RELATION IN SOLVING A 1 ON 1 GAME SITUATION DURING MATCHES AND WITHIN TRAINING SESSIONS IN ICE-HOCKEY JUNIOR U 18 CATEGORY

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Key words: sports games, ice hockey, game situations, training process, match

ABSTRACT

The aim of this paper is to analyze whether there is a significant relation in solving a typical 1 on 1 game situation during matches and within training sessions. The research was carried out with the ice-hockey team HK 99 Ružinov Bratislava, which is a member of the Slovak U 18 ice-hockey extra league. The successfulness of solving game situations was evaluated by analyzing 60 games during the regular season using a 2-point scale system (successful or unsuccessful solution). The relation between successful and unsuccessful solutions was assessed by the χ^2-test. The relation was determined by utilizing 4 equal periods (26 one-week sessions) during the regular season. Based on these results indications suggest that there is a significant relation ($p < 0.01$) between 1 on 1 game situations and the fact that these situations were solved either during matches or within training sessions.

ANALYSIS OF PROBLEMS BEING SOLVED

The term situation occurs in sports games in various forms, including match situations, game situations, power play situations, short-handed situations and situations with the same number of players, potentially advantageous or disadvantageous game situations. From these terms further terms are derived, for example standard game situations, decisive situations, the change of situation, critical situations, signs of situations, training of situations and the like.

There is a vast number of game situations in ice-hockey games, and each of them has an infinite number of solutions. From simplest situations, which solution is relatively clear, up to the most complicated situations, which solution is demanding, variable, requiring long-time practical experience and high level of players' performance. The course of some situations can be anticipated, however, the development of the game brings many unpredictable moments.

According to Peráček (2003), game situations can be divided as follows:

- **Standard game situations** that are defined by rules.
- **Typical game situations,** which tend to be repeated during the game and occur several times (for example 1 on 1, 2 on 1, 3 on 2, etc. game situations). Their solution is still limited, however, participating players can choose from among several game activities; these situations have alternative solutions.
- **Complex game situations** – all other game situations, which are limited by the largest number of factors. Their solution is determined not only by reaction of the opponent but also by activity of team-mates. They can have several possible, optimal solutions. Each solution can be tactically correct, however, not the most efficient one. Effectiveness of the solution depends on tactical maturity of players and their successfulness is dependent on current performance of players.

Classification of game situations based on the number of players participating in their solution (Tóth, Peráček 2006):

- **With the same number of players:** 1 on 1, 2 on 2, 3 on 3, 4 on 4, 5 on 5, etc. The number of defending and attacking players is the same. The character of the game situation is determined by the number of players involved in it.

- **With a different number of players:**
    a) **Attacking players outnumber defending players:** 1 on 0, 2 on 1, 3 on 2, 4 on 3, 5 on 4, and the like. The solution of the game situation in the offensive game phase based on greater number of attacking players.
    b) **Defending players outnumber attacking players:** 1 on 2, 2 on 3, 3 on 4, 4 on 5, 5 on 6, and the like. The solution of the game situation in the defensive game phase based on greater number of defending players.

THE GOAL, HYPOTHESIS AND TASKS OF THE PAPER

The goal of the paper

Ice-hockey is typical of the fact that there is a big number of variously complicated game situations. From simplest situations, which solution is relatively clear, up to the most complicated situations, which solution is demanding, variable, requiring long-time practical experience and high level of players' performance. Within the training process we copy game situations occurring during matches and thus they become important adaptation impulses for ice-hockey players.

The goal of our paper is to find out the relation between successfulness of solving typical 1 on 1 game situations during championship matches and the same game situations in the offensive game phase during training sessions of junior ice-hockey players.

Hypothesis of the paper

We suppose that there is a significant relation between successfulness of solving typical 1 on 1 game situations and the fact whether they are solved during championship matches or within training sessions.

The tasks of the paper

The following tasks arise from the goal of the paper:

1. To record successfulness of solving typical 1 on 1 game situations during championship matches and within training sessions of the extra league junior team HK Ružinov 99 Bratislava in the 2006/07 ice-hockey season from to point of view of the offensive game phase.
2. To find out whether there is a significant relation between successfulness of solving typical 1 on 1 game situations and the fact whether they are solved during championship matches or within training sessions.

METHODOLOGY OF THE PAPER

Determining the research situation

We carry out the research paper through a research of the ex-post-facto type with a defined object of monitoring, selection and organization of variables. The object of the research monitoring are select typical game situations during championship matches of HK

Ružinov `99 a.s. junior team and within training sessions during the 2006/07 ice-hockey season. The research observation has longitudinal character.

Characteristics of the set

The research set was represented by the extra league junior team HK Ružinov 99` a.s., which played 60 championship matches (each team played two matches at home and two matches away with every other team) and 3 preparation matches during the monitored competition year. Of the total number of 60 championship matches, the team won 21 games, drew 11 games and lost 28 games with 53 points (in the total evaluation). The team shot 207 and collected 224 goals, and ended up at 11th place.

Table 1: Characteristics of the research set

No.	Name and surname	Date of birth	Player post	Years of active sporting activity
1	P.K.	Feb 11, 1990	center forward	11
2	J.S.	Feb 02, 1989	right defenseman	12
3	T.Z.	Aug 24, 1990	right defenseman	10
4	M.K.	Jan 27, 1990	left defenseman	11
5	P.P.	Nov 21, 1990	right defenseman	11
6	F.S.	Jan 31, 1990	left wing	11
7	A.C.	Mar 13, 1990	left defenseman	10
8	R.J.	Jul 08, 1990	left wing	12
9	L.V.	Jun 21, 1989	right defenseman	12
10	R.V.	Aug 27, 1990	right wing	10
11	L.B.	Jul 17, 1989	right wing	12
12	P.K	Oct 07, 1990	center forward	11
13	P.B.	Apr 07, 1989	left wing	12
14	F.K.	Nov 29, 1990	left wing	10
15	M.V.	Mar 15, 1989	left defenseman	11
16	P.S.	May 18, 1989	left defenseman	11
17	L.B.	Mar 08, 1991	left defenseman	9
18	T.M.	Aug 26, 1990	center forward	10
19	A.H.	Jan 15, 1989	right wing	12
20	B.G.	Jun 07, 1990	center forward	10
21	M.F.	Jan 18, 1990	right defenseman	10
22	J.O.	Jan 08, 1990	right defenseman	10
23	M.A.	Jul 15, 1989	center forward	11
24	J.V.	Apr 11, 1991	left defenseman	10
25	M.M.	Mar 27, 1991	center forward	9

The competition period started September 3, 2006 and ended April 1, 2007. During this period the team had 141 training units on ice – 148.75 hours of special preparation and 78.5 hours of general preparation (exercise room, gymnasium, playground and the like.)

Matches of the Slovak junior extra league (the highest Slovak ice-hockey league in this age category – 16 teams) were played regularly on Saturdays and Sundays (some matches were rarely played in advance on Wednesdays). During November, December and February there were several representation breaks.

The team was composed of 28 ice-hockey players (3 goaltenders are not included in Table 1) during the 2006/07 ice-hockey season. The average age of players was 16.4 years thus making the youngest team in the extra league (only 4 boys born in 1989 played regularly). Despite this, the team had quite a high number of shots on goal – 1,872, however

only 207 goals were shot (11.05 percent successfulness of shots) and scored the highest number of short-handed goals of all teams in the competition.

The team was less successful in the defensive game phase because they collected 224 goals, of which 70 short-handed ones and 12 during power play. Two team players, P.B. and M.A., placed 4th and 9th in productivity (the number of goals and passes) of players in the whole junior extra league.

Methods of obtaining and processing research data

In order to observe select typical game situations we used a combination of **direct and indirect observation** and evaluation of game performance of players and group of players. During the training process we used the method of **direct observation** under natural conditions.

During championship matches we used the method of **indirect observation** with the help of Sony video camera. The camera was placed approximately ten meters over the level of ice area (on the stands) so that the whole playground could be shot. Its position was constant.

To record evaluation of select typical game situations we created a record sheet. We evaluated only the offensive game phase on the offensive half of the team. Every match was documented on an independent record sheet. Video recordings of all matches were converted to the .avi format, which was then easier to analyze on the computer (we used BS Player PRO).

While solving typical game situations of the team in the training process and within championship matches, the subject matter of our evaluation using the record sheet was the individual game performance of players – successfulness of players in a typical 1 on 1 game situation from the point of view of attack (the number of successful/unsuccessful solutions of game situations in the offensive game phase).

After every match and training unit we processed and evaluated the data. During this phase we obtained summary values of monitored indicators. This processed data was then recorded to a computer where we further modified it using Microsoft Office Excel.

While processing and evaluating obtained empirical data we not only applied basic logical methods but also analyses, syntheses, inductive and deductive procedures, heuristic and relevant standard mathematical-statistical methods.

In the first part of the successfulness analysis of solving select typical game situations we calculated the basic statistics – frequency of occurrence and its percentage expression, and, if necessary, also arithmetic average, extreme values and the like.

The actual analysis of relations was evaluated by the chi - square (χ^2) in a table and graphical implementation. In case of significant results we tried to find out whether the total value of χ^2 was influenced more by the frequency of occurrence of successful or unsuccessful solutions of game situations (contribution to χ^2), which we marked as χ^2_c.

RESULTS OF THE PAPER

The relation between successfulness of solving a typical 1 on 1 game situation during championship matches and within the training process

We discovered a significant relation between successfulness of solving select typical 1 on 1 game situations during championship matches and within the training process in all 4 monitored meso cycles.

During the first competitive meso cycle, August 28 to October 15, 2006, successfulness of solving this game situation is significantly connected with the fact whether it was solved within trainings or during matches (χ^2 = 32.091; p < 0.01). Successfulness of solving 1 on 1 game situations within trainings was significantly higher than during matches (68 percent to 56 percent). Difference between successfulness of solving 1 on 1 game situations within trainings and during matches thus represented 12 percent. While during trainings the proportion between successful and unsuccessful solutions was 2 to 1, during matches it was 1.3 to 1. The discovered significant relation was mostly caused by the relative occurrence of unsuccessful and successful solutions of the game situation in matches χ^2_c = 14.492; χ^2_c = 8.043 (Figures 1 and 2, Tables 1 and 2).

The analysis of the given relation in the second competitive meso cycle, October 16 to December 10, 2006, also pointed to a statistically important relation (χ^2 = 27.809; p < 0.01) between successfulness of solutions and the fact whether this game situation is solved within trainings or during matches. During trainings successfulness of 1 on 1 game situations was significantly higher than in matches. The difference was 10 percent. While during trainings the proportion between successful and unsuccessful solution was 2.3 to 1, it was 1.5 to 1 during matches. In a more detailed analysis we discovered that unsuccessfully solved game situations during matches have relatively the highest share in the total value of this relation χ^2_c = 11.237 (Figures 3 and 4, Tables 3 and 4).

In the third meso cycle, January 1 to February 25, 2007, we also confirmed the significant relation (χ^2 = 33.717; p < 0.01). Also in this meso cycle players were more successful in solving 1 on 1 game situations within training sessions than during matches. Difference between successfulness of solving game situations within training sessions and during matches was 11 percent. While the proportion between successful and unsuccessful solution was 1.9 to 1, it was only 1.2 to 1 during matches. Results of the analysis show that the frequency of occurrence of unsuccessfully solved 1 on 1 game situations during matches had the greatest influence on the discovered significant relation χ^2_c = 12.306 (Figures 5 and 6, Tables 5 and 6).

During the last competition meso cycle, February 26 to April 1, 2007, we also discovered a statistically significant relation (χ^2= 24.824; p < 0.01) between successfulness of solving the game situation and the fact whether this game situation is solved within training sessions or during matches. Within training sessions successfulness of solving the 1 on 1 game situation was higher than during matches. The difference was 12 percent. The proportion between successful and unsuccessful solutions was 2.9 to 1 within training sessions and 1.6 to 1 during matches. Results of a detailed statistical analysis show that unsuccessful solutions of the game situation during matches χ^2_c = 9.491 and within trainings χ^2_c = 7.610 have the relatively highest share in the total value of the relation (Figures 7 and 8, Tables 7 and 8).

We approached the analysis of the relation between successfulness of solving a typical 1 on 1 game situation and the fact whether this game situation is solved during championship matches or within training sessions also from the point of view of individual micro cycles (Annex B, Table 21). We tried to find out whether the immediate consequence of matches and trainings within one micro cycle will bring different results than during the analysis of meso cycles. The relation between successfulness of solving the 1 on 1 game situation and the fact, whether this game situation was solved during matches or within training sessions, was statistically significant in 19 of 26 micro cycles (in 13 micro cycles at the level of p < 0.05 and in 6 micro cycles at the level of p < 0.01). This means that in overwhelming majority of micro cycles players couldn't achieve successfulness of solving this game situation during matches which would be comparable with successfulness of its solving within training

sessions. On average, differences between successful solving of 1 on 1 game situations within training sessions and during matches represented 12 percent in particular micro cycles.

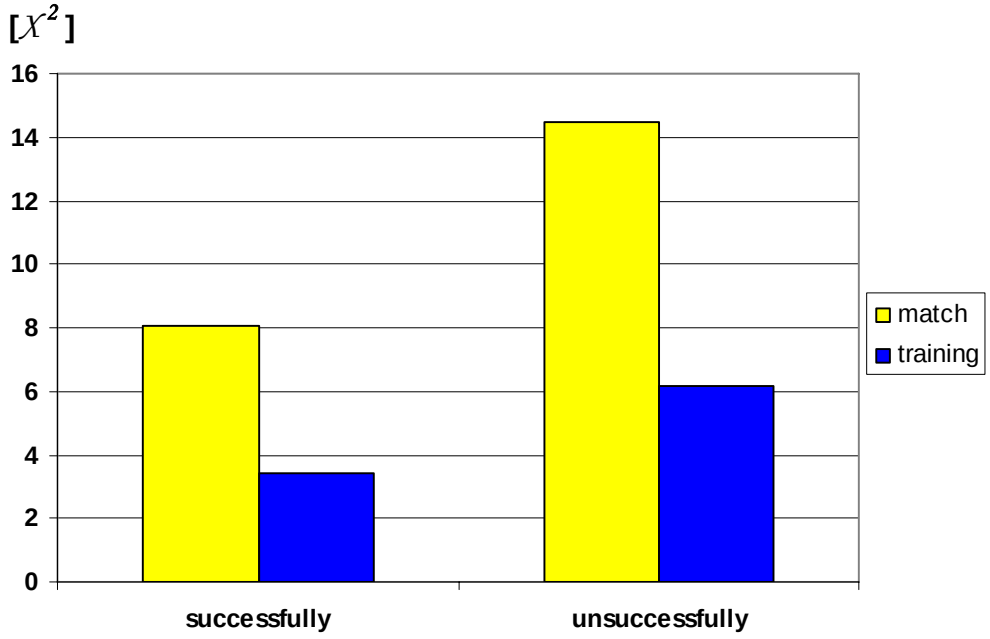

Figure 1: Share in the relation between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 1st meso cycle

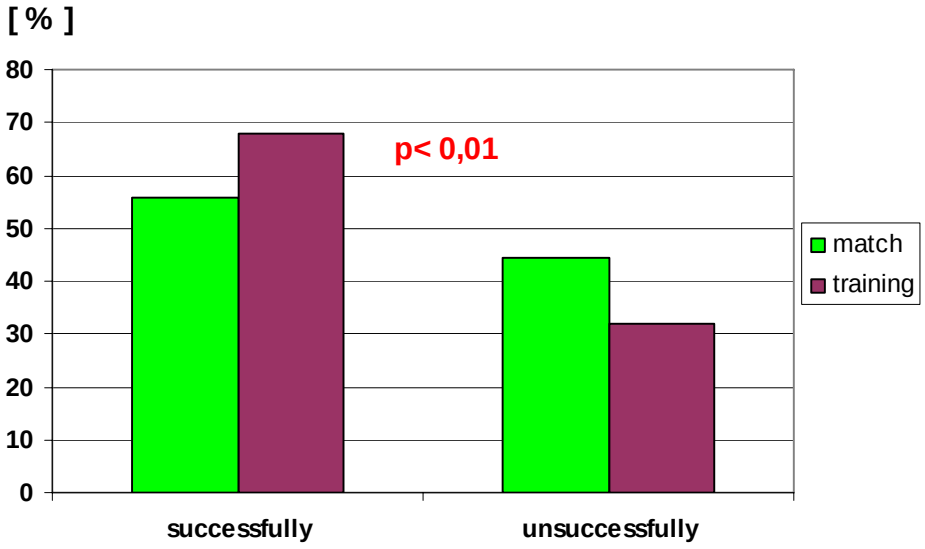

Figure 2: Difference between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 1st meso cycle

Table 1: Frequency of occurrence of 1 on 1 GS

Quantity	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	387	308	695
Training	1,184	525	1,639
Total	1,501	833	**2,334**

Table 2: Share in the total χ^2

Chi	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	8.403	14.492	22.535
Training	3.410	6.145	9.556
Total	11.453	20.637	**32.091**

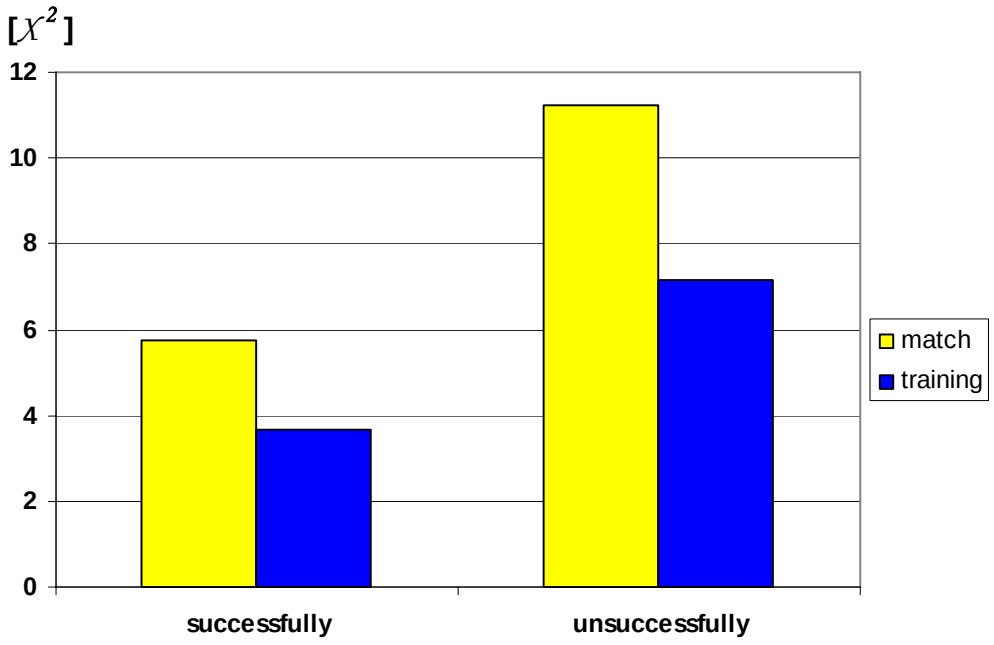

Figure 3: Share in the relation between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 2nd meso cycle

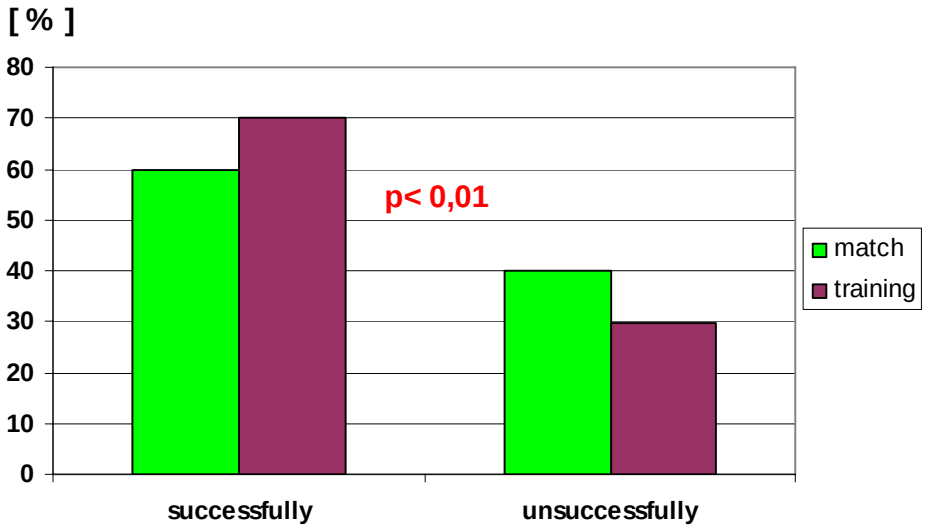

Figure 4: Difference between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 2nd meso cycle

Table 3: Frequency of occurrence of 1 on 1 GS

Quantity	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	575	386	961
Training	1,059	451	1,510
Total	1,634	837	**2,471**

Table 4: Share in the total χ^2

Chi	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	5.756	11.237	16.994
Training	3.663	7.152	10.815
Total	9.420	18.389	**27.809**

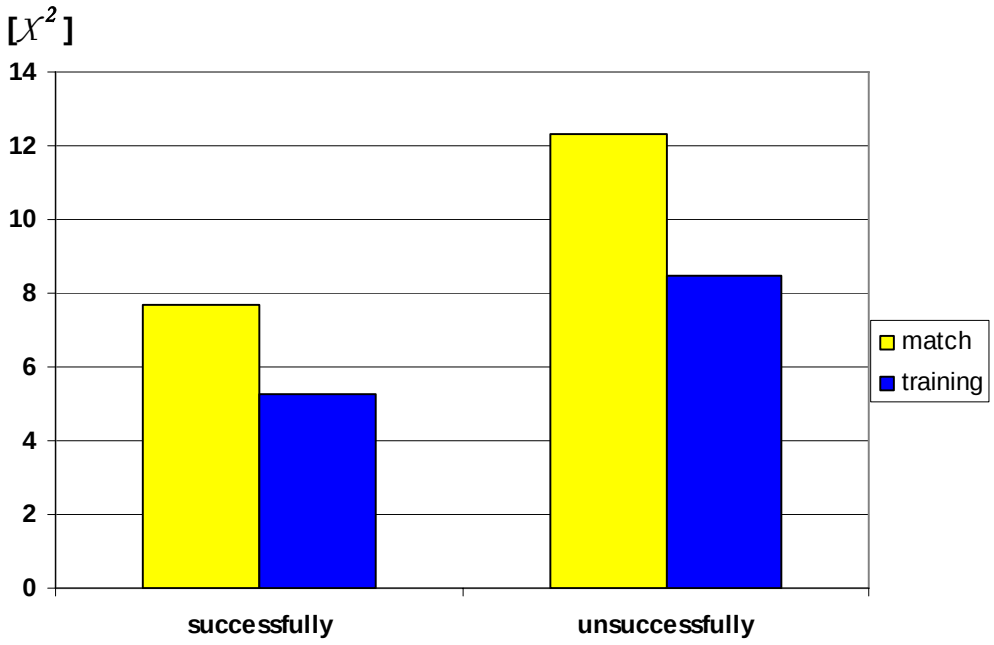

Figure 5: Share in the relation between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 3rd meso cycle

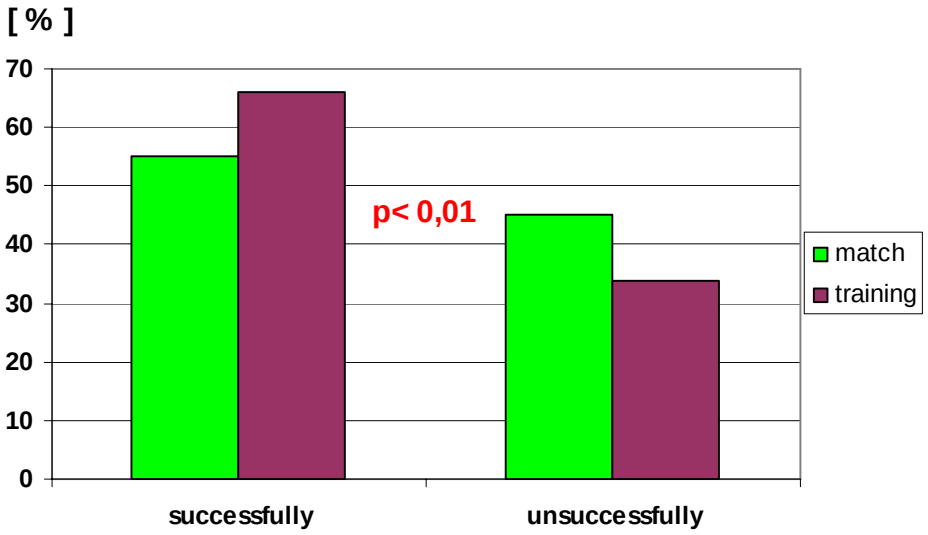

Figure 6: Difference between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 3rd meso cycle

Table 5: Frequency of occurrence of 1 on 1 GS

Quantity	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	585	480	1,065
Training	1,025	524	1,549
Total	1,610	1,004	**2,614**

Table 6: Share in the total χ^2

Chi	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	7.674	12.306	19.980
Training	5.276	8.461	13.737
Total	12.950	20.767	**33.717**

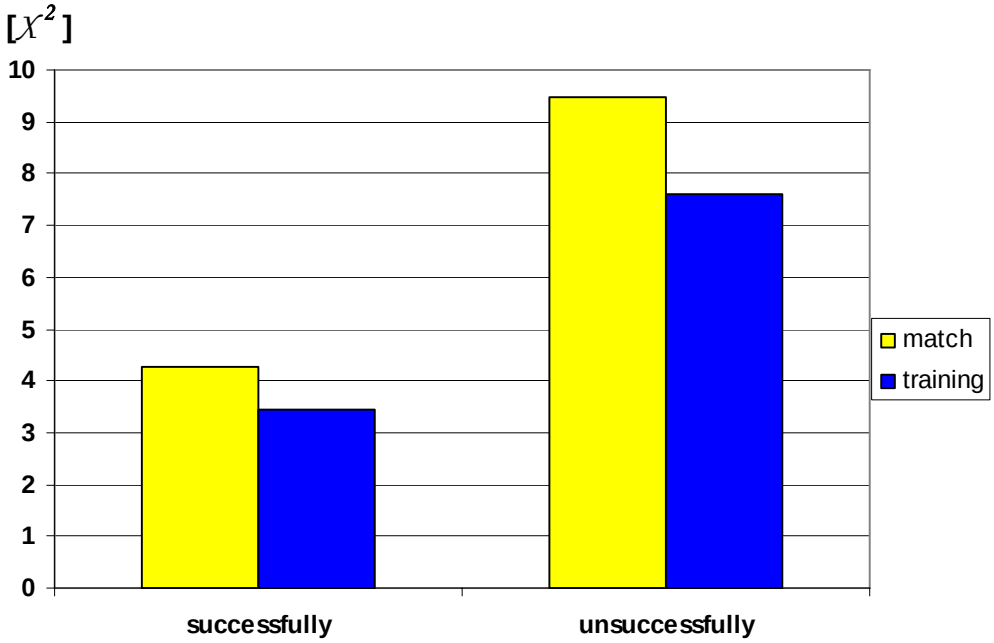

Figure 7: Share in the relation between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 4th meso cycle

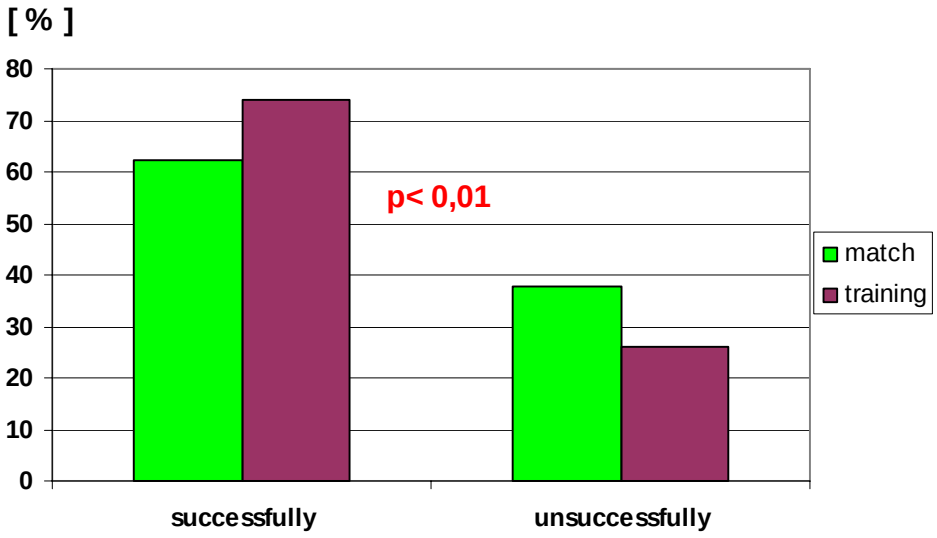

Figure 8: Difference between successfulness of solving a typical 1 on 1 game situation during matches and within training sessions – 4th meso cycle

Table 7: Frequency of occurrence of 1 on 1 GS

Quantity	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	442	266	708
Training	654	229	883
Total	1,096	495	**1,591**

Table 8: Share in the total χ^2

Chi	Solution of game situation		Total
	Successfully	Unsuccessfully	
Match	4.287	9.491	13.777
Training	3.437	7.610	11.047
Total	7.723	17.101	**24.824**

DISCUSSION

From the point of view of successfulness of solving 1-on-1 game situations in particular meso cycles and micro cycles we can state that there are several explanations why players did not solve the above-mentioned typical game situations during championship matches as successfully as within training sessions:

- In case of 1 on 1 game situations, the first reason can be little technical stability of game activities of individuals, which players applied when solving game situations. We carried out our paper in the junior category in the team of HK 99 Ružinov, where the average age was 16.4 years. Even though players in this age category have developed game activities at quite a high level, however, under complicated conditions of matches, mainly due to psychical pressure, they are rather less stable than during training sessions.
- One of other reasons is the age of players and the related technical-tactical maturity. The observed team ranked among the youngest ones in the junior competition. This category includes two years. This team had regularly only 4 players, who played for this team also during the previous competitive period, which is in comparison with other teams (for example the team of the town of Topoľčany – 2nd place in the competition), where there were regularly 12 such players, quite a big disproportion. Players, who already played one competitive period in this category, gained invaluable game experience thanks to the great number of played matches. Their experience is evident in self-confidence, which is supported by higher technical-tactical maturity. During matches this can be seen in situations when they take responsibility for the solution of game situations, where they are less limited regarding technical as well as tactical sides, and in the given moment they choose the most effective way of solving the game situation. If a team does not have such players or their number is limited, it is reflected in successfulness of solving game situations.
- Complexity of load during the training process can be one of other reasons why players in this age category do not solve game situations during championship matches as successfully as within training sessions. According to Peráček (2003), application of methodological-organizational forms of exercises in the training process is closely related to outer load of players, namely with its complexity. Under conditions of differently complicated game situations, players not only learn to analyze situation factors but they are also trained to pay less attention to technique and more to solution of tactical tasks. In our opinion, which we obtained through observation of the training process, game exercises were little complex, their level of complexity did not often get close to conditions of matches.
- Another factor from the point of view of methodological-organizational forms was the fact that the coach spent little time leading preparation games during trainings. Even though preparation games were included in trainings, players did not solve these situations as they would during matches. From this point of view, trainings were little consistent.
- Another reason might have been the content and proportional side of the training process. Not all game activities are equally significant for successfulness of solving game situations. Therefore it is necessary to distinguish their suitability within technical-tactical preparation and accordingly make their selection and adjust proportionality. Not only should the frequency of occurrence but also contribution to successfulness of individual or collective solution of the given game situation decide about the scope, which particular game activities are to occupy in the training process.
- One of the last reasons why players did not solve the above-mentioned typical game situations during championship matches as successfully as within training sessions could be the different quality of opponents that changed during particular monitored micro and meso cycles. Despite the fact that our team played 4 matches with every opponent (two

matches at home and two matches away), successfulness of solution of individual game situations in matches varied.

CONCLUSIONS

In rationalization of the training process:

- Dominant attention in the offensive game phase should be paid to solving a typical 1 on 1 game situation. From the point of view of results of championship matches, it is a critical game situation. A successfully solved 1 on 1 game situation in the offensive game phase means outnumbering, winning space, better position of players towards opponents' goal cage and many times an individual penetration.
- Proportionality of particular typical game situations within training sessions should be derived from the frequency of occurrence of these game situations in championship matches. For the junior category we basically recommend 1 on 1 game situations (45 percent), 2 on 1 game situations (35 percent) and 1 on 2 game situations (10 percent).
- While improving offensive game activities of individuals in typical 1 on 1 game situations, game exercises and preparation games should be applied under conditions similar to matches.

While evaluating game performance (successfulness of solving typical game situations):

- Solution evaluation of game situations with a 2-point scale system (successful – unsuccessful) can be used in various levels of players' performance and also for different age categories (pupils, juniors, seniors).
- While evaluating successfulness of solving game situations, our recording sheet (match – training) should be used.
- We recommend carrying out evaluation of the game performance (successfulness of solving game situations) not only during matches but also in select micro cycles within training sessions in order to obtain fast and return information.
- We recommend interpreting obtained results individually for each evaluated typical game situation during matches but also within training sessions.
- From the point of view of evaluation of successfulness of game situations in the training process and during championship matches it turned out that it was appropriate to evaluate individual micro and macro cycles of the monitored period.

From the point of view of the game strategy and while leading the team during matches we recommend coaches:

- To take into account the fact that the result of the match is significantly dependent on successfulness of solving a typical 1 on 1 game situation.

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