LATENT STRUCTURE OF SITUATIONAL EFFICIENCY OF ELITE JUNIOR BASKETBALL PLAYERS

Mario Jeličić[1], Marko Trninić[1] and Igor Jelaska[2]

[1] Faculty of Kinesiology, University of Split, Croatia
[2] Faculty of Electric Eng., Mechanical Eng. and Naval Architecture, University of Split, Croatia

Original scientific paper

Abstract
The main goal of this research is to establish the latent structure of situational efficiency of elite junior basketball players. For this purpose, an exploratory factor analysis strategy by use of principal components method was implemented in 13 standard situation efficacy indicators on the sample of 108 elite junior basketball players who participated in the 19th Junior European Basketball Championship in Zadar, 2000. The sample of respondents consisted of competitors who averagely played 8 minutes per a game for more than 3 games, and they were chosen from 11 teams that played 46 games in the championship. Two relatively independent latent dimensions have been isolated and named as: situational technical and tactical activity factors of inside and outside players. It has been concluded that neither the standard use of the variable of the situational efficiency, nor the use of the latent dimensions that have been derived from them suffice to fully explain the structure of basketball game.

Key words*: basketball game, situational efficiency, elite juniors, latent structure*

Introduction

From the point of view of movement structure and the structure of game situations, basketball is one of the most complex and variable team games, dominated by fast transformations from action to action (Trninić, 1995). Furthermore, Javier (1992) states that basketball is a dominantly strategic sport or strategic team game in which every player synchronizes his individual technique and tactics with his co-players, through the collective tactics of the team. He also points out that in the game of basketball, strategic behavior comprises all parameters that determine the development of actions in the game: game rules, technique, tactics, space, time and communication. Consequently, that means that basketball is a contradicting sport with a game tactics model and an infinite number of possibilities to resolve game situations, while on the team level there is a cooperation – opposition model (Hernandez, 1987, 1988; Gréhaigne and Godbout, 1995), so harmonizing individual and team goals, i.e., individual and team resolution of game situations is an important ability (Trninić, Perica and Dizdar, 1999; Trninić and Dizdar, 2000; Gréhaigne, Bouthier and Godbout, 1997).

However, a basketball match can be interpreted as a defined sequence of jobs or tasks in the game that each player has to perform with regard to his place and role in the team, within a specific game tactics model. Game tasks differ not only according to the position of a player in a team, but also according to the structure of the required anthropological characteristics. Therefore, game tasks can be seen from the viewpoint of sports activity analysis and the analysis of dimensions responsible for their successful completion. Trninić, (1995) states that it is possible to explain situational efficiency of particular types of players. It can be done based on game assignments on the level of structural and functional approach, because game assignments that a particular player performs within the game tactics model directly reflect on the situational efficiency of players on all positions in the game. In the analysis of game tasks through the stages of the course of the game, one can distinguish between tasks and individual situational efficiency for every position in set defense, offense transition, set offense and defense transition, according to the analysis of the video recording. The functional structure of basketball can also be viewed through technique/tactics and cooperation/opposition categories. Task performance in the game includes specific demands that refer to encumberment (energetic, informational and emotional component), resolving and realizing particular situations in the game, the course of actions within the stages and the game tactics model, the specific anthropological characteristics and states responsible for the successful completion of tasks that a particular player has during a basketball match (Trninić, 1995). Presumably, situational efficiency indicators in the game of basketball are determined by the level of successful completion of individual and collective tasks that each player needs to perform with regard to his position (place) and functional role in the team. It refers to the various modes of task performance in the game that demand specific technical-tactical knowledge about how to do something, which enables the execution of actions. Accordingly, the basic rule that enables an organized game to function successfully is that each player keeps to his own responsibilities and authority (rights in the game), i.e. that each player knows exactly what his task is, and what is expected of him with regard to his position.

Pavlović (1977) divides all playing situations into typical (standard) and untypical (nonstandard). He also states that typical playing situations are the ones that are in a certain way more often found in the same form in the game course stages, which is why they shape the characteristic situations that occur several times during a match in the same way. Furthermore, he says that untypical playing situations are the ones that rarely occur during a match, are hard to read, and are "played" by players with special abilities who have an untypical way of resolving problems and make the game completely nonstandard. The problem with constructing a valid measuring instrument that can successfully interpret inadequate and positive dimensions of each player in situational and competitive environment is resolved with a sequence of statistical techniques. Therefore, it is very important to encompass a wide structure of relevant situational efficiency indicators that can be successfully registered at a basketball match. With this purpose in mind FIBA standardized 13 situational efficiency indicators that have been officially monitored at each match of the World Championship in Hamilton and Toronto, 4 to 14 August 1994. The suggested situational efficiency indicators are: the number of two-point field goals, the number of two-point field goal attempts, the number of three-point field goals, the number of three-point field goal attempts, the number of free throws (1, 2 and 3), the number of free throws (1, 2 and 3) attempts, defensive rebound, offensive rebound, assists, personal fouls, turnovers, steals and blockshots. The statistical overview of the above-mentioned matches of the World Championship showed that the number of two-point field goals was the primary situational parameter for the overall successfulness in the game, whose efficiency was averaging between 50 and 60 %, and comprised 55 to 60 % of the total number of points at a basketball match. Therefore, for a successful realization in the transition or position offense, it was necessary to set a structure of movement lines, which enabled a large number of running in and blockshots between the short – tall and tall – short players, and consequently arriving at the wanted selective (open) shot.

Aim

Since the above-mentioned standard indicators of situational efficiency of basketball players do not occur in isolation, one can assume that their co-variability is dependant on a smaller number of latent dimensions, which are the grounds for interpreting the game of basketball from a functional point of view. Therefore, the goal of this research is to try and determine the latent structure of standard situational efficiency indicators registered during a basketball match to determine the presupposed functional dependence, and gain a fuller insight in their interaction.

Research review

After having carried out a three-year study at some American universities using basketball players, Swalgin (1994) established the norms. Those were norms for the assessment of the situational efficiency of basketball players according to the positions they played and their playing time. He designed an efficiency-related computer program for the assessment of basketball players whereby positive and inadequate dimensions of each player could be assessesed with regard to his position in the game. Looking at works concerned with other sports games, only Janković (1988) researched and defined the latent structure of technical-tactical elements in the game of volleyball. The author took a sample of the best four volleyball teams that participated in the final tournament of the former Yugoslavia Cup (1981) and registered 20 basic data of a closed system of volleyball matches with the purpose to check the dimensionality and structure of volleyball game elements. The author used componential analysis to extract four main components significant under the Guttman-Kaiser criterion that coherently describe the structure of the game of volleyball, and named them as: overall game efficiency, lift efficiency, implementing backcourt elements efficiency and the game course during fast breaks. A smaller number of experts were researching the latent structure of situational space of sports games. For example, Trninić (1995) carried out a quantity analysis of the game of basketball with mathematical-statistically multivariate procedures. The analysis was made by using basic and specific game attributes and entities (game tasks), based on top-level and selected basketball experts – players and coaches and scientist-practitioners and their knowledge of the game. A correlation matrix was factored in the frame of explorative strategy with a factor analysis of attributes or variables under a component model.

Three factors were extracted after applying the Gutman-Kaiser criterion and they exhaust 76,9% of the total variance of the manifest area. The first factor (inside players) exhausts 32,4%, the second (course of the game) 23,7%, and the third (outside players) 20,8% of the total variance. The factor solutions gained show that the examined experts (players and coaches) comprehend the game of basketball in keeping with the theories of tactics. The same work features a factor analysis of specific attributes or variables under a component model. A correlation matrix was factored in the frame of explorative strategy and, after applying the Guttman-Kaiser criterion, 3 latent dimensions that exhaust 80,3% of the total variance of the manifest area were extracted. The first latent dimension (informational component of the game of basketball) exhausts 37,3%, the second (energy component – game intensity) 31,5%, and the third (sociomotoric interaction) 11,4% of the total variance. The correlation matrix between the OBLIMIN factors showed the connection between the informational component and sociomotoric interaction of 0,38. Most likely, at the basis of it is a common denominator, a cognitive component. A negative connection (-0,17) was noted between the energy component and sociomotorical interaction.

With regard to the determined latent structure in the specific attributes area (informational, energy and sociomotorical component of sports activities), it is assumed that this structure is necessary for game tasks realization. Trninić and al. (1995) also attempted to determine the latent structure of a basketball game by using ALPHA – factor analysis (initial coordinate system has been transformed by non-orthogonal rotation using oblimin criterion) by 13 standard indicators of the situational efficiency of a basketball game, recorded at 64 games of the World Basketball Championship held in Toronto, Canada in 1994. The authors isolated four relatively independent latent dimensions using Guttman-Kaiser criterion: 1. the efficiency of inside players or players of the back defense line and the front offense line, 2. the efficiency of outside players or players of the front defense line and the back offense line 3. general offense-related efficiency, and 4. the efficiency of throwing the ball into the basket from a distance. From the point of view of game roles, Thomson (1994) speaks of inside players (numbers 4 and 5) and post-technique with the back to the basket, while Wissel (1994) describes outside players (numbers 1, 2 and 3) and the specific qualities of the face to the basket technique. On the other hand, Javier (1992) divides players into two big categories with regard to the roles in the game, outside (organizer, realizer and wing) and inside (post and pivot man) players.

Methods

Sample

The sample is composed of 108 elite junior basketball players (42 guards, 26 forwards and 40 centers), participants of 19 European Championship in Zadar in 2000 (*Table 1*). Out of the total number of players only those who played averagely more than 8 minutes per game and 3 or more matches were included in the sample.

Table 1. Sample

Team	Number of respondents	Final rankings
France	12	1
Croatia	10	2
Israel	8	10
Slovenia	10	9
Greece	8	3
Lithuania	11	7
Bulgaria	9	12
Russia	11	6
Italy	10	4
Latvia	8	8
Spain	11	11

The average age of the basketball players was 17,8 years (± 0,7σ). All respondents (apart from the players of the Yugoslavian team) have consented to participate in the study, based on a permit issued by FIBA. It is a representative sample of the best junior basketball players in Europe. Eleven basketball teams participated: France, Croatia, Israel, Slovenia, Greece, Lithuania, Bulgaria, Russia, Italy, Latvia and Spain.

Variables

The sample of manifest variables is consisted of 13 standard indicators of situational efficiency.

Variables are standardly registered for every team in the match and they are: 1. *two-point field goals – successfully (S2US) – the number of successful goals within 6.25m line),* 2. *two-point field goal – unsuccessfully (S2NE) – the number of unsuccessful goals within 6.25m line,* 3. *three-point field goal – successfully (S3US) – the number of successful goals beyond 6.25m line,* 4. *three-point field goal – unsuccessfully (S3NE) – the number of unsuccessful goals beyond 6.25m line,* 5. *free throw (1,2 and 3) – made (SBUS) – the number of successful goals behind the free throws line,* 6. *free throw (1,2 and 3) – missed (SBNE) – the number of unsuccessful goals behind the free throws line,* 7. *offensive rebound (SN) – the number of ball caught (rebounds off the rim or backboard) on the rebound in the phase of offense,* 8. *defensive rebound (SO) – the number of ball caught (rebounds off the rim or backboard) on the rebound in the phase of defense,* 9. *assists (A) – the number of balls passed to the "open" (undefended) player enabling a successful throw into the basket,* 10. *personal foul (OP) – the number of fouls; it implies a prohibited, irregular body contact with the opponent, no matter whether the ball is in play or it is a tie ball; fouls regarding the infringement of the rules of conduct (technical fouls),* 11. *turnover (IL) – the number of turnovers in the offense stage as a result of inaccurate assist, bad catch, bad ball dribbling and infringement of the rules (foot faults, intentional kicking of the ball, the ball out-of-bounds, double dribbling, carrying the ball, rule 3,5,10 and 30 seconds and the ball returned into the backcourt),* 12. *steal (OL) – the number of steals during the stage of transition or set defense following the team foul during the transition or set offense. Stealing ball during dribbling or cutting off passed balls are some of the ways for defense players to gain possession of the ball,* 13. *blockshot (B) – the number of blockshots during the stage of transition or set defense*. The collected data are the official results that are recorded at every mach according to the rules of the technical commission of FIBA. The data regarding the basketball results in the computer programs has been registered by persons specially trained for the job.

Methods of data processing

Factor analysis of principal components extraction was applied in the framework of exploratory strategy, consistently with the goal of the research. The initial factor number was determined on the basis of the Guttman-Kaiser criterion and the initial coordinate system has been transformed by means of orthogonal rotation according to varimax raw criterion.

In the framework of the stated method calculations were made of: The basic statistical parameters, manifest variables correlation matrix, eigenvalues, explained and cumulative variance (λ%,cum.%), communalities (h^2), determination coefficient of multiple correlation of each variable with the others in the set (SMC) and saturation matrix for manifest variables with calculated factors.

Results and discussion

Table 2. The descriptive statistical parameters for variables of situational efficiency

	N	$\overline{X}$	Min	Max	σ	α_3	α_4
SHOT1-SU	108	12,30	0,00	44,00	9,58	1,08	0,64
SHOT1-UNS	108	5,55	0,00	31,00	5,14	2,14	6,61
SHOT2-SU	108	14,71	1,00	50,00	10,66	1,19	1,23
SHOT2-UNS	108	14,89	0,00	51,00	10,25	0,93	0,77
SHOT3-SU	108	3,13	0,00	16,00	3,69	1,50	2,02
SHOT3-UNS	108	7,41	0,00	36,00	7,78	1,35	1,69
REBOU-DEF	108	1,78	0,00	6,20	1,20	1,38	2,37
REBOU-OFF	108	0,85	0,00	3,20	0,72	0,97	0,57
ASSIST	108	0,88	0,00	5,10	0,85	2,26	7,48
STEAL	108	1,18	0,00	4,20	0,84	1,52	2,35
TURNOVER	108	1,54	0,00	4,70	0,85	0,89	1,26
PERSFOUL	108	2,11	0,20	4,00	0,87	0,28	-0,73
BLOCKSHOT	108	0,27	0,00	2,10	0,41	2,04	4,43

(N – the number of respondents, $\overline{X}$ – arithmetic mean, Min – minimal result, Max – maximal result, σ – standard deviation, α_3 – skewness, α_4– kurtosis)

Table 3: Correlation matrix for the manifest variables

	SBUS	SBNE	S2US	S2NE	S3US	S3NE	SO	SN	A	OL	IL	OP	B
SBUS	1,00												
SBNE	**0,69**	1,00											
S2US	**0,71**	**0,66**	1,00										
S2NE	**0,66**	**0,49**	**0,74**	1,00									
S3US	0,17	0,01	0,00	0,10	1,00								
S3NE	0,15	-0,01	0,05	**0,19**	**0,84**	1,00							
SO	**0,67**	**0,64**	**0,74**	**0,65**	-0,05	-0,01	1,00						
SN	**0,44**	**0,52**	**0,57**	**0,52**	**-0,29**	**-0,26**	**0,70**	1,00					
A	**0,36**	0,17	**0,30**	**0,34**	**0,43**	**0,52**	**0,27**	-0,08	1,00				
OL	**0,39**	**0,28**	**0,30**	**0,48**	**0,31**	**0,37**	**0,30**	0,07	**0,59**	1,00			
IL	**0,58**	**0,37**	**0,43**	**0,52**	**0,25**	**0,28**	**0,47**	**0,28**	**0,56**	**0,55**	1,00		
OP	**0,38**	**0,32**	**0,36**	**0,41**	0,01	0,05	**0,34**	**0,35**	0,06	**0,22**	**0,28**	1,00	
B	**0,30**	**0,47**	**0,41**	**0,29**	**-0,22**	**-0,19**	**0,56**	**0,57**	-0,08	0,00	0,08	**0,34**	1,00

Statistically significant correlation coefficients on the significance level of 0.05 are in bold type.

Sample analysis shows a mild positive asymmetry in the following variables: PERSFOUL (α_3= 0,28), TURNOVER (α_3= 0,89), SHOT2-UNS (α_3= 0,93) and REBOU-OFF (α_3= 0,97). A somewhat more emphasized asymmetry can be seen in most of the other variables whose values range from 1,08 to 1,52 (for example, SHOT1-SU, SHOT3-UNS, REBOU-DEF). A highly emphasized positive asymmetry can be seen in variables: BLOCKSHOT (α_3= 2,04), SHOT1-UNS (α_3= 2,14) and ASSIST (α_3= 2,26). Satisfactory kurtosis values are found in variables whose values α_4 range from 0,57 to 0,77 (REBOU-OFF, SHOT1-SU, SHOT2-UNS). Mildly negative result value can be seen in variable PERSFOUL (α_4= -0,73).

Marked test sensitivity is shown by the following variables: SHOT2-SU, TURNOVER and SHOT3-UNS, whose α_4 values range from 1,23 to 1,69. More emphasized kurtosis values can be seen in variables SHOT3-SU (α_4= 2,02) and STEAL (α_4= 2,35). Furthermore, high kurtosis values of the overall sample can be seen in variables SHOT1-UNS (α_4= 6,61), ASSIST (α_4= 7,48) and BLOCKSHOT (α_4= 4,43) and that is also a warning about the high test sensitivity. In the correlation matrix (*Table 3*) a major link between the analysed variables can be seen. Out of the total of 78 correlation coefficients, it is significant that as much as 60 is on a significance level of 0,05, which is a mere 77% of the total number, ranging from -0,19 to 0,84.

The highest number of the statistically significant correlation coefficients (11) with the other variables is between the two-point field goals – unsuccessful and turnovers variables, therefore, they cause the greatest part of the covariabilities in the area of the situational efficiency indicators in the game of basketball. As many as 5 variables (SBUS, S2US, SO, SN, OL) is statistically significantly correlated with 10 out of the remaining 12 variables. Trninić et al. (1995) state in their empirical findings that out of the total number of goal attempts, 52,13% of points scored, i.e. 55,48% of points scored refers to two-point field goals. It is therefore understandable that the two-point field goal – unsuccessful and turnover variables are the greatest covariability generators in the total situational area. The numerical magnitude of the correlation coefficient (0,84) between the three-point field goal – unsuccessful and the three-point field goal – successful points toward a clear connection between the frequency of shots fired beyond 6.25m line (three-point field). Using factor analysis and the method of *principal components* a correlation matrix was factored in the frame of explorative strategy. Two latent dimensions that exhaust 64% of the total variance of the manifest area were extracted by the application of the Guttman-Kaiser criterion. The first latent dimension exhausts 40% and the second 24% of the total variance (*Table 4*). These percentiles are relatively high and understandable with regard to the structure of the correlation matrix.

Table 4: Eigenvalues

factor	λ	λ %	kum%
1	5,37	40	40
2	2,88	24	64

The initial coordinate system of two extracted factors has been transformed by means of orthogonal rotation according to Varimax raw criterion. *Table 5* shows the results of the factor analysis for the system of 13 variables for evaluating situational efficiency of top European junior basketball players in the overall sample of 108 players who averagely played three and more matches and eight and more minutes per match.

Table 5. Parallel projections matrix for manifest variables with rotated factors, the coefficient of multiple determination (SMC) and communalities for manifest variables (h^2)

	F_1	F_2	SMC	h^2
SHOT1-SU	**0,79**	0,30	0,71	0,71
SHOT1-UNS	**0,78**	0,04	0,61	0,61
SHOT2-SU	**0,85**	0,12	0,73	0,74
SHOT2-UNS	**0,78**	0,29	0,70	0,69
SHOT3-SU	-0,12	**0,81**	0,73	0,67
SHOT3-UNS	-0,08	**0,85**	0,76	0,73
REBOU-DEF	**0,88**	0,03	0,74	0,78
REBOU-OFF	**0,78**	-0,32	0,65	0,72
ASSIST	0,23	**0,77**	0,59	0,65
STEAL	0,36	**0,64**	0,50	0,55
TURNOVER	0,54	0,54	0,55	0,59
PERSFOUL	0,53	0,04	0,27	0,28
BLOCKSHOT	0,63	-0,35	0,47	0,52

The first significant factor describes 40% of the total applied variables system for evaluation of situational efficiency and it has marked correlations with SHOT1-SU, SHOT1-UNS, REBOU-DEF, REBOU-OFF, PERSFOUL and BLOCKSHOT variables. Therefore, one can talk about the factor of inside players' situational activity, i.e., their game tasks, which are evident in situational efficiency variables that determine the latent dimension of technical-tactical activity of inside players at a competition. Presumably, at the stated factor are positively projected players who play on positions 4 and 5, and whose organization of defensive and offensive activities is primarily in the restricted area. For example, inside players primarily realize offenses in the vicinity of the basket with and without ball handling and are responsible for opening the first outside pass in the initial phase of offense transition. Inside game consists of action units that contain dribble penetration, inside running, inside passes and offensive rebound. Expert coaches consider breaking defense to be the first principle of a successful offense (Winter, 1997), as much as stopping dribble penetration is the first principle of a successful team defense (Trninić, 1996). Plays under the basket create chances for drawing a great number of personal fouls on players who primarily play on the inside positions by which they come into situations to shoot numerous successful or unsuccessful free throw shots. Also, on the account of their technical-tactical activities under their own basket, inside players have more opportunities to successfully blockshot in the defense stage.

Therefore, this latent dimension is above all defined by variables characteristic for players who primarily act in the area under the basket (mainly positions 4 and 5). The second significant factor describes 24% of the total system variance and highly correlates with SHOT3-SU, SHOT3-UNS, ASSIST and STEAL variables. This latent dimension is marked by situational efficiency indicators that are characteristic for outside players (positions 1, 2 and 3). It is because tasks in the stages of transition and position defense performed by outside players (ball pressure and passing lines in the front defensive line) determine a bigger number of steals. On the other hand, the activities of players in the back offensive line open the possibilities for shooting beyond the 6,25 line and passing the ball which precedes selective shots – assists that increase offense efficiency. It is important to point out that outside players directly determine the offense organization quality, as well as organizing pressure on the front defense line. They have positions and moves, but also primary roles of assisting and outside shooting, which gives them opportunities for a number of successful and unsuccessful three-point shots, as well as assists.

Conclusion

The basic goal of this research was to establish and explain latent structure of situational efficiency variables in elite junior basketball players in order to determine their functional dependency and gain a fuller perspective on their mutual interaction. To this end, an explorative strategy of principal components extraction was applied with Varimax raw transformation of the initial coordinate system to 13 standard indicators of situational efficiency, which were monitored on 46 matches of the Junior European Basketball Championship in Zadar in 2000. In the process, two factors that account for 64% of the total variability were isolated. The first significant factor markedly correlates with variables SHOT1-SU, SHOT1-UNS, REBOU-DEF, REBOU-OFF, PERSFOUL and BLOCKSHOT, so one can assume there is a factor that accounts for the technical-tactical activities of inside players at a competition. The other significant factor highly correlates with variables SHOT3-SU, SHOT3-UNS, ASSIST and TURNOVER, so in this case one can talk about a factor that accounts for the technical-tactical activities of outside players.

The factors comprise two isolated latent dimensions, i.e. functionally related structures of situational efficiency indicators. The functional division of players on outside and inside was substantiated in accordance with the above-mentioned. One can conclude that neither the standard use of situational efficiency variables, nor latent dimensions that were derived from them are enough to fully explain the structure of the game of basketball, because determining and interpreting latent structure on the basis of standard indicators of situational efficiency does not explain their entire functional dependency, thereby not giving complete insight into their interaction.

Literature

Grehaigne, J.-F., & Godbout, P. (1995). Tactical Knowledge in Team Sports - From a Constructivist and Cognitivist Perspective. *Quest, 47*, 490-505.
Gréhaigne, J.-F., Bouthier, D., & Godbout, P. (1997). Performance Assessment in team sports. *Journal of Teaching in Physical Education, 16*, 500-516.
Hernandez, J. (1987). *Estudio sobre el analisis de la accion de juego en los deportes de equipo: su aplicacion al balancesto*. (Dissertation) Barcelona: Facultad de filosofia y ciencias de la educacion.
Hernandez, J. (1988). *Baloncesto iniciacion y entrenamiento*, Barcelona: Editorial Paidotribo.
Janković, V. (1988). Latentna struktura tehničko - taktičkih elemenata u odbojkaškoj igri. *Kineziologija, 20* (1), 57-62.
Javier, O. (1992). *1250 ejercisios y juegos en baloncesto*, 1-3, Barcelona: Editorial Paidotribo.
Knight, B., & Newell, P. (1986). *Basketball-1*. Seamoor: Graessle Mercer co.
Pavlović, M. (1977). *Struktura taktičnega mišljenja košarkarjev*. (Dissertation), Zagreb: Fakultet za fizičku kulturu.
Official Basketball Rules 1994 - 1998 (1994). International Basketball Federation - FIBA.
Swalgin, K. (1994). The Basketball Evaluation System: a Scientific Approach to Player Evaluation. U: J. Krausse Ed. *Coaching Basketball*, 40-43.
Thompson, J. (1994). Inside players. U J. Krause (ur.), *Coaching basketball,* 40-43).
Trninić, S. (1995). *Strukturna analiza znanja u košarkaškoj igri*. [Structure of knowledge in basketball. In Croatian.]. (Dissertation), Zagreb: Fakultet za fizičku kulturu.
Trninić, S., Viskić-Štalec, N., Štalec, J., Dizdar D., & Birkić, Ž. (1995). Latentna struktura standardnih pokazatelja situacijske efikasnosti u košarkaškoj igri. [Latent structure of standard indicators of situational efficiency in basketball. In Croatian.]. *Kineziologija*, *27*(1), 27-37.
Trninić, S., Perica, A., & Dizdar, D. (1999). Set of criteria for the actual quality evaluation of the elite basketball players. *Collegium Antropologicum, 23*(2), 707-721.
Trninić, S., & Dizdar, D. (2000). System of the performance evaluation criteria weighted per positions in the basketball game. *Collegium Antropologicum, 24*(1), 217-234.
Trninić, S. (2006). *Selekcija, priprema i vođenje košarkaša i momčadi*. [Selection, preparation and guidance of basketball players and teams. In Croatian.]. Zagreb: Vikta-Marko.
Wissel, H. (1994). *Basketball: Step to success*. Champaign, IL: Human Kinetics.

LATENTNA STRUKTURA SITUACIJSKE UČINKOVITOSTI ELITNIH KOŠARKAŠA - JUNIORA

Sažetak

Glavni cilj ovog istraživanja je utvrđivanje latentne strukture situacijske učinkovitosti elitnih košarkaša juniora. U tu svrhu, primjenjena je eksplorativna strategija faktorske analize glavnih komponenata 13 standardnih pokazatelja situacijske učinkovitosti na uzorku od 108 elitnih košarkaša juniora koji su usdjelovali na 19-om Juniorskom košarkaškom prvenstvu u Zadru 2000.g. Uzorak ispitanika se sastojao od natjecatelja koji su prosječno proveli u igri 8 minuta u više od tri utakmice, i bili su izabrani iz 11 momčadi koje su odigrale 46 utakmica na prvenstvu. Izolirane su dvije relativno neovisne latentne dimenzije i imenovane su kao: situacijska tehnička i taktička aktivnost 1) unutrašnjih i 2) vanjskih igrača. Zaključeno je kako niti korištenje standardnih pokazatelja situacijske učinkovitosti, a niti korištenje iz njih deriviranih latentnih dimenzija nisu dostatni za objašnjenje strukture košarkaške igre.

***Ključne riječi**: košarkaška igra, situacijska učinkovitost, elitni juniori, latentna struktura*

Received: January 17, 2010.
Accepted: March 15, 2010.
Correspondence to:
Marko Trninić
University of Split
Faculty of Kinesiology
21000 Split, Teslina 6, Croatia
Tel: 00 385 (0)21 30 24 40
E-mail: trninic@kifst.hr