-Malavés, Tudela-Desantes, de Matías-Cid and Aranda, 2021) to capture entirely the collective and individual behavior of both teams.

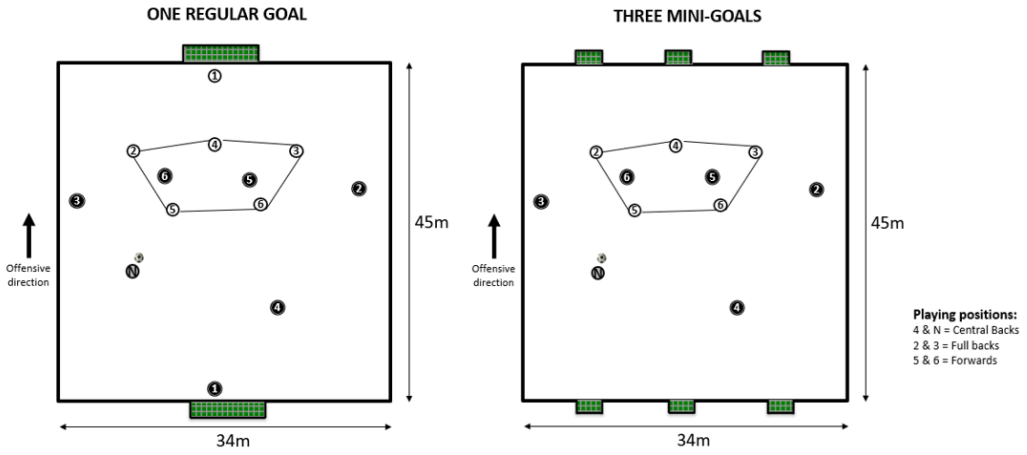

Figure 1. Different formats of SSGs conducted in this study and playing positions.

Table 1 shows the main characteristics of the SSGs conducted in this investigation. It is crucial to highlight that both teams had the same tactical objectives and implemented the same tactical formations both in defensive and offensive moment. The SSGs were part of the tactical periodization followed by this team to improve the implementation of the collective game model. These SSGs reflect a representative learning design, including the attacking and defending moments, as well as the defensive and offensive transitions (Hewitt, Greenham and Norton, 2016). Nevertheless, the main objective was to build attacks that disorder the opposing team by creating space and switching the point of attack to create shooting opportunities. The players were placed in specific playing positions based on the style of play of the team and their technical and tactical abilities (González-Rodenas et al., 2021).

Before the beginning of the study, the players were familiarized with the tactical formations implemented and the game format. The size of the pitch was established considering similar research designs (Praça et al., 2021) and previous research on SSGs (Clemente et al., 2021) since most of the studies used pitch sizes that involved a range between 100 and 150 m^2 per player. In this context, the coach did not provide direct or indirect instructions to the players to not have influence in their decisions and actions during or between the games.

Table 1. Design of the small sided games.

Task constraints	**Description**
Player number (without goalkeepers)	5vs5
Floaters	1 (playing as a central back)
Area per player (m^2)	139 m^2
Time (work: passive recovery)	(5:2 minutes)
Tactical objective	***Offensive: t***o create goal scoring opportunities by creating and exploiting free space ***Defensive: t***o perform high defensive pressure to recover the goal
Team formations	***Offensive:*** 1.4.2**; *Defensive:*** 1.3.2
Coach´s feedback	No direct instructions
Rules	Official soccer rules including off-side. The only exception is that all the restarts are taken as goal kicks (no throw ins, corner kicks or free kicks)
Type of finishing	A) Three mini-goals; B) One regular goal

According to the defensive team formation of both teams during the SSGs, it is interesting to mention the concept of "invasive space" that is based on the space of defensive occupation (SDO). The SDO was defined by Gréhaigne (2001) as the space that is formed by the positions of the players located, at a specific moment, in the periphery of a team in play, except the goalkeeper. In this way, the "invasive space" is formed by different subspaces that are dynamic

and change every second depending on the positioning and movement of the defending players (Figure 2B). This spatial structure allows to analyse the level of invasion over the opponent defensive lines. Thus, the evaluation of these three subspaces (non penetrative, penetrative and high penetrative) provides a very appropriate procedure to locate actions encompassing its tactical meaning according to the opponent distribution on the field (Seabra and Dantas, 2006; Aranda, González-Rodenas, López-Bondia, Aranda-Malavés, Tudela-Desantes and Anguera, 2019), as well as complement the evaluation of the formal field space towards the understanding of the spatial constraints experienced by the players during both SSGs formats.

Procedure

The study was based on systematic observation (Anguera and Hernández-Mendo, 2013). The unit of analysis was the individual ball possession (IBP), described by Link and Hoernig (2017) as the time that begins the moment a player can perform an action with the ball, and it ends the moment IBP for another player begins. For the evaluation of the IBP, the INDISOC observational tool (González-Rodenas, Villa, Tudela-Desantes, Aranda-Malavés and Aranda, 2022) inspired by previous research (Aranda et al., 2019). was used to evaluate six tactical dimensions related to three temporal moments within the IBP: 1) receiving the ball, 2) processing the ball and 3) culminating the action (Table 2).

Table 2. Description and categories for the dimensions related to the start and development of the team possession.

Moment	Dimension	Categories	Description
Receiving the ball	**1.Field zone** Zone of the field where the player receives or recovers the ball (figure 2A)	**Defensive**	The player receives the ball in the pre-defensive sector
		Pre-defensive	The player receives the ball in the offensive sector
		Pre-offensive	The player receives the ball in the defensive sector
		Offensive	The player receives the ball in the defensive sector
	2. Invasive space Area within the SDO of the opponent where the player receives the ball (figure 2B)	**Non-penetrative space**	The player receives the ball in front of the opposing forwards' line
		Penetrative space	The player receives the ball between the opposing forwards´ line and the defenders´ line.
		High penetrative space	The player receives the ball behind the opposing defender´s line.
	3. Defensive pressure Distance between the player with the ball and the immediate pressing opponent player(s) when receiving the ball.	**Initial pressure**	One or several opponent players pressure the attacker when receiving the ball (the defender(s) are located 1.5 meters of the player) (Lago-Ballesteros, Lago-Peñas, Rey, 2012)
		Non-initial pressure	No defensive player (s) pressure the attacker when receiving the ball
Processing the ball	**4. Type of action.** Behavior of the ball carrier since he/she receives the ball until the culmination of the action.	**One touch action**	The ball carrier only needs one contact with the ball to culminate the action.
		Quick action	The player needs few contacts (with no directional changes or turns) with the ball to culminate the action.
		Carrying the ball.	The ball carrier runs with the ball performing multiple touches or directional changes
		Dribbling	The ball carrier attempts to beat an opponent in possession of the ball.
Culminating the action	**5. Action culmination** Final action of the player that intends to pass to a teammate or shoot at goal	**Possess the ball**	The player performs a pass that does not past opponent player (s).
		Progress to the goal	The player performs a pass towards the opponent' s goal past opponent player (s)
		Finish	The player shoots at goal.
		No culmination	The player does not culminate the ball possession.
	6. Tactical outcome Final performance of the action, considering the success when passing/shooting.	**Positive outcome**	a) The player performs a pass that is received and brought under control by the receiving player, b) the player scores a goal after shooting at goal, or c) the player is fouled or achieves a corner kick or throw in for its team.
		Negative outcome	a) The player performs a pass that is intercepted or missed, b) the player loses the ball by a tackle or turnover c) the player does not score a goal after shooting, or c) the player commits a foul during the individual ball possession.

For the analysis, a soccer coach/researcher experienced in match performance analyzed each possession post-event as many times as necessary. This observer holds a PhD in performance analysis in soccer, as well as have more than ten years of coaching experience in professional soccer academies in different countries. The Lince-Plus software (Soto-Fernández, Camerino, Iglesias, Anguera and Castañer, 2021) was used to code and register the data.

The reliability of data was calculated by the intra and inter-observer agreement (Cohen´s Kappa) by analyzing four games of 5 minutes of the implemented SSGs (332 IBPs; 25% the sample). This analysis showed high reliability according to Altman criteria (1991) (inter-observers kappa coefficient= 0.81-0.93; intra-observer kappa coefficient= 0.84-0.97).

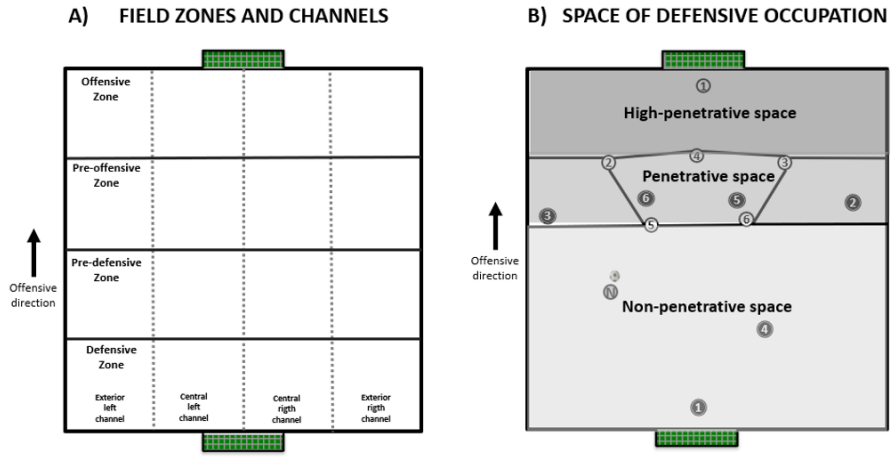

Figure 2. Field zones and space of defensive occupation.

Statistical analysis.

This study is a descriptive, comparative, and predictive analysis. Statistical analyses were carried out using the software IBM SPSS Statistics Version 27.0 (IBM Corp., Armonk, NY, United States). Firstly, descriptive statistics (frequencies) were calculated for the distribution of each tactical dimension within each format. A chi-square ($\chi 2$) test was used to compare the frequencies of tactical dimensions among formats for the different playing positions, following the methodology of similar studies (Pic and Lavega-Burgués, 2019; Gómez, Leicht, Rivas and Furley, 2020). The significance level was set to $p < 0.050$. The effect size was calculated by the Cramer´s V (<0.1=Trivial;0.1-0.2=Small;0.2-0.4=Moderate; >0.4=Strong) according to previous studies (Rea and Parker, 1992; Lee, 2016).

Secondly, a multinomial logistic regression analysis was carried out, in which the dependent variable was the action culmination that players executed at the end of their IBP. Finally, a bivariate logistic regression analysis was performed in which the dependent variable was whether the tactical outcome was successful or not, based on previous research (Gómez, Alarcón-López and Ortega-Toro, 2015, Pic and Castellano, 2016). From these models, an odds ratio with 95% confidence limits was calculated. In the univariate analyses, each of the independent variables was tested separately, and the association between the single variables and the dependent variables was assessed. Multivariate logistic multilevel models were constructed by including those variables that showed a P-value lower than 0.05 in the univariate analysis.

Results

Descriptive and comparative analysis

Table 3 shows the general tactical differences according to the different SSG formats. It can be observed that there were differences between 3MG and RG for the field zone of intervention ($p<0.001$), defensive pressure ($p<0.001$), type of action ($p<0.001$), action culmination ($p<0.001$) and possession outcome ($p<0.001$), while no differences were found regarding the invasive space of intervention ($p=0.439$). As for the moment of receiving the ball, the 3MG format registered lower proportion of offensive actions in the defensive zone, while the RG produced fewer actions in the pre-defensive, pre-offensive and offensive sectors. Also, the 3MG format decreased the defensive pressure of the opponent over the ball carrier.

Regarding the ball processing, the 3MG format decreased the proportion of one touch actions and dribbles, in comparison to the RGG. Finally, when culminating the action, the 3MG format registered lower proportion of actions related to progress to the goal, while the RG produced more actions related to progress towards the opposing goal. In addition, the 3MG registered higher rate of positive outcomes during the players´ actions than RG (87.5% vs 75.4%, respectively).

Table 3. Individual tactical differences according to the type of finishing in categorical dimensions (n=1056).

Dimensions	**Three mini-goals**		**One regular goal**		**P[1]**	**ES[2]**
	%	[CI]	%	[CI]		
Field zone					**<.001**	Moderate
Defensive	19.5	[16.3-22.7]	37.7	[33.3-42.1]		
Pre-Defensive	39.2	[35.2-43.1]	33.5	[29.2-37.7]		
Pre-Offensive	28.8	[25.1-32.4]	20.8	[17.1-24.4]		
Offensive	12.5	[9.8-15.1]	8.1	[5.5-10.5]		
Invasive space					.439	Trivial
Non-penetrative space	55.7	[51.6-59.6]	51.7	[47.1-56.2]		
Penetrative space	39.7	[35.7-43.7]	43.2	[38.7-47.7]		
High penetrative space	4.6	[2.9-6.3]	5.1	[3.1-7.1]		
Defensive pressure					**<.001**	Moderate
Defensive pressure	42.3	[38.2-46.3]	63.8	[59.4-68.1]		
Type of action					**<.001**	Moderate
One touch	9.8	[7.3-12.1]	15.0	[11.8-18.2]		
Quick	67.1	[63.3-70.9]	52.5	[48.0-57.0]		
Carrying the ball	19.3	[16.1-22.5]	18.9	[15.3-22.4]		
Dribbling the ball	3.8	[2.2-5.3]	13.6	[10.4-16.6]		
Action culmination					**<.001**	Small
Possess the ball	62.8	[58.9-66.7]	54.4	[49.9-58.9]		
Progress to the goal	22.3	[18.8-25.6]	30.1	[25.9-34.2]		
Finishing	12.7	[9.9-15.3]	9.7	[7.1-12.4]		
No culmination	2.2	[1.0-3.4]	5.7	[3.6-7.8]		
Tactical outcome					**<.001**	Small
Positive outcome	87.5	[84.8-90.1]	75.4	[71.5-79.3]		

Values in bold indicate significant differences between three mini-goals and one regular goals

[1] Chi-square test; [2] Effect size=Cramer´s V (<0.1=Trivial;0.1-0.2=Small;0.2-0.4=Moderate; >0.4=Strong)

Table 4 shows the different proportions of tactical variables that both formats registered depending on the playing position of players. For central defenders, the 3MG format produced lower proportion of actions in the defensive sector ($p<0.001$) and fewer actions under defensive pressure ($p<0.001$). Additionally, central defenders performed fewer one touch actions and dribbles ($p<0.001$), as well as lower proportion of actions related to progress towards the goal than the RG format ($p=0.028$).

For full backs, the 3MG format, in comparison to the RG, increased the proportion of actions in the pre-offensive and offensive sectors (p=0.004) and decreased the proportion of actions under defensive pressure (p<0.001). Regarding the ball processing, these players decreased the percentage of one-touch actions and dribbles (p=0.001), as well as decreased the actions to progress towards the goal (p=0.009). Also, the 3MG format registered a higher rate of success than the RG (p=0.001)

For forwards, only significant differences were observed for the variables "defensive pressure" (p=0.031), "type of action" (p=0.001) and "individual tactical outcome" (p=0.001). In this sense, forwards performed fewer actions under defensive pressure and lower proportion of dribbles during the 3MG format. However, no differences were found regarding the field zone of intervention (p=0.069), the invasive space (p=0.415) and the action culmination (p=0.162) between different formats. Finally, the percentage of successful actions was higher for this playing position during the 3MG, in comparison to the RG (80.9 vs 62.3%; p=0.001).

Table 4. Individual tactical differences according to the type of finishing in categorical dimensions according to the playing positions (n=1056).

Dimensions	**Central defenders**				**Full backs**				**Forwards**			
	3MG %	**RG %**	**P[1]**	**ES[2]**	**3MG %**	**RG %**	**P[1]**	**ES[2]**	**3MG %**	**RG %**	**P[1]**	**ES[2]**
Field zone			**<.001**	Moderate			**.001**	Moderate			.069	Small
Defensive	39.6	74.1			3.3	10.3			0.8	5.3		
Pre-Defensive	44.4	22.6			43.2	51.4			22.9	30.7		
Pre-Offensive	14.4	2.8			35.0	29.5			49.6	43.0		
Offensive	1.5	0.5			18.6	8.9			26.7	21-1		
Invasive space			.081	Small			.991	Trivial			.415	Trivial
Non-penetrative	95.9	92.8			24.6	24.0			16.0	10.5		
Penetrative	3.3	7.1			69.4	69.9			73.3	76.3		
High penetrative	0.7	0.1			6.0	6.2			10.7	13.2		
Defensive pressure			**<.001**	Moderate			**<.001**	Moderate	58.8	71.1	**.031**	Small
Defensive pressure	36.3	60.8			39.3	62.3						
Type of action			**<.001**	Small			**<.001**	Moderate			**.001**	Moderate
One touch	5.6	13.7			8.2	11.6			20.6	21.9		
Quick	80.7	67.0			60.7	44.5			48.1	36.0		
Carrying the ball	12.6	14.2			26.2	27.4			23.7	16.7		
Dribbling the ball	1.1	5.2			4.9	16.4			7.6	25.4		
Action culmination			**.028**	Small			**.009**	Small			.162	Trivial
Possess the ball	67.4	60.8			62.8	54.8			53.4	42.1		
Progress to the goal	28.1	34.4			19.1	30.1			14.5	21.9		
Finishing	4.1	1.9			14.8	7.5			27.2	27.5		
No culmination	0.4	2.8			3.3	7.5			4.6	8.8		
Tactical outcome			**.025**	Trivial			**.001**	Small			**.001**	Moderate
Positive outcome	91.9	85.8			85.8	70.5			80.9	62.3		

Values in bold indicate significant differences between three mini-goals and one regular goals
[1] Chi-square test; [2] Effect size=Cramer´s V (<0.1=Trivial;0.1-0.2=Small;0.2-0.4=Moderate; >0.4=Strong)

Multidimensional logistic regression analysis

Table 5 shows the univariate and multivariate effects of different dimensions on the action culmination performed by players. The dimensions "type of goal", "defensive pressure" and "type of action" registered significant effects to predict the players´s type of actions.

In this sense, the 3MG format obtained lower odds of performing passes to progress vs to possess than the RG (OR= 0.577; 95% CI: 0.427-0.779; p<0.05). Other tactical dimensions such as receiving under no defensive pressure and carrying the ball increased the odds of performing a pass to progress vs to possess the ball, regardless of the type of goal.

Table 5. Multivariate logistic regression predicting to perform a pass to progress vs a pass to possess (Reference Category).

Dimension	Pass to progress vs pass to possess (Univariate Analysis)			Pass to progress vs pass to possess (Multivariate analysis)		
	β	SE	OR (95% CI)	**β**	SE	OR (95% CI)
Type of goal						
Regular Goals (R)						
Three mini-goals	-0.445	0.146	0.641 (0.481-8.54)**	-0.550	0.153	0.577 (0.427-0.779)***
Position						
Central defender (R)						
Full backs	-0.168	0.166	0.846 (0.610-1.158)			
Forward	-0.251	0.203	0.778 (0.523-1.158)			
Field Zone						
Defensive (R)						
Pre-defensive	0.003	0.171	1.003 (0.718-1.401)			
Pre-offensive	-0.192	0.206	0.825 (0.551-1.235)			
Offensive	-0.202	0.329	0.817 (0.429-1.557)			
Defensive pressure						
Pressure (R)						
No pressure	0.383	0.146	1.466 (1.102-1.952)**	0.452	0.157	1.571 (1.155-2.138)**
Type of action						
Quick action (R)						
One touch action	0.016	0.241	1.016 (0.633-1.631)	0.014	0.247	1.104(0.625-1.646)
Carrying the ball	0.504	0.179	1.655 (1.166-2.349)**	0.384	0.184	1.468 (1.024-2.105)*
Dribbling	0.114	0.390	1.120 (0.522-2.405)	0.059	0.397	1.061 (0.487-2.311)

β = *Coefficient; SE =Standard error; OR= Odds Ratio; CI= Confidence interval for odds ratio; **=p>0.05; ***=p>0.01; ***=p>0.05.*

In the Table 6 can be observed the univariate and multivariate effects of different dimensions, including the SSG formats, on the individual tactical outcome. On one hand, the multivariate analyses revealed that players presented higher odds of achieving a positive outcome in their actions during the 3MG format (OR: 2.143; 95% CI: 1.488-3.086, p<0.05), regardless of the position, field zone, defensive pressure and type of action.

Table 6. Binary logistic regression predicting to achieve a positive individual tactical outcome vs a non-positive outcome (Reference Category).

Dimension	Positive outcome vs non positive outcome (Univariate Analysis)			Positive outcome vs non positive outcome (Multivariate analysis)		
	β	SE	OR (95% CI)	**β**	SE	OR (95% CI)
Type of goal						
Regular Goals (R)						
Three mini-goals	0.825	0.165	2.281 (1.652-3.149)**	0.762	0.186	2.143 (1.488-3.086)**
Position						
Central defender (R)						
Full backs	-0.786	0.200	0.456 (0.308-0.674)**	-0.118	0.245	0.860 (0.504-1.468)
Forward	-1.156	0.205	0.315 (0.211-0.470)**	-0.150	0.272	0.888 (0.549-1.437)
Field Zone						
Defensive (R)						
Pre-defensive	-0.548	0.243	0.578 (0.359-0.931)*	-0.560	0.284	0.571 (0.327-0.997)**
Pre-offensive	-1.195	0.243	0.303 (0.188-0.488)**	-1.110	0.316	0.329 (0.117-0.612)***
Offensive	-1.340	0.289	0.262 (0.149-0.461)***	-1.208	0.375	0.299 (0.143-0.624)***
Defensive pressure						
Pressure (R)						
No pressure	1.304	0.104	1.644 (1.191-2.269)*	0.200	0.189	1.222 (0.843-1.770)
Type of action						
One touch action (R)						
Quick action	1.040	0.238	2.829 (1.772-4.514)**	0.713	0.251	2.040 (1.246-3.340)*
Carrying the ball	0.373	0.269	1.452 (0.856-2.462)	0.226	0.290	1.254 (0.710-2.214)
Dribbling	-1.244	0.296	0.288 (0.161-0.515)**	-1.046	0.308	0.351 (0.192-0.643)**

β = *Coefficient; SE =Standard error; OR= Odds Ratio; CI= Confidence interval for odds ratio; **=p>0.05; ***=p>0.01; ***=p>0.05.*

On the other hand, higher odds of achieving a positive outcome were found when players received the ball in the defensive sector, in comparison with the rest of the sectors, as well as when players performed a quick action, in comparison to perform a one touch action. Finally, the action of dribbling registered lower odds of achieving a positive outcome, in comparison to performing a one touch action.

Discussion

The aim of this investigation was to explore the effects of modifying the number of targets on the individual offensive behaviors and tactical performance during SSGs in youth soccer players. The results support the idea that using three small targets instead of the regular goals had influence not only on the individual behavior of players but also in the tactical success of their actions.

Regarding the moment of receiving the ball, the 3MG format registered higher proportion of offensive actions in advanced field zones than the RG format for all playing positions. Contrarily, both formats registered similar proportions of offensive actions considering the space of defensive occupation. This spatial comparison between formats reflects that although players are in higher field zones during the 3MG, no more penetration was achieved over the opposing team defensive lines in relation to the RG. In addition, the 3MG format registered lower frequency of actions under defensive pressure.

These facts may be due because of the higher number of targets in the 3MG format, what could lead the defensive team to prioritize the protection of the goals rather than performing defensive pressure in central and offensive areas of the field. In this scenario, the defensive team would form a lower block to be closer to the mini-goals. According to these findings, Travassos et al. (2014) observed that using more scoring targets led the emergence of higher distances between teams and more time played in defensive sectors of the field. These authors suggested that when playing with three targets, the defensive team retreats the position on the pitch to account with the advantage of defending additional targets. Besides this, existing literature revealed that when using additional targets, defensive teams implement a wider disposition in the field in the defensive moment, creating a more flattened defensive line (Castellano et al., 2016). Thus, the necessity of adopting a wider disposition to protect more goals can make it more difficult to move to higher zones in the field and exert defensive pressure in central and offensive zones.

As for the moment related to the ball processing and action culmination, the 3MG format decreased the proportion of one touch actions and dribbles, as well as registered higher odds of performing passes to possess the ball, while the RG produced more passes to progress towards the goal. These results may be related to the higher position of the field and higher pressure exerted by the defensive teams in the RG format. For instance, the study of Coutinho, Reis, Gonsalves, Pereira, da Eira Sampaio and Leite (2016) observed that when using only one target, the game tended to be more focused in specific spaces and therefore, the game intensity increases, in comparison to use additional targets. In this context of higher intensity, players would experience more duels against their closest opponents, what would require performing quicker an even riskier actions, such as one-touch passes, or dribbles to past opposing players. These are key findings of our study, that show how the tactical constraints that players have to experience are very different depending on the type of format, what can influence the learning and development of technical and tactical skills during training sessions.

Concerning the tactical performance, players presented higher odds of achieving a positive outcome in their actions during the 3MG format, regardless of the position, field zone, defensive pressure, and type of action. These results can also be related to the lower defensive pressure exerted by the opposing team during the 3MG. In this scenario, the offensive players could have more time and space to make tactical decisions and increase the odds of achieving a positive outcome in their actions. Also, playing against a defensive team more focused on protecting the mini-goals could create more passing lanes for the ball carrier. In contrast, playing during the RG format may decrease the distances between attackers and defenders (Travassos et al., 2014; Castellano et al., 2016), increasing the defensive pressure and the odds of losing the ball possession. This change of tactical behavior is probably since having only one central goal to defend, the defensive team can focus on protecting the central channels of the field (Clemente, Wong, Martins and Mendes, 2014) and advance their position to be closer to the ball carrier in order to prevent possible shots at goal. In this line, Almeida, Duarte, Volossovitch and Ferreira (2016) observed that youth players regained more possessions during SSGs with central goals vs double goals. Also, Gonet, Bezerra, Reis and Vasconcellos (2020) found how the occurrences of wrong passes, lost balls and conquered ball increased when playing with one small and central target, instead of two targets.

These findings show important practical applications for practitioners. On one hand, using additional targets seem to increase the odds of performing passes to possess vs passes to progress, as well as to reduce the number of one touch actions and dribbles. These findings are key for coaches to design training tasks that reproduce the tactical situations that are more appropriate for the development of their players. For example, coaches that want to teach how to face 1v1 situations and actions under defensive pressure should reduce the use of SSGs with multiple targets, according to our study. On the other hand, using additional targets seem to help players to perform offensive actions with lower risk of losing the ball possession. This knowledge can be used by coaches to design SSGs during their training sessions, optimizing the player development process.

Nevertheless, this study presents several limitations. Firstly, our investigation only focused on the analysis of offensive behaviors, while the effects of modifying the type of finishing on the defensive behaviors were not determined. Secondly, one of the strengths of this study can also be considered a limitation, so that we used exclusively observational methodology to analyze and register the individual behaviors of players. This methodology has been proved to be suitable for analyzing tactical behaviors in soccer (Anguera and Hernández-Mendo, 2013) but it is different from the one used by other studies, which measured collective and positional variables (i.e., team width and length or centroid distance) to determine the collective behaviors of team during SSGs (Frencken, Lemmink, Delleman and Visscher, 2011).

Conclusion

In conclusion, this study found how modifying the number of targets constrains not only the individual behaviors of players, but also their technical and tactical success during small sided soccer games in youth soccer players.

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