

RELATIONSHIPS OF SUCCESSFUL MANEUVERS IN MATCH, INDIVIDUAL SKILLS, RUNNING AND REACTION SPEED, LEG STRENGTH AND GAME UNDERSTANDING IN JUNIOR BASKETBALL PLAYERS

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There are many general problems in the coaching of the competitive collective team games at the **junior** level. **Some** interesting questions are; how much **stress** should **be** put on **the** training of physical **properties**, skill **abilities**, tactical understanding, perceptual and psychological **abilities** and group dynamics of **the** team; the training of different skill domains and the different **training** methods of the essential skills and tactical understanding.

In the field of basketball, several studies can **be** found which have tried to solve some of these questions. Statistical studies have been done on senior level teams from the point of view of the number of actions and efficiency of the actions in games (**Keilty, 1977**). **A large number** of physical **skill** (**Hopkins, 1977**), **psychological** studies (**Craighead, Privette, Vallianos, & Byrkit, 1986**), studies on understanding of **the** game (**Sallade, 1986**) and group dynamics (**Yukelson, Weinberg, & Jackson, 1984**) have been **performed**.

The purpose of this research was to study **the** relationships between successful maneuvers of the basketball in match conditions and the selected individual skills (dribbling-passing, dribbling-lay-up and throwing), speed (running), strength (explosive leg strength) and game understanding in Finnish junior basketball players.

METHODOLOGY

Ten Finnish Basketball League and national level teams participated in this study. Sixty-one subjects completed all test **batteries** and games.

The methods used to analyze the matches and the test batteries performed **have** been presented elsewhere (Luhtanen, Nieminen, Helimäki, **Westerlund, & Mäkinen, 1986**; Luhtanen, 1989).

For further analyses new variables were calculated. The independent test variables were constructed **as** follows:

1. The total individual skill index (SI) was the average value of the tests in **dribbling**-passing, dribbling-lay-up, dribbling and throwing for scoring.
2. The speed index was the average maximal running speed (MRS) in the distance of 30 meters,
3. The index of **explosive** leg strength was the vertical jumping **strength** (VJS) as measured by the jumping height in maximal **vertical** jump,
4. ~~The~~ index of the reaction speed was the inverse of choice reaction time (**CRS**) to a light signal with fingers,
5. The total index of **understanding** (**TIU**) of ~~the~~ game was **measured** using multiple choice questionnaires **concerning** the purposeful action of one player. A player group and knowledge of the **rules**. **TIU** was calculated as the sum of these variables.

A linear regression analysis was applied to the successful action in match conditions and tested **background** variables as follows:

1. The dependent variables were, separately, the percentage of successful maneuvers in match conditions (SMC) in receiving the **ball**, passing the ball, dribbling **and** passing combination, interceptions, **shooting** for scoring and the average of all successful maneuvers
2. The independent variables were the individual **skill** index, the index of running speed, explosive leg strength, reaction speed and **total** index of understanding of the game.

The formula for the forced linear regression equation was as follows:

$$SMC_i = a * SI + b * MRS + c * TIU + d * VJS + e * CRS + C,$$

where **a-e** = linear regression coefficients **and**

C = constant

The other abbreviations were explained above.

The linear regression analysis was **performed** with a **VAX** 8600 computer and SPSS-X software. For the testing of statistical significance the F-ratio was applied.

RESULTS

The total number of actions in the match analysis with the ball was 4163. For the dependent variables the players succeeded relatively in their attempts as follows: passing 92 %, receiving 95 %, dribbling with the **ball** 61 %, interception 50 %, rebounds 68 % and shooting for scoring 36 %. The results in the independent variables have been described by **Luhtanen** (1989).

The results of the regression analysis are presented in Table 1. The model of the forced linear regression analysis described significantly the percentage of the successful

maneuvers in shooting ($p < .001$) and in interception ($p < .06$). No significant model was found in total skills in match conditions in relation to the tested background factors with the percentage of explanation less than 69 %.

Table 1. Linear regression coefficients between dependent (percentage of successful maneuvers in match condition) and independent variables (tested background factors) in junior basketball.

Dependent variables	Independent variables						R	F	p<
	SI	MRS	TTU	VJS	CRS	Constant			
Passing	-.02	+9.37	-.46	-.65	+.01	+45.85	.430	1.75	n.s.
Receiving	+.01	+2.94	+.05	+.06	+.03	+57.53	.290	.71	n.s.
Dribbling	-.03	+3.0	-.42	-.28	-.20	-144.87	.360	.94	n.s.
Interception	-.23	-32.99	-1.09	+3.23	+.03	+116.77	.540	2.47	.06
Shooting	+.14	48.99	+.13	+3.75	-.06	+202.51	.830	11.19	.001
Total skills	+.06	-.18	+.14	-.03	-.05	+71.33	.430	1.75	n.s.

DISCUSSION

The most often discussed problems in team game training are individual and team skills during a game and ways of developing these skills. Several conceptual characteristics behind these skills are the ability to read the game and react in play situations quickly, accurate and efficient execution of all individual skills, and accuracy and timing in cooperation between players and speed.

The highest number of skill maneuvers per player was in passing (25) and receiving (28). The relative success in these actions were 92 % and 95 %, respectively. The model of linear regression did not work in an efficient way in explaining successful passing skills in match condition with the tested individual skills, speed and understanding of the game. The percentage of explanation for the studied model in passing was only 19 %. A similar type but lower trend was observed in receiving and dribbling skills in match conditions. However, all independent variables related positively to the successful receiving maneuvers.

The number of interception trials per player in matches was only five. A positive influence for the successful interception maneuvers in match conditions was found through the tested leg strength factors and choice reaction speed.

The linear regression analysis was not significant for total skills in match conditions. It can be concluded that at junior level, in basketball, all successful actions

with the ball were positively related to the tested individual skills and game understanding, and negatively related to the maximal running speed, explosive leg strength and choice reaction speed. Maybe, this emphasized that the training programs of all teams had been well balanced between individual and team skill factors but not with the players physical abilities.

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