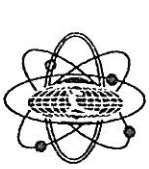

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RELIABILITY OF THE CHOSEN POLISH TEST FOR EVALUATING SPECIFIC TRAINING STATUS IN ADVANCED WRESTLERS

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INTRODUCTION

There is a small number of batteries of tests with a tradition of over 24 years of use in training, like the Polish battery of tests for the basic and specific training status for advanced wrestlers (Starosta, Tracewski 1981, 2001, Starosta 1984). Before creating such tests, the importance of the motor abilities for success in wrestling was estimated, and according to them coordination plays the most important role in wrestling (Starosta at al. 1985, Starosta 1998). This was also reflected in the creation of the battery of tests for the assessment of basic and specific training status for advanced wrestlers in which the coordination abilities play the most important role (for cadets and juniors 52.2%, and for seniors 28.6% of the total number of tests). According to the author (Starosta 1997) the result of this long-term approach to training was the later success of the Polish wrestlers, who won 5 Olympic medals in Atlanta (including 3 gold medals). The biggest success of this battery of tests, according to the authors, was the establishment of a «T» scale (norms) for all the tests. The «T» scale is the result of a series of 18 tests with 524 national team wrestlers (Starosta 1984).

From this we can say that this Polish battery of tests confirmed its reliability in practice. The goal of the author is to confirm whether the metric characteristics of tests for specific training status have high marks for some other populations of top wrestlers. The received results would permit professionals of the field of sport and science from other countries to use this battery, and to have as much scientific information about its metric characteristics as possible, and most of all about its reliability.

METHODS

The sample of participants comprised 35 top cadet Greco-Roman wrestlers (15 to 17 years of age) from 8 different Croatian clubs. This sample may be considered as a representative sample of Croatian top wrestlers. All of these wrestlers were chosen

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according to their ranking (1-4 place) at the national chamiponships in 2004. A small number of participants who did not respond could not be foreseen, and was the result of injuries, sickness or some other objective circumstances. All tested as healthy, which was determined by a physical examination.

The chosen tests from the battery of tests for the assesment of basic and specific training status for advanced wrestlers (Starosta, Tracewski 1981) were: strive, the so-called «merry-go-round» (SESTAR_DL), bridge from above upper, the so-called bridge execution (MOST_ST) for assessment of specific flexibility and speed of movement, and the catch (snatch) from the neck (SKL_S_VR) and bridge arrival - pirouettes (PIRUETE) for the assessment of specific coordination and speed. More detailed description of these tests can be found in the written work (Starosta 1984), and the translation of the tests into Croatian in the writen work (Starosta, Tracewski 2001).

The research was conducted in January 2005 at the Faculty of Kinesiology in Zagreb, and 7 basic and 8 specific wrestling tests were conducted. The testees went from one test to another by random choice, and for the necessity of this research only the above-mentioned four tests were analyzed. The gyms where the tests were done were heated normally according to the season, and the testing took place between 9am and 2pm.

RESULTS

The average age of the group of wrestlers was 16.24+/-0.74 years. Their average number of training sessions per week was 4.65+/-0.94, years of training 5.69+/-0.29, body height 172,28+/-1.49 cm, and body weight 66.47+/-1.92 kg. Other results are shown in Tables 1 and 2.

Table 1. Analysis of basic statistic parameters for each item, and the influence of each item on the reliability amplitude of the test (n=35)

R.b.	Test	Item	Mean	Minimum	Maximum	Std.Dev.	Factor 1	Cra id
1.	SESTAR_DL (sec)	1	14,482	10,700	19,670	2,293	0,955	0,976
		2	14,035	10,300	18,010	2,141	0,985	0,929
		3	13,775	9,910	18,440	2,174	0,970	0,953
1.1.	SESTAR_D* (sec)	1	7,164	5,350	9,350	1,064	0,959	0,911
		2	6,938	5,280	8,950	1,009	0,951	0,926
		3	6,869	5,290	9,340	1,152	0,948	0,932
1.2.	SESTAR_L** (sec)	1	7,318	5,070	10,320	1,331	0,925	0,953
		2	7,097	4,630	9,620	1,262	0,959	0,900
		3	6,906	4,590	9,240	1,155	0,963	0,897
2.	MOST_ST (sec)	1	2,396	1,500	3,450	0,452	0,793	0,786
		2	2,218	1,670	3,600	0,434	0,891	0,621
		3	2,199	1,500	3,330	0,455	0,835	0,730
3.	SKL_S_VR (sec)	1	8,195	6,310	10,910	1,202	0,918	0,644
		2	8,206	6,130	10,580	1,213	0,836	0,797
		3	8,357	6,700	12,090	1,332	0,826	0,814
4.	PIRUET (sec)	1	5,926	4,510	9,470	1,019	0,864	0,824
		2	5,644	4,330	7,590	0,841	0,937	0,672
		3	5,699	4,500	7,330	0,792	0,837	0,852

Legend: n - ordinal number of items; Mean - arithmetical mean; Minimum - minimum value; Maximum - maximum value; Std.Dev.- standard deviation; Factor 1- correlations of items with the first main component; Cra id- evaluated Cronbach's - a coefficient of reliability if the particle was excluded; SESTAR_D*- strive to the right is part of the test SESTAR_DL, can be performed as a separate test for specific flexibility and speed of movemet to the right; SESTAR_L**- strive to the left is part of the test SESTAR_DL, can be performed as a separate test for specific flexibility and speed of movemet to the left.

Table 2. Analysis of the reliability of selected tests for advanced wrestlers (n=35)

R.b	Test	n	SB	ac	Cra	ECra	R	Eigenval	Cumul. %
1.	SESTAR_DL	3	0.969	0.969	0.968	0.857	0.918	2.823	0.941
1.1	SESTAR_D	3	0.949	0.950	0,947	0.845	0.861	2.722	0.907
1.2	SESTAR_L	3	0.945	0.945	0.942	0.909	0.859	2.704	0.901
2.	MOST_ST	3	0.791	0.792	0.790	0.556	0.563	2.120	0.707
3.	SKL_S_VR	3	0.824	0.825	0.821	0.605	0.618	2.240	0.741
4.	PIRUET	3	0.854	0.859	0.847	0.648	0.671	2.325	0.775

Legend: n - ordinal number of items; SB-Spearman-Brown coefficient of reliability; ac-Kaiser-Caffrey coefficient of reliability; Cra – Cronbach's - a coefficient of reliability; Ecra - estimated Cronbach's - a coefficient of reliability if there are two items fewer; R-Average Inter - Item Correlation; Eigenval- absolute amplitude of characteristic values of the matrix of item correlation; Cumul. % - by a percentage articulated cumulative part of the characteristic values of the matrix of item correlation

DISCCUSSION

The reliability of strive tests for the evaluation of specific flexibility and speed of movement (SESTAR_DL, SESTAR_D, and SESTAR_L) evaluated by the Spearman - Brown procedure, Kaiser-Caffrey and Cronbach's - a coefficient, is very high (table 2). Arithmetical means of items are on the decline, as well as the minimal and maximal results (table 1). According to this we can assume that these tests are contaminated by the adaptation of the testees to this test situation. That is confirmed by the tendency of the smallest result being achieved in the first item of these two tests, and the smallest correlation coefficients of the first result in the first important main component (table 2). Because of that, the authors suggest that the first attempt of the participants is treated as probationary, because it has been detected that by throwing out the first item, Cronbach's - a coefficient of reliability remains almost the same (table 1). This is very important information for this test because too much time would be spent if the test was repeated three or more times. The validity of the test regarding the success criteria in wrestling has been confirmed in all previous studies (Glaz, Starosta 1994, Baić 2003, Baić, Starosta, Marić 2003), where the results in this test were better as the group of participating wrestlers was better.

The reliability of the bridge from above upper test (MOST_ST) evaluated by the Spearman-Brown procedure, Kaiser-Caffrey and Cronbach's - a coefficient, is of medium value (table 2). The average coefficient of the correlation between the items is the lowest in the battery of tests, and the only important main component takes up a good deal of the variance (71%), and that is the smallest of the total achieved variance in this battery of tests. We can assume that this test is also contaminated by adaptation on the part of the participants of this test situation. That confirms the tendency of the smallest result being achieved in the first item of these two tests, and the smallest correlation coefficient of the first item on the first important main component (table 1). Because of that, the authors suggest that the first attempt of the participants is treated as probationary, because it has been detected that by throwing out the first item Cronbach's - a coefficient of reliability remains almost the same (table 1). The results of former researches point to the validity of the test for evaluating explosive strength (Baić 2003) where this test obtains the biggest number of statistically important correlations with other tests for evaluating explosive strength (20m run from a flying start and maximal high jump with both feet). The same tests were used to define the factor of explosive strength.

The reliability of the catch (snatch) from the neck test (SKL_S_VR) evaluated by the Spearman-Brown procedure, Kaiser-Caffrey and Cronbach's - a coefficient, is of medium value (table 2). The arithmetical means of the items are on the rise, similar to the standard deviations. Regarding the variability and range of results we could say that the sensitivity of this measuring instrument is good. But this test is very hard for this sample of particitants, and only 57% of wrestlers managed to do it. The coefficient of correlation between the items is high, and the only important main

component takes up a big part of the variance (74%). According to this we can assume that the results of this test are contaminated by some other factors. The authors assume that fatigue and less motivation resulted in less reliability. This test was in the group of tests at the very end of the research, and even though the group of wrestlers did not do a large number of the tests, the number of items per test was large and de-motivating. The order and size of the projections in the first important main component, and evaluated Cronbach's - a coefficient of reliability, point to the fact that two attempts should be enough to obtain almost the same reliable results in this test (table 1). For a minimum of 0.9 reliability, at least one item would be needed, under the condition of having enough time for recovery and the motivation of the athletes. The validity of the test according to the success criterion in wrestling is confirmed by researches (Baić 2003, Baić, Starosta, Marić 2003), where the results in this test were better as the group of wrestlers was better.

The reliability of the bridge arrival test (PIRUETE) evaluated by the Spearman-Brown procedure, Kaiser-Caffrey and Cronbach's - a coefficient, is of medium high value (table 2). The arithmetical means of the items are mostly unchanged, similar to the minimal and maximal result. The coefficient of correlation between the items is of medium value, and the only important main component takes up a big part of the total variance (78%). According to that we can assume that the results of this test are also contaminated by another component. These tests have extreme coordination demands (symmetrical jump with both legs), so this can be a problem for athletes who were used to doing this drill with a one legged jump in their clubs, and this required an adaptation to this more complex test situation. The order and size of the projections in terms of the first important main component, and the evaluated Cronbach's - a coefficient of reliability, suggest that two attempts should be enough to obtain reliable results in this test (table 1). For a minimum of 0.9 reliability at least five items would be needed, under the condition of enough recovery time and proper motivation of the athletes.

The authors can conclude that the applied tests range from medium to very high reliability. We can assume that the improvement of reliability would occur if the number of participants was larger and the wrestlers older and better. In the case of a smaller sample of participants, the authors suggest increasing the number of items for increasing the reliability. The authors also conclude that if the Polish battery of tests is applied, the number of items by test should be less and according to the suggestions of the authors (Starosta, Tracewski 1981). The number of tests for advanced wrestlers is very large (cadets and juniors do 23, seniors 15), and even during this small research it was noticed that the accumulated fatigue was close to the upper level of tolerance for both athletes and trainers. The authors feel that with such a large battery of tests it is more important: to have an optimal number of items determined by long-term practice and a large volume of research, properly divided into tests during the days of testing, have determined norms, have top sport results of athletes who are observed while doing the suggested battery of tests. Only then

would the motivation of top athletes for testing be retained even under increasing fatigue, and then also the real reliability of the applied tests would be maintained.

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