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## **THE INFLUENCE OF CERTAIN TESTS FOR EVALUATING THE ANTHROPOMETRIC, MOTOR AND SPECIFIC MOTOR DIMENSIONS ON THE ELEMENTS OF THE ATTACK IN SPORT KARATE FIGHTING**

### **INTRODUCTION**

The process of achieving higher sport results is more and more based on the scientific researches and methods, the determinations of the factors that influence on achieving success and higher sport results. The value of this researches in the area of karate sport is mostly consist in finding and establishing of the most economical and effective factors which are significant for achieving high sport results, with revealing the structure of the personality and finding the suitable measurement instruments. The fast development of the karate sport is enabled by the better material conditions for training, development of the technical devices, the training process is run by competent person, planning and programming of the appropriate trainings and also timely selecting the young categories for this sport. Because of the different, unanticipated and various situations which can occur in the sport battle there should be completeness of the all parts which are included in the battle. Because of that, from the first start of the training process, the process should be directed towards forming, developing and improving of the anthropological, motor dimensions, and also on the situational karate techniques and specific karate elements. In the intention to accomplish the desired aim, there is a need of bigger number of information's which will be properly embedded and used in the process of constructing the personality of the karate sportsmen. Because all of this, there should be created a continuous connection between the theory and the practice for the sportsmen so he could increase more and more his opportunities' and achievements.

### **METHODS**

This research is applied on stratified sample of participants, karate-competitors, males, cadets and juniors. The total coverage is 78 competitors from 20 karate clubs in Macedonia. In the first phase the participants were taped while performing specific karate elements on the official competitions (state and electoral tournaments for composing the national representation). The participants were divided according to age and weight categories (determined by the rules of WKF) in sport battle (kumite). In the second phase, the same participants individually were covered with anthropometric measures and tests for evaluating the specific karate abilities. In the research were applied total 36 variables from which: 4 anthropometric variables, 4 variables for evaluating the explosive strength, 4 variables for evaluating segmented velocity (frequency of the movement), 12 variables from karate elements which are applied in sport karate battle and 12 variables for evaluating the specific karate abilities grouped in 3 motor

spaces presented with: 4 variables for evaluating the specific karate coordination, 4 variables for evaluating specific karate precision and 4 variables for evaluating specific karate balance. The data's from this research based on the characteristic and the size of the selected sample are processed with various package programs. For the needs of this research there were calculated the following measures: Mean, SD-standard deviation with minimal value of 1/3 from the value of the mean, Min.-minimal result, Max.-maximal result, Skewness, Courtosis, K-S-Collmogorov-Smirnoff which determines the normal distribution of the results, Factor analysis-the aim is from the number of the interconnected manifest variables, condense and reduce smaller number of each relatively independent latent variables which can explain the mutual relation of the analyzed manifest variables. Regressive analysis- for determine the influence of the system of predictor variables of karate elements which are applied in the sport battle presented like criteria with whom there will be calculated the next parameters: Beta, part-R, p-level.

## RESULTS AND DISCUSSION

The applied Gutman-Caiser criteria extract 3 significant latent dimensions, which seems to be enough for explication of the variability and co variability of the manifest variables applied on the sample of karate sportsmen. The obtained high measures on the communality, indicates that the system of factors relatively very well defines the variability and co variability of the manifest variables. Orthogonal varimax solution leads to creating structures, which satisfy the conditions of simplicity of the structure. The first latent dimension (F1) includes satisfying and higher projection of the measures of dimensional of the body as a factor of longitudinal dimension of the skeleton (FLDS). The second latent factor (F2) constitutes higher values of the variability of the specific karate coordination and it is defined as a factor of specific karate coordination (FSKK). The third latent factor (F3) can be defined as a factor of segmented velocity or frequency of movement (FSB).

The results given from the regressive analysis from the criteria variable "combined attack arm-leg and leg-arm" (KKNRNNR) table 1, presents that the predictor system has a statistically satisfying influence on the criteria variable ( $p=.00$ ). The coefficient of the multiple correlation  $RO=.58$  is moderately higher which can indicate that there is satisfying correlation. The explained variability between the system of predictor dimensions and the criteria variable is 28%. Based on the partial participation of the latent dimensions in prediction of the criteria can be noted that the statistically significant influence has the factor of FLDS ( $.02$ ). With this it confirms the significance of the coefficient of the partial correlation which confirms that there is link between these variables.

**Table 1. Regression Summary for Dependent Variable: KKNRNNR (Matrica juniori)**

R= ,58629579 R<sup>2</sup>= ,34374275 Adjusted R<sup>2</sup>= ,28269556  
 F(4,43)=5,6308 p<,00098 Std.Error of estimate: 1,1444

	Beta	Std.Err.	Part-r	t(43)	p-level
<b>Intercept</b>				9,46	0,00
<b>FLDS</b>	<b>-0,30</b>	<b>0,12</b>	<b>-0,34</b>	<b>-2,41</b>	<b>0,02</b>
<b>FSKK</b>	-0,03	0,12	-0,03	-0,22	0,83
<b>FSB</b>	0,02	0,12	0,02	0,15	0,88

Based on the given results of the regressive analysis (table 2), shows that the system of latent predictor dimensions statistically influence on the prediction of the criteria variable “attack with one stroke with leg on the body” (KNUNT) on the level of significance p=.00. The coefficient of multiple correlation R=.76 is with a higher value which indicates that there is significant correlation. The explained variability between the systems of the predictor dimensions on the criteria variable is 54%. Individually statistically significant influence on the system of predictor dimension on the criteria variable has the factor of longitude dimensionality of the skeleton FLDS (0.02), and the factor of the specific karate coordination FSCK (0.04).

**Table 2. Regression Summary for Dependent Variable: KNUNT (Matrica juniori)**

R= ,76392879 R<sup>2</sup>= ,58358720 Adjusted R<sup>2</sup>= ,54485112  
 F(4,43)=15,066 p<,00000 Std.Error of estimate: 2,8721

	Beta	Std.Err.	Part-r	t(43)	p-level
<b>Intercept</b>				13,12	0,00
<b>FLDS</b>	<b>-0,23</b>	<b>0,10</b>	<b>-0,34</b>	<b>-2,35</b>	<b>0,02</b>
<b>FSKK</b>	<b>-0,21</b>	<b>0,10</b>	<b>-0,31</b>	<b>-2,11</b>	<b>0,04</b>
<b>FSB</b>	0,16	0,10	0,24	1,65	0,11

The result given from the regressive analysis on the criteria variable “combined attack on the ashibarai and a stroke” (KKNPU) table 3, shows that the predictor system has a statistically satisfying influence on the criteria variable (p=.00). Coefficient of the multiple correlation RO=.61 with a higher value which indicates that there is significant correlation. The explained variability between the systems of the predictor dimensions on the criteria variable is 32%. Based on the partial participation of the latent dimensions in prediction of the criteria can be noted that the statistically significant influence has the factor of FSB (.00). With this it confirms the significance of the coefficient of the partial correlation which confirms that there is link between these variables.

**Table 3.** Regression Summary for Dependent Variable: KKNPU (Matrica juniori)

R= ,61709140 R<sup>2</sup>= ,38080180 Adjusted R<sup>2</sup>= ,32320197  
 F(4,43)=6,6112 p<,00031 Std.Error of estimate: 2,0573

	Beta	Std.Err.	Part-r	t(43)	p-level
<b>Intercept</b>				6,59	0,00
<b>FLDS</b>	-0,10	0,12	-0,13	-0,86	0,40
<b>FSKK</b>	0,11	0,12	0,14	0,93	0,36
<b>FSB</b>	<b>0,40</b>	<b>0,12</b>	<b>0,45</b>	<b>3,34</b>	<b>0,00</b>

The result given from the regressive coefficient (table 4), shows that the system of the three latent predictor dimensions has a statistically satisfying influence on the prediction of the criteria variable “interception with kizame cuiki” (KRKS) (p=.00). Coefficient of the multiple correlation RO=.71 is with a relatively higher value which indicates that there is significant correlation. The explained variability between the systems of the predictor dimensions on the criteria variable is 46%. Individually statistically significant influence on the system of predictor dimension on the criteria variable has the factor of specific karate coordination (FSKK (0.00), and the factor of the segmented velocity FSB (0.00).

**Table 4.** Regression Summary for Dependent Variable: KPKC (Matrica juniori)

R= ,71632388 R<sup>2</sup>= ,51311991 Adjusted R<sup>2</sup>= ,46782873  
 F(4,43)=11,329 p<,00000 Std.Error of estimate: ,79614

	Beta	Std.Err.	Part-r	t(43)	p-level
<b>Intercept</b>				7,43	0,00
<b>FLDS</b>	0,00	0,11	0,00	0,00	1,00
<b>FSKK</b>	<b>-0,34</b>	<b>0,11</b>	<b>-0,44</b>	<b>-3,24</b>	<b>0,00</b>
<b>FSB</b>	<b>0,37</b>	<b>0,11</b>	<b>0,47</b>	<b>3,48</b>	<b>0,00</b>

## CONCLUSIONS

With the analysis of the given results from this research the conclusions can be set in these directions:

- Based on the partial participation of the latent dimensions in the prediction of the criteria can be notice that statistically satisfying influence has the factor FLDS on the level of .02. Also, as a predictor system of variables, has a statistically satisfying influence on the criteria variable “combined attack arm-leg and leg-arm” (KKNRNRR) on the level of p=.00.

- Analyzing the results from the regressive analysis, we can conclude that the system of latent predictor dimensions statistically satisfying influence on the prediction of the criteria variable “attack with one stroke with the leg to the body” (KNUNT) on the level of significance  $p=0.00$  %. Individually statistically significant influence on the system of predictor dimension on the criteria variable has the factor of longitude dimensionality of the skeleton FLDS (0.02), and the factor of the specific karate coordination FSKK (0.04).

- The predictor system of the latent dimensions has a statistically satisfying influence on the criteria variable “combined attack on the ashibarai and a stroke” (KKNPU) ( $p=0.00$ ). Based on the partial participation of the latent dimensions in prediction of the criteria can be notice that the statistically significant influence has the factor of FSB (0.00).

- The result given from the regressive coefficient, shows that the system of the three latent predictor dimensions has a statistically satisfying influence on the prediction of the criteria variable “interception with kizame cuki” (KRKS) ( $p=0.00$ ). Individually statistically significant influence on the system of predictor dimension on the criteria variable has the factor of specific karate coordination FSKK (0.00), and the factor of the segmented velocity FSB (0.00).

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### SUMMARY

*The research involved 48 participants - top male karate competitors, juniors from karate clubs from Republic of Macedonia. The subject of this research are the defining elements of karate attack in sports karate fighting, and the basic aim is to establish the influence of anthropometric, motor and specific motor dimensions on the karate elements that use in sport karate fighting. In the research were used 36 variables: 4 antropomotorical variables, 4 variables for estimate on the explosive strength, 4 variables for estimate on the segmentary speed (movement frequency), 12 variables of the specific karate elements used in the sport karate fighting and 12 variables for estimate on the specifically karate abilities in 3 motor space: 4 variables for estimate on the specific karate coordination, 4 variables for estimate on the specific karate precision and 4 variables for estimate on the specific karate balance, which are predictive system of variables. The criterion set of variables of this research are represented by 4 karate elements which define the attack in sports karate fighting. From the received results was determined existing of groups in the different spaces of the treated variables and influence of the predictive system of variables on the criterion set of variables.*

**Key words:** karate elements, sport fighting, specific karate abilities