

No. 37
2007

ANTROPOMOTORYKA

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SUMMARIES

DISSERTATIONS AND ARTICLES

Ulrich Wiesmann, Kirsten Eisfeld, Hans-Joachim Hannich, Peter Hirtz

Motor Action Competence in Active Elders: Correlates of Motor Resources and Subjective Health

The concept of Motor Action Competence (MAC) denotes the capability of adequately mastering motor demands in everyday life by using motor resources optimally. Main objectives were the investigation of active seniors' MAC in three different areas and their associations with motor resources and subjective health.

168 active senior volunteers at the mean age of 67 took part in a sport scientific screening of two MAC areas – "Perceiving & Reacting" (P&R) and "Managing Complex Situations" (MCS) – and motor resources. The subjective MAC area "Everyday Life Motor Competence" (ELC) and various standardized scales assessing physical, psychological and social dimensions of subjective health were assessed by questionnaire.

MCS and ELC significantly declined with increasing age, whereas P&R proved to be age-independent. The two objective areas P&R and MCS were associated with motor resources: Competent participants (compared to incompetent ones) in both areas showed faster speed of movements, faster simple reactions, a stronger handcraft of both dominant and non-dominant hand, and higher mobility. With respect to MCS, they were also better in dynamic balancing. MCS and ELC proved to be health-related, while P&R did not: Poorly performing persons in MCS (in comparison to competent ones) showed deficits in psychological health, BMI, and physical well-being, whereas poorly performing persons in ELC showed deficits in physical health, symptoms, physical well-being, and BMI.

The results corroborate the concept of MAC and emphasize the significance of age-compatible and everyday life-adjusted physical activity for successful ageing.

Włodzimierz Starosta, Waclaw Petryński

Selected Problems of International Terminology in Motor Science

Authors present the language not as a passive tool of description, but as an active element of a science building system. The main task of science is accurate reproduction of reality by means of abstract, symbolic, immaterial items: words, being the means of presenting of theories and models.

In such a system the quality of language determines to great extent the quality of science as a whole. It is possible to distinguish two types of language problems: intralingual and interlingual ones. The authors discuss parallel semantic and physical analysis of the notions: physical efficiency, endurance and exercise tolerance. They have shown that the notions under consideration make a coherent system, best illustrated by the phenomenon of supercompensation. The authors suggest logically coherent definitions of the above notions. They also present the language analysis of terms used in motor science – Polish and English ones – connected with the notion of force or strength (“static strength”, “dynamic strength”, “explosive strength”, “shear force”, “fast force”, and “endurance force”). They also prove the incoherency of the terms with basic rules of physics. They advocate the necessity of eliminating from the scientific terminology the terms clearly incoherent with basic rules of physics. They suggest two definitions of the term “force” used in motor science: as a physical quantity, and as a motor ability. They give an example of the logically incoherent motor performance pattern, often presented in American literature. Then they suggest how to improve the terminology. Finally the authors stress the opinion that in all physical culture sciences just the motor science is most vulnerable to incoherencies in terminology. The cause of it is the fact that its main task is creation of human behaviour models, which are made of words. Thus the need of working out the international encyclopaedic dictionary of motor science – as well as national dictionaries, consistent with it – seems to be necessary.

Józef Drabik

Sekular Trends in Maximal Anaerobic Work (MAW) of 6-year-old Children from Gdańsk in the Period 1995-2004

To our best knowledge there is no study published describing anaerobic non lactic efficiency in 6 years old children. Therefore, the aim of the paper was the evaluation of MAW level and monitoring the tendencies in MAW level changes during 1995–2004. 9881 boys and 9541 girls (6 years old) from Gdańsk took part in the study. Motoric test – standing broad jump was used to evaluate MAW level according the model:

$$\text{MAW} = \text{length of jump (cm)} \times \text{body mass (kg)} \times \text{acceleration } 9.81 \text{ (g)}.$$

M, SD were calculated for all the variables (height, body mass, BMI, broad jump, MAW). Linear regression was used to test for trends in the MAW.

Significant differences ($p < 0.001$) were found in average MAW results between boys and girls in 1995 and 2004. Throughout all monitored years, there results were changing in progressive direction.

It was shown that sequential population of 6-year-olds, particularly boys, was achieving significantly better results in MAW level. Therefore, quite popular opinions about “continual degrading motor efficiency of the young generations” do not apply to 6-year-old children.

Jerzy Januszewski, Edward Mleczko

Quetelet II Height-weight Index – BMI and Tested Physical Efficiency Referring to the Health of Boys from Małopolska

Basing on the results of the researches conducted on 4037 boys from Małopolska in years 1996–2005 some hypothesis were verified about ontogenetic period appearance of: the negative influence of too low and too high fatness level on the positive health measures level, and the similar structure of the physical efficiency analyzed referring to health and the similar strength of the correlation connection between its elements and the height-weight index (Quetelet II) sorted in groups according to BMI level.

The results of the positive health indexes were analyzed such as: the basic somatic features, antropometric indexes, the oxygen efficiency (VO₂ max), motor ability tested on Eurofit and

MTSF tests. Basing on the average value and the standard aberration of BMI all tested girls were divided into 3 groups: 9–10, 13–14, 17–18. In every group the range and the trend of the considering features differentiations were discerned and only in two groups (above and below the range of 1 SD BMI) the concentration analysis was conducted where the strength of the correlation connection between the elements of the physical efficiency structure, tested according to the relation of health and BMI level, were estimated.

The researches confirmed the accepted hypothesis about the negative influence of low and high fatness level, tested by BMI indexes, on the selected indexes of the positive health. The results of the concentration analysis and the Pearson's correlation between BMI index and the physical efficiency's elements tested referring to health show the reason to claim there are similar connections between the elements of the physical efficiency and the hierarchic structure in the group of individuals of low and high fatness. The statistically essential correlations only between efficiency's morphologic components and BMI were found.

The conducted researches confirmed: 1. The negative influence of too low and too high level of fatness on the level of the health positive indexes, 2. The statistically essential correlation connections only between BMI and the somatic features which measure a body's fatness, 3. The poor relations between BMI level and the positive health measures such as: physical efficiency, motor ability, 4. The similar structure of the physical efficiency tested referring to health in groups of lower and higher level of fatness.

Zofia Ignasiak, Grażyna Dąbrowska, Grzegorz Żurek

Fatness Level in Physically Active and Inactive Female Students at Wrocław University of the Third Age

The objective of the study was to present selected parameters of body composition at Wrocław University of the Third Age. 150 women have been examined. Based on interviews, they were divided into two groups, of higher (114 women) and lower (36 women) levels of physical activity. The women were assigned to particular groups on the basis of frequency and length of weekly physical exercise. Body height and mass as well as waist and hip size were measured with the use of standard methods for anthropometrical measurements. The measurements were used to calculate the Body Mass Indicator (BMI) and the Waist-Hip Ratio (W/H-R). Parameters of body components were determined with the use of the apparatus FUTREX 5000. All the calculations on the obtained data were made by means of the software package STATISTICA.

Upon further analysis it was concluded that the examined women are marked by similar basic somatic measurements: body mass and height. The BMI and W/H-R of the Third Age University students were also very similar. However, women with higher level of physical activity had more favourable parameters of lean body mass and content of fatty tissue, both in percentages and in the absolute value, as well as water content in the body.

Adam Haleczko, Leszek Korzewa, Ewa Misiołek, Urszula Włodarczyk

Cooperation and Contradiction in Motor Abilities Manifestation. Part I. Speed and Endurance

The positive influence of coordination motor abilities on sports results is extremely important in all sports disciplines. However experimental evidences concerning the physical fitness are somewhat different. Among people with high level of physical preparation some cases of contradiction between speed and endurance capabilities are observed. In children and people with mediocre physical fitness there is consistent and positive impact of motor abilities which are engaged in certain kind of movement. In common opinion such "motor conflicts" in top class athletes have their source in genetic determinations, particularly in proportions of two kinds of skeletal muscle fibers. Domination of fast-contracting fibers (FT) is conducive to higher speed and force-speed achievements, while majority of slow-contracting ones (ST) determines rather endurance predispositions.

In literature one can find many different pieces of information concerning an extend of relationship or contradiction between speed and endurance. Most of them refers to different distance runs. In presented paper an attempt was made to describe some factors which influence the direction and power o connections which are conditioned by these abilities.

Two samples were analyzed. First consisted in somatic data as well as results of 100 m and 1500 m runs of 100 world-top decathletes. Second including beside of somatic features the results of 20 m run and Cooper's test of 287 students of University of Physical Education whose motor ability was established with the help of seven tests set. Statistical characteristics (mean values and correlation coefficients) were calculated in whole samples as well as in 10-persons subgroups differing from each other by sports results. The mean differences were normalized by standard deviations of whole sample.

The run results and somatic data in two samples under consideration were presented in manner convenient for making the comparisons. Correlations in the whole sample of 100 decathletes as well as in first six ten-athletes subgroups show the phenomenon of functional antagonism. In student group the sign “-“ in correlation coefficient occurred only in the most physically fitted subgroup, which additionally was characterized by higher values of the body height and mass. The negative correlations are observed also in ten-decathletes subgroups who were the best in both runs. The same phenomenon was found in ten-persons student subgroups the best in 20 m run and in Cooper's test. In subgroups of individuals with worse run results the positive sign of correlation shows, in contrary, the consistent cooperation of speed and endurance. The greatest differences of the body height were observed between decathletes who achieved the best results in sprinter run, but such differences of the body mass were found in students diverse to the most extent by Cooper's test results.

A possibility of occurrence of negative relationships between speed and endurance should be taken into account not only in sports training of highest level athletes but even in training of persons with worse physical fitness preparation.

Paweł Ciężczyk, Miłosz Stępiński

How Does Preliminary Selection for Football Differentiate Candidates in Comparison with Other Sports Disciplines and Non-Training Students?

Aim of this study was to determine whether there are significant differences in boys selected for soccer from equals selected for other team sport and subject not trained. The research material consisted of 10 years old boys selected for different team sport including soccer (n = 97) and un-trained equals – students of Szczecin's primary schools (n = 39). The research methods included indirect tests of motor abilities with proved reliability and validity that can be applied in field conditions. The tests evaluated the level of: basic anthropometric variables, flexibility, kinesthetic differentiation, speed of reaction, movement frequency, space orientation, balance, maximal a-lactic and lactic anaerobic power, quick mobilization of the muscle, aerobic endurance and absolute muscle strength. Due to the fact that indirect field tests were used in the research not all results are represented with SI units.

The obtained results indicate that children selected for soccer have a statistically significant lower body height than candidates for basketball training. The analysis of the results obtained in the flexibility tests showed that candidates for soccer present significantly higher level of this ability only in comparison with un-trained boys. Candidates selected for soccer presented a higher level of kinesthetic differentiation than all other examined boys. They also presented a higher level of movement frequency than volleyball players and a higher level of space orientation than the un-trained boys. Soccer players presented a lower level of time of reaction than the candidates selected for basketball training. Results of all conditioning abilities tests obtained by soccer players were significantly better than those obtained by un-trained boys ($p \leq 0.001$) and the candidates for volleyball training ($p \leq 0.05$, $p \leq 0.001$). The greatest differences were noticed in tests of aerobic endurance and maximal a-lactic and lactic anaerobic power.

REVIEW PAPERS

Wladimir Ljach, Zbigniew Witkowski

The Influence Of W.s. Farfiel on the Development of Sports-Motor Measurement Devices: from the History of Anthropomotorics

In the article the output of W.S. Farfiel and his students in the area of the development of sports-measurement devices is presented. The devices are used in order to: consciously steer the smallest details of the characterizations of separate movement parameters and to increase effectiveness of a teaching process and to improve technique in various sports disciplines.

Wacław Petryński

The Mosaic Model of Human Movement Construction

The paper presents a model of movements control and learning, originally described by Wolpert and Kawato, then supplemented by Haruno and termed MOSAIC. It bases on the previous model by Jordan and Rumelhart of supervised distal teaching, involving forward (“predictor”) and inverse (“controller”) models. Haruno, Wolpert and Kawato associate the forward and inverse models and put them into a common module, along with one more element, termed “responsibility predictor”, which involves the factor of probability in motor control and learning. Then the Authors construct a complex model of motor control consisting of many modules. During just being performed fragment of a motor task only some of them get activated. Module structure of the motor control model gives to it some flexibility, i.e. enables using relatively small number of modules to construct numerous movement patterns as solutions of many different movement tasks by building multiple different combinations. Moreover, the MOSAIC model describes, too, the motor learning processes. Finally, there has been shown a simple example of applying the MOSAIC model to description of force control by a hand grip of ball. The MOSAIC model describes both motor control and motor learning, so in the title there was used the formulation “movement construction” (as Bernstein did).

DISCUSSIONS

Zbigniew Czajkowski

The Influence of Psychology and Social Conditions on Sport Activity

The Author discusses and stresses the importance of psychology and psychological processes in sport activity. He explains how the psychological processes – such as perception, thinking, various qualities of attention, arousal, emotions, motivation – influence the quality and efficacy of training, athlete’s behaviour, competition results, and coach’s style of leadership. Taking above into considerations the Author describes and discusses Freud’s psychology, behaviourism, and cognitive psychology. He also discusses the social changes in contemporary society, especially the mutual relations between director and worker, chief and subordinate, coach and athlete. Discussing the subject he describes McGregor’s X-Y theory.

Wacław Petryński

Analysis of the Mosaic Model of Human Movement Construction

There have been presented some doubts associated with theories of motor control and learning by Wolpert, Kawato and Haruno (MOSAIC model). The most important ones arise from the fact that the authors of the MOSAIC model have described the relations between the functions and variables, but not between real situations. Such an approach would have been justified if the mathematical description would represent true real situations. Unfortunately, there is no basis to accept such an assumption; on the contrary, each model (including MOSAIC) involves some

simplifications, which make impossible a true projection of the phenomena and processes being modelled into the sphere of mathematical formalism. So, there has been suggested another grouping of the variables to make the whole model more understandable. The modified pattern includes three feedback loops, not existing in the original MOSAIC model. Particular loops can be matched against three basic patterns of sensorimotor reactions: reflex, skill, and voluntary response. In this context the notion of “central pattern generator” has been presented and the inconsistencies in its description pointed out. There has been also presented a general pattern of data processing during motor control and proved its consistency with both the original MOSAIC model and its modified version as suggested in the paper.

REVIEWS

Edward Mleczko

The Defects of Postures of Bodies and the Development Somatic, Functional and Motor of the Rural Children in Book of Cristine Górniak

In her book Cristine Górniak tried to define a correlation between the quality of a body posture and level of sexual puberty, somatic development and physical fitness of rural children. She assumed that at the early period of development irregularities and flat foot were related to a developmental disharmony of children under research. The research was conducted in the years 1988–1999. It accounted for 1035 girls and 1025 boys aged 7–19 attending random selected schools of the bialskopodlaski county. A body posture was characterized by the Wolański point rating method and orthopedic examination. The Wejsflog’s foot prints were used to evaluate longitudinal foot arch. Physical fitness was defined on the grounds of Eurofit test. Next the material was processed by means of basic calculations.

The body posture the girls and boys revealed high degree of inter-personal differentiation. The highest was the occurrence of kyphotic types, the lowest was the occurred types. Rural children were also characteristic of slight head, shoulder and abdomen protrusion, scapular settling and flattening of chest. Low degree scoliosis were present in 29,9% of girls and 32,6 % of boys. Lower limbs settlement was generally appropriate, knee valgity concerned 36,3% of researched and various deformity of 15,7%. Flat foot was dominant if longitudinal foot arch is concerned (58,3% – right foot, 56,1% – left foot). Low degree scoliosis and foot were mostly present among children at maturation age.

The boys and girls with lateral scoliosis particular degrees of sexual puberty slower than their peers with a right body posture. Significant differences in the structure were observed among the girls and boys with regular feet. Physical fitness among the children did not vary so much depending upon the changes in body posture and longitudinal foot arch. Only the boys with a right body posture aged 15–16 were better at functional and static strength test and at tapping test than their peers with scoliosis.

¹ Górniak K: *Rozwój biologiczny dzieci wiejskich z wadami postawy ciała*. Studia i Monografie, Warszawa, AWF, 2006; 106.

ANNOUNCEMENTS

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