

## Are there differences in the technical actions performed by players from different playing position during small-sided games?

### *Existem diferenças nas ações técnicas realizadas por jogadores de diferentes posições durante os pequenos jogos?*

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**Abstract** – This study aimed to compare technical actions of soccer players from different playing position during small-sided games in which teams were composed of players from the same position (e.g., three defenders). In total, 14 U-14 soccer players ( $14.43 \pm 0.16$  years), four defenders, four midfielders and four forwards, as well as 2 non-evaluated goalkeepers, participated in this study. The incidence of technical actions performed by players was analyzed through proportion chi-square test and omega effect sizes, and significance level was set at 5%. Results showed no differences in technical actions performed by players from different playing positions ( $p > 0.05$ , small effect size). Thus, it is suggested that the 3v3 small-sided game, with teams composed of athletes with the same playing position, is characterized by a more general training stimulus, which can be particularly useful during the first years of deliberate practice.

**Key words:** Physical education and training; Soccer; Task performance analysis.

**Resumo** – Este estudo objetivou comparar as ações técnicas de jogadores de futebol de diferentes posições em pequenos jogos com equipes compostas por atletas de mesma posição (e.g., três defensores). Participaram do estudo 14 atletas de futebol categoria sub-14 ( $14,43 \pm 0,16$  anos) divididos em 4 defensores, 4 meio-campistas e 4 atacantes, além de dois goleiros não avaliados. A incidência das ações técnicas realizadas foi analisada por meio do teste de qui-quadrado de proporções e do tamanho do efeito ômega, mantendo-se nível de significância em 5%. Os resultados apontam para a ausência de diferenças nas ações técnicas realizadas por jogadores de diferentes posições ( $p > 0,05$ , tamanho do efeito pequeno). Desta forma, sugere-se que o pequeno jogo 3v3, com equipes compostas por atletas de mesma posição, permite um estímulo geral em relação às especificidades do estatuto posicional, apresentando-se particularmente útil em momentos iniciais da formação esportiva.

**Palavras-chave:** Educação Física e Treinamento; Futebol; Análise de desempenho de tarefas

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## INTRODUCTION

In soccer, athletes of different playing positions - e.g. defenders, midfielders and forwards - have different physical and technical performances<sup>1-3</sup> regarding the problem situations found during the game. These specific performances demand that the training process should be designed in a specific way by playing position, allowing the achievement of the adaptations necessary for the game. Therefore, recent studies have evaluated the tactical<sup>4</sup> and physical<sup>5</sup> responses of athletes from different positions in training sessions such as small-sided games (SSG), which allow coaches to adjust each game modification in order to facilitate the specific adaptations for players of different positions.

Previous studies that have pointed out differences in the physical and tactical performance of players due to the playing position in small-sided games used the playing position as a criterion for team composition<sup>4,5</sup>. The main justification for maintaining teams composed of a defender, a midfielder and a forward is the attempt to maintain similar characteristics of playing field by opposing teams<sup>6</sup>. As teams have one player playing in each position, it is assumed that defenders will perform more actions characteristic of their role in the game, e.g. defensive actions, and less characteristic actions of players of other positions, e.g., finalizations (related to the forward's action). Thus, it is expected that the division of teams in this way will lead athletes to perform more specific actions during the game, reducing the variability of stimuli in the training process. Conversely, in the early years of deliberate practice, a process of experimentation of different game requirements is suggested, providing appropriate adaptations related to tactical creativity<sup>7</sup>. Thus, contexts in which teams are composed of players of only one position, e.g. only defenders, may allow a reduction in the influence of playing position and seem to be important pedagogical resources at the beginning of deliberate practice. The lack of data in this context limits a broader understanding of SSG as a means of training and their use to promote adequate development of the performance of young athletes.

In soccer, technical ability is assessed from actions involving the ball (pass, dribble, interception, etc.). In the formal game, studies have reported differences in the number of actions performed by players of different playing positions<sup>1,8</sup>. In this context, Bush et al.<sup>1</sup> reported, for example, higher incidence of passes made by midfield players in comparison to defenders and forwards, indicating that this is a specificity of players of this position. Thus, in case specificities of formal game appear in the small-sided game, midfielders are expected to perform more actions with ball, namely passes, in comparison to the other players. However, this hypothesis has not been tested in literature.

The investigation of different configurations of small-sided games, including information about the influence of playing position on the behavior of players in situations of small-sided games with teams composed of players of only one position, and their impact on the behavior of players

seems to be important in pedagogical planning in the soccer teaching and training process. To date, investigations about the influence of playing position on technical actions during small-sided games are incipient, limiting the use of this technique in the training process. In view of the above, the aim of the present study was to compare the technical actions of soccer players of different positions during 3v3 small-sided games with teams composed of players of only one position. From differences in the technical actions of players of different positions reported in the formal game, and differences in the behavior of players of different positions in small-sided game situations, it is hypothesized that there will be differences in the incidence of technical actions among players of different positions during small-sided games.

## METHODOLOGICAL PROCEDURES

### Ethical Procedures

This study was approved by the Research Ethics Committee of the Federal University of Minas Gerais and registered under CAE 51011915.9.0000.5149. Prior to collection, all legal representatives and volunteers were presented to the data collection procedures. The legal representatives signed the informed consent form and the volunteers, underage athletes, were consulted and also filled out the free and informed consent form.

### Subjects and Sample Calculation

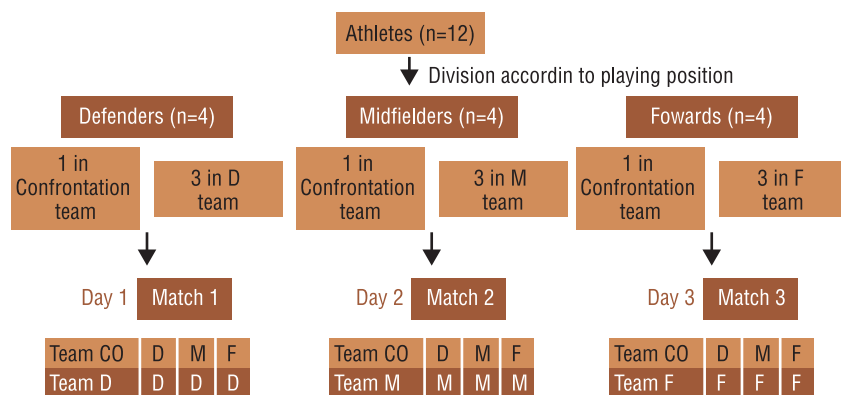
The sample of this study was composed of fourteen male soccer players (age  $14.43 \pm 0.16$  years, body weight  $62.58 \text{ kg} \pm 8.72$  and height  $172.16 \pm 7.20$  cm), modality practitioners and belonging to a team of the national elite (affiliated to the Confederação Brasileira de Futebol, which participates in the first division of the main national competitions) located in the city of Curitiba. Athletes perform, on average, six training sessions, lasting approximately 1h30min, in addition to one official game per week. Of these fourteen players, two goalkeepers were selected for participation in the small-sided games but were not evaluated during the study procedures. The 12 athletes effectively evaluated in the U-14 category were selected taking into account their playing positions, being four defenders, four midfielders, four forwards (plus two goalkeepers not evaluated during the study).

The GPower 3.17 software was used for sample size estimation. For this, the dependent variable with the highest variation coefficient obtained from a pilot study (distance between 14.4 and 21.5km / h - VC = 0.062) was used. This information has been entered in the GPower software in the field "t family of tests", selecting the field "differences between two dependent (paired) groups". Using the effect size, calculated from the pilot data, alpha = 0.05 and beta = 0.8, the software pointed out the need for 6 subjects.

### Procedures

Initially, 14 athletes from the main team were selected to participate in

the study. These athletes were selected by the club staff according to the interest of the club. In the present study, unlike literature, the 14 athletes performed activities separated from the main team throughout the collection period, with training and load contents standardized by the club staff in consonance with the group of researchers in order to guarantee better control of the experiment. Previous study pointed out that the alteration of the adversary can lead to changes in the behavior of players during small-sided games<sup>9</sup>. In this sense, in the present study, 3 athletes were allocated in the “confrontation” (CO) team, used as standard opponent for all other opponents. The other line athletes were distributed in 3 teams, composed only of defenders (team D), midfielders (team M) or forwards (team F). Goalkeepers were kept fixed during all small-sided games. Figure 1 shows the details of the team composition process. As small-sided games, including the 3v3 configuration, are part of the athletes’ training routine, no familiarization procedures were necessary.



**Figure 1.** Team composition procedures and collection sequence. D = Defender; M = Midfield player; F = forward.

The study lasted 3 days. In these days, the average temperature in the city of data collection was 16.42°C (highest average temperature = 20.44 °C and lowest average temperature = 14.7 °C) and relative humidity of 85.54% (highest average relative humidity = 95.75 and lowest average relative humidity = 81.75), always measured at noon on the day of collection by the city’s meteorological station (data available at <http://www.inmet.gov.br/projetos/network/search/>). On each day of collection, the CO team played against a different team (D, M and F). On the same day, the two teams that did not participate in the game against the CO team carried out series of small-sided games among themselves (not evaluated) in order to maintain the same training routine among all athletes who participated in the study. All collections took place in the afternoon, respecting the start and end times in order to standardize the effects of the circadian cycle<sup>10</sup>. In all, 12 series of small-sided games were held (4 by playing position against the CO team).

Before each session, athletes underwent a preparatory, standardized activity, divided into two five-minute moments. In the first moment, a

sequence of joint protection was presented, characteristic of the work proposed by the club they belong to. In the second moment, standardized pass and reception drills were also performed in the standardized manner by the institution.

After the preparatory activity, athletes performed the small-sided games, which followed the rules inherent to the modality, including offside and took place in a soccer field with natural grass and dimensions of 36m in length by 27m in width. In each collection, 4 series were performed, with 4 minutes of duration and 4 minutes of passive pause, maintaining a 1: 1 work regime. All collected series were filmed for later analysis. After the small-sided games, athletes participated in technical and tactical activities planned and coordinated by the group of researchers. These activities aimed at maintaining the athletes' normal training routine. Each training session, including preparatory activity, small-sided games and technical and tactical activities lasted 60 minutes.

### Observation tool

For the evaluation of technical actions, a scout similar to that adopted by other authors was used<sup>11,12</sup>, which is detailed in Box 1. Performance analysts, with at least five years of experience and familiarity with the software and hardware used in the study, performed the analyses. These professionals evaluated the images and recorded the actions of each player on a specific worksheet with the aid of an Ipad platform and a computer interfaced with performance analysis software called SportsCode®. The frequency of technical actions performed by each athlete (teams D, M and A) was recorded. To facilitate the process, the technical actions registered were divided into defensive (tackle and interception) and offensive (reception, dribble, finalization and pass). Inter- and intra-observer analysis protocols were conducted, revealing Kappa Coefficient values above 0.8 in all cases, considered satisfactory in literature<sup>13</sup>.

**Box 1.** Variables analyzed and their descriptions

Actions	Concept
Defensive	
Tackle	The player withdraws the ball from the opponent through an approach.
Interception	The player intercepts the trajectory of the ball by preventing an opponent's pass from reaching the intended destination.
Offensive	
Reception	The player receives the ball from a pass made by a teammate or controls the ball that has been knocked over and keeps it under control.
1x1	The player, with the ball possession, overtakes an opponent by means of body movements
Finalization	The player intentionally sends the ball towards the goal, with the feet or with any other part of the body in the attempt to score a goal.
Wrong Pass	The player intentionally sends the ball towards a teammate who is unable to receive it due to a defender's action or poor pass quality
Goal	Goals scored by each team.

## Data analysis

The incidence of technical actions performed by players of different positions was analyzed using the chi-square test ( $\chi^2$ ) of proportions. In technical actions with frequency lower than 5, the Monte Carlo correction was adopted. The effect size  $\omega$  (omega) was calculated according to the small ( $\omega = 0.1$ ), medium ( $\omega = 0.3$ ) and large ( $\omega = 0.5$ ) classification. The SPSS 20.0 statistical software was used for all analyses, maintaining the significance level at 5%.

## RESULTS

Table 1 presents the comparison of the incidence of technical actions among players of different positions. Mean values are presented in brackets by series. No significant differences were found in the incidence of technical actions performed by players of different positions. The  $\omega$  values are considered small. In addition, it is observed, from a descriptive point of view, greater incidence of technical actions of reception and finalization in comparison to tackle and interception actions.

**Table 1.** Incidence of technical actions by playing position (and mean values by series). D = Defender; M = Midfield player; F = Forwarder

	D	M	F	p-value	$\chi^2$	$\Omega$
Tackle	2(0.5)	3(0.75)	2(0.5)	1.000	0.286	0.289
Interception	6(1.5)	9(2.25)	8(2.0)	0.738	0.609	0.246
Reception	77(19.25)	89(22.25)	75(18.75)	0.490	1.427	0.163
1x1	6(1.5)	6(1.5)	11(2.75)	0.337	2.174	0.112
Finalization	16(4.0)	13(3.25)	13(3.25)	0.807	0.429	0.269
Wrong Pass	8(2.0)	13(3.25)	11(2.75)	0.552	1.188	0.184
Goal	6(1.5)	3(0.75)	3(0.75)	0.629	1.500	0.157

## DISCUSSION

The present study aimed to compare the technical actions of soccer players from different positions in small-sided games with teams composed of athletes of the same position. It was hypothesized that there would be differences in the incidence of technical actions between different positions, based on the assumption of specificities in the roles of players in each position in the formal game in which differences are found, for example, in finalizations and interceptions between defenders and forwards<sup>8</sup>. Therefore, the study hypothesis was rejected because no differences were reported in the variables analyzed.

One of the possible explanations for the result found may be related to the game configuration adopted in the present study. According to literature, the 3v3 configuration allows the appearance of few differences in tactical behavior among athletes of different positions<sup>15</sup>, despite differences in physical performance<sup>5</sup>. At this point, some tactical principles

are characterized by a direct action on the ball or on the player with ball possession, such as the tackle-related containment and penetration related to 1x1 actions - allowing the associating them to technical actions analyzed in this study. Thus, based on the absence of difference in tactical principles, a similar result is expected in the technical action associated with this principle.

Also in relation to the game configuration adopted in the present study, differences in tactical behavior between the 3v3 structure and other small-sided game formats, such as 5v5 and 6v6<sup>16,17</sup>, are reported in literature. Although the 3v3 small-sided game presents itself as the minimum structure to guarantee decision-making requirements similar to the formal game<sup>18</sup>, it is believed that situational requirements of small-sided games closer to the formal game, e.g., 5v5 and 6v6, may allow the emergence of specificities related to the playing position. Therefore, it is suggested that the game format used in this work has characteristics that allow athletes to perform more general functions in the game, less specific in relation to the playing position.

Another explanation for the results found concerns the age of the sample selected in the present study. As the specificities of the playing position are the result of the training process in the modality<sup>19,20</sup>, it is expected that athletes with longer time of deliberate practice, e.g. U-17 and U-20 athletes, present more specific behaviors based on the different experiences during deliberate practice of the modality. The age group of the present study is in the phase of the direction of the training process<sup>21</sup>, and did not fully develop their tactical, technical, physical and psychological abilities. Accordingly, studies have shown differences in the performance of athletes between different categories<sup>22-24</sup>, which evidence the need for hours of practice towards expertise and consequently a more specific performance regarding position functions. Also related to the teaching-learning-training process, in the age group of the present study, athletes evolve significantly throughout the season<sup>24</sup>, so the moment when the evaluation was performed may have influenced the observed results.

Regarding the incidence of technical actions, similar values are observed in other studies performed with small-sided games using the same format<sup>25,26</sup>, suggesting that the behavior of these variables presents low variability in different contexts. In addition, there is similarity in the values reported in this study compared to those observed in a formal game situation when relativizing the incidence by the number of players<sup>11</sup>. Despite the similarity between protocols and the formal game, caution is suggested in the use of this small-sided game as a means for the training of some technical actions, as the low frequency of occurrence - e.g., tackles and 1x1 situations - may not translate in an ideal pedagogical context to generate adaptations in the behavior of athletes. Other means of training, for example games with less players or technical-coordinative tasks, which guarantee a greater propensity to the appearance of these behaviors, may be necessary in the training process.

Results involving teams composed of athletes of the same position during small-sided games allow an initial basis for reflections and decisions regarding the configuration of teams using the small-sided game as a means of training. Based on the results of this study, it is proposed, as a practical application, the adoption of more general game structures - for example, without equivalent distribution of players of different positions in the same team - in order to allow an increase in the variety of stimuli during the initial stages of sports training. However, there are limitations in the present study regarding specificities in the formation process characteristic of this soccer club. Thus, further studies in different training centers of athletes in Brazil and different contexts of practice (schools, clubs and high level teams, for example) should be carried out in order to broaden the understanding of this phenomenon.

## CONCLUSION

It was concluded that the 3v3 small-sided game, with teams composed of athletes of the same position, does not allow the appearance of specific technical actions of each playing position.

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