

# The efficiency of action of young soccer players in competitive games and *small-sided games*

## Authors' Contribution:

- ☑ **A** Study Design
- ☑ **B** Data Collection
- ☑ **C** Statistical Analysis
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## Abstract

**Background & Study Aim:** The extremes of professional soccer prejudice two factors (criteria): coordination difficulty; body burden effort during of match (90 minutes and more). The aim of this study is correlation between the efficiency of actions 14-16 years old football players during *small-sided games* and during competitive games.

**Material & Methods:** Among 16 young male elite soccer players the mean age of the first group ( $C_1$ ) was  $14.2 \pm 0.5$  years, and the second group ( $C_2$ ) was  $16.1 \pm 0.6$  years. The efficiency of action in *small-sided games* was assessed by means of a test method involving "1-on-1" and "2-on-2" games and in the competitive game with the *SGPAI* method (*Soccer Game Performance Assessment Instrument*). The inter- and intra-observer agreement for the first and third stages of the research was assessed using Intraclass Correlations Coefficients (ICC). The 95% confidence intervals (CI) for the ICC were calculated in each case. Test-retest reliability values above 0.8 indicated good reliability.

**Results:** The study has proved a significant and strong positive correlation between the efficiency of action achieved by young players in *small-sided games* and the expert assessment of their competence in the competitive game. The ICC of test-retest for *small-sided games* for both groups were, respectively: 0.89, 0.87 and 0.92, 0.90

**Conclusions:** Proposed method was proven to be a reliable tool for the comprehensive evaluation of young football players' efficiency. Early identification and shaping of skills in individual actions and in cooperation are essential to achieving high efficiency and develop young football players' talents.

**Keywords:** effectiveness • extreme sport • Intraclass Correlations Coefficients • Soccer Game Performance Assessment Instrument • talent

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**Extreme sport** – it included in the definition of “extreme form of physical activity – EFPA” [40-42].

**EFPA** – “extreme form of physical activity are **extreme sports**, often classified according to the environment in which they are performed (water, land, air), extreme form of physical recreation as well as gainful activity or voluntary service, and all varieties of physical activity that meet at least one classification criterion of the feature associated either with extreme risk of injury or death, or extreme body burden with high level of effort, or extreme coordination difficulty” [42, p. 19].

## INTRODUCTION

In team games, the efficiency of a player’s actions is understood as all of his practical assets manifested in a game, specifically the positively assessed features of these actions. These features primarily include activity (the frequency of performing certain actions), efficiency (the accordance of the result with the intended aim), and effectiveness (actions producing a favourable although possibly unintended result). These assets are mostly quantified by calculating the efficiency or reliability indices (the ratio of efficient and effective actions to all actions performed). An analysis of competition based on observation constitutes the grounds for creating training programmes and, in particular, assigning specific tasks to competitors with regard to shaping motor abilities and improving knowledge and skills. Thus, the key to identifying players’ abilities lies in observation of the game, and performing systematic observations is a condition of effective training control [1-4].

Traditional manners of control applied in the practice of sports games, such as special fitness tests, do not permit correct assessment of the level of a player’s skills. They merely enable the evaluation of selected technical elements and/or isolated motor abilities, which are implemented in a competitive game only to a small extent [5]. Svensson and Drust [6] stress that individual test results cannot be conclusively used to predict performance in a match because of the complex nature of performance in competition.

Therefore, in team games, it is increasingly advised that competitors’ knowledge and skills be assessed through simulation to comprehensively evaluate players’ knowledge and skills. Chart and computer simulations [7-9] as well as fragments of the game and small-sided games [10-12] are used. Events produced in the model (e.g. in *small-sided games*) have effects that are similar to events that occur in competition [13-15].

The efficiency of individual actions (e.g. in “1-on-1” games) has high significance, particularly in team games in which particular players can determine the effects of the whole team’s achievements. Some authors [16-18] note that the level of a player’s individual potential is a basis for team success. However, the ability to cooperate (e.g. in “2-on-2” or “3-on-3” games) together with motivation, the status of socio-emotional bonds between particular team members, and their experience are also crucial factors in terms of effective competition [17, 19-21]. Hence, a player’s capabilities should be verified on the basis of a

comprehensive evaluation of his efficiency in individual (“1-on-1” games), group (*small-sided games*), and team (competitive game) actions.

In practice, observation sheets are often used to evaluate players/teams. Before these sheets can be used as reliable research tools, they need to undergo a validation procedure. It is necessary to precisely define the analysed actions and for experienced observers to assess the reliability and accuracy of the sheets [22]. This assessment is of paramount importance because, as Hughes et al. [23] prove, some performance analyses in sports involve no reliability studies. The assessment of players’ efficiency of actions in “1-on-1” and “2-on-2” games is a vital supplement to the assessment of young players based on their performance in competitive games (“11-on-11”). Analysis of efficiency allows the quantification of the most important offensive and defensive actions and consequent decisions about players’ objective rankings on the condition that the applied assessment method has been validated. Additionally, assessing the correlation between efficiency in competitive games and efficiency in *small-sided games* gives credibility to the assessment of a player’s capabilities.

The aim of this study is correlation between the efficiency of actions 14-16 years old football players during *small-sided games* and during competitive games. The consequence of this objective are two research tasks: to develop a tool to enable the verification of young soccer players’ skills through an evaluation of the efficiency of their actions in a competitive game (“11-on-11”); to establish a correlation between the efficiency of action in *small-sided games* and competitive games among 14- to 16-year-old football players using the proposed research tool.

## MATERIAL AND METHODS

### Participants

Two groups of 16 young male elite soccer players participated in this study. The mean age of the first group ( $C_1$ ) was  $14.2 \pm 0.5$  years, and the mean age of the second group ( $C_2$ ) was  $16.1 \pm 0.6$  years. The players had been in systematic training for five and seven years, respectively (the mean training period of  $C_1$  was  $5.1 \pm 0.5$  years and of  $C_2$  was  $7.1 \pm 0.5$ ). The mean body masses were  $53.2 \pm 7.0$  kg ( $C_2$ ) and  $66.2 \pm 7.3$  kg ( $C_1$ ). The mean body heights were  $166.3 \pm 6.5$  cm ( $C_1$ ) and  $178.9 \pm 8.5$  cm ( $C_2$ ).

All players had been members of the Polish Football Association for the three previous years. The subjects

participated in regular training five times a week, and they played matches in the youth league on weekends.

Each competitor obtained his parents'/guardians' consent to be involved in the scientific project. The studies were approved by the Bioethical Committee for Scientific Research at the Regional Medical Chamber.

### **Experimental design and procedures**

The experimental procedures took place during the last third of the competitive season (March – May 2012). The purpose and of research tasks of the study were accomplished in a few stages.

#### **Stage 1 – reliability of SGPAI**

In the first stage, actions assessed in the “11-on-11” game were defined, and an observation sheet (Appendix 1) for the evaluation of the efficiency of actions in the “11-on-11” game was verified (*Soccer Game Performance Assessment Instrument – SGPAI*). The observation sheet comprised 12 basic categories of offensive and defensive actions (six individual action and six group actions) performed by players while positioning the game (ball possession and gaining the field of play with the ball), creating situations to score and cooperating during set pieces of the game. Each action was assessed on a scale from 5 to 1: 5 – very effective performance (always); 4 – effective performance (usually); 3 – moderately effective performance (sometimes); 2 – weak performance (rarely); 1 – very weak performance (never).

The efficiency of actions among players of the national team of Poland in a friendly match against the national team of Portugal was observed. An audio-visual recording of the game was analysed using the freeze-frame function (TV set – Sharp Aquos LC46LE830E, DVD player – Yamaha 8520), and data were marked on the observation sheet (Appendix 1). To measure the intra-observer agreement, the study was conducted twice (at an interval of one month, in identical conditions with the same observer). To measure the inter-observer agreement, three experts (licensed coaches, two of the UEFA Pro master class and one of the UEFA A first class) independently viewed the same game and assessed different components of the game performance using the newly developed instrument tool.

#### **Stage 2 – reliability for simulation games**

In the second stage, the reliability of small-sided games was assessed using a test-retest procedure, as described below. Tests were conducted that involved “1-on-1” and “2-on-2” *small-sided games* for both

groups on a pitch with artificial grass in the form of two two-day research sessions (in the same place and at the same time of day).

#### **Instructions to carry out test – “1-on-1” small-side game**

The “1-on-1” game should be organised separately for each group on the same day in the system of a match and a rematch on a pitch with artificial grass (in total, 30 games for each player; time of game 90 seconds, with an interval of 2–3 minutes; area of the game field 15×20 m; goals used in a game of getbol, 40×65 cm in dimension, by the company Energoexport-Silesia, Poland). The aim of the game is to achieve the maximal number of points by scoring goals (hitting the goal post or crossbar is rated) and to prevent the opponent from getting points (lost goals, also hitting the crossbar or post). Based on the value of efficiency of the ‘game ratio’ (the difference between scored and lost goals in all games), a ranking of the players’ effectiveness in a “1-on-1” game is determined. Before the start of each first-round game, a coin is tossed. The winning player starts the game from his goal, and his opponent starts from the middle of the field (similarly, in the same game in the rematch, the loser resumes). After losing a point, the game is resumed from the goal, and the defensive player has to retreat to the middle of the playing field. Counteracting may begin only when the opponent with the ball touches it for the first time on his half of the pitch. In other cases (hitting, kicking the ball out, player’s error, using a hand), an opponent begins playing from that place. In such a case, the defender is obliged to remain at a distance of at least 3 m from the player with the ball and to begin playing only after the ball is on the field of play. A penalty kick (from the middle of the field into an empty goal) is awarded for defending a goal with the hands. This kick is performed at the end of the match. Games are supervised by five people (head of research and four assistants). Assistants follow the actions of two pairs of players and, if necessary, pass the ball to players who resume the game.

Before the first round of games, players should be familiarised with the objective of the study, instructed about the rules of the game, and well-motivated. Subsequently, a typical 15-minute warm-up with elements of the “1-on-1” game should be conducted.

#### **Instructions to carry out test – 2-on-2 small-side game**

The day after conducting the “1-on-1” games, players’ efficiency in cooperating in “2-on-2” games is

assessed separately in every group. To do this, strictly according to the ranking list of efficiency in “1-on-1” games (i.e., the 1st team – the 1st and 2nd players from the rank list, the 2nd team – the 3rd and 4th players from the list, etc.), eight two-man teams should be arranged in the system where each team plays against each other team (the match and rematch system), and 14 games should be arranged for them (duration of every game is 180 seconds; field of the game approximately 30x20 m in dimension with outlined zones – semicircles of a 3 m radius in which there can be no defensive players; the remaining rules of the game remain the same as for the “1-on-1” games). On the basis of the results achieved in the “2-on-2” games, a ranking is constructed of the most efficient players in cooperation. Games are supervised by five people (head of research and four assistants). Assistants follow the actions of two pairs of players and, if necessary, pass the ball to players who resume the game. Before the first round of games, players should be familiarised with the objective of the study, instructed about the rules of the game, and well-motivated. Subsequently, a typical 15-minute warm-up with elements of the “1-on-1” game should be conducted. The test’s reliability is estimated using the test-retest method (at an interval of two weeks).

### **Stage 3 – SGPAI and correlations between “1-on-1”, “2-on-2”, and “11-on-11” games**

In the last stage of the study, three experts (licensed coaches), independently of each other and separately for both research groups, assessed the examined players’ abilities with SGPAI on the basis of a direct observation of the examined competitors in three competitive games (“11-on-11”). Inter-observer reliability (among the assessments of 3 raters) was also estimated. On the basis of the results achieved by the examined competitors in small-sided games, ranking lists of their efficiency in “1-on-1” games and in “2-on-2” games were established. On the basis of arithmetic means of evaluations of the game by experts, a ranking of their usefulness for the competitive game was created. The interdependence between efficiency of the players’ actions in *small-sided games* and their competence in the competitive game was estimated individually in both research groups.

### **Statistical analysis**

The inter- and intra-observer agreement for the first and third stages of the research was assessed using Intraclass Correlations Coefficients (ICCs). For the inter-observer agreement between multiple observers, a two-way mixed model of ICC (3.1) was calculated,

and for the intra-observer agreement, a two-way random model of ICC (2.1) was calculated [24]. ICC was interpreted as follows: 0-0.2 indicated poor agreement, 0.3-0.4 indicated fair agreement, 0.5-0.6 indicated moderate agreement, 0.7-0.8 indicated strong agreement, and >0.8 indicated almost perfect agreement [25]. Test-retest reliability for small-sided games (stage 2) was also determined by ICC (2.1) using a two-way random model (subject by session) and the absolute agreement definition [24, 26, 27].

The 95% confidence intervals (CIs) for the ICCs were calculated in each case. Test-retest reliability values above 0.8 indicated good reliability. A systematic error (the mean differences in the scores of the test and the retest) was checked by a paired t-test with the significance level set at 0.05 [28, 29]. To determine correlations between the results achieved in simulation games and the expert assessment of the competitive game, Spearman’s rank correlation coefficient and correlations of Gamma and Kendall’s Tau were applied. It was assumed that values of the rank correlation coefficient above 0.7 confirmed a high correlation [30]. In all cases, the level of statistical significance was set at  $p \leq 0.05$ . All calculations were performed using Statistica 10.0 (StatSoft, Inc., US) and MedCalc (MedCalc Software, Belgium).

## **RESULTS**

### **Stage 1 – Reliability of SGPAI**

The ICC for intra-rater reliability ranged from 0.89 (counteracting the positioning of the game) to 0.99 (for scoring a goal and creating situations to score goals) with a 95% CI. The ICC for inter-rater reliability ranged from 0.81 (counteracting the positioning of the game; 95% CI from 0.60 to 0.93) to 0.96 (for scoring a goal, 95% CI from 0.90 to 0.98), as shown in Table 1. The results confirmed almost perfect agreement for both intra- and inter-rater reliability.

### **Stage 2 – reliability for small-sided games**

The results achieved by the examined players in *small-sided games* were verified for reliability. The ICCs for the test and retest were as follows: in “1-on-1” games, 0.89 for  $C_1$  and 0.92 for  $C_2$ ; in “2-on-2” games, 0.87 for  $C_1$  and 0.90 for  $C_2$ , respectively, which confirms their high reliability. In “1-on-1” games, the examined 14-year-olds achieved efficiency indices from -16 to +18 points (test) and from -12 to +10 (retest), whereas the 16 year olds achieved -12 to +14 points and -12 to +9 points, respectively. In “2-on-2” games, the results in group

**Table 1.** Inter- and intra-rater reliability for SGPAI

Elements of assessment	Inter-rater reliability ICC (3,1)	Intra-rater reliability ICC (2,1)
<b>Individual actions</b>		
Positioning of the game	0.84	0.93
Creating situations to score goals	0.92	0.99
Scoring goals	0.96	0.99
Gaining control of the ball	0.91	0.94
Interrupting actions	0.87	0.90
Interfering in gaining the field of play	0.86	0.92
<b>Group/team actions</b>		
Positioning of the game	0.87	0.90
Creating situations to score goals	0.93	0.98
Counteracting the positioning of the game	0.81	0.89
Counteracting creating situations to score goals	0.90	0.95
Counteracting scoring a goal	0.94	0.97
Cooperation in set pieces of the game	0.83	0.92

$C_1$  fluctuated from  $-14$  to  $+24$  points (test) and from  $-10$  to  $+20$  (retest), whereas in group  $C_2$ , the results ranged from  $-12$  to  $+14$  and from  $-8$  to  $+14$  points, respectively.

### Stage 3 – SGPAI and correlations between “1-on-1”, “2-on-2”, and “11-on-11” games

An assessment of the examined players’ abilities was made separately for both research groups using SGPAI on the basis of direct observation of the players’ actions in three competitive games (11-on-11). The ICC for inter-rater reliability ranged from 0.79 (for creating a situation to score goals, 95% CI from 0.58 to 0.92) to 0.95 (for scoring a goal, 95% CI from 0.88 to 0.97). This result indicates almost perfect agreement. The highest unanimity between experts’ assessments was identified with reference to actions with the aim of scoring goals, creating a situation to score them, and counteracting such situations in both group  $C_1$  and group  $C_2$  (the difference in assessment did not exceed 1 point). The lowest unanimity was found for cooperating in offence, in defence (positioning of the game), and in set pieces (the difference in assessment was 3 points). The top assessed players received a total of 56 and 57 points, whereas the worst players received 32 and 34 points (groups  $C_1$  and  $C_2$ , respectively). On the basis of the mean of the experts’ assessments in the competitive game and the

results achieved in *small-sided games* (“1-on-1” and “2-on-2”), a ranking list was developed of the most efficient players in particular categories (Table 2).

Ranking results for the competitive game (“11-on-11”) were correlated with the ranking results of the *small-sided games* obtained in the second study. The values of the rank correlation coefficients are presented in Table 3.

In both group  $C_1$  and group  $C_2$ , statistically significant correlations between both of the *small-sided games* and among each of the games (“1-on-1” and “2-on-2”) and the competitive game were found at the level of  $p \leq 0.05$ . The highest coefficient values refer to the examination of the correlation of ranks with Spearman’s test, and the lowest one refers to the examination with Kendall’s Tau test, which results from the discriminatory strength of the statistical tools used.

### DISCUSSION

to assess the efficiency of actions in a competitive game, the authors’ observation sheet was proposed. Among others, the experiences of Griffin et al. [31], Hughes and Bartlett [32], Carling et al. [3], Suzuki and Nishijima [33], Chen and Hendricks [34] and Auld [12] were used.

**Table 2.** Ranking assessment of the examined players (group C<sub>1</sub> and C<sub>2</sub>) in “1-on-1” and “2-on-2” games (second study) and in the competitive game (“11-on-11”).

Player's number	Group C <sub>1</sub>			Group C <sub>2</sub>		
	“1-on-1” game	“2-on-2” game	“11-on-11” game	“1-on-1” game	“2-on-2” game	“11-on-11” game
1	6	2	5	3	2	3
2	4	3	3	8	3	10
3	11	6	12	4	2	4
4	9	6	8	12	6	9
5	12	8	11	12	8	13
6	5	3	6	16	7	14
7	2	1	4	1	1	1
8	1	1	2	9	5	12
9	8	4	10	7	4	7
10	16	7	12	10	5	8
11	15	8	15	11	6	10
12	3	2	1	2	1	2
13	10	7	9	14	8	16
14	7	4	7	5	3	5
15	14	5	16	6	4	6
16	13	5	14	15	7	14

**Table 3.** Values of Spearman's, Gamma, and Kendall's Tau rank correlation coefficients among results achieved in “1-on-1”, “2-on-2”, and “11-on-11” games

Examined players	1-on-1 game / 2-on-2 game	1-on-1 game / 11-on-11 game	2-on-2 game / 11-on-11 game
Group C <sub>1</sub> (Spearman)	0.88*	0.94*	0.78*
Group C <sub>1</sub> (Gamma)	0.77*	0.82*	0.64*
Group C <sub>1</sub> (Kendall's Tau)	0.74*	0.81*	0.62*
Group C <sub>2</sub> (Spearman)	0.95*	0.94*	0.92*
Group C <sub>2</sub> (Gamma)	0.89*	0.86*	0.85*
Group C <sub>2</sub> (Kendall's Tau)	0.86*	0.85*	0.83*

Notes: \* – the value of rank correlation coefficients higher than 0.50 for the two-tailed test was assumed to be statistically significant.

The observation sheet was verified using ICCs as the best tool for checking data of this type with reference to both intra- and inter-rater reliability [24, 26, 27]. The achieved results correspond to the findings of other researchers who analysed the reliability of observation methods in football, including Tallir

et al. [35], Tenga et al. [36] and Auld [12]. The results confirm perfect agreement for intra-rater reliability (ICC = 0.98). Additionally, examining inter-rater reliability showed almost perfect agreement. The agreement of the experts' assessments was the highest in the individual and group actions of creating situations

for scoring goals (ICC = 0.92) and scoring them (ICC = 0.96) as well as gaining control of the ball (ICC = 0.91) and group actions creating situations for scoring goals (ICC = 0.93), counteracting the creation of situations to score goals (ICC = 0.90), and counteracting scoring a goal (ICC = 0.94) (cf. Table 1). This result appears obvious due to the ease of estimating these elements of the game. However, the agreement of the experts' evaluations concerning counteracting the positioning of the game and cooperation in set pieces (both in offence and in defence) was the lowest (0.81 and 0.83, respectively). Understandably, the observers had the greatest difficulty in estimating individual players' contribution to collective action. Gréhaigne et al. [5] and Auld [12] observed similar differentiation in experts' assessments.

To evaluate the efficiency of actions in "1-on-1" and "2-on-2" games, a test game was used. The reliability of the results achieved in small-sided games was verified by the test-retest method with an application of ICC. The calculated ICC values confirmed the high retest reliability of "1-on-1" and "2-on-2" games according to the criteria proposed by Hopkins [28], Weir [29] and Christie et al. [37]. The slightly lower reliability in group  $C_1$  most likely resulted from greater differentiation of skills between particular groups; this group had two less years of training experience than players from group  $C_2$ . In turn, the higher reliability of the second examination (in both groups  $C_1$  and  $C_2$ ) can be explained by practice gained while players were performing test tasks.

To complete the second objective (to identify correlations between the efficiency of the players' actions in small-sided games and their evaluation in a competitive game), the results obtained in the second examinations (retest) were used. In this session, smaller differences were found between the values of the efficiency of the 'game ratio' (the difference between scored and lost goals in all games of the given category) in both research groups (both 1-on-1 and "2-on-2" games).

It follows from the data presented in Table 3 that players achieving the best results in "1-on-1" games were also highly appraised in terms of their skills in the competitive game ("11-on-11"). For example, player No. 7, the most efficient in "1-on-1" and "2-on-2" games ( $C_2$ ), was ranked the highest by the experts in terms of the efficiency of his actions in the competitive game. A similar correlation was noted in the cases of players No. 1 and No. 3.

Among the 14-year-old players ( $C_1$ ), this agreement was not perfect, but it was very distinct. Player No. 8, the best in "1-on-1" and "2-on-2" games, was ranked second in terms of efficiency of actions in the "11-on-11" game, and competitor No. 3, who was ranked third in the "1-on-1" game, was regarded by the experts as the best footballer in the competitive game. Additionally, in both groups ( $C_1$  and  $C_2$ ), considerable agreement was apparent between the results achieved in small-sided games and the experts' assessments of the competitive games among the weakest footballers (e.g., players No. 11 and No. 16, who took fifteenth and thirteenth places in the "1-on-1" games, were ranked 15 and 14 ( $C_1$ ) by the experts, respectively; competitors No. 6 and No. 16, who ranked 16 and 15, respectively, in the "1-on-1" games, took *ex aequo* fourteenth place in the coaches' ranking ( $C_2$ ).

Among the players taking the middle places in the ranking lists, the agreement between the results achieved in *small-sided games* and the expert evaluations was not as distinct, which can be explained by the limitations of the observation method itself [38]. It follows explicitly from the conducted study (Table 3), however, that there is a strong positive correlation between all types of games in both research groups between results obtained by 14- to 16-year-old footballers in *small-sided games* ("1-on-1" and "2-on-2") and the efficiency of their actions in competitive games.

In both research groups, the highest correlation was found between the "1-on-1" game and competitive games, and in group  $C_2$  the highest correlation was found between the "1-on-1" and "2-on-2" games. The lowest correlation was found between "2-on-2" games and the "11-on-11" game, particularly in group  $C_1$ . This result can be explained, on the one hand, by a positive effect appearing during players' cooperation (e.g., because of their individual profiles, players achieving average results in "1-on-1" games can effectively cooperate in "2-on-2" games [17] and, on the other hand, by the uneven personal contribution of individual players to the team's performance resulting from their position and function in competitive games (e.g., a player efficient in a "1-on-1" game or two efficiently cooperating players in a "2-on-2" game are unable to show their potential in an "11-on-11" game because the positions they fill limit their cooperation). In turn, the stronger correlation between individual games (in each category, except for "1-on-1" and "11-on-11" games) in group  $C_2$  can be justified by the greater game skills of 16-year-olds compared with their younger colleagues.

Our results proved that 14-16-year-old footballers who were efficient in “1-on-1” games were also highly appraised by coaches for their abilities in an “11-on-11” game. It is possible to draw a similar conclusion from the findings of Žak and Duda [38] and Unnithan et al. [39]. One can therefore claim that young footballers with talents for individual action also have outstanding predispositions that determine efficient cooperation in games with a large number of competitors.

## CONCLUSIONS

The proposed observation sheet and the methods of assessing players' efficiency in test matches are reliable tools for the comprehensive evaluation of young football players' efficiency.

The efficiency of action of 14- to 16-year-old soccer players displayed in *small-sided games* positively and strongly correlates with their competence in the competitive game.

In the process of selection, early identification and shaping of skills in individual actions and in cooperation are necessary. They are essential to achieving high efficiency in team actions and the full development of football players' talents.

## COMPETING INTERESTS

Authors have declared that no competing interest exists.

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**Appendix 1.** The observation sheet for the evaluation of the efficiency of actions in the “11-on-11” soccer game.

Player's number	Player	Individual actions						Group/team actions				Total score	
		Positioning of the game	Creating situations to score goals	Scoring goals	Gaining control of the ball	Interrupting actions	Interfering in gaining the field of play	Positioning of the game	Creating situations to score goals	Counteracting the positioning of the game	Counteracting creating situations to score goals		Counteracting scoring a goal
1													
...													
16													

**INDIVIDUAL ACTIONS PERFORMED IN “1-ON-1” GAME:**

a) *positioning of the game* (ball possession and gaining the field of play) – action of the player with the ball against a rival within the so-called reach of play (field around the player with the ball in a 2 m radius), as a result of which the competitor is moving with the ball or ball possession – dribbling, controlling, shielding with the ball, bounding the ball off the opponent.

b) *creating a situation to score a goal* – action of the player with the ball against a rival within the reach of play, as a result of which the competitor gains an opportunity to shoot – dribbling, controlling, shielding with the ball, “1-on-1” game.

c) *scoring a goal* – action of the player with the ball taken against a rival within the reach of play whose aim is to shoot or to gain temporary freedom to shoot – leg shot, headshot, situational shots, performed with

the opponent’s attendance or in a situation of free actions.

d) *gaining control of the ball* – action of a player without the ball within the reach of play of the rival with the ball, as a result of which the player gains control of the ball – overtaking-takeover of the ball, retrieving the ball, forcing the opponent to make a mistake, blocking and pushing the opponent.

e) *interrupting actions* – action of a player without the ball who is within the reach of play of the rival with the ball, as a result of which the player is kicking out – overtaking-kicking the ball out, blocking a pass/shot, forcing the opponent’s mistake (ball still in the rival’s possession).

f) *interfering in gaining the field of play* – action of a player without the ball being within the reach of play of the rival with the ball, as a result of which the

one having the ball is forced to hold in place or to move with it in a direction parallel to the goal line or towards his own goal or to pass it to a partner – covering and positioning himself against the opponent, blocking, pushing out.

#### **ACTIONS PERFORMED IN CONDITIONS OF COOPERATION:**

a) *positioning of the game* (ball possession and gaining the field of play) – passing the ball between offensive players to possess it in a situation of a rival's/ rivals' counteraction – keeping the ball and crossing, playing the ball without a pass (first-time pass), moving to open space, supporting the ball carrier, clearing out of the field for another player to come in, overlapping run, screens.

b) *creating a situation to score a goal* – passing the ball between offensive players in a situation of opponents counteracting, as a result of which the competitor gains an opportunity to shoot or to pass the ball enabling his partner to shoot at the goal – assistance (perpendicular, crosses), playing the ball without a pass (first-time pass), moving to open space, supporting the ball carrier, clearing out of the field for another player to come in, blocks, changes in the area of action.

c) *counteracting the positioning of the game* (ball possession and gaining the field of play) – action of players without the ball, as a result of which competitors effectively prevent the opponent from ball possession or gaining the field of play – duplication, tripling, play to offside, shortening and narrowing the field, blocking players, assistance and passing, eliminating the opponent's temporary advantage.

d) *counteracting creating situations to score goals* – action of players without the ball, as a result of which competitors prevent an effective pass to the competitor being in a situation enabling him to score a goal – duplication, tripling, play to offside, blocking a player with or without the ball, assistance and passing.

e) *counteracting scoring a goal* – action of players without the ball who are within reach of play of the rival with the ball, as a result of which competitors prevent scoring a goal – simultaneous duplication, consequent duplication, blocking, pushing the rival (retrieving the ball, stopping action).

f) *cooperation in set pieces of the game* – in defence: taking position, blocking players, assisting partners, “active zone” (organised migration towards the player with the ball); in offence: changes in the area of action, creating temporary advantage and free areas, screens.