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DISCOVERING DIFFERENCES BETWEEN OLYMPIC AND NON-OLYMPIC SPORTS DISCIPLINES, BASED ON THE TOP SPORTS RESULTS

UGOTAVLJANJE RAZLIK MED OLIMPIJSKIMI IN NE-OLIMPIJSKIMI ŠPORTNIMI PANOGAMI NA PODLAGI VRHUNSKIH ŠPORTNIH REZULTATOV

ABSTRACT

A top sports result has social, economic and media effects, which in turn define its relative value. The evaluation of a sports result is often a subjective process influenced by an emotional connection to a certain sport, knowledge about the sport and the implicit expectations of the evaluator. Sports experts have been trying to resolve the dilemma of whether results in Olympic sports disciplines are more recognised socially, economically and in the media in comparison to the results of non-Olympic sports, as well as whether this is because they are included in the Olympic programme or whether there are some objective reasons for this differentiation. Eighteen variables representing the products of results from competitions in 2004 were used to evaluate 83 sports disciplines. First, the method of hierarchical cluster analysis was used to merge the sports disciplines into groups; two large groups emerged: one group of Olympic and another of non-Olympic sports. Later, the single variance factor analysis method revealed statistically significant differences between these two groups of sports disciplines with regards to 15 variables. The discriminatory analysis method revealed that the variable measuring the extent of the worldwide practice of a sports discipline differentiates the compared groups the most. In Olympic sports disciplines, significantly more countries are members of international sports federations.

Key words: sports management, sports disciplines, top sports result, evaluation

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POVZETEK

Vrhunski športni rezultat ima družbene, ekonomske in medijske učinke, ki mu določajo relativno vrednost. Vrednotenje športnega rezultata je velikokrat subjektivni proces, pogojen s čustveno pripadnostjo nekemu športu, poznavanjem športa in implicitnimi pričakovanji tistega, ki vrednoti. Znotraj strokovne športne javnosti se pojavljajo dileme, ali so rezultati v olimpijskih športnih panogah bolj družbeno, ekonomsko in medijsko priznani od rezultatov v ne-olimpijskih športnih panogah samo zato, ker gre za olimpijske športne panoge, ali za to obstajajo tudi vsebinski (objektivni) razlogi. Na podlagi 18 spremenljivk, ki predstavljajo proizvode športnega rezultata, smo ovrednotili 83 športnih panog, ki so imele leta 2004 kategorizirane športnike na podlagi doseženih rezultatov na tekmovanjih. Športne panoge smo najprej z metodo hierarhične klaster analize združevali v skupine, kjer se je izkazalo, da se le-te na predzadnjem nivoju združevanja združijo v dve veliki skupini, in sicer skupino olimpijskih in skupino ne-olimpijskih športnih panog. V nadaljevanju smo z metodo enofaktorske analize variance ugotovili, da se dobljeni skupini športnih panog statistično značilno razlikujeta v 15 spremenljivkah. Z metodo diskriminantne analize pa je bilo ugotovljeno, da spremenljivka, s katero smo merili mednarodno razširjenost posamezne športne panoge, najbolj razlikuje primerjani skupini, pri čemer imajo olimpijske športne panoge statistično značilno večje število držav, vključenih v mednarodne panožne športne zveze.

Ključne besede: športni management, športne panoge, vrhunski rezultat, vrednotenje

INTRODUCTION

Sport may be seen as a social, economic and media phenomenon (De Knop, 1998; Larive, 1994). It has various aims and goals such as winning a competition, learning sports skills, relaxation, staying healthy, rehabilitation, creating an income, having fun and mostly a lifestyle which in a "chaotic sense" involves the term "quality of life" (Chelladurai, 1992; De Knop, 1998; Kolar, 2005; Sasser, Olsen, & Wyckoff, 1978).

Another way sport manifests itself is top sport. The criterion for success here is an internationally recognised sports result which a sportsperson achieves through a systematic training process. Every result in top sports has, via its feedback and in line with the logic of system theory, an effect on the entire training process as well as on the consumers of the top sports: spectators and the sports industry (Bednarik, 1996). Therefore, as such a result can be viewed as a multiplier and "creator" of other types of sport such as the sport of children and young people, commercial sport and sports recreation (Bednarik & Petrovič, 1998).

Precisely due to the different goals, aims, consequences and effects of sport, various types of the public evaluate individual sports results differently; therefore, the individual sports disciplines are also viewed differently (Kovač et al., 2004). The value of a top sports result differs for the expert sports public than for other segments of the public such as the general public, the media or politicians, who may in this case be considered the "lay public". Nevertheless, the evaluation depends significantly on the international recognition of a particular sports discipline, which is itself the result of important media events such as the Olympic Games, major sporting events at home, and sports events connected with those sports disciplines that represent an important part of nation's identification (Kovač, Kolar, Bednarik, & Doupona Topič, 2005; Starc, 2004; 2005).

In practice, the sports results of national and foreign sportspeople are often evaluated not only on the basis of the actual recognition of the contents that produce the sports result and its market value, but also on the basis of previously formed beliefs and preconceptions. The amount of such hidden expectations and beliefs is quite large and often an evaluation is based on them without even realising it (Musek, 1997). It is characteristic of an intuitive evaluation to start with a relatively small amount of information (Sruk, 1995). It seems that people are not born "intuitive scientists" who constantly keep creating and checking presumptions and constructs about themselves, others and the world, and then test them with information (Kelly, 1955). Our mental notions create "theories" about factual phenomena, including sports results. Modern cognitive and personality psychology reveals that our evaluation is influenced by gained experience, beliefs, attitudes and prejudices on one hand and by hidden latent dimensions, structures and mechanisms, which act beyond experienced and conscious cognitive activity, on the other (Musek, 1997).

The problem of different evaluations of a selected sports result is also found within the expert public as individual experts hold different subjective views which often relate to belonging to a specific sport or even a particular sports discipline (Doupona Topič, Godnič, & Kovač, 2005; Kolar, 2005).

A large proportion of the sports experts believe that what a sport needs is a model of the evaluation of sports disciplines from the point of view of top sports results. Such a model should be formed and based on expert attributes and be scientifically tested. Thus, it would allow a comparative evaluation of sports achievements and consequently sports disciplines. Such a model

would create order and expert objectivity in the area of evaluating top sports results (Bednarik, Kolar, Kovač, & Jurak, 2007), which are mostly decisive for the financing of sport from public sources (Kovač et al., 2005).

When dividing sports disciplines into groups, the *international distribution of a sports discipline* was chosen as the main criterion. The number of national sports associations included in the relevant international governing body represented the measuring unit of the criterion.

Based on this criterion, sports disciplines were divided into groups. For each of them, the highest possible category was determined according to the achieved result and thereby the different possibilities of obtaining statutory rights for the sportspeople in these sports disciplines.

Since the division of disciplines into groups merely involved two criteria (Olympic and non-Olympic sport) and, as a result of expert knowledge, this could be described as *artificial division of sports disciplines*. For this reason, appropriate data for 18 variables (products of top sport) were selected for 83 sports disciplines, which included categorised sportspeople in the February Notices of the SOC (Slovenian Olympic Committee), thereby determining how successful a sports discipline was in terms of top sports results (SOC Notices, February 2004). Sports were divided into groups with the use of the statistical methods and criteria that most significantly distinguish these sports disciplines.

This interpretation could help in understanding the reasons underlying the division of sports disciplines into groups.

METHODS AND PROCEDURES

Subjects

The sample of subjects was represented by 83 sports disciplines that had categorised sportspeople included in the Notices of the SOC in February 2004.

Variables

Variables representing the products of top sports results were included. The sample criteria and their appropriate variables was formed within the framework of a project group working on the *Evaluation of sports disciplines in the Republic of Slovenia on the basis of top sports results* (Kolar, 2003). The sample variables and their appropriate criteria are shown in Table 1. Data for evaluating the variables were taken from the databases of SOC, the Foundation for Sport of Slovenia and based on the opinions of different segments of the public (general, sports-experts, media and sponsors) within the project *Sport in the Role of the National Identity of Slovenian people* (Kovač et al., 2004).

Table 1: Criteria, variables and abbreviations of variables and the source of values for individual variables

CRITERION	VARIABLE	ABBREVIATION OF VARIABLE	SOURCE
(NON)OLYMPIC SPORT	*Olympic sport or non-Olympic sport*	***OIŠP***	*SOC*
SUCCESS IN COMPETITIONS	*World category*	***TUSR***	*SOC*
	International category	***TUMR***	*SOC*
	Potential category	***TUPR***	*SOC*
	National category	***TUDR***	*SOC*
	Junior category	***TUMLR***	*SOC*
INTERNATIONAL DISTRIBUTION OF SPORTS DISCIPLINE	*No. of countries included in the International Governing Body*	***MRMPZ***	*SOC*
COMPETITIVENESS OF SPORTS DISCIPLINE IN SLOVENIA	*No. of clubs in the National Sports Association*	***TRPŠZ***	*Foundation for sport*
	No. of sportspeople in national competition systems	***TRŠTR***	*Foundation for sport*
IMPACT ON MASS SPORTS PARTICIPATION	*Share of primary schoolchildren in voluntary activity*	***MNOŠ***	*Foundation for sport*
	Share of secondary schoolchildren in voluntary school activity	***MNSŠ***	*Foundation for sport*
	Share of sportingly active people in the sports discipline	***MNREK***	*Questionnaire*
MEDIA ATTRACTION TO SPORTS DISCIPLINE	*Share of sports discipline via which sponsors can fulfil their goals*	***MOSPO***	*Questionnaire*
	Share of viewing of sports discipline	***MODEG***	*Questionnaire*
	Share of media attention towards sports discipline	***MODZP***	*Questionnaire*
EVALUATION OF SPORTS DISCIPLINE	*Evaluation of sports discipline according to values of the general public*	***VPNPP***	*Questionnaire*
FINANCIAL POTENTIAL OF SPORTS DISCIPLINE	*Total income of sports discipline*	***EKCPR***	*Foundation for sport*
	Income from own activity of sports discipline	***EKPRD***	*Foundation for sport*

Data analysis

The statistical package Windows SPSS 11.5 was used to analyse the data. The following statistical analyses were performed in the process of searching for solutions:

– Simple statistical characteristics were calculated for all variables.

– Sports disciplines were placed in groups with the use of hierarchical cluster analysis. Ward's method was chosen to carry out the cluster analysis. The interval unit of distance was the Euclidean distance. Variables were transformed into standard values with a range between –1 and +1. The number of groups was set between 2 and 4.
– To discover differences between individual groups of sports disciplines, the single-factor analysis of variance (ANOVA) method was used; for evaluating those variables that most significantly differentiate the individual groups the method of discriminatory analysis was employed.

RESULTS AND DISCUSSION

Table 2: *Distribution of sports disciplines into groups according to the number of groups whilst connecting with the use of Ward's method (minimum two groups and maximum four groups)*

Cluster Membership				**Cluster Membership**			
Sports discipline	4 Clusters	3 Clusters	**2 Clusters**	**Sports discipline**	4 Clusters	3 Clusters	**2 Clusters**
1: Athletics	1	1	**1**	44: Motorbike racing – road	2	2	**2**
2: Motorcar racing – mountain	2	2	**2**	45: Motorbike race – motorcross	2	2	**2**
3: Motorcar racing – go cart	2	2	**2**	46: Speedway	2	2	**2**
4: Motorcar racing – rally	2	2	**2**	47: Table tennis	4	3	**1**
5: Badminton	3	3	**1**	48: Football	1	1	**1**
6: Lawn bowls	2	2	**2**	49: Volleyball	3	3	**1**
7: Baseball	4	3	**1**	50: Beach volley	4	3	**1**
8: Bridge	2	2	**2**	51: Orienteering	2	2	**2**
9: Ice skating	4	3	**1**	52: Mountaineering - skiing	2	2	**2**
10: Duathlon	2	2	**2**	53: Mountain climbing	2	2	**2**
11: Rhythmic gymnastics	4	3	**1**	54: Free climbing	2	2	**2**
12: Artistic gymnastics	3	3	**1**	55: Swimming	3	3	**1**
13: Go	2	2	**2**	56: Dancing – acrobatic R&R	2	2	**2**
14: Golf	2	2	**2**	57: Dancing - ST and LA	2	2	**2**
15: Ice hockey	3	3	**1**	58: Diving – speed event	2	2	**2**
16: Hockey	4	3	**1**	59: Diving – swim	2	2	**2**
17: Sailing	3	3	**1**	60: Fishing– casting	2	2	**2**
18: Ju – jitsu	2	2	**2**	61: Fishing – fresh water	2	2	**2**
19: Judo	3	3	**1**	62: Sports fishing	2	2	**2**
20: Kayak canoe – white water	3	3	**1**	63: Wrestling – Greco-Roman	4	3	**1**
21: Kayak canoe – flat water	4	3	**1**	64: Handball	1	1	**1**
22: Karate	2	2	**2**	65: Rugby	2	2	**2**
23: Karate – traditional	2	2	**2**	66: Fencing	4	3	**1**
24: Bowling	2	2	**2**	67: Luge – natural course	2	2	**2**
25: Curling	2	2	**2**	68: Luge - artificial course	4	3	**1**

Cluster Membership				**Cluster Membership**			
Sports discipline	4 Clus-ters	3 Clus-ters	**2 Clus-ters**	**Sports discipline**	4 Clus-ters	3 Clus-ters	**2 Clus-ters**
26: Kickboxing – IAKSA	2	2	**2**	69: Acrobatic skiing	4	3	**1**
27: Kickboxing – WAKO	2	2	**2**	70: Alpine skiing	1	1	**1**
28: Cycling – road race	3	3	**1**	71: Biathlon	4	3	**1**
29: Mountain biking	4	3	**1**	72: Snowboarding	4	3	**1**
30: Cycling – track race	4	3	**1**	73: Skiing – Nordic combination	4	3	**1**
31: Equestrianism	4	3	**1**	74: Ski jumping	3	3	**1**
32: Basketball	1	1	**1**	75: Cross country skiing	4	3	**1**
33: Roller-skating – speed event	2	2	**2**	76: Squash	2	2	**2**
34: Roller-skating – figures	2	2	**2**	77: Shooting	4	3	**1**
35: Flying – acrobatic	2	2	**2**	78: Taekwondo – WTF	4	3	**1**
36: Flying – hot air balloons	2	2	**2**	79: Taekwondo – ITF	2	2	**2**
37: Flying – gliding - flying	2	2	**2**	80: Tennis	4	3	**1**
38: Flying – gliding - parachuting	2	2	**2**	81: Triathlon	4	3	**1**
39: Flying – traditional- parachuting	2	2	**2**	82: Water polo	4	3	**1**
40: Flying – motor	2	2	**2**	83: Rowing	3	3	**1**
41: Paragliding	2	2	**2**				
42: Flying – ultra light	2	2	**2**				
43: Archery	4	3	**1**				

The results of the distribution of sports disciplines into groups, as shown in Table 2, indicate that at the highest level (two clusters or groups of sports disciplines) sports disciplines are divided into Olympic (1st group) and non-Olympic (2nd group) sports. The group of non-Olympic sports does not change until the separation of sports disciplines into four groups, whereas the group of Olympic sports disciplines (1st group) firstly is divided into the 1st and 3rd groups of sports disciplines and then the 3rd group is further divided into the 3rd and 4th groups of sports disciplines. Since for this research the separation of sports at the highest level is particularly important, sports disciplines are divided into two large groups (40 Olympic and 43 non-Olympic disciplines). This indicates the homogeneity of the group of non-Olympic sports at least up to the fourth level of division (the first level of association). Therefore, only these two groups of sports disciplines will be included in our further analyses.

The study will attempt to discover for which variables the 1st and 2nd groups of sports disciplines show the most significant differences and which variables mostly differentiate the two groups of sports disciplines.

Table 3: Differences between the 1st and 2nd groups of sports disciplines *on the basis of a single-factor analysis of variance (ANOVA)*

Variable	Average value		ANOVA
	1st Group	2nd Group	Sig.
OIŠP	1	0	
TUSR	**0.70**	0.02	**0.002**
TUMR	**9.23**	3.14	**0.003**
TUPR	**4.30**	1.14	**0.011**
TUDR	**19.83**	5.95	**0.000**
TUMLR	**19.23**	4.09	**0.002**
MRMPZ	**137.28**	86.33	**0.000**
TRPŠZ	57.65	**58.28**	0.961
TRŠTR	**1734.07**	440.15	0.053
MNOŠ	**7.85**	1.49	**0.019**
MNSŠ	**0.90**	0.09	**0.010**
MNREK	**115.74**	25.99	**0.018**
MOSPO	**315.80**	221.05	**0.000**
MODEG	**522.00**	24.12	**0.007**
MODZP	**16.43**	0.26	**0.000**
VPNPP	**1566.50**	103.47	**0.001**
EKCPR	**524117.63**	120176.77	**0.003**
EKPRD	**411273.23**	86573.09	**0.002**
N	40	43	

Bold: Statistically significant at the 1% risk level, Statistically significant at the 5% risk level, Better (higher) average value

The results of the single-factor analysis of variance shown in Table 3 reveal that the 1st (Olympic sports disciplines) and 2nd (non-Olympic sports disciplines) groups of sports disciplines significantly differentiate at the 1% risk level for 11 variables (TUSR, TUMR, TUDR, TUMLR, MRMPZ, MOSPO, MODEG, MODZP, VPNPP, EKCPR, EKPRD) and at the 5% risk level for four additional variables (TUPR, MNOS, MNSS, MNREK). It can also be seen in Table 3 that Olympic sports disciplines recorded higher average values in 16 variables included in the analysis.

Since the two groups of sports disciplines that were formed after the cluster analysis differentiated in 15 variables, we attempted to find those variables which most significantly differentiate both groups of sports disciplines. For this purpose, discriminatory analysis was used and a discriminatory function was calculated; with this latent dimension those variables are satiated where the differences between groups of sports disciplines are the biggest. Variables which most significantly differentiate the two groups will have the strongest connection with the discriminatory function.

Table 4: Results of discriminatory analysis between the 1st and 2nd groups of sports disciplines

Own value	1.126
% Correct distribution	100%
Canonical correlation	0.728
Wilks' λ	0.470
χ^2	54.699
Df	17
Characteristics	0.000
Centroids of groups	Olympic sports disciplines 1.087 Non-Olympic sports disciplines -1.011
Correlation of variables with discriminative function	
	1st discriminative function
MRMPZ	0.611
MOSPO	0.580
TUDR	0.432
MODZP	0.402
VPNPP	0.372
TUMLR	0.342
TUSR	0.339
EKPRD	0.338
TUMR	0.326
EKCPR	0.318
MODEG	0.287
MNSŠ	0.274
TUPR	0.272
MNREK	0.252
MNOŠ	0.250
TRŠTR	0.205
TRPŠZ	-0.005

Statistically significant at the 1% risk level

Statistically significant at the 5% risk level

The results of the discriminatory analysis comparing Olympic and non-Olympic sports disciplines on the basis of 17 variables show that the groups significantly differentiate at the 1% risk level. The centroid for Olympic sports (1st group) is on a positive pole (1.087) while the centroid for non-Olympic sports (2nd group) is on a negative pole (-1.011). The positive values of coefficients of the structure matrix indicate higher values (a better result in an individual variable) for Olympic sports disciplines and negative values for non-Olympic sports disciplines.

For the 11 variables (shown in Table 4 in dark grey) that most significantly correlate with the discriminatory function single-factor analysis shows (Table 3) that groups of sports disciplines

statistically significantly differentiate at the 1% risk level. Among these are four (TUDR, TUMLR, TUSR in TUMR) out of five variables of the criterion TU (success in competitions), one variable (MRMPZ) of the criterion MR (international distribution), all three variables (MOSPO, MODZP and MODEG) of the criterion MO (media attraction to the sports discipline), one variable (VPNPP) of the criterion VP (evaluation of sports discipline) and both variables (EKPRD and EKCPR) of the criterion EKP (economic potential of sports discipline). These 11 variables are followed by five variables for which the single-factor analysis of variance found a difference between the groups (Table 3) with a statistical significance at the 5% risk level (shown in Table 4 in light grey). They include all three variables (MNSS, MNREK and MNOS) of the criterion MN (impact on mass participation) and one variable (TUPR) of the criterion TU (success in competitions). The last two variables, where no statistically significant differences were found, are TRSTR and TRPSZ of the criterion TR (competitiveness of the sports discipline in Slovenia). The variable TRPSZ *(number of clubs, members of national sports association)* is also the only variable for which non-Olympic sports recorded better results (a difference of 0.63) than Olympic sports.

On the basis of the correlation coefficients between the variables and the discriminatory function, we see that the two groups mostly differentiate as regards the variable **MRMPZ** – *number of national sports associations included in the international governing body.* With this variable, the first group of sports disciplines (Olympic sports) achieved at a 1% risk level a significantly higher average result than the second group of sports disciplines (non-Olympic sports) (see Table 3). Olympic sports disciplines have on average 50.95 (see Table 3) more national sports associations included in the relevant international governing bodies.

CONCLUSIONS

Several conclusions can be drawn from this study. On the basis of the selected criteria (products of top sport results), sports disciplines in Slovenia are also divided after empirically studying the groups of Olympic and non-Olympic sports disciplines. The distribution is perfect since none of the Olympic sports disciplines was placed in the group of non-Olympic sports and vice versa. With 15 out of 18 variables (products of top sports results), Olympic sports disciplines significantly differentiate from non-Olympic sports. For all 15 variables, a higher average value is characteristic of the group of Olympic sports disciplines. The variable MRMPZ differentiates the two studied groups of sports disciplines the most. This variable is the only representative of the criterion of the international distribution of sports disciplines. This indicates greater international competition in Olympic sports disciplines; consequently, it is harder to win medals in the biggest competitions (Kolar, 2005). In addition, the variables of the criterion media attention to the sports discipline differentiate the two groups, strongly indicating that Olympic sports disciplines attract more viewers (the general public) and, in the opinion of reporters, deserve a bigger share of media attention. They are also more interesting for meeting the marketing-advertising goals of Slovenian companies (the sponsorship segment of the public). In the opinion of the Slovenian general public (VPNPP), Olympic sports disciplines are more important for the development of sport in Slovenia, Slovenia's recognition in Europe and around the world; they also contribute more to Slovenians' national identity (Kovač et al., 2004; 2005). It is also characteristic of Olympic sports disciplines that they achieve bigger success in competitions (Kolar et al. 2007). The impact on mass sports participation differentiates the groups of sports disciplines slightly less; however, Olympic sports disciplines again recorded significantly higher

results. The only criterion for which the variables do not significantly differentiate the groups of sports disciplines is the competitiveness of sports disciplines in Slovenia.

The empirically-determined facts in this study confirm the decisions of the expert group working within the framework of the project *Evaluation of sports disciplines in Republic of Slovenia from the top sports results point of view* (Kolar, 2003). Sports disciplines were also empirically divided into two groups of Olympic and non-Olympic sports disciplines, indicating that non-Olympic sports associate on the basis of the top sports results separately from Olympic sports disciplines. In finding the differences between the two groups, it was seen that particularly the variable *number of national sports associations included in the international governing body* differentiates the two groups the most. This criterion was also chosen by the expert group in order to divide sports disciplines into groups and to provide the basis on which the categorisation of sportspeople into different categories will be performed.

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