CANONICAL CORRELATION BETWEEN BASIC-MOTOR ABILITIES AND KARATE COMPETITOR'S EFFICACY

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Abstract

The main characteristic of karate is conflict of two fighters in a certain space with certain rules of behavior with constant supervision of judges. Complex phenomenon of karate requires discipline and scientific approach of all its aspects. The research was conducted on the sample of 61 respondents – top class karate players in order to determine canonical correlation between basic-motor abilities and competitor's efficacy. With canonical analysis we extracted one significant canonical factor. Analyzing variable projections through extracted canonical factor, we can conclude competition efficacy depends on arms and legs movement speed, segmented speed of arms and explosive strength of lower extremities.

Key words: *karate, mobility, efficacy, relations, variables*

INTRODUCTION

Karate belongs to the group of sports that have significant influence on transformation of psychosomatic status of a sportsman. It belongs to the group of poly structural acyclic sports where acyclic complex movements dominate in relatively small space with goal of scoring, respectively, symbolic destruction of opponent. Competitor's efficacy is influenced by the entire spectrum of anthropological dimensions that in the process of psychosocial adaptation transform from initial values into more stochastic values that represent achieved result in the competition (Huremović, 2009).

Special treatments being implemented on karate players within training process always tend to form anthropological dimensions, which are adequate for realization of strictly specific sport activities leading towards successful high quality sport performance (Mikić, 2000). Provocation of wanted changes, i.e. bringing into optimal relation of all relevant anthropological characteristics that are necessary for performance of particular special activities, is achieved through situational training. For the success in such kind of activity it is necessary to have a large number of relevant information in order for process to be successful. First of all the goal of this research is to determine canonical correlation between basic-motor abilities and competitive efficacy of karate players. The subjects of the research are basic-motor abilities and competitive efficacy of karate players.

METHODS

Participants

The sample consists of 61 respondents, karate players that participated in Federal and State championship in Tuzla (March and May 2008). We isolated and tested only players that were competing in activity that was expressed numerically and were placed from first to fifth place on Federal championship including competitors from 13 clubs.

To define population we maintained respondent homogenization based on achieved results during competition, thus avoiding general selection but satisfied criterion.

Instruments

Measuring instruments for this research were following: basic-motor abilities (10 variables) and competitor's efficacy (10 variables). To help data processing variables were encrypted and marked with abbreviations in capital letters.

Variables for basic-motor ability estimation

TAPRU-Hand tapping, TAPNO - Leg tapping, TAPNZ - Leg tapping against the wall, SKOUD - Long jump from a stand still, SKOVIS - High jump from a stand still, TR20M - 20 meter run, TROSK - Triple jump from a stand still, KORPL - Coordination with a bat, OKRZR - Agility in the air, BUBNR - Hand and legs drumming

Variables for competitor's efficacy estimation

OPUSP - General Player's success, POENZ - Collective points won in the competition, BRBORB - Number of fights in the competition,

PROSJ - Average points per match, IZGUB - Lost points in the competition, IPON - Ipon competitor's point activity 1 point, NIHON - Nihon competitor's point activity 2 points, SANBON - Sanbon competitor's point activity 3 points, KAZC1 - Contact penalty, KAZC2 - Penalty for leaving tatami and misconduct.

Methods of data processing
Data processing was conducted by program package SPSS 12.0. To determine canonical correlation between basic-motor abilities and competition efficacy of karate players we applied canonical correlation analysis.

RESULTS AND DISCUSSION

With canonical correlation analysis it was proved there is extremely high coefficient of canonical correlation R=0.95 with explanation R=0.95 (R-sqr 0.90), 90% of mutual variance on statistically significant level of 0.00, area of basic-motor abilities and set of competitor's efficacy variables. With canonical correlation analysis we extracted one statistically significant factor. Result with one obtained statistically significant canonical pair can be defined as general factor of researched areas of correlation (table 1).

Table 1. Canonical correlation analysis of basic motor abilities and competitor's efficacy

	Canonical R	Canonical R-sqr.	Chi-sqr.	df	p	Lambda Prime
0	0,952669	0,907577	205,7874	100	0,000000	0,015649
1	0,676041	0,457031	87,90891	81	0,281212	0,169325
2	0,629824	0,396678	57,67913	64	0,697906	0,311849
3	0,449988	0,202489	32,66658	49	0,964818	0,516887
4	0,400889	0,160712	21,4667	36	0,973647	0,648126
5	0,377027	0,142149	12,79423	25	0,978902	0,772233
6	0,26362	0,069495	5,204632	16	0,994635	0,900195
7	0,137437	0,018889	1,639242	9	0,995975	0,967426
8	0,109218	0,011928	0,695292	4	0,951907	0,986052
9	0,045211	0,002044	0,101282	1	0,750299	0,997956

From such high correlation we can conclude there is statistically high correlation between test battery of basic-motor abilities and competitor's achievement of karate players – competitors on State and Federal championship in Karate, Tuzla 2008.

Isolated canonical function in the field of competitor's efficacy (table 2), was saturated from almost all variables of competitor's efficacy and most of them were statistically significant. Structure of canonical factor in the field of competitor's efficacy can be analyzed as bipolar. The highest significance present variables OPUSP **–** competitor's general success, PEONZ – collective points won in the competiton, BRBORB- number of fights in the competition, PROSJEK, IPON**-** ipon competitor's point activity 1 point, SANBON – sanbon competitor's point activity 2 points and NIHON **-** nihon competitor's point activity 3 points and this group of variables is constituted of mutual characteristics, while variables IZGUB- lost points in the competition**,** KAZC2 **–** penalty for leaving tatami and misconduct and KAZC1 – contact penalty**,** have statistically lower values.

In the field of variable canonical function of basic-motor abilities (table 3) canonical factor structure is defined with variables BUBNR – two plane coordination and TAPRU- hand tapping with segmented speed and variables that in latent area present explosive strength and these are variables SKOKUD – long jump from a stand still, TR20M- 20 meter run, SKOKVIS- high jump and TROSK – triple jump. These results are in accordance with research results (Huremović et al., 2009).

Respondents, which had better results in variables two plane tapping, segmented hand speed and explosive strength, achieved better results in all variables that contribute competitor's efficacy. Results are in accordance with the research (Mehinović et al., 2009). Lower extremity segmented speed is not crucial but step frequency should be emphasized. Whole body coordination and agility visible through variables KORPL – coordination with a bat, OKRZR – agility in the air indicates statistically less significance in contributing competitor's efficacy of karate players.

Table 2. Isolated canonical function in the field of competitor's efficacy

Variables	KF 1
OPUSP	**-0,8972**
POENZ	**-0,8918**
BRBORB	**-0,7995**
PROSJ	**-0,7663**
IZGUB	0,3140
IPON	**-0,7578**
NIHON	**-0,5295**
SANBO	**-0,5900**
KAZC1	**-0,2964**
KAZC2	0,28969

Table 3. Isolated canonical function in the field of basic-motor abilites

Variables	KF 1
TAPRU	**-0,6712**
TAPNO	-0,2129
TAPNZ	**-0,3587**
SKOUD	**-0,6857**
SKOVIS	**-0,5784**
TR20M	**0,6360**
TROSK	**-0,5555**
KORPL	0,3884
OKRZR	0,2404
BUBNR	**-0,9632**

CONCLUSION

The research was conducted on the sample of 61 competitors with goal of determination of canonical correlation between basic motor abilities and competitive efficacy of karate players. With canonical correlation analysis we extracted one statistically significant canonical factor which can be defined as general correlation factor of researched areas. By analyzing projections of variables of competitor's efficacy on isolated canonical factor we can notice that following variables have the greatest statistical significance: competitor's general success (OPUSP), collective points won in the competition (POENZ), number of fights in the competition (BRBORB), average points in the competition (PROSJ), ipon competitor's point activity 1 point (IPON), nihon competitor's point activity 2 points (NIHON), sanbon competitor's point activity 3 points (SANBON).

On the basis of statistical significance of variables of basic-motor abilities projected on isolated canonical function, we can conclude that competitor's efficacy is mostly conditioned by arms and legs movement speed, segmented speed of arms and explosive speed of lower extremities, which is in accordance with the research (Huremović, et al., 2009).

LITERATURE

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KANONIČKA KORELACIJA IZMEĐU BAZIČNO-MOTORIČKIH SPOSOBNOSTI I TAKMIČARSKE EFIKASNOSTI KARATAŠA

Originalni naučni rad

Sažetak

Osnovna karakteristika karate borbi je konflikt dva borca na određenom prostoru uz određena pravila ponašanja i budni nazor sudija. Složeni fenomen karate sporta zahtijeva multidisciplinarno i naučno tretiranje svih njegovih aspekata. Istraživanje je provedeno nauzorku od 61 ispitanika vrhunskih karatista sa ciljem utvrđivanja kanoničke povezanosti bazično-motoričkih sposobnostii takmičarske efikasnosti. Kanoničkom korelacionom analizom estrahiran je jedan statistički značajan kanonički faktor. Analizirajući projekcije varijabli na izdvojenom kanoničkom faktoru možemo zaključiti da takmičarska efikasnost zavisi od brzine pokreta rukama i nogama, segmentarne brzine ruku i eksplozivne snage donjih ekstremiteta.

Ključne riječi: *karate, motorika, efikasnost, relacije, varijable.*

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