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Relations of the motor latent dimensions with the motor knowledge and habits among the high school female students

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Relations of the motor latent dimensions with the motor knowledge and habits among the high school female students: *The survey was conducted with 183 female respondents, regular students at the secondary education, aged 15-16 years (± 6 months). The objective of this research was to see what was the impact of the motor latent dimensions on the motor-criteria test to check the motor skills and habits. By applying the factor analysis in varimax rotation were extracted two latent dimensions: 1) factor of strength and coordination, and 2) factor of flexibility and speed, of which with regressive analysis was established statistically significant influence on the criteria.*

Key words: *latent dimensions, capabilities, readiness, test, psychomotor*

INTRODUCTION

The success in the achieving complex motor contents in the area of sport and physical education could be obtained only than, if they previously could be organized and planned accordingly, i.e. when will be planed, what and how will be worked in a longer period of time. Considering that one of the factors for success in the realization of the teaching process is the motivation among students, it is a necessity for every teaching class to be well prepared and planned, assuming new challenge [3, 5, 7, 8].

The basis of every physical activity is consisted of basic motor skills, which are responsible for the performance of movements, which depend largely on the genes, the knowledge and habits that can change in a positive or negative direction. The high level of motor abilities represents one of the basic prerequisites for effective learning new and different motor structures [6, 9].

The subject of our study were the high school students who attend classes regularly and the goal was to see what was the impact of latent motor dimensions on motor skills and habits.

EXPOSITION

Methods of work

The sample of respondents was defined on the population of high school students who regularly attended the high school curriculum in several cities of the Republic of Macedonia. The total numbers of the respondents were, 183, composed of female students in the first and second year, at age of 15-16 years (± 6 months).

To obtain the data, into account were taken nine variables of which, eight variables for assessing motor skills and one variable for assessing motor skills and habits.

The sample of the motor variables included: standing long jump (SDM), height knuckle (VIZ), raising the body from ground (PTT), multiple progressive running at 10x5 (AGIL); dynamometric of the stronger hand (DPR), taping by hand (TPR), a deep bend on the bench (PDK) and balance with eyes closed (RZO) [4].

For the indicator of motor skills and habits was made a test polygon for testing the psycho-motor knowledge among students. Modification was made to the polygon for testing the psychophysical readiness of applicants under this program and the criteria for the student's enrolling to the first year in 2007/08 academic year, in state secondary school "Metodi Mitevski - Brico" in Skopje. The polygon was modified upon the inspected conditions for work at schools where the testing was done. The polygon was pre-tested (tried) in order to increase its objectivity. By finishing the polygon goals at the same time was executed checking on the specified performances of motor skills: speed, explosiveness, strength, agility, coordination and precision [2].

The data from all variables were treated with the basic descriptive statistical parameters, and previously their normality of distribution was tested with the method of

Kolmogorov and Smirnov. Factorization of the data was carried out with the Hotelling's method on the main components. The number of the significant principal components was determined on the basis of the Kaiser-Guttman's criterion. The significant main components were transformed with varimax and the direct oblimin position with parallel and orthogonal projections. The processing of data about the impact of latent dimensions on motor tests knowledge and habits was performed with regression analysis. With regression analysis were calculated: the coefficient of multiple correlation between the criteria variable and the system of predicators (R), the correlation coefficients between each predicator's variable and criteria variable (R^2), the coefficient of the partial correlation of each predicator's variable with the criteria variable (PART - R), partial and regression coefficients of each predicator variable (BETA), the standard error prediction (SIGMA), T-test, the level of significance of the partial regression coefficients (Q-BETA), the coefficient of determination, the standard forecast error of the criteria variable based on prediction system (SIGMA), and for checking the hypothesis that the true value of the multiple correlation is actually zero, was calculated F-test and its significance with the appropriated degrees of freedom (DF1 and DF2) [1].

Results and discussion

After processing the data with the basic statistical parameters and calculation of correlation between the indicator for motor knowledge and habits and the motor tests was applied component factor analysis of the motor variables (Table 1), where two main components were defined with characteristic root over one (Eigenval=3,29 and 1.45), which explains the total variability of 59.19% (% total Variance=59,20).

Table 1

Varimax rotation, communalities and characteristic roots and the percentage of the total variance of the system of the initial coordinating system of the motor abilities

Variables	Factor 1	Factor 2	h2
SDM	**0,71**	0,34	0,62
VIZ	**0,79**	0,22	0,67
PTT	**0,71**	0,36	0,63
AGIL	**-0,60**	-0,52	0,61
DPR	**0,69**	-0,28	0,55
TPR	0,07	**-0,85**	0,73
DPK	0,17	**0,77**	0,62
PZO	**0,55**	-0,05	0,31
Eigenval	3,29	1,45	
Cumul. Eigenval	3,29	4,74	
% total Variance	41,06	18,13	
Cumul. %	41,06	59,19	

According to the Hotelling procedure (table 1) was presented a factor matrix on the applied bio-motor tests at female respondents aged 15-16 years, where it may be noted that the applied system formed two main components that explain the entire research system.

According to the gained values of the communalities the biggest validity of the motor tests were achieved with: taping by hand (TPR), height knuckle (VIZ), raising the body from the ground (PTT), a deep bend on the bench (PDK) and standing long jump (SDM).

After the applying of varimax rotation, the initial coordinate system of the initial motor tests were received two latent dimensions defined as a factor of strength and coordination and factor of flexibility and speed. Significant positive high and medium saturation towards the first motor factor achieved tests: a standing long jump, height knuckle, raising the body from the ground and dynamometric of the stronger hand. Significant negative saturation

towards the same made observed test running 10x5 meters. Significant positive high saturation the second factor noted the test deep bend of the body, and significant negative high saturation towards to the same noted the test taping by hand. Taking into account the indicators in which there are no substantial differences in the latent dimensions among the Hotelling and varimax and oblimin rotation is interpreted only the varimax rotation.

On the criterion variable for checking the motor knowledge and habits was applied a regressive analysis in order to define the predictive influence of the defined latent dimensions on the criteria.

Regression multiple analyses (Table 2) with the system of the extracted motor latent dimension and the criteria, test-polygon for testing of motor knowledge and habits, showed statistically significant impact at the level of .00. The coefficient of multiple correlation, i.e. correlation of all motor measures with the test explained 55 % (R=.55), and the prediction coefficient R^2=.30 which means that the system of motor measures act as a condition for success in the test. The remaining 45% in the explanation of the total variability of the test to assess motor skills and habits remain on some others characteristics and abilities of the respondents who were not subjects to research (such as other motor variables, anthropometric, conative, cognitive, motivational, functional, etc.).

Individually, statistically significant negative impact on the criteria showed the both extracted latent motor dimensions.

Table 2

Multiple regression analysis of the system of anthropometric measures with the factor of force and coordination

R=,55 RI=,30 Adjusted RI=,30						
F(2,180)=39,34 p<,00 Std.Error of estimate:15,18						
	Beta	**St. Err.of Beta**	**B**	**St. Err. of B**	**t(180)**	**p-level**
factor 1	-0,15	0,06	-2,67	1,13	-2,37	0,02
factor 2	-0,53	0,06	-9,62	1,13	-8,55	0,00

CONCLUSION

From the results obtained in the research we can conclude the following:

Based on the applied factor analysis in the analyzed motor area were extracted two latent dimensions, defined as: a factor of strength and coordination and factor of flexibility and speed.

The system of extracted factors noticed statistically significant effects on the indicator for checking the motor skills and habits.

The success of the test's performance for checking motor knowledge and habits is a conditioned by the two latent dimensions.

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The report has been reviewed.