

ON THE TRANSFER OF SKILLS SKILL IN DIFFERENT CONDITIONS OF MOTOR ACTIVITY

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Annotation. The aim of the study is a metric description of the transport of mobility in terms of kinesthesia in examined in a comprehensive registration block of six different motor coordination tasks. A total of 56 students in six different test tasks coordination complexity. The results of the initial control of processed statistically. Two calculated correlation matrix 6x6. The efficiency of use in subsequent statistical operations previously only justified, metrological reliability of the results. The transfer of skills in terms of agility kinesthesia found only in two exercises of this nature, explicable by common physiological mechanisms of regulation. The results of the study confirm the well-known knowledge of the complexity of mobility and contrary to some of the original authors of the possible use of a single universal control exercise - test for evaluation.

Keywords: agility, kinesthesia, transport, skills, control, evaluation.

Introduction

We assume that urgency of question under our consideration about transferring of dexterity skills in different conditions of motion activity is conditioned by existed in scientific-methodic literature opinion about, the so-called, total coordination and application of universal test for its evaluation [11,12]. Initial cause of such, from our point of view, discussible opinion can be evident disproportion between fundamental knowledge about psycho-physiological mechanisms of dexterity [1,6], and practical knowledge about methods of measurements and evaluation of this ability in conditions of physical education and sports.

As it is known, structure of dexterity is characterized by several little interconnected its kinds. They include: dexterity of cyclic, stereotype and acyclic, not stereotype movements; manual dexterity and dexterity with participation of all body parts. Also dexterity in quickness of human responses, in rhythm of movements, in quickness of coordination's re-switching in suddenly appeared conditions of motion activity and so on. Integral criterion of dexterity is accepted to be considered complexity not of some universal test – exercise, but anyone from great variety of specific, difficult in coordination exercises, accuracy of their numerous repetitions and quickness of their mastering in the process of training [1,6,11,13,14]. These knowledge are in the base of organization of control and evaluation of dexterity of trainees in specifically conditioned loco-motions. This in itself causes doubts in opinion about efficiency of using of universal test, suitable for evaluation of dexterity of a gymnast, swimmer, downhill skier, football player and so on.

That is why opinion about dexterity as global ability against the background of fundamental knowledge about its complex psycho-physiological structure and numerous forms of its manifestation in different conditions of human motion activity is of discussible character and causes need in organization of additional researches.

Considering the fact that in the base of dexterity there is human sense of movement, in our research we made an attempt to metrically evaluate kinesthetic state of the tested in standard laboratory conditions and basing on this material to judge mediately about structure of dexterity skills and peculiarities of transfer of these skills in coordination conditions of different difficulty.

Purpose, tasks of the work, material and methods

The purpose of the research is to metrically ground peculiarities of transferring of dexterity by indicators of kinesthesia of the tested group in conditions of complex registration of several coordination-different motion tasks.

The tasks of the research:

- to calculate reliability of measurements in conditions of numerous repetitions of differentiation accuracy of motion tasks in six test exercises.
- to study character of correlation interconnection between results of accuracy of differentiation in these test exercises.

We assumed that in this case it would be possible to substantially from metrological positions observe the character of kinesthesia's state transferring of the tested in adjoining test tasks and mediately judge about structure of dexterity and means of its evaluation in system of control in pedagogical process.

The methods of the research. The research was carried out in scientific laboratory with observance of commonly accepted metrological requirements to measurement procedure, described in our previous publications [3,4,5,8]. We tested 56 students, who do not practice systemically any kind of sports. Their average age was 21.8 years old, height – 180.6 cm, mass of body -78.1 kg. Testing program included six arbitrarily selected motion tasks of different difficulty. We registered accuracy of results of numerous repetitions of every from six listed below tasks.

1. Two high jumps from the spot with rotation around longitudinal axis of body; one – to the left and one to the right in every series. Landing - in circle. Protractor – 380°. Three repetitions of series. Sums of degrees in series.

2. Accuracy of ball's throws in target in golf conditions from 9 meters' distance. Gym, floor covered with linoleum. Five series, 7 throws in each series (cm).
3. Standard Romberg's test. Computerized strain gage platform. Three repetitions (mm²).
4. Accuracy of task's differentiation - 50% from maximal value of strength in elbow. Five repetitions (N).
5. Accuracy of task's differentiation - 50% from maximal result of long jump from the spot. Five repetitions (cm).
6. Body balance in static-dynamic conditions. Test "ellipse". Computerized strain gage platform. Five repetitions (mm.p.sec.).

Statistical analysis of data general amount was carried out as per general requirements [2,7] in the following sequence:

1. We preliminary calculated reliability of measurements of every of the tested, basing on percentage of comparability of successive attempts in every of six test tasks;
2. We characterized reliability of measurements of all group by every indicator on the base of calculation of in-test correlation (r_{it}). The total scope of measurements, which reflected accuracy of tasks' fulfillment in six test exercises, was processed with method of rank correlation. It was assumed that this method would permit to objectively evaluate the state of kinesthesia of the tested in every of six test tasks, as well as to observe the character of motion sense's transference in conditions of every test task.

Results of the researches

It was stated that in conditions of repeated changes in every test task in group, consisting of 56 tested, variability of measurements was different and was in the range V% 12.4-45.8. It meant that stability of repeated measurements' results of some tested was lower than the required metrological norms of reliability (see table 1). As it is known, measurements' reliability is characterized by degree of interconnection of repeated attempts' results. Within the limits of low, but still admissible reliability there were measurements, which correlated in the limits 0.69-0.60; admissible reliability – 0.79-0.70; middle – 0.89-0.80 and so on. [2, 8].

Table 1

Indicators of differentiation's accuracy and measurements' reliability of the tested in six test tasks

Statistical parameters	Test tasks and units of measurements					
	1(°)	2 (cm)	3 (mm ²)	4 (N)	5 (cm)	6 (mm.p.sec.)
M	884	128	552	29	4	23
δ	171	16	273	7	2	8
min	515	88	196	16	1	14
max	1300	161	1513	47	12	62
V%	39.4	12.4	45.4	24.4	45.6	34.7
Reliability of measurements (r_{it})						
M	0.399	0.599	0.388	0.444	0.402	0.506
min	0.275	0.404	0.203	0.393	0.303	0.412
max	0.618	0.817	0.615	0.796	0.637	0.808

Low mark of measurements' reliability of some tested excluded using in further statistical operations of data general population of 56 tested, because there were a lot of random, not stable measurements, which did not meet requirements of reliability. Expressed differences between the tested took place in results of accuracy of high jumps with rotation; Romberg's test; in differentiation of long jump's distance; in test "ellipse" (tasks 1,3,5,6 V%=39.4; 45.4; 45.6 and 34.7 accordingly). These differences were noticeable in comparing of minimal and maximal results of measurements of students' group in every of six test tasks and were reflected in indicators of measurements' reliability with calculating of in-test correlation (see table 1). As it can be seen in the table, certain part of the tested demonstrated comparatively high comparability of results of repeated measurements (r – in the limits of 0.615-0.817). At the same time other part of the tested distinguished by low reliability of measurements (r – in the limits 0.203-0.412).

This fact served a base for solution of main task of the research – metrical description of transferring of dexterity in conditions of different test tasks; it was necessary to use only that part of general measurements' population, which corresponded to metrological requirements of reliability. The purposefulness of such approach was proved by materials, presented in table 2, where in upper part of matrix there are correlations, calculated by data of 56 students' measurements. Here mean reliability of measurements was in low zone of reliability, within limits r_{it} =0.388-0.599. Transferring of dexterity, by kinesthesia's indicators took place, in this case, only in Romberg's test and in test "ellipse" (r =0.371).

Table 2

Results of correlation analysis of indicators of motion tasks differentiation's accuracy transferring in two sub groups of the tested

	1	2	3	4	5	6
1	x	-0,137	0.026	-0.199	0.096	-0.149
2	0.299	x	0.190	0.180	0.027	0.206
3	0.267	0.333	x	-0.145	0.112	0.371*
4	0.311	0.299	0.317	x	0.141	0.165
5	0.386*	0.199	0.289	0.293	x	0.017
6	0.233	0.354	0.502**	0.312	0.301	x

Notes: *P<0.05; **P<0.01

Results of correlation analysis of general population of measurements were duplicated in the following way. From 56 of the tested we selected only those, whose repeated measurements' accuracy difference did not exceed 21% and reliability was in the limits of correlation coefficients 0.70-0.79 and higher. In this case there were 28 such tested, including 11 with measurements' reliability within correlation limits 0.80-0.89. In total, all group of the tested was characterized by admissible and middle reliability of changes (see table 2, lower part of matrix). With it, we received two statistically significant correlation coefficients at level of P<0.05-0.01. They were in tests 1 and 5 – high jump with rotation and accuracy in long jump from the spot ($r=0.386$), and in tests 3 and 6 – Romberg's test and "ellipse" ($r=0.502$). In this case as well transferring of motion sense, videlicet - dexterity, can be explained by community of physiological mechanisms in these, similar by coordination, movements. In other combinations of control tasks correlation interconnections turned out to be insignificant.

Conclusions

As it is known, dexterity is a complex quality, with specific interaction of motor and other analyzers and participation of central and periphery sections of human nervous system in the base. These knowledge are proved by practice of physical education and sports, by examples, which witness about absence or insignificant transferring of dexterity, acquired in some conditions to other, not specific conditions of motion activity [2,6,9,10]. In this connection results of separate researches, which try to prove conceptions of global dexterity and universal method of its evaluation, cause doubts [11,12].

Proof or rejection of these conceptions can be realized only with the help of experimental data and this idea served the subject of our research. Observation of dexterity transference can be only in mediate way, basing on indicators of human motion sense (kinesthesia), which can be evaluated metrically in objective units, with the help of reliable from metrological position measurements.

In conditions of our research we based only on reliable from metrological position measurements' results in six test indicators of different coordination difficulty. However, transference of skill to differentiate motion task equally accurately was observed only in two cases: in Romberg's test and in "ellipse"; in accuracy of long jump and high jump with rotation. One can assume that in these cases transference of skill can be connected with similar physiological mechanisms, which regulate human arbitrary similar movements. In other combinations of six test exercises transference of skills was not found. It means that introduction of opinion about global coordination and universal methods of its evaluation in conceptual system of theory and practice of physical education can be considered to be rather discussible, and requiring further metrical foundations.

The prospects of further researches imply more profound foundation of universal methods of global coordination's evaluation.

References:

- 1 Bernshtejn N.A. *O lovkosti i ee razvitii* [On dexterity and its development], Moscow, Physical Culture and Sport, 1991, 276 p.
- 2 Godik M.A. *Sportivnaia metrologiia* [Sports metrology], Moscow, Physical Culture and Sport, 1988, 192 p.
- 3 Zaporozhanov V.A., Boraczyński T. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo viovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2009, vol. 9, pp. 52-56.
- 4 Zaporozhanov V.A., Boraczyński T. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo viovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2012, vol.11, pp. 38-42.
- 5 Zaporozhanov V.A. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo viovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2013, vol. 4, pp. 21-25.
- 6 Zaciorskij V.M. *Fizicheskie kachestva sportsmena* [The physical quality of the athlete], Moscow, Physical Culture and Sport, 1966, 200 p.
- 7 Urbakh V.Iu. *Biometricheskie metody* [Biometric methods], Moscow, Science, 1964, 415 p.
- 8 Boraczyński T., Zaporozhanov V.A. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo viovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2009, vol. 12, pp. 221-225.

- 9 Czajkowski Z. *The nature and importance of sensory-motor habits in sports activities and their correlation with the efficiency of sensory-motor* [Istota i znaczenie nawyków czuciowo-ruchowych w działalności sportowej oraz ich współzależności ze sprawnością czuciowo-ruchową], Katowice, AWF, 1995, pp. 283-285.
- 10 Prusik Ka., Kochanowicz K. *Control of special fitness athletes practicing the discipline of complex motor coordination. Trends in improving training and combat sports: diagnosis* [Kontrola sprawności specjalnej zawodników uprawiających dyscypliny o złożonej koordynacji ruchowej. Kierunki doskonalenia treningu i walki sportowej: diagnostyka], Warsaw, PTNKF, 2006, vol. 3, pp. 91-94.
- 11 Starosta W. *Motor coordination capacity. Meaning, structure, conditioning, shaping* [Motoryczne zdolności koordynacyjne. Znaczenie, struktura, uwarunkowanie, kształtowanie], Warsaw, 2003, 564 p.
- 12 Starosta W. *Global and local motor coordination in physical education and sport - and conditional volatility* [Globalna i lokalna koordynacja ruchowa w wychowaniu fizycznym i sporcie – zmienność i uwarunkowanie], Poznań, AWF, 2006, 738 p.
- 13 Piper T., Teichelman T. Strength Training for Pre-adolescent Students. *Strategies*, 2003, vol.17(2), pp. 35–38.
- 14 McGiverin R.H. Sensory-Motor Skills. *Behavioral & Social Sciences Librarian*, 1990, vol. 8(3-4), pp. 61–63.

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Cite this article as: Zaporozhanov V.A., Borachinski T. On the transfer of skills skill in different conditions of motor activity. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 25-28. doi:10.6084/m9.figshare.749693

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Received: 09.06.2013
Published: 30.09.2013