DETERMINATION OF RELATIONS AND DIFFERENCES IN MOTOR SPACE IN CANDIDATES FOR RECEPTION IN STATE INSTITUTIONS IN THE REPUBLIC OF MACEDONIA

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Abstract
In a sample of 100 respondents, population special forces, divided into two groups, 50 respondents made a study of motor abilities as part of the program structure to carry out the unit. Candidates are extracted according to an open competition for the needs of the state institutions. To accomplish the set goal in the research, five tests for motor skills testing were applied, four variables for assessing motor skills, the fifth variable is the criterion for determining the impact of motor variables expressed in points for each motor test. The results of the motor tests were firstly processed with descriptive statistics, where the measures of the central tendency for the two sample respondents were presented. With the application of multivariate methods for data analysis, differences between candidates were identified, and the influence of psychomotor variables was determined as predictors on the criterion variable points, which are decisive for admission to the state institutions of the Republic of Macedonia. The results show that the candidates differ greatly in psychomotor abilities, although our expectations were that the respondents would not show greater differences, because it is natural when they compete in such institutions that they will prepare to successfully pass the test. We can conclude that they have not paid more attention to prepare or have applied candidates with poor motor skills.

Key words: motor skills, variables, analysis, regression, differences

Introduction

State institutions in the Republic of Macedonia, such as the military, police and security agencies, need to fulfill certain conditions for candidates to successfully perform their work tasks that are of special character. Work assignments usually require possession of certain psychomotor abilities as well as specific morphological construction, as a basis for quality fulfillment and management in certain unexpected situations.

Subject of the research are the psychomotor abilities of two groups of respondents for admission to the state institutions that are subjected to certain motor tests.

The aim of the research is to determine the psychomotor abilities of the candidates for admission to the state institutions in the Republic of North Macedonia and to determine the differences between the respondents regarding the psychomotor abilities.

Methods

The sample of respondents constitutes a random - stratified simple group sample of respondents from the male population, where the law of probability rules. Candidates are extracted according to an open competition for the needs of the state institutions. Candidates are at the age of 18 with differences of ± 6 months, a total of 50 respondents in both groups who have applied in 2017 and 2018.

To accomplish the set goal in the research, five tests for motor skills testing were applied, four variables for assessing motor skills, the fifth variable is the criterion for determining the impact of motor variables expressed in points for each motor test.

Variables for estimating motor skills:
1. Jump in a distance from a place
2. Bend the shaft in a holding

3. Abdominal lifting (homeopathic musculature)
4. Running at 1600 meters
5. Points

Determination of Results From Motor Tests
Every discipline - that is a motor test, is evaluated separately. The sum of the obtained points from the achieved results in the motor tests of the four motor variables is divided by a coefficient of 4, after which the result is rounded off with an accuracy of two decimals. According to this evaluation, candidates can earn no more than 10 points.

Results and Discussion
The results of the motor tests were firstly processed with descriptive statistics, where the measures of the central tendency for the two sample respondents were presented. According to the obtained results, the differences between the respondents determined by the minimum and maximum result, the height of the standard deviation vectors and the variance according to which there are greater deviations of the results above and below the central value, and also according to the graphic representation - the cross and the kurtosis indicate the dissimilarity of the results, where the Kolmogorov-Smirnov test was applied, according to which the weakest results were achieved in the variable shaft of the shaft in survival $Sig = .017$ and running at 1600 meters $Sig = .011$.

Table 1.Univariate analysis - ANOVA

	Sum of Squares	Df	Mean Square	F	Sig
SKOK Between Groups	702.250	1	702.250		
Within Groups	39030.500	98	398.270	1.763	.187
Total	39732.750	99			
ZGIB Between Groups	88.360	1	88.360		
Within Groups	1711.680	98	17.466	5.059	.027
Total	1800.040	99			
STOM Between Groups	1600.000	1	1600.000		
Within Groups	11212.560	98	114.414	13.984	.000
Total	12812.560	99			
T16M Between Groups	5.144	1	5.144	22.273	
Within Groups	22.633	98	.231		.000
Total	27.777	99			
POEN Between Groups	13.786	1	13.786	18.367	.000
Within Groups	73.559	98	.751		
Total	87.346	99			

In table 1 the results of the univariate analysis of the differences between the groups and within the groups are presented. Significant differences were found in motor bending tests $F = 5.059$ and $Sig = .027$, abdominal muscles $F = 13.984$ and $Sig = .000$, running at 1600 meters $F = 22.273$ and $Sig = .000$ and points $F = 18.367$ and $Sig = .000$.

Table 2.Regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952	.907	.898	.22428

Predictors (constant). T16M, ZGIB, SKOK, STOM

According to the results of the regression analysis of the predictor motor variables with the criterion variable points, it shows that the influence on the criterion is determined, as is shown by the coefficients of the multiple correlation R = .952 and the coefficient of determination R-Square = .907.

Table 3.Univariate analysis - ANOVA from regression analysis

Model	Sum of Squares	Df	F	Sig
1 Regression	21.952	4	109.096	
Residual	2.264	45	.050	.000
Total	24.215	49		

From the univariate analysis made according to the regression analysis, statistically significant differences were found, for which the result of F = 109.096 with a significance level Sig = .000 testifies to us.

Table 4 .Regression analysis of the results of the second group of examinees

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
1	.970	.941	.935	.25529

From the regression shown in Table 4 for the second group of examinees, significant prognosis variables were found on the criterion - points, which we conclude from the coefficient of multiple correlation R = .970 and the determination coefficient R-Square = .941.

Table 5.Univariate analysis of regression analysis

Model	Sum of Square	Df	Mean Square	F	Sig
1 Regression	46.411	4	11.603	178.027	.000
Residual	2.933	45	.065		
Total	49.344	49			

With the univariate analysis of the second group of respondents from the results of regression, differences were found according to the values of F = 178.027 with sig significance level = .000.

Conclusion

With the application of multivariate methods for data analysis, differences between candidates were identified, and the influence of psychomotor variables was determined as predictors on the criterion variable points, which are decisive for admission to the state institutions of the Republic of North Macedonia.

The results show that the candidates differ greatly in psychomotor abilities, although our expectations were that the respondents would not show greater differences, because it is natural when they compete in such institutions that they will prepare to successfully pass the test.

We can conclude that they have not paid more attention to prepare or have applied candidates with poor motor skills.

References
Bala, G. (1986): Logičke osnove metoda za analizu podataka iz istraživanja u oblasti fizičke culture. Novi Sad
Gajić, M. (1985), Osnovi motorike čoveka, Novi Sad.
Verhošanski, J.I. (1979): Razvoj snage u sportu, Beograd.
Metikoš, D., Hofman, E., Prot, F., Pinter, Ž., Oreb, G. (1989): Merenje bazičnih motoričkih dimenzija sportaša, Zagreb.

Macenzie, B. (2005): 101 Performance Evaluation Tests, London.

Radich, Z., Simeonov, A. (2000), Determining the latent structure of morphological characteristics in students from 6th grade, Skopje.

Radich, Z., Simeonov, A. (2008): Establishment of the latent structure of the morphological characters and motor abilities and their relations with the shut put performance international conference, ,, Track and Field Athletics and Science ", Sofija.

Radich, Z., Simeonov, A. (2009): Pulse frequency of the Macedonian record holder on 800 m. Vane Stojanov, International conference, ,, Track and Field Athletics and Science ", Sofija

Simeonov, A., Radich, Z. (2005), Structure and influence of motor skills on specific sprint runs among students of FFK - Skopje.

Simeonov, A., Radich, Z., Rakovich, A., Savanovich, V. (2011): Element relation from training in competition period and length of a javelin launch by the Macedonian javelin record holder Dean Angelovski, Univerzitet Mateja Bela Banska Bystrica , Faculta humanitnych vield, Slovenska asocijacija Kondycnich trenerov recenzovany vedecky zbornik Medzinarodney vedeckey Konferencie. Kondicny training.