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*Mokslas – tarsi neužbaigta knyga, kurios puslapius nuolat rašome... Naujųjų išvakarėse nors trumpam stabtelkim ir pamąstykim, ką nuveikėm, ką rašėm į tą knygą ir ką rašysim ateity. Tegu darbai lukteli, o svajonės įgyja sparnus.
Sveikinu visus su šv. Kalėdom ir Naujaisiais 2013-ais! Lai ateinantys metai Jums dovanoja daug spalvingų ir įkvepiančių akimirku.*

Vyriausiasis redaktorius

*Science is like an unfinished book which we keep writing ... On the eve of the New Year, let's pause and reflect about what we have done, what we have written in that book and what we are going to write in the future. Our work can wait, let our dreams gain wings.
Merry Christmas and a Happy New Year! Let the coming year bring you a lot of colourful and inspiring moments.*

Editor-in-Chief

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ADAPTATION PROCEDURE OF LEVEL OF EMOTIONAL INTELLIGENCE (LEI) TEST AND ITS METHODOLOGY PROBLEMS

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ABSTRACT

Research background and hypothesis. There are only few original psychological methodologies developed in Lithuania, therefore most often foreign test procedure adaptation is undertaken. In Lithuania the initiative of psychologists to develop original methodologies is met with hostility though it is universally agreed that tests developed abroad are marked with strong “cultural charge”. Furthermore, some other problematic aspects of foreign test development become obvious, e. g. free treatment of survey construct, etc. Therefore, while adapting new methodology, in addition to correct implementation of all psychometric procedures, detection of problematic areas of the adapted methodology is relevant.

Research aim was to present new adapted methodology of Level of Emotional Intelligence (LEI) test and to demonstrate major problems that arise in the adaptation procedure.

Research methods. The survey involved 590 students from seven Lithuanian universities. In the five-step survey LEI test validity and reliability were examined using different statistical analysis methods (authors S. Beliayev, S. Yanovitch and A. Mazurov, 2009).

Research results. The authors of the methodology maintain that the psychometric parameters of LEI test are sufficient. However, the authors of the present article have uncovered a number of disputable aspects of the said methodology. All required adaptation procedures of LEI methodology were performed: new scale structure was developed and tested using multi-factor analysis, test internal consistence and resolution were checked, test construct validity and re-test reliability were verified, test construction mistakes were spotlighted.

Discussion and conclusions. LEI test adaptation procedure has disclosed important methodological problems that have to be addressed while adapting instruments of psychological research: 1) theoretical concept of methodology suggested by the authors and essential conformity of the said methodology to the universally accepted definition of construct in the science of psychology must be evaluated; 2) statement assessment logic proposed by the authors of methodology must be analyzed; 3) validation methods used by the authors must be critically assessed.

Keywords: emotional intelligence, psychometry, validity, reliability.

INTRODUCTION

The need for psychometric tests is obvious in various spheres of life: they are most often encountered in professional screening, search for talented, creative people, etc. (Boyatzis, 2008 a, 2008 b; Leonard, 2008). Therefore, problems of both valid methodology development and its adaptation remain relevant. As major mistakes are made in methodology construction and adaptation, psychometry is not always reliable and

sometimes it is depreciatingly called “pathology of science” (Barrett, 2003). Scientists themselves with such declarations want to draw attention to poorly developed test methodologies, inadequately performed adaptation procedure, etc. Therefore, essentially the principal question of psychometry today is the same as it was in the last decades: how instruments that would really measure the desired mental attributes could be developed and how it

can be ensured that the developed instruments are maximally reliable. It was this scientific problem that inspired the authors, based on specific methodology, to show in more detail problems that are encountered in adaptation procedure. As the authors of the present article currently implement a large scale project “Emotional Intelligence of Young People of Lithuania and its Factors”, which is financed by Research Council of Lithuania, in preparation for adaptation of original EI methodology development and standardization procedure various pilot investigations were performed, one of which is presented in this article.

The **purpose** of the present article was to introduce a new adapted Level of Emotional Intelligence (LEI) test methodology and to unveil the essential problems that arose in the procedure of adaptation. *Objectives*: 1) presentation of the adapted methodology and its psychometric parameters; 2) highlighting the principle obstacles in test adaptation procedure.

RESEARCH METHODS

Methodology. Level of Emotional Intelligence (LEI) test developed by S. Beliyev, S. Yanovitch and A. Mazurov was selected with the permission of the authors. The said methodology has two scales: *personality and communication scale* and combined – *overall emotional intelligence scale*. More detailed parameters of the test will be presented in the results section as in that section adaptation procedure results obtained by the authors will be shown in parallel.

Research participants were 590 respondents. Respondents were surveyed by qualitative selection of target groups. All subjects were students from seven Lithuanian universities: most of them were from Kaunas University of Technology (194 subjects, 32.9%) and from Lithuanian Academy of Physical Education (196 subjects, 33.2%). Other subjects were from the following universities: Mykolas Romeris University (57, 9.7%), Vytautas Magnus University (47, 8.0%), Lithuanian University of Health Sciences (40, 6.8%), Siauliai University (40, 6.8%), Lithuanian Academy of Music and Drama (16, 2.7%).

Phases of research. The adaptation procedure of Level of Emotional Intelligence (LEI) test developed by S. Beliyev, S. Yanovitch and A. Mazurov was implemented in several phases. *In the first phase*, upon the authors' permission, methodology was translated into Lithuanian. The

translation was performed independently by two psychologists-experts that hold scientific degree and are experienced in test adaptation. Later translations were compared, discussed and the final version of the methodology was selected. Test was performed with 10 subjects to find out whether methodology statements were understandable and clear to the subjects. *In the second phase* test questionnaire was prepared. In addition to the methodology prepared for adaptation, social and demographic questions about subject's gender, age, family parameters (is it full, what is its financial status, etc.) and academic achievements were included into the questionnaire. To test construct validity, Social Competence Test (adapted by R. Lekavičienė, 2001) was also included into the questionnaire. In the *third phase* the survey of 590 subjects was performed. In the *fourth phase* re-test was performed. 82 subjects participated in the re-test procedure. In the *fifth phase* statistical processing of the obtained data was performed using *SPSS 17.0 for Windows*.

Methods of mathematical statistics: factor analysis using orthogonal rotation VARIMAX, factor internal consistence reliability was assessed by calculating Cronbach's α coefficient, test validity was verified using dispersion analysis ANOVA and Spearman's correlation coefficient, two measurements were compared using Wilcoxon test.

RESEARCH RESULTS

To determine the structure of LEI test variables, factor analysis method was used. Factor analysis was applied to multiplex primary variables of the survey and to generate LEI scales. To process survey data, main component method and orthogonal rotation VARIMAX, e. i. rotation of variable axes to determine maximal dispersion, were used. Sufficiently high *Kaiser-Meyer-Olkin* (KMO) coefficient, which amounted to 0.71, and the overall descriptive power (dispersion) of the model, which was 54.2%, proved that variables were appropriate for factor analysis. To determine whether variables that fell into the same factor correlated with each other, internal consistence reliability (*Cronbach's α* coefficient) of each factor was verified. Table 1 shows the following statistical parameters: in the “Scale” column Cronbach's α coefficient, average intercorrelation among items (statements) and minimal as well as maximal correlation are presented; in the “Statements

Summarized in the Scale” column averages and standard deviations are shown; the other three columns contain: resolution *i/tt*, factor loadings *L*, and model overall explained dispersion in percent.

After test internal consistence assessment and factor validation, nine LEI scales (dimensions) were established. For each cluster of primary

attributes that fell into the same factor conditional title was assigned taking into account semantics of the primary statements (see Table 1).

LEI test psychometric quality parameters were not strong, but tolerable. Dispersion of individual factors was low, but it did not violate applicable

Table 1. LEI Test Factor Validation Data

Scale	Statements Summarized in the Scale	<i>i/tt</i>	<i>L</i>	%
I. Management of Exterior Related Destructive Emotions $\alpha = 0.69$ 0.23 0.15–0.37	• Are you scared of snakes. spiders. etc.? (–) (M = 2.70, SD = 0.99).	0.43	0.66	9.3
	• Are you scared of darkness? (–) (M = 3.04, SD = 1.05).	0.48	0.66	
	• Do you freeze (or are disgusted) upon seeing blood? (–) (M = 3.01, SD = 1.10).	0.42	0.65	
	• Do you feel fear watching fighting animals? (–) (M = 2.70, SD = 0.1.09).	0.39	0.55	
	• Do you feel embarrassed when you have to submit your urine for test in the clinic? (–) (M = 2.97, SD = 1.06).	0.36	0.51	
	• Do you feel discomfort talking to a police officer? (–) (M = 2.80, SD = 1.07).	0.34	0.43	
	• Do you feel discomfort communicating with a disabled person? (–) (M = 2.82, SD = 0.97).	0.32	0.42	
II. Risk Limitation $\alpha = 0.67$ 0.40 0.28–0.55	• Would you like to practice extreme sports? (–) (M = 2.04, SD = 1.04).	0.59	0.81	7.7
	• Could you sky dive? (–) (M = 1.98, SD = 1.07).	0.52	0.81	
	• Do you often take risk? (–) (M = 2.32, SD = 0.87).	0.37	0.48	
III. Integrity $\alpha = 0.49$ 0.24 0.22–0.26	• Could you pick up an item that is “in the wrong place”? (–) (M = 2.92, SD = 1.03).	0.32	0.69	5.7
	• In most cases you easily accept material gratuity? (–) (M = 2.51, SD = 0.91).	0.29	0.64	
	• Can you be unfaithful to your partner? (–) (M = 2.97, SD = 1.03).	0.30	0.50	
IV. Management of Internal Destructive Feelings $\alpha = 0.50$ 0.20 0.14–0.25	• Do to easily forget harm/offence/grievance? (M = 2.14, SD = 1.02).	0.28	0.68	5.1
	• Could it be said that you hold jealousy? (–) (M = 1.72, SD = 0.79).	0.27	0.61	
	• Could it be said that you are revengeful? (–) (M = 2.67, SD = 0.98).	0.33	0.61	
	• When in anger or wrath, could you be rude with a person dear to you? (–) (M = 2.26, SD = 1.01).	0.28	0.48	
V. Ability to Demand	• Will you file a complaint without hesitation if your rights are violated? (M = 2.57, SD = 0.83).		0.74	5.6
	• In a restaurant a dish is brought that is obviously inadequately prepared. Will you suppress your displeasure? (–) (M = 2.66, SD = 0.93).		0.63	
VI. Caution	• Do you often make spontaneous (abrupt) decisions? (–) (M = 2.13, SD = 0.90).		0.60	5.4
	• Do you know your “limit” when consuming alcohol? (M = 3.27, SD = 0.90).		0.49	
VII. Tolerance	• Would you calmly accept the news that your friend is homosexual? (M = 2.67, SD = 1.05).		0.76	5.2
	• Can you be friendly even with those that you are not very fond of? (M = 2.97, SD = 0.84).		0.52	
VIII. Noncompliance	• Do you defend your attitude to the end? (M = 3.19, SD = 0.76).		0.62	11.8
	• Do you point to the people surrounding you their shortcomings? (M = 2.56, SD = 0.83).		0.54	
IX. Devotion	• Could you honestly nurse a patient that is tied to the bed? (M = 3.24, SD = 0.85).		0.68	6.6
	• Do you experience pleasure when buying gifts to your friends? (M = 3.51, SD = 0.72).		0.47	

Note. * – the entire model explains 54.2% of dispersion; KMO = 0.71.

to psychometric surveys rule of ignoring factors that explained dispersion lower than 5–10%. Cronbach's α coefficient, resolution, and factor loading met minimal requirements applied to psychometric tests.

As emotional intelligence construct was tightly related to social competence construct (Guralnick, 1999; Weare, Gray, 2003; CASEL, 2008; Mirabile, 2010 et al.), LEI test construct validity was verified by looking for coherence between LEI test and Social Competence Test (developed by R. Lekavičienė, 2001) results. The said test consisted of the following subscales: "Overall Self-confidence" (the scale was characterized by statements like "In general, I rely on my decisions"); "Resistance to Failures and Criticism" (the scale was characterized by statements like "I am constantly afraid that I will say or do something inappropriate" with (–) sign); "Noncompliance" ("I cannot argue with people that are dear to me" with (–) sign); "Not Feeling Guilty" ("I am feeling guilty if I do not give pittance to a beggar" with (–) sign); "Ability to Ask for a Favor" ("I feel uneasy when others offer me help" with (–) sign); "Ability to Demand" ("In a restaurant it is very easy for me to call loudly for a waiter"); and "Ability to Express Feelings" ("In the presence of the opposite sex I am always shy" with (–) sign). Test validity was verified using dispersion analysis (ANOVA). The said analysis was applied

comparing average differences among several independent samples. The dependent variable was Social Competence test results, i. e. scale averages (Cronbach's α varied within the range of 0.60 to 0.80). At selected level of significance $\alpha = 0.01$ calculated $p = 0.00$. Zero hypothesis was rejected, in other words, not all averages were equal. Thus, scores of emotional intelligence test and social competence test were related. After analysis of results by individual emotional intelligence scales statistically significant correlation with social competence scales was determined. Correlation of both test scale data are shown in Table 2.

All seven social competence scales positively correlated with two scales of LEI – "Management of Exterior Related Destructive Emotions" (Spearman's correlation coefficients varied within the range of 0.11 to 0.42, $p = 0.00$; an example of scale statement could be: "I do not feel discomfort talking to a police officer", etc.) and "Ability to Demand" (Spearman's correlation coefficients varied within the range of 0.16 to 0.37, $p = 0.00$; an example of scale statement could be: "I will file a complaint without hesitation if my rights are violated"). Also, six correlations (out of seven possible) were determined with "Noncompliance" scale (Spearman's correlation coefficients varied within the range of 0.14 to 0.40, $p = 0.00$; an

Table 2. Correlation between LEI and Social Competence Test Subscales

SC Scale EI Scale	Overall Self-confidence	Resistance to Failures and Criticism	Noncompliance	Not Feeling Guilty	Ability to Ask for a Favor	Ability to Demand	Ability to Express Feelings
Management of Exterior Related Destructive Emotions	0.38 0.00	0.42 0.00	0.11 0.01	0.33 0.00	0.33 0.00	0.30 0.00	0.28 0.00
Risk Limitation	-0.33 0.00	-0.20 0.00	-0.12 0.00	-	-	-0.20 0.00	-0.16 0.00
Integrity	-0.13 0.00	-	-	-	0.11 0.01	-	-
Management of Internal Destructive Feelings	-	0.22 0.00	-0.18 0.00	-	0.22 0.00	-	-
Ability to Demand	0.34 0.00	0.31 0.00	0.19 0.00	0.16 0.00	0.20 0.00	0.37 0.00	0.29 0.00
Caution	-0.24 0.00	-0.17 0.00	-0.15 0.00	-	-	-0.14 0.00	-
Tolerance	-	-	-	-0.14 0.00	-	-	-
Noncompliance	0.40 0.00	0.27 0.00	0.33 0.00	-	0.14 0.00	0.22 0.00	0.27 0.00
Devotion	-	-	-	-0.10 0.02	0.16 0.00	-	0.28 0.00

Note: Spearman's correlation coefficient r and statistical level of significance p are specified in the table.

FACTORS	Factor 1 29.3%	Factor 2 27.5%
SCALES	I Communicational EI	II Personality EI
“Ability to Demand”; “Noncompliance” (4 statements)	0.78	-0.18
“Management of Exterior Related Destructive Emotions”; „Management of internal destructive feelings” (11 statements)	0.62	0.05
“Caution”; “Risk Limitation”; “Integrity” (8 statements)	-0.38	0.74
“Tolerance”; “Devotion” (4 statements)	0.49	0.72

Table 3. The Final Factorization of LEI Test

Note. The entire model explains 56.8% of dispersion; KMO = 0.56.

example of scale statement could be: “*I defend my attitude to the end*”).

Some negative correlations were theoretically meaningful, e.g. between “Caution” (“*I seldom make spontaneous decisions*”) in Emotional Intelligence Scale and some social competence scales, such as “Overall Self-confidence”, “Resistance to Failures and Criticism”, “Noncompliance” and “Ability to Demand”. Similarly, “Risk Limitation” scale, which in essence indicated person’s fear to take risk, and it negatively correlated with such social competence scales as “Overall Self-confidence”, “Ability to Demand” and the like.

All other individual parameters of correlation among various scales of emotional intelligence and social intelligence were also logically valid in the semantic sense, therefore in summary it may be maintained that LEI construct validity is sufficient.

In further calculations (after multi-step factorization) the said nine dimensions (scales) were multiplexed into two larger components (see Table 3).

Proof of factor analysis relevance is the possibility of theoretical interpretation of factors clustered in a given factor. The obtained model satisfied the said condition. It was theoretically valid and statistically meaningful. Two generalized factors were given subtest names of methodology developed by the authors (communicational EI and Personality EI) and the said names in this case were also appropriate. Communicational emotional intelligence encompasses the ability to control impulsive behavior towards the others, take care of surrounding people, i. e. to build and maintain mutually satisfactory relationship and use person’s abilities not just for his own good, but also for the good of the surrounding people. Personality emotional intelligence encompasses the ability to understand own positive and negative sides, resist to stress situations, change own attitude when proof of

made mistake is provided, to be open and tolerant to various ideas, orientations, methods and customs.

Test reliability was verified using re-test when test procedure was repeated after 5 months. Results obtained in the first and in the second tests were compared using Wilcoxon Signed Rank Test. The said test was handy because of its non-parametric nature and ability to test paired median differences. Another advantage of the said test was its logical conformity with t-test, therefore it was a very effective tool for analysis of compatibility of two dependent measurements as well as for phenomenological assessment of possible causes of differences. Hypotheses on two measurement compatibility were developed. Thus, if statistical significance level $p \leq 0.05$, hypothesis about compatibility of two measurements was rejected and statement about difference of two measurement results is accepted. Wilcoxon Signed Rank Test showed that neither joint assessment of the first test and re-test nor evaluation of both measurements by individual scales met the condition of $p \leq 0.05$, therefore it can be maintained that there were no statistically significant differences between both measurements.

DISCUSSION

As problematic issues of the researched methodology validity will be discussed in this section, the reader may find it interesting to learn about the procedure of “birth” of methodology developed by S. Beliayev, S. Yanovitch, and A. Mazurov, therefore we will concisely present the most important phases of the development of the said methodology and its standardization as they were described by the test authors. Initially, while developing the said methodology so called rough version containing 177 questions was prepared. Content validity was verified using the method

of expert assessments. Professional psychologists having no less than five-year working experience were invited as experts. After expert assessment 70 questions were left in the methodology, which were divided into two scales – *Personality and Communicational Emotional Intelligence* and the combined – *Overall Emotional Intelligence* – scale. In methodology construct validity verification the authors used *Polagr 6M* polygraph. They made an assumption that questions related to emotional sphere should provoke in respondents significant physiological reactions that polygraph could register. The following parameters were measured: skin phasic and tonic galvanic reactions, heart performance based on peripheral blood circulation, changes of face expression and body muscle overall activity (authors of the present article would not like to agree with such construct validity verification: it is obvious that in such procedure expressions of emotions, but not emotional intelligence level is registered). This way 30 respondents (15 men and 15 women) were tested. After polygraph test data analysis the authors left 50 statements in the methodology that were divided into two abovementioned scales, 25 statements in each scale. 685 subjects participated in the methodology standardization. The following descriptive statistics of scales was obtained: personality EI $M = 67.27$, $SD = 8.37$; communicational EI $M = 69.49$, $SD = 6.37$; overall EI $M = 136.75$, $SD = 12.34$. Normality of obtained distribution was established (in separate personality EI and communicational EI scales and in the combined scale; Shapiro-Wilk test was used; $p > 0.05$). The following procedures were performed when verifying compatibility of scales and reliability of methodology: 1) correlation links between both scales were determined (Pearson's correlation coefficient $r = 0.39$, $p \leq 1.001$); 2) correlation between overall emotional intelligence level and individual scales was determined (Pearson correlation coefficients were $r = 0.88$ and $r = 0.78$ for personality and communicational EI correspondingly, $p \leq 1.001$). Re-test with 65 subjects was performed 2.5 months after the first survey; the results confirmed sufficiently high reliability of the methodology and stability of attributes (the following Spearman's correlation coefficients were obtained: personality EI $r = 0.87$, communicational EI $r = 0.89$, overall EI $r = 0.91$, $p \leq 0.05$). Using factor analysis relations among scales were examined. The authors specified the following weights of factors: personality EI $L = 0.86$; communicational EI $L = 0.80$, overall

EI $L = 0.99$ and claimed that factor structure of the methodology was stable. Construct validity of the methodology was repeatedly verified, but this time verification was based on Eysenck EPQ (The Eysenck Personality Questionnaire) methodology. Such choice of the authors was determined by their treatment of temper as a natural structure and support of the opinion that emotional intelligence was of physiological nature. Developers of the test determined the following scale correlations between methodology developed by them and Eysenck EPQ: personality EI, communicational EI and overall EI with extroversion-introversion $r = 0.82$, $r = 0.15$, $r = 0.72$ ($p \leq 0.05$) correspondingly; personality EI, communicational EI and overall EI with neuroticism $r = 0.38$, $r = 0.69$, $r = 0.66$ ($p \leq 0.05$). Thus the authors of methodology maintained that construct validity of methodology was sufficient.

In the adaptation of Level of Emotional Intelligence (LEI) test in Lithuania, all required procedures were performed and problematic areas were identified that will be discussed shortly. After detailed qualitative analysis of statements became obvious that major part of statements could hardly be attributed to identification of EI level. We would like to remind that classical concept of emotional intelligence contains four major aspects that express effective understanding of own and others' feelings and emotions (understand my own strengths, weaknesses, needs and drives, recognize how feelings affect me, listen to others, understand others' perspectives, sense how others are feeling) and management (manage feelings and impulses, choose words carefully, avoid hasty judgments, motivate self to achieve, recognize others' specific strengths, inspire and motivate others, overcome obstacles that prevent improvements, nurture relationships, promote a friendly, co-operative climate) (Jordan et al., 2002; Schutte et al., 2002; Boyatzis, 2007; Palmer, 2007; Wong et al., 2007; Koman, Wolff, 2008) (see Figure 1).

After statement analysis it became obvious that some of them were related to the assessment of *the level of emotionality, but not emotional intelligence*. For example, "Are you venturesome?" High score on this statement could hardly be an indicator of high personality EI. On the contrary, a person capable to control his/her emotions is more intelligent emotionally. Some of the statements are also ambiguous and disputable, e. g. "Do you tell the truth into interlocutors face?" (unambiguous answer is impossible: a person who is emotionally intelligent will consider the situation and the

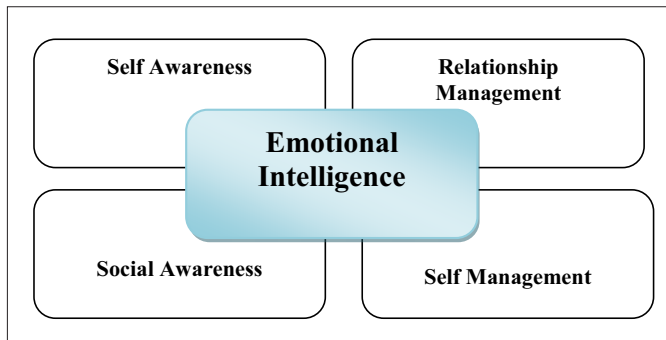


Figure. Classical concept of the structure of emotional intelligence

personality of collocutor), “Do you give pittance?” (unambiguous answer also is impossible). Some statements are altogether astonishing as it is not clear on what basis they were included into EI test: “Do you observe fashion changes?”, “Will you pick up without hesitation trash that you missed throwing into wastebasket?” etc. When it became obvious that LEI methodology measured the level of emotionality, but not emotional intelligence statements were submitted for assessment of psychologists-experts. The purpose of the said assessment was to reject very ambiguous questions and assess which questions might be analyzed by calculating the scores assigned to respondent’s questions (no, rather no, rather yes, yes) and answers to which questions should be re-coded, i. e. the opposite score calculated if the answer was to be rated as emotionally intelligent instead of emotional. For example, if answers to such statements as “Do you feel embarrassed when you have to submit your urine for test in clinic?”, “Do you feel discomfort talking to a police officer?” were positive, the lowest score should be assigned meaning that such answer, as was mentioned above, expressed high tension of the subject rather than emotionally intelligent behavior. The methodology was fundamentally rearranged using statistical procedures. The problematic areas highlighted in the article should help those psychologists who intend to undertake test adaptation procedures.

CONCLUSIONS AND PERSPECTIVES

1. All necessary LEI methodology adaptation procedures were performed: communication, EI and emotional EI Cronbach’s α values, resolution and factor loading indices that were calculated using multi-factor analysis met the minimal requirements for psychometric tests; LEI construct validity and reliability verified using re-test were sufficient.

2. The adaptation procedure unveiled important methodology problems that need to be addressed in the adaptation of psychological investigation instruments: 1) theoretical concept of construct and conformity of the said concept to the principal construct definition in the science of psychology must be evaluated; 2) statement assessment logic proposed by the authors has to be analyzed; 3) validation methods used by the methodology authors must be critically assessed.

As some psychometric parameters of LEI methodology meet only minimal requirements, it would be expedient to continue validation of the present methodology, e. g. verify its discriminant and criterion validity.

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EMOCINIO INTELEKTO LYGIO (EIL) TESTO ADAPTAVIMO PROCEDŪRA IR METODOLOGINĖS PROBLEMOS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Originalių psichologinių metodikų Lietuvoje sukuriama mažai, todėl dažniausiai imamasi užsienio testų adaptavimo procedūros. Lietuvoje psichologų iniciatyva kurti originalias metodikas neretai sutinkama priešiška, nors visuotinai pripažįstama, kad užsienietiški testai dažnai yra informatyvesni. Be to, išryškėja ir kiti probleminiai kūrinių užsienio testų kūrimo aspektai, pavyzdžiui, laisvas tiriamo konstrukto traktavimas ir pan. Todėl atliekant naujos metodikos adaptavimą svarbu ne tik korektiškai atlikti visas psichometrinės procedūras, bet ir pastebėti adaptuojamos metodikos problemišumą.

Tikslas – pristatyti naują adaptuotą emocinio intelekto lygio (EIL) (LEI – *Level of Emotional Intelligence*) vertinimo metodiką ir nurodyti esmines problemas, kilusias adaptavimo procedūros metu.

Metodai. Buvo tiriama 590 studentų iš septynių Lietuvos universitetų. Penkių etapų tyrimu, taikant įvairius statistinės analizės metodus, patikrintas EIL (autorai S. Beliajev, S. Janovič ir A. Mazurov, 2009) testo validumas ir patikimumas.

Rezultatai. Metodikos autorių teigimu, EIL testo psichometrinės charakteristikos yra pakankamos. Tačiau šio straipsnio autorės atskleidė daug diskutuotinų šios metodikos ypatumų. Buvo atliktos visos reikalingos EIL metodikos adaptavimo procedūros: daugiafaktorinės analizės metodu patikrinta ir suformuota nauja skalių struktūra, patikrinta testo vidinė konsistencija, skiriamoji geba, įvertintas testo konstrukcinis validumas ir retestinis patikimumas, išryškintos testo konstravimo klaidos.

Aptarimas ir išvados. EIL testo adaptavimo procedūra atskleidė svarbias metodologines problemas, į kurias reikėtų atkreipti dėmesį adaptuojant psichologinius tyrimo instrumentus: 1) būtina įvertinti metodikos autorių teorinę tiriamo konstrukto sampratą ir tos sampratos esminį atitikimą visuotinai priimtam konstrukto apibrėžimui psichologijos moksle; 2) išanalizuoti metodikos autorių pateiktą teiginių vertinimo logiką; 3) kritiškai įvertinti metodikos autorių taikytus validavimo metodus.

Raktažodžiai: emocinis intelektas, psichometrija, validumas, patikimumas.

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INFLUENCE OF 200 mm Hg OCCLUSION PRESSURE ON ARTERIAL BLOOD FLOW IN SKELETAL MUSCLES AND PHYSICAL WORKING CAPACITY

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ABSTRACT

Research background and hypothesis. Different weights, resistance, scope of work, rest periods, frequency, and performance velocity are used to increase strength in training sessions. The traditional training facility with high resistance can be replaced by low resistance while limiting muscle blood flow. Hypothesis: a single 15-minute 200 mm Hg occlusion pressure can affect physical working capacity and blood flow intensity.

Research aim. was to analyze changes in the intensity of the calf muscle arterial blood flow and physical working capacity with and without 200 mm Hg pressure occlusion.

Research methods. were dynamometry, ergometry, venous occlusive plethysmography. The control group included six and experimental group – 12 male athletes in endurance sports. In both groups we recorded arterial blood flow at rest and after 75% of maximum voluntary contraction force (MVC) physical work lifting a weight until complete fatigue. Between the first and second physical workloads in the experimental group we applied 15 min occlusion with 40 mm wide cuff in the groin area.

Research results. During the physical load in the control group, arterial blood flow significantly increased, and during recovery it did not reach to baseline. In the experimental group arterial blood flow significantly increased and during recovery it did not reach the baseline. Blood flow intensity both the first and the second physical loads altered analogically. Before the second physical load in the experimental group, 200 mm Hg occlusion had a negative effect on skeletal muscle working capacity compared with the passive rest in the control group.

Discussion and conclusions. Occlusion of 200 mm Hg in the groin area reduces arterial blood flow intensity in calf skeletal muscles. Immediately after the removal of 200 mm Hg occlusion, arterial blood flow intensity increases and then decreases to its original value. 200 mm Hg occlusion pressure reduces blood flow intensity in the skeletal muscles. Before the second physical load, 200 mm Hg occlusion decreases skeletal muscle working capacity compared with passive rest in the control group.

Keywords: occlusion, physical working capacity, arterial blood flow.

INTRODUCTION

Sports training sessions include various training techniques and programmes enhancing athlete's fitness. Training with varying resistance is used to increase force (Jackson et al., 2004). Athletes use different weights, resistance, scope of work, rest periods, frequency, and speed of performance. Traditional training facility with high resistance can be replaced by low resistance together limiting muscle blood flow (Sato, 2004).

While sports performance improves, training load and intensity inevitably increase. Recently there has been an intensive search for ways and means to increase the efficiency of training and to reduce the duration of training sessions. To remedy this problem, various measures are applied. The possible measures include over-threshold electrostimulation. Such method as over-threshold electrostimulation significantly

increases knee extensor isokinetic muscle strength (Brocherie et al., 2005). Muscle heating, passive warming up (muscle heating) carried out before the eccentric exercise may be more useful than active or not completely performed warming up (Evans et al., 2002). Cooling and heating effects on the body have been studied for quite a long time. Body temperature is one of the most important factors that affect physiological processes within animals and humans. Cryotherapy has long been used to treat inflammation of the internal organs, spinal cord injuries and other ailments. Heating and cooling effect has been widely used in rehabilitation. It has been shown that treatment with heating means increases tissue strength, elasticity, reduces joint stiffness, pain, muscle spasms, and accelerates blood flow. The importance of changes in external and deep tissue hemodynamics has been distinguished affirming that cold therapy reduces pain and muscle spasms. This includes using a variety of refrigeration sources and a wide temperature range. Besides heating and cooling skeletal muscle functional state can be improved in other ways, such as doing low-intensity exercise with skeletal muscle blood flow restriction. Hand metacarpal four-week workout performed with circulatory disturbance (200 mm Hg) influences the strength in hand and shoulder artery dilation. The hand grip strength in the control group increased by 8.32%, in the experimental group it increased by 16.17%. Shoulder artery dilation in the hands of the control group increased by 24.19%, while in the experimental group it decreased by 30.36%. (Credeur et al., 2009).

Three-week walking practice sessions with thigh muscle blood flow disturbance (160 mm Hg), influenced the functional state of muscles. After walking workouts with circulatory disturbance in the areas of the quadriceps muscle and the iliac, muscle bulk increased by 1.7 and 2.4%. Maximal voluntary contraction force (MVC) of legs increased by 7.3%, isometric knee extension force increased by 4.4%. Group without occlusion experienced no changes (Abe et al., 2009). However, there is little research how a single 200 mm Hg occlusion pressure affects muscle working capacity. Our hypothesis is that a single 15-minute 200 mm Hg occlusion pressure can affect physical working capacity and blood circulation intensity. Therefore, our aim was to analyze changes in the intensity of calf muscle arterial blood flow and physical working capacity under 200 mm Hg pressure occlusion.

RESEARCH METHODS

The study included 12 middle and long distance runners. Their training experience was four–six years: six men were in the control group, and 12 men – in the experimental group (Table 1). The age, height, weight, and body mass indices of the research participants were similar. Body mass index (BMI) is height to weight ratio, enabling the assessment of whether the person's weight is normal, too small, there is overweight or obesity. This index is calculated by the following formula: $BMI = \text{body weight (kg)} / \text{height (m)}^2$. BMI within the normal range is 18.5–25 relative units.

Dynamometry. Feet flexor muscle strength was measured with a dynamometer. While determining foot flexor muscle strength, the subjects sat holding the dynamometry device with their hands. The subjects' knee of the working leg was fixed at the angle of 90° , and the ankle – at the angle of 70° . MVC size, measured in kilograms, was registered three times and charged at a higher value.

Ergometry. Feet flexor muscle working capacity was measured by ergometry methods using a dynamometry device. Dynamic work was done lifting weights (resistance – 75% of maximum voluntary contraction force determined before the workout) until the inability to continue this work. Amount of work expressed in kilogram/meters was considered as the indicator of muscle working capacity.

Venous occlusion plethysmography. Registration of arterial blood flow in the calf muscles was performed using venous occlusive plethysmography method. The essence of the method of veno-occlusive plethysmography is that after pressing (occluding) the veins with a cuff, positioned more proximally from the segment tested, within the first few seconds the volume of the segment tested increases. This growth of the segment tested is directly proportional to arterial blood flow velocity. Therefore, the increase in the volume of the segment tested after venous occlusion indicates the amount of blood flowing that was before venous occlusion. The amount of arterial blood is one of the main factors in the evaluation of peripheral blood circulation. It characterizes what amount of blood was received per unit of time for the tested segment.

Research organization. The study was carried out in LAPE Laboratory of Kinesiology. Initially, foot flexor muscle MVC was measured three times in with three minutes of rest between

the measurements. Thirty min after the MVC measurements arterial blood flow at rest was recorded. After recording arterial blood flow, the first physical load of 75% of MVC was done lifting a weight until complete fatigue. Arterial blood flow intensity was recorded immediately after physical load, after 21, 36, 53, 77, 107, 142, 168, 196, 231, 257, 284, 307 s. After that there was a 15 min passive rest. After passive recovery there was a second physical load of 75% of MVC lifting a weight until complete fatigue. Recording of arterial blood flow was done in the same way as after the first physical load (Table 2).

The study in the experimental group was performed similarly to that in the control group, but after 5 minutes after the first physical load, 15 min circulatory disturbance was performed with a 40 mm wide cuff on the groin with 200 mm Hg pressure (Table 2).

Statistical analysis. We calculated arithmetic means and standard deviations of indicators for all groups. The equity of sample means was estimated according to Student's t-test. The difference of $p < 0.05$ was considered to be significant. Before testing the equity of means, the equity of variances

was verified. Calculations were performed using *Microsoft Excel* statistical package and a specialized statistical program *Statistica*.

RESEARCH RESULTS

The indicators of three measurements of maximal voluntary contraction force in the control and the experimental groups differed slightly ($p > 0.05$) (Figure 1).

In the control group, during the second physical load, physical work less than by 3.8% was carried out compared to the first physical load. In the experimental group, during the second physical load, physical work less by 13.2% was carried out compared to the first physical load ($p < 0.05$). In the experimental group, 15 min 200 mm Hg occlusion pressure applied before the second physical load had a negative effect on skeletal muscle working capacity compared with passive rest in the control group (Figure 2).

In the control group, blood flow intensity before the first dynamic work was 2.4 ± 0.3 ml/100 ml/min. After the first dynamic work until complete fatigue the intensity of blood flow increased to

Subjects	n	Age, years	Height, cm	Weight, kg	BMI
Control group	6	22.8 ± 0.8	181.2 ± 2.5	74.0 ± 3.4	22.5 ± 0.8
Experimental group	12	22.4 ± 0.7	180.1 ± 1.5	71.4 ± 2.1	22.0 ± 0.5

Table 1. Antrpometric data of subjects in control and experimental groups

Note. (mean ± SE).

Determination of MVC force	30 min rest	Recording the initial value of arterial blood flow	First physical load of 75% MVC	Recording arterial blood flow for 305 s	1) 15 min rest 2) 15 min 200 mm Hg occlusion	Second physical load of 75% MVC	Recording arterial blood flow for 305 s
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Table 2. The organization of research on calf muscle arterial blood flow intensity and working capacity in control and experimental groups

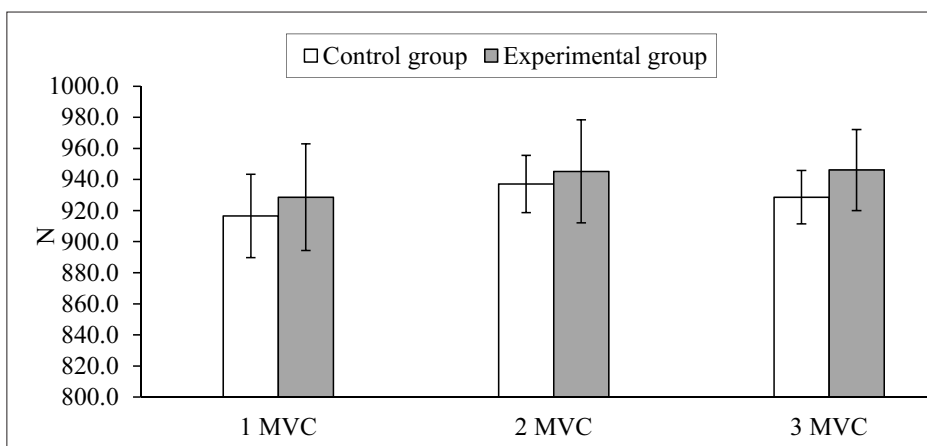
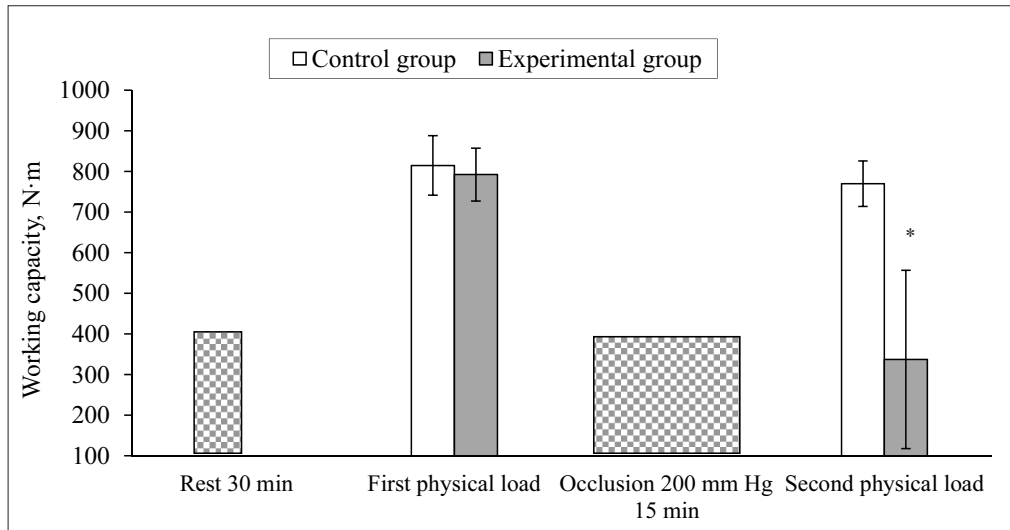
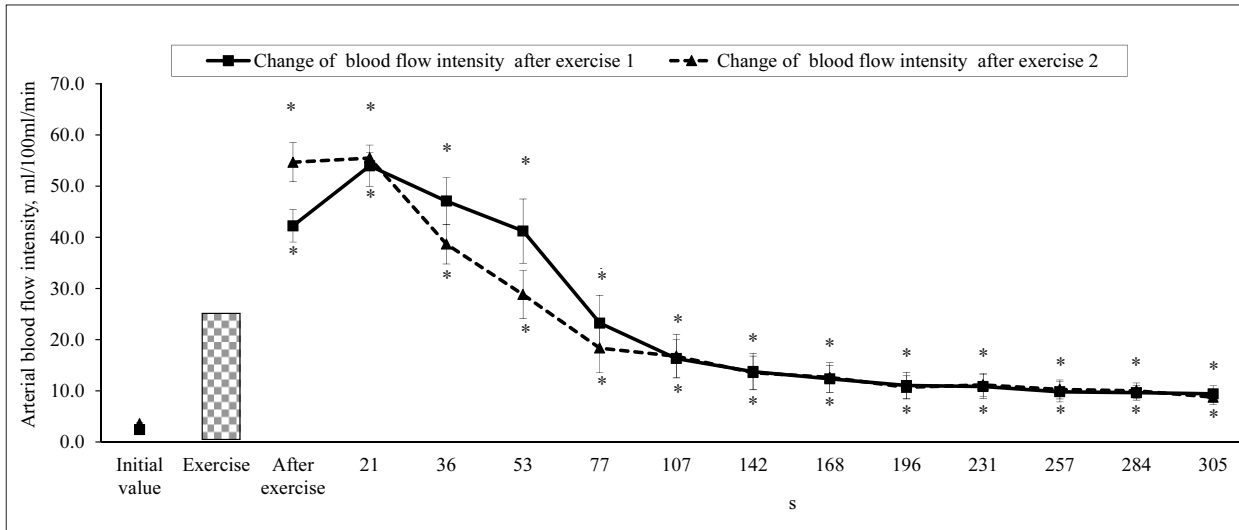


Figure 1. Changes of maximal voluntary contraction in control and experimental groups

Figure 2. Changes of working capacity in control and experimental groups

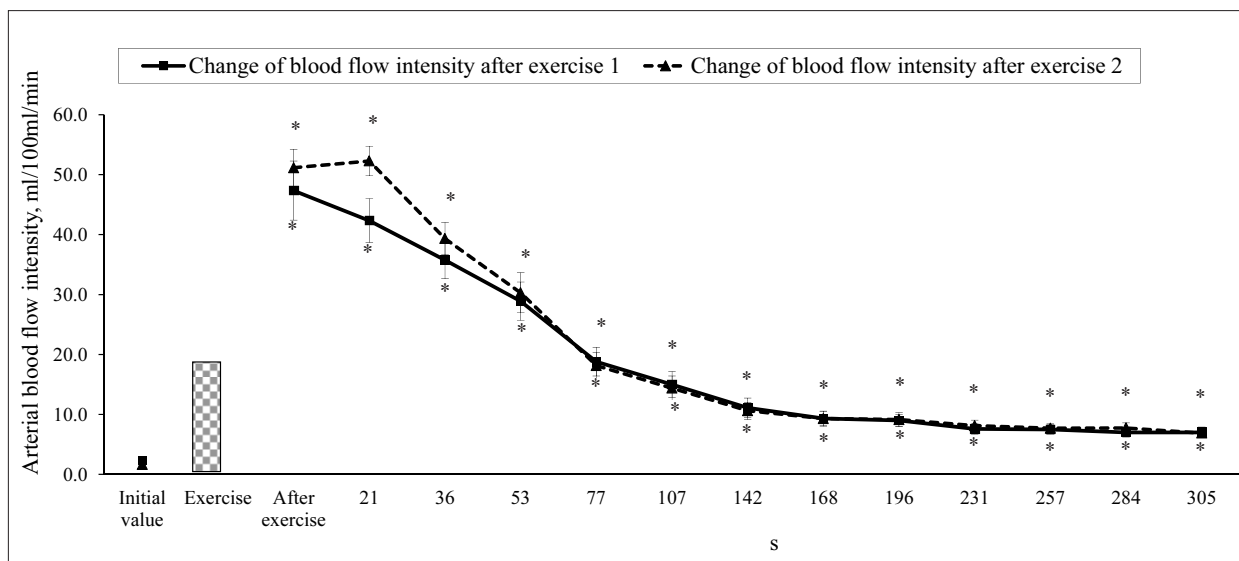


Note. * – $p < 0.05$, compared with the first physical load.



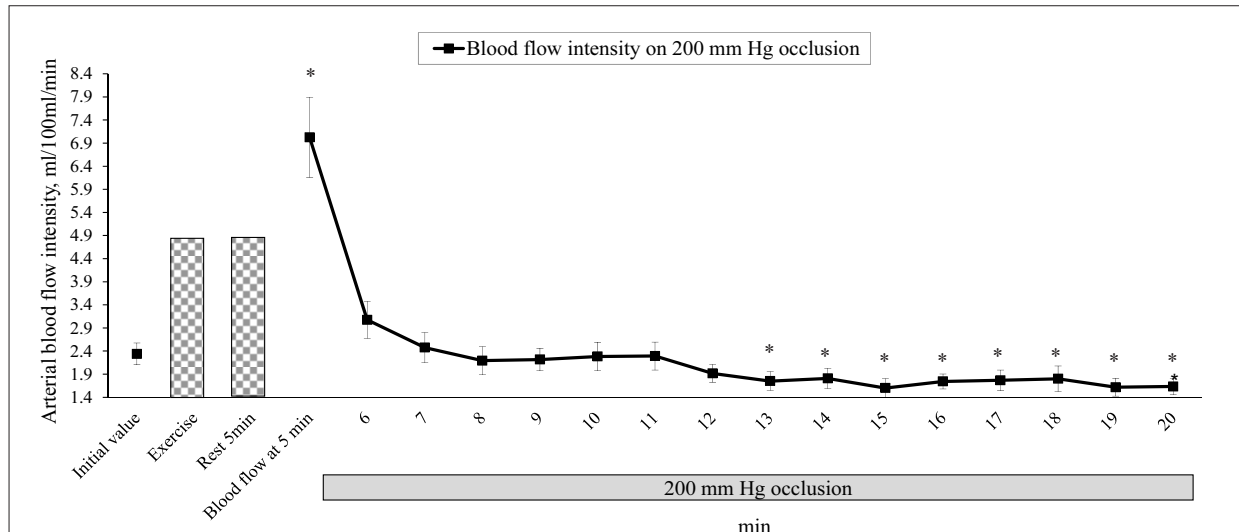
Note.* – $p < 0.05$, compared with the initial value.

Figure 3. Changes of arterial blood flow intensity after the first and the second exercises in the control group



Note.* – $p < 0.05$, compared with the initial value.

Figure 4. Changes of arterial blood flow intensity after the first and the second exercises in the experimental group



Note.* – $p < 0.05$, compared with the initial value.

Figure 5. Blood flow intensity during 15-minute occlusion in the experimental group

42.2 ± 3.2 ml/100 ml/min, and on the 21st second – up to 54.0 ± 4.1 ml/100 ml/min. During other measurements at 36, 53, 77, 107s, arterial blood flow declined substantially. Later (142 s), the intensity of blood flow decreased from 13.8 ± 3.6 ml/100 ml/min to 9.4 ± 1.6 ml/100 ml/min (305 s). Blood flow intensity before the second dynamic work was 3.5 ± 0.3 ml/100 ml/min. After the second dynamic work, blood flow intensity increased to 54.7 ± 3.8 ml/100 ml/min, and at 21 s – up to 55.5 ± 1.1 ml/100 ml/min. During other measurements at 36 s, 53 s, 77 s, arterial blood flow declined substantially. Later, at 107 s, blood flow intensity decreased from 16.8 ± 4.3 ml/100 ml/min to 8.8 ± 1.4 ml/100 ml/min (305 s) (Figure 3).

In the experimental group, the intensity of blood flow before the first dynamic work was 2.3 ± 0.2 ml/100 ml/min. Immediately after the first dynamic work, blood flow intensity increased to 47.4 ± 4.9 ml/100 ml/min. In other measurements at 21, 36, 53, 77, 107 s, arterial blood flow declined substantially. Later (142 s), the intensity of blood flow decreased from 11.1 ± 1.6 ml/100 ml/min to 7.0 ± 0.9 ml/100 ml/min (305 s) and did not reach the baseline ($p < 0.05$). Blood flow intensity before the second dynamic work was 1.6 ± 0.2 ml/100 ml/min. Immediately after the second dynamic work to complete fatigue, the intensity of blood flow increased to 51.1 ± 3.1 ml/100 ml/min and at 21 s – up to 52.3 ± 2.5 ml/100 ml/min. In other measurements at 36 s, 53 s, 77 s, 107 s, arterial blood flow declined substantially. Subsequently, the intensity of blood flow (142 s) decreased from

10.6 ± 1.4 ml/100 ml/min to 6.9 ± 0.7 ml/100 ml/min (305 s) (Figure 4).

Blood flow before the first exercise was 2.3 ± 0.2 ml/100 ml/min. After physical load, during recovery, on the fifth minute, the blood flow was 7.0 ± 0.9 ml/100 ml/min ($p < 0.05$), while on the sixth minute, after blood flow disturbances with the cuff on the thigh in the groin area, blood flow intensity decreased to 3.1 ± 0.4 ml/100 ml/min. During subsequent measurements from 7 min (2.5 ± 0.3 ml/100 ml/min) to 12 min (1.9 ± 0.2 ml/100 ml/min), blood flow intensity slightly decreased. From 13 min (1.8 ± 0.2 ml/100 ml/min) to 20 min (1.6 ± 0.2 ml/100 ml/min) blood flow intensity was lower ($p < 0.05$) than the initial value (2.3 ± 0.2 ml/100 ml/min) (Figure 5).

DISCUSSION

Exercise intensity and exercise volume in training sessions are alternated. Recently, non-traditional training methods have been used, such as the skeletal muscle blood flow disturbances known as KAATSU methodology. KAATSU-walking workout can be a potentially useful method to improve muscle function (muscle hypertrophy, strength, and endurance) for a wide range of people. It is applied for the rehabilitation of people of all ages with health problems and after injuries.

The intensity of human muscle blood flow under the conditions of rest varies, depending on their functional state, and quite a lot of differences can be found in the data of various authors. M. Raitakari

et al. (1996), using the tomography methodology of labeled positron emission, conducted research and revised the indices of muscle blood flow intensity under the conditions of rest. According to the data of those authors, human muscles blood flow is 1.1 to 7.5 ml/100 ml/min under the conditions of rest. It is believed that such large individual differences in resting muscle blood flow can be the residual effect of the work performed before. In our study, blood flow at rest ranged from 1.5 to 6.3 ml/100 ml/min, and the dissemination of results was analogous to M. Raitakari submitted data.

H. Iida et al. (2005) found that disruption of blood flow in both legs with occlusive cuffs increased the accumulation of venous blood in the legs, and then venous return to the heart decreased. After the removal of blood flow disturbances, the return of venous blood to the heart increases. Performing physical loads of 75% of maximum voluntary contraction force until complete fatigue, arterial blood flow in the control group significantly increased, and during recovery it did not reach the baseline. Blood flow intensity both after the first and the second the physical loads altered analogically. The greatest work of $814.62 \pm 73.2 \text{ N}\cdot\text{m}$ was first performed during the first physical load, and the second work of $769.92 \pm 56 \text{ N}\cdot\text{m}$ was lower than the first one ($p > 0.05$). In the experimental group arterial blood flow significantly increased and during recovery it did not reach the baseline. Blood flow intensity both after the first and the second the physical loads altered analogically. The greatest work of $792.4 \pm 65.2 \text{ N}\cdot\text{m}$ was first performed during the first physical load, and the second work of $687.1 \pm 62.7 \text{ N}\cdot\text{m}$ was lower than the first one ($p > 0.05$). After the first physical load until complete fatigue, after 5 min, 200 mm Hg occlusion on the thigh significantly reduces blood flow intensity in the calf muscles. In the experimental group, before the second physical load, 200 mm Hg occlusion had a negative effect on skeletal muscle working capacity compared with passive rest in the control group. Muscle activity increase depends on the amount

of occlusion. High or moderate occlusion more increases muscle activity than in the group without occlusion. Strength increases under the conditions of moderate pressure occlusion compared with the group without occlusion, but in comparison with the high-pressure occlusion group, less work was carried out (Yasuda et al., 2009). At the start of the workload, the use of energy increases instantaneously, but the blood flow adaptation and aerobic metabolism takes time resulting in arterial blood and oxygen debt. Their size depends on the intensity of physical activity (Schmidt, Thews, 1996). During occlusion the blood flow intensity decreases as arterial blood vessels are mechanically pressed. After the removal of the occlusion arterial blood flow in the calf muscles increases three times. Blood flow increase after the removal of occlusion can affect the supply of blood to working muscles. In the control group without occlusion, working capacity during the performance of the second physical load slightly decreased compared with the first physical load. In the experimental group, working capacity during the performance of the second physical significantly declined compared with the first physical load. The results show that 200 mm Hg occlusion, significantly exceeding arterial blood pressure, reduces muscle working capacity.

CONCLUSIONS AND PERSPECTIVES

1. Arterial blood flow intensity after physical loads significantly increases. During the recovery time after the first physical load, 200 mm Hg occlusion pressure reduced blood flow intensity in the skeletal muscles in the experimental group.

2. The indices of maximum voluntary contraction force in the control and the experimental groups of differed insignificantly ($p > 0.05$). Before the second physical load, 200 mm Hg occlusion decreased skeletal muscle working capacity compared with passive rest in the control group.

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200 mm Hg SLĒGIO OKLIUZIJOS POVEIKIS GRIAUČIŲ RAUMENŲ KRAUJOTAKAI IR DARBINGUMUI

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Jėgai didinti pratybose naudojami įvairūs svarmenys, pasipriešinimas, skirtinga darbo apimtis, nevienodi poilsio periodai, dažnis ir atlikimo greitis. Tradicinę pratybų priemonę – didelį pasipriešinimą – galima pakeisti mažu pasipriešinimu kartu apribojant raumenų kraujotaką. Hipotezė: vienkartinė 15 minučių trukmės 200 mm Hg slėgio okliuzija gali paveikti fizinį darbingumą ir kraujotakos intensyvumą.

Tikslas – išanalizuoti blauzdos raumenų arterinės kraujotakos intensyvumo kaitą ir fizinį darbingumą taikant 200 mm Hg slėgio okliuziją ir be jos.

Metodai. Dinamometrija, ergometrija, veninė okliuzinė pletizmografija. Tirtos dvi grupės. Kontrolinėje grupėje buvo 6, eksperimentinėje – 12 ištvermės sporto šakų vyrų. Abiejose grupėse registruojama arterinė kraujotaka ramybėje ir po 75% maksimaliosos valingos jėgos (MVJ) fizinio darbo kilnojant svarmenį iki visiško nuovargio. Eksperimentinėje grupėje tarp pirmo ir antro fizinių krūvių atliekama 15 minučių okliuzija uždėjus 40 mm pločio varžtį kirkšnies srityje.

Rezultatai. Kontrolinėje ir eksperimentinėje grupėse atliekant fizinį krūvį arterinė kraujotaka smarkiai didėjo, o atsigavimo metu nepasiekė pradinių dydžių. Kraujotakos intensyvumas tiek po pirmo, tiek po antro fizinio krūvio kito analogiškai. Eksperimentinėje grupėje prieš antrą fizinį krūvį atlikta 200 mm Hg okliuzija neigiamai paveikė griaučių raumenų darbingumą, palyginti su pasyvaus poilsio rodikliais kontrolinėje grupėje.

Aptarimas ir išvados. 200 mm Hg dydžio okliuzija kirkšnies srityje mažina arterinės kraujotakos intensyvumą blauzdos griaučių raumenyse. Tuoj po 200 mm Hg slėgio okliuzijos pašalinimo arterinės kraujotakos intensyvumas padidėja, vėliau sumažėja iki pradinio dydžio. 200 mm Hg slėgio okliuzija smarkiai mažina kraujotakos intensyvumą griaučių raumenyse. Prieš fizinį krūvį atlikta 200 mm Hg slėgio okliuzija mažina griaučių raumenų darbingumą, palyginti su pasyvaus poilsio rodikliais kontrolinėje grupėje.

Raktažodžiai: okliuzija, fizinis darbingumas, arterinė kraujotaka.

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DIFFERENT APPROACHES TO THE CONCEPT OF COLLOCATION IN ENGLISH: WHY LEARN COLLOCATIONS?

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ABSTRACT

Research background. A collocation is a combination of two or more words that are commonly used together in English. Collocation is an indispensable element of any English text and no piece of natural spoken or written language is totally free of collocation. There exist different approaches to the concept of collocations in English. However, there is no exhaustive and uniform definition or categorization of it. Second language learners do not have many guidelines to follow considering the admissibility of collocation, thus collocations seem to be an insurmountable obstacle to the attainment of native like fluency and is one of error generating areas in general English and especially in EAP (English for Academic Purposes) and ESP (English for Special Purposes).

Research aims were to analyze and systemize different theoretical approaches to the concept of collocation in English with reference to the data of scientific research as well as give the answer why collocations should be learned and taught at all levels of language proficiency and within different registers.

Research method used – theoretical analysis of classical and modern research articles on collocation in English.

Research results. Various linguistic schools have had different approaches to the study of collocations. Acquisition of collocations can be the source of particular difficulties for L2 learners in attaining native-level competence. Collocations should be taught from the very beginning at all levels of language proficiency.

Discussion and conclusions. As a result of analysis and systemization of scientific data the following conclusions have been made:

1. Collocation is a lexical co-occurrence of lexemes. In order a lexical combination could be called a collocation it should satisfy the criterion of frequency and grammatical structure;

2. Lexis and grammar cannot be separated;

3. Lexis is inseparable from semantics.

4. Knowledge of collocations can help develop language proficiency in such areas as English for Specific Purposes (ESP) and English for Academic Purposes (EAP). Students' motivation to learn collocations and make good use of them in their essays, research works and academic language should be increased.

Keywords: collocational, co-occurrence, language acquisition, register.

INTRODUCTION

Collocation is an indispensable element of any English text and no piece of natural spoken or written language is totally free of collocation. Second language (L2) learners do not have many guidelines to follow considering the admissibility of collocation, thus collocations seem to be an insurmountable obstacle to the attainment of native like fluency and is one of error generating

areas in general English as well as in EAP (English for Academic Purposes) and ESP (English for Special Purposes).

This linguistic study is primarily concerned with the usefulness of collocation in the process of teaching foreign languages as well as problems they may cause for L2 learners, especially in attaining language proficiency in academic and specialized

language writing essays, scientific articles, etc. Collocational knowledge could facilitate L2 learners in avoiding language errors, ambiguity and help express more clearly the information they want to convey.

Speech formation, its functioning and development are determined by the opposition of two contradictory factors: on the one hand, creativity, unlimited realization of language potentialities, on the other – non-productivity, fixedness, use of prefabricated closely bound units.

English linguist John Sinclair suggests two main principles of language model:

- the open-choice principle,
- the idiom principle (Sinclair, 1991)

The open-choice principle is a way of seeing language text as the result of a very large number of complex choices. At each point where a unit is completed (a word, a phrase or a clause), a large range of choices opens up and the only restraint is grammaticalness. “It is called a slot and filler model, envisaging texts as series of slots which have to be filled from a lexicon which satisfies local restraints” (Sinclair, 1991, p.109).

However, it is clear that words do not occur at random in a text. It would be impossible to produce a normal text simply by operating the open-choice principle.

There are sets of linguistic choices which come under the heading of register and which can be seen as large-scale conditioning choices. Once a register choice is made, then all the slot-by-slot choices are reduced in scope or even pre-empted.

The idiom principle accounts for the restraints that are not captured by the open-choice model. The essence of this principle is that a language user has available to him a large number of semi-preconstructed phrases that constitute single choices.

The freedom with which the speaker brings together words in speech may be restricted by requirements of the language itself, its syntactic structure, its inner regularities and laws, which can be presented in the dichotomy of colligation and collocation.

Colligation is defined as the morpho-syntactically conditioned combinability of words in speech. It is based on the abstract form of language; its syntactic patterns. It is obvious that speech formation would be impossible without certain general patterns which must be accepted by the speaker. The speaker is obliged to obey the

general syntactic rules for combining words of a particular class. The general syntactic patterns are followed by the speaker regardless of the concrete lexical meanings of words which “fill in “the formula (for instance, when forming the simplest and most classical kind of word combination – a binary attributive word combination – the speaker of English places an adjective before a noun, while in French the syntactic pattern of the same kind of word combination would require the reverse order.

Collocation is defined as lexically-phraseologically conditioned combinability of words. “By this we mean that when the speaker combines words in speech his freedom is restricted by the lexical-phraseologically “valencies of words”, their lexical-phraseological attraction or repulsion” (Alexandrova, Ter-Minasova, 1987, p. 37).

Thus, the process of speech formation is conditioned, on the one hand, by morphosyntactic or colligational factor, which is more general, more abstract, a kind of formula separated from concrete lexical meanings of words (*adjective+noun, adverb+adjective, noun+noun, noun+verb, verb+noun, verb+adverb, verb+expression with preposition*, etc.) and, on the other, lexical-phraseological, or collocational, which is something particular, something specific.

The general colligation patterns form the skeleton of a speech event, while specific lexical filling, the collocational aspect, shapes its body, makes it real.

This research arises out of the importance of collocation itself. It is important to study collocation because:

- It is a frequently discussed phenomenon;
- There are different attitudes towards the phenomenon of collocation and its categorization;
- Collocations are defined and interpreted differently;
- Collocations are significant in the process of second language acquisition.
- Collocation tends to be one of the most problematic and error-generating areas of academic and special vocabulary.

Research aims were to analyze and systemize different theoretical approaches to the concept of collocation in English with reference to the data of scientific research as well as give the answer why collocations should be learned and taught at all levels of language proficiency from the very beginning.

RESEARCH METHODS

Research method used – theoretical analysis of classical and modern research articles on collocation in English. The object of the research was collocation in English.

RESEARCH RESULTS

There are several approaches to the concept of collocation in English.

The lexical approach. Supporters of the lexical approach claim that the meaning of a word is determined by the co-occurring words. Lexis is considered to be independent and separable from grammar. Thus, a part of the meaning of a word is the fact that it collocates with another word. The interpretation of collocation by English linguist John Firth became the most popular among other methods of syntagmatic analyses. He introduced the first formal definition of collocation. The meaning of a word is determined by the co-occurring words. “You shall know a word by the company it keeps” (Firth, 1957, p.195). J. R. Firth calls this company “collocation”, which is part of the meaning of a word. Meaning by collocation is an abstraction at the syntagmatic level. Thus, part of the meaning of a word is the fact that it collocates with another word. But those combinations are strictly limited.

After J. R. Firth (1957), and M. K. Halliday (1966) added some insights for the notion. McIntosh investigated the “collocational range”. He noticed that the range of words is not fossilized. M. K. Halliday’s innovation was that he clearly separated lexical matters from grammatical ones.

For M. K. Halliday collocations are examples of word combinations. He introduced the term “lexical set”. It is a set of lexemes that show similar tendencies to collocate. In his works he highlights the crucial role of collocations in the study of lexis.

However, J. Lyons (1977) argues that meaning of a lexeme is not only syntagmatically determined. He spoke about “encapsulation” of meaning, that is, lexicalization of the syntagmatic modifying component. If a lexeme is frequently used in collocation with a restricted set of syntagmatically modifying lexemes or phrases, it may encapsulate their sense.

J. Sinclair in the early period of his investigations argued that collocation in its purest sense recognizes only the lexical co-occurrence of words. Later on J. Sinclair (1996) slightly changed his attitude by dismissing the previous

idea that lexis is separated from grammar. In this new approach both the lexical and grammatical aspects of collocation are taken into consideration. To the above mentioned linguists at this stage of collocation analysis collocation is the occurrence of independent lexemes. They should be analyzed at the preferably lexical level.

The semantic approach. The advocates of this approach attempt to examine collocations from the semantic point of view, also separately from grammar (Martynska, 2004). Their main goal is to find out why words collocate with certain other words. J. Sinclair in his later research emphasized the role of semantic factor in collocations. “There is no assumption that meaning attaches only to the word. It is anticipated that meanings also arise from the loose and varying co-occurrences of several words, not necessarily next to each other” (Sinclair, 1996, p. 99). If there is no meaning between the combining lexemes, our lexicon becomes empty. Lexical semantics, according to Sinclair, is inseparable from grammar.

The structural approach. According to this approach, collocation is determined by structure and occurs in patterns. Therefore, the study of collocation should include grammar. Lexis and grammar cannot be separated and, consequently, two categories are defined: lexical and grammatical collocations, which represent two distinctive but related aspects of one phenomenon. Grammatical collocations usually consist of a noun, an adjective or a verb plus a preposition or a grammatical structure such as “to+infinitive” or “that+clause”, e. g. *by accident, to be afraid that...* Lexical collocations do not contain grammatical elements, but are combinations of nouns, adjectives, verbs, adverbs.

Among advocates of the structural approach R. Carter, G. Kjellmer and M. Lewis’ names are mentioned.

R. Carter (1998) defines collocation as a group of words that recurrently co-occur in a language. He distinguishes between grammatical collocations which result not only from grammatical relationship, but most of all from co-occurrence of lexical units in a specific company. The total number of words which can collocate with an X word is called a “cluster” of X. He also points out that certain elements of a cluster are more central than other, which means that they are more likely to co-occur with X.

Swedish linguist G. Kjellmer (1990) states that individual word classes are “collocational” or “non-

collocational” in character: articles, prepositions, singular and mass nouns as well as the base forms of verbs are collocational in their nature whereas adjectives, singular proper nouns and adverbs are not. According to G. Kjellmer English words are scattered across a continuum which extends from those items whose contextual company is entirely predictable to those whose contextual company is entirely unpredictable.

Most words tend to appear towards the beginning of the continuum, which can also be described as a scale of fixedness of collocation. Then it extends from totally free, unrestricted combinations to totally fixed and invariable ones.

M. Lewis (2000) argues that most collocations are found in the middle of this continuum, which means that there are very few “strong” collocations. He makes a distinction between “strong” collocation, “common” collocation which makes up numerous word combinations and “medium strong” one, which account for the largest part of the lexis a language learner needs.

M. Lewis defines collocation as a subcategory of multi-word items, made up of individual words which habitually co-occur and can be found within the free-fixed collocational continuum.

S. Hunston (2002) concluded that there are correlations between grammatical patterns and lexical meaning. All words can be represented by specific patterns and the meanings of words which share patterns have a lot in common. That means that a word has a specific meaning when it co-occurs with a certain word.

To the above mentioned authors lexis and grammar cannot be separated. Therefore two basic types of collocations are distinguished: grammatical which result from grammatical relationship and lexical which result not only from grammatical relationship but most of all from co-occurrence of lexical units in a specific company.

Besides, individual word classes are “collocational” or “non-collocational” in character: prepositions, articles, base forms of verbs, singular and mass nouns are collocational in their nature whereas adverbs, adjectives, singular and proper nouns are not.

Individual words habitually co-occur within the free-fixed collocational continuum.

A new era in linguistics began with the introduction of computers to the study of language. Access to large corpora has uncovered a lot of new facts about language. It made language research more objective and effective and laid a background

to development of Corpus Linguistics. Corpus Linguists specify a key word in context (KWIC) and identify the words immediately surrounding them. This gives an idea of the way words are used.

The processing of collocations involves a number of parameters, the most important of which is the measure of association, which evaluates whether the co-occurrence is purely by chance or statistically significant. Due to the non-random nature of language, most collocations are classed as significant, and the association scores are simply used to rank the results.

Besides, electronic support to dictionary content management has changed a great deal how data are encoded, managed and retrieved (Robichaud, 2011).

From its outset, one of the main concerns of corpus linguistics was the construction of corpora that were representative as closely as possible of natural language. To this end, larger corpora offered not only ever increasing amounts of data but also, more importantly, different kinds. This allowed previously unnoticed patterns of language use to emerge. It also suggested that language itself as a linguistic system, rather than being rule-based, is – inherently probabilistic and that choices made by users of the language are affected by more than just internal linguistic constraints (Laybutt, 2009).

The notion of the influence of context on language choice has also informed the development of smaller, specialized corpora. “The use of these specialized corpora can play a key role in the investigation of the linguistic characteristics of restricted academic disciplines, specialized language and the description of recurrent patterns that may characterize particular genres or registers within a sample of texts. It has found application in particular within such areas as English for Specific Purposes (ESP) and English for Academic Purposes (EAP)” (Laybutt, 2009, p. 12).

Collocations in sports. One of the examples of specialized corpora is sports language. The role of sports language is strictly related to the role of sports in man’s life, and the function of linguistic expression in sports is associated with particular patterns of sports behavior of different individuals and groups. Each human activity affects its linguistic expression in terms of vocabulary, phonology and syntax. The sport variation of language has been developed by athletes and all other sports people in order to fulfill their needs of communication in the areas of their sports activities.

The language of sports is full of collocations which may be problematic for L2 learners:

Do – athletics, gymnastics, judo, weightlifting, aerobics, yoga, wrestling, archery, etc.;

Play – games: tennis, chess, basketball, badminton, billiards, hockey, rugby, golf, etc.;

Go – jogging, swimming, fishing, skiing, bowling, cycling, skateboarding, surfing, snowboarding, climbing, sailing.

If we take only a small section of “winning and losing” numerous collocations can be found there:

Sportsmen and sportswomen want to win matches, not lose matches.

But you can't win all the time! Sometimes a team or player deserves to win, but gets narrowly defeated/beaten.

Before they go in for/enter a competition, athletes train hard.

They probably attend/do at least five training sessions a week.

Of course, a sportsperson's ultimate aim is to break the world record in their sport.

If they succeed, they set a new world record and become a world record holder.

They are sure to come up against fierce/intense competition as they try to achieve their ambitions.

Sometimes they are satisfied if they just achieve a personal best (McCarthy, O'Dell, 2005, p. 56).

Consequently, collocation in sport language tends to be problematic and error-generating area as well as academic vocabulary and other special vocabularies. In order to help learners of English in the process of acquisition of collocations suggestion was also made by B. E. Laybutt (2009) that, for the study of collocation, language learners may be better served by taking a genre teaching' approach, focusing not only on the surface forms and patterns of individual collocations but also their functional role for cohesion within text, register and genre. In this way, a more systematic and manageable approach to the study of collocation may be achieved.

The precise understanding and command of the language of sports, its terminology and its combinations of collocations, is crucial for an adequate degree of communication in this era of globalization and competition.

DISCUSSION

Why learn collocations?

Various linguistic schools have had different approaches to the study of collocations. Recently, research interests of many linguists have been

focused on the lexical approach to the study of collocations. “The principle of lexical approach is to allow learners experience language items in natural contexts and to learn from their experience. It focuses on developing learners' proficiency with words and word combinations” (Willis, 1994, p-viii). It is based on the idea that an important part of language acquisition is the ability to produce lexical phrases as chunks and that these chunks become the raw data by which learners perceive patterns of language traditionally thought of as grammar (Lewis, 1993). For years L2 teachers were overwhelmed with the idea of communicative approach. Thus, in teaching and learning a foreign language fluency in language was considered to be of more importance than accuracy. However, students of L2 may have good speaking and listening skills but the effectiveness of vocabulary and grammar is still questionable. Lexical approach has been adopted in teaching and learning foreign languages as well.

Acquisition of collocations is difficult for L2 learners as only native speakers can have a good knowledge of collocations. According to M. Stubbs (2005), culturally and communicatively competent native speakers of English are aware of such probabilities and of the cultural frames which they trigger. On the other hand, often native speakers' intuitions about collocations are inaccurate, and they also have to refer to dictionaries.

“For foreign language learners, however, collocation can be the source of particular difficulties in attaining native-level competence due to the seemingly arbitrary nature of the word combinations and the sheer number of collocations present in the language” (Nesselhauf, 2003, p. 230).

Collocation cannot be invented by a second language user as s/he does not have many guidelines to follow considering the admissibility of collocation, whereas a native speaker uses them instinctively.

Knowledge of collocations is vital for the competent use of a language: a grammatically correct sentence will stand out as awkward if collocational preferences are violated.

Learning collocations is a good idea because they can:

- a) give you the most natural way to say something;
- b) give you alternative ways of saying something, which may be more colorful/expressive or more precise;
- c) improve your style in writing;

d) help develop language proficiency in such areas as English for Specific Purposes (ESP) and English for Academic Purposes (EAP), which can be especially useful for university students.

Thus, when combining courses with collocations teaching, instructors' priority is to help students acquire collocations. Teachers should be selective about what collocations to teach. They should make sure that collocations are active and appropriate for learners at different stages (Hill, 2000).

Methods of teaching collocations include, for example, providing vocabularies in a collocation form, adopting books that include collocations, training students to observe and note collocations in reading texts, encouraging students to collect their collocation for future use, collecting words from their own topics of interest. This would increase students' motivation to learn collocations and make good use of collocations in their essays, which also helps students to record and memorize words more systematically.

CONCLUSIONS AND PERSPECTIVES

Collocation is an indispensable element of any English text and no piece of natural spoken or written language is totally free of collocation. There exist different approaches to the concept of collocations in English. However, there is no exhaustive and uniform definition or categorization of collocation. The definition of collocation still remains the subject of some debate. Therefore, it tends to be one of the most problematic and error-generating areas of vocabulary.

In this theoretical research attempts have been made to analyze and systemize different theoretical approaches to the concept of collocation in English with reference to the data of scientific research. Besides, as collocations are important in L2 acquisition, we tried to answer the question why collocations should be learned and taught at

all levels of English language proficiency as well as within different registers.

As a result of analysis and systemization of scientific data the following conclusions have been made:

1. Collocation is a lexical co-occurrence of lexemes. In order a lexical combination could be called a collocation it should satisfy the criterion of frequency and grammatical structure.

2. Lexis and grammar cannot be separated.

3. Lexis is inseparable from semantics. Lexemes are associated with each other by meaning relations.

4. Collocation cannot be invented by a second language user as s/he does not have many guidelines to follow considering the admissibility of collocation, whereas a native speaker uses them instinctively.

5. Knowledge of collocations helps L2 learners express more clearly the information they want to convey as well as give you alternative ways of saying something, which may be more colorful/ expressive or more precise;

6. Collocations should be taught from the very beginning at all levels of language proficiency as collocational competence can help language learners produce texts which are not only grammatically but also syntactically correct.

7. A genre teaching approach should be taken for the study of collocation, focusing not only on the surface forms and patterns of individual collocations but also their functional role for cohesion within text, register and genre.

8. Knowledge of collocations can help develop language proficiency in such areas as English for Specific Purposes (ESP) and English for Academic Purposes (EAP), which can be especially useful for university students. By encouraging students to collect words from their own topics of interest should increase students' motivation to learn collocations and make good use of collocations in their essays, research works and academic language in general.

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KOLOKACIJOS ANGLŲ KALBOJE: KODĖL REIKIA MOKYTIS KOLOKACIJŲ?

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Kolokacija – tai dviejų ar daugiau žodžių junginys, kurį įprasta vartoti kalboje. Anglų kalboje kolokacijos yra ypač plačiai paplitusios.

Egzistuoja skirtingi požiūriai į kolokacijas anglų kalboje. Deja, nėra išsamaus ir vienodo kolokacijų apibrėžimo. Nėra ir taisyklių, kurių laikantis besimokantieji anglų kalbos galėtų žinoti, kurias kolokacijas galima vartoti, kurių – ne. Tad kolokacijos išlieka viena iš sunkiausiai įveikiamų kliūčių mokantis bendrinės anglų kalbos, kartu tai ypač opi akademinės ir specialiosios anglų kalbos problema.

Tikslas – analizuoti ir susisteminti įvairius teorinius požiūrius į kolokacijas remiantis tyrimų duomenimis, taip pat bandyti atsakyti į klausimą, kodėl reikia mokytis ir mokyti, kaip taisyklingai vartoti kolokacijas visų žinių lygių ir įvairių funkcinį stilių anglų kalboje.

Metodai. Buvo analizuojami klasikiniai ir šiuolaikiniai moksliniai darbai, susiję su kolokacijomis anglų kalboje.

Rezultatai. Įvairios lingvistinės mokyklos turi skirtingą požiūrį į kolokacijas. Kolokacijas sunkiai išmoksta tie besimokantieji, kurių anglų kalba yra gimtoji. Taigi žinias apie kolokacijas būtų patartina teikti įvairiais kalbos mokymo lygiais.

Aptarimas ir išvados. Išanalizavus ir susisteminus tyrimo duomenis padarytos išvados, kad kolokacija yra sudaryta iš leksemų. Tai nėra paprastas žodžių junginys, nes jis turi atitikti dažnumo ir gramatinės struktūros reikalavimus. Svarbu tai, kad leksika yra neatsiejama nuo gramatikos ir semantikos. Žinios apie kolokacijas gali padėti besimokantiems anglų kalbos išvengti klaidų, dviprasmiškumo kalboje ir aiškiau perteikti informaciją. Ypač tai svarbu vartojant akademinę anglų kalbą. Taisyklingas kolokacijų vartojimas studentų rašiniuose, mokslo darbuose ir šnekamojoje akademinėje kalboje turėtų būti nuolat skatinamas.

Raktažodžiai: kolokacija, žodžių junginys, kalbos išmokimas, funkcinis stilius.

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GENDER DIFFERENCES IN BODY IMAGE PERCEPTION AMONG 8th GRADE PUPILS

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ABSTRACT

Research background and hypothesis. Previous studies have shown that dissatisfaction with the body image among girls often reflects a desire to be thinner, among boys – a desire to be bigger, taller, become more muscular and have a nice body shape. It is known that adolescents have a very precise body image which is related to their own perception. However, there is a gap in research, analyzing body image aspect, i. e. evaluation of specific body image components. *Hypothesis* – there is a difference in the satisfaction level with specific body image components among 8th grade pupils; body image assessment of 8th grade pupils is different in the aspect of gender.

Research aim was to establish gender differences in body image perception among 8th grade pupils.

Research methods. The research has been conducted during the months of March-April-May of 2012. A random probability sampling method was used with 8th grade pupils from 24 general education schools located in various cities and towns around Lithuania. The research sample was comprised of 1347 (boys n = 674, girls n = 673) 8th grade pupils. To perform the diagnostic analysis, the author designed a body image perception questionnaire, composed on the basis of V. Rittner (1986), A. Zaborskis et al. (1996), R. Jankauskienė (2001), A. Zaborskis, J. Makari (2001), W. D. Brettschneider, T. Kleine, G. Klimek (2003), D. M. Garner (2004), R. Russell (2004), A. Miškinytė (2011), questionnaires.

Research results. Results of the present research allows concluding that respondents are more dissatisfied with their body image components which are influenced by adolescents' phenotype. i.e. stomach, shoulders, legs, thighs, hips, buttocks, waist, shin, breast ($p < 0.001$). Gender differences in body image perception revealed that girls tended to be more dissatisfied with their facial features ($p < 0.001$), nose ($p < 0.001$), cheeks ($p = 0.003$), facial skin ($p < 0.001$), hair ($p = 0.001$), breasts ($p = 0.004$), waist ($p = 0.001$), stomach ($p < 0.001$), legs ($p = 0.001$), hips ($p < 0.001$), thighs ($p < 0.001$), shin ($p < 0.001$), buttocks ($p < 0.001$), feet ($p < 0.001$), naked body ($p < 0.001$), body shape ($p < 0.001$), and body weight ($p < 0.001$).

Discussion and conclusions. Differences in body image perception among 8th grade pupils depend on gender, i. e. girls compared to boys ($p < 0.001$), tend to be more dissatisfied with their body image.

Keywords: body image, adolescence, body weight, body type, body shape.

INTRODUCTION

Lately, scientists theorists (Brettschneider, Kleine, 2002; Vaičiulienė, 2004), as well as practitioners (Jankauskienė, 2003; Evans et al., 2008; Pelegrini, Petroski, 2010) especially focus on issues related with the body image. Everyday life placed a significant pressure on physical appearance as beauty ideals shifted in the social environment together with the requirements to pursue and maintain them. Beauty ideals which are promoted by the mass media increase

dissatisfaction with the body image and motivate to pursue such ideals (Blond, 2008). Body shape and size is a form of self-expression. Therefore, it is not surprising that contemporary culture uses body as an indicator to judge oneself as well as others (Polivy, Herman, 2007; Miškinytė, 2011, p. 6). Considering dissatisfaction with the body image, gender differences are of the utmost importance (Miškinytė, 2011, p. 37).

Body image is a schematic own body representation, comprised on the basis of space, time and movement experience (*Sporto terminų žodynas*, 2002). A lot of attention is paid to a negative body image component, which is body dissatisfaction, looking for ties to depression (Kardelis, Stakytė, 2003; Markevičiūtė et al., 2003; Didžiokienė, Žemaitienė, 2005) and eating disorders (Barker, 2003; Vizbaraitė et al., 2007; Jankauskienė, 2008; Pelegrini, Petroski, 2010). Conducted studies revealed that the majority of adolescents (especially girls) believed that appearance and other people's opinion formed basis for self perception (Blond, 2008). Scientists who performed body image studies emphasized the importance of positive body image development (Cash, 2002; Pelegrini, Petroski, 2010). Positive body image is a significant factor for adolescents' well-being (Brettschneider, Kleine, 2002; Avalos, Tylka, 2005, 2006; Swami et al., 2008). Adolescents have a very specific body image which is related with their own perception (Evans et al., 2008). Body image issues become very complex during the adolescence period, as during it an adolescent might feel confused due to changes occurring in his/her body, which might invoke dissatisfaction with the body image. Nobody is born with a negative body image. If the adolescent wanted to feel satisfied, be able to adjust and overcome difficulties, the body image should be positive (Vaičiulienė, 2004). When developing a positive body image, it is very important to acknowledge and respect a natural body shape, appearance, form, learn to manage negative thoughts and feelings. Adolescents can receive acknowledgement through their bodies (Baur, Burmann, 2000).

Research aim was to establish gender differences in body image perception among 8th grade pupils.

Research object was body image perception of 8th grade pupils.

RESEARCH METHODS

Research sample. The questionnaires were handed out during the months of March-April-May of 2012. Adolescents of 8th grades were chosen as the research sample. A random sampling was performed of 8th grade pupils from 24 general education schools located in various cities and towns in Lithuania (Vilnius, Kaunas, Klaipėda, Kretinga, Gargždai, Tauragė, Telšiai). During the anonymous survey, a total of 1347 adolescents of

8th grade were surveyed. The research sample was comprised of $n = 674$ boys and $n = 673$ girls, i. e. in regards to gender, the sample was comprised of a similar number of boys (50%) and girls (49.9%). The chosen study sample represents population of Lithuania and is sufficient in respect to the size of the sample. The present study conducted a research using a probability random sampling.

Research instrument. The research uses a body image perception questionnaire designed by the author based on V. Rittner (1986), R. Jankauskienė (2001), A. Zaborskis et al. (1996), A. Zaborskis, J. Makari (2001), W. D. Brettschneider, T. Kleine, G. Klimek (2003), D. M. Garner (2004), R. Russell (2004), A. Miškinytė (2011) questionnaires. For assessment of the body image the author composed a Likert Scale. The questionnaire presents 52 questions regarding the perception of adolescent body image. The participants were asked to rank certain body parts and place their answers on a scale from *dislike* to *like* (on a 7-point rank scale). To assess reliability of questionnaire scale as well as scale internal consistency a Cronbach's alpha coefficient was used. It is based on correlation of individual questions in a questionnaire and assesses whether all scale items reflect the sample and enable to specify the number of necessary questions in the scale. The more the value is closer to 1, the better the questionnaire is designed, i. e. all of the questions are significant and confirm data interpretation validity. The questionnaire was composed of closed and semi closed questions.

Data analysis. For a quantitative data analysis, a *Statistical Package for Social Sciences* SPSS 17 was used. Differences between body image elements were assessed using a *Friedman* criterion; response differences of boys and girls were assessed using *Mann-Whitney* criterion. Assessing body image scale reliability, a reliability analysis was employed; *Cronbach's alpha* coefficient > 0.912 . Thus, the above described scale was a reliable means of assessment.

RESEARCH RESULTS

Results of the present research show that respondents were more dissatisfied (Figure 1) with their stomach ($p < 0.001$), arms ($p < 0.001$), shoulders ($p < 0.001$), legs ($p < 0.001$), thighs ($p < 0.001$), hips ($p < 0.001$), buttocks ($p < 0.001$), hips ($p < 0.001$), waist ($p < 0.001$), shins ($p < 0.001$), breasts ($p < 0.001$), face ($p < 0.001$), nose ($p < 0.001$). Respondents tended to be more satisfied with

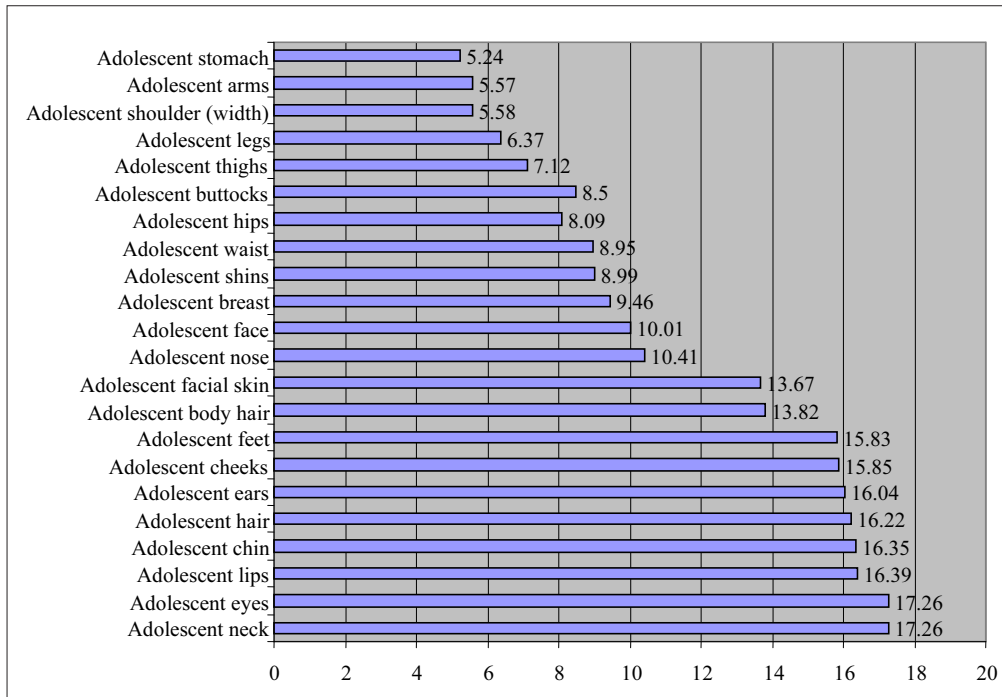


Figure 1. Adolescents' body image assessment results (mean rank is based on Friedman's criterion)

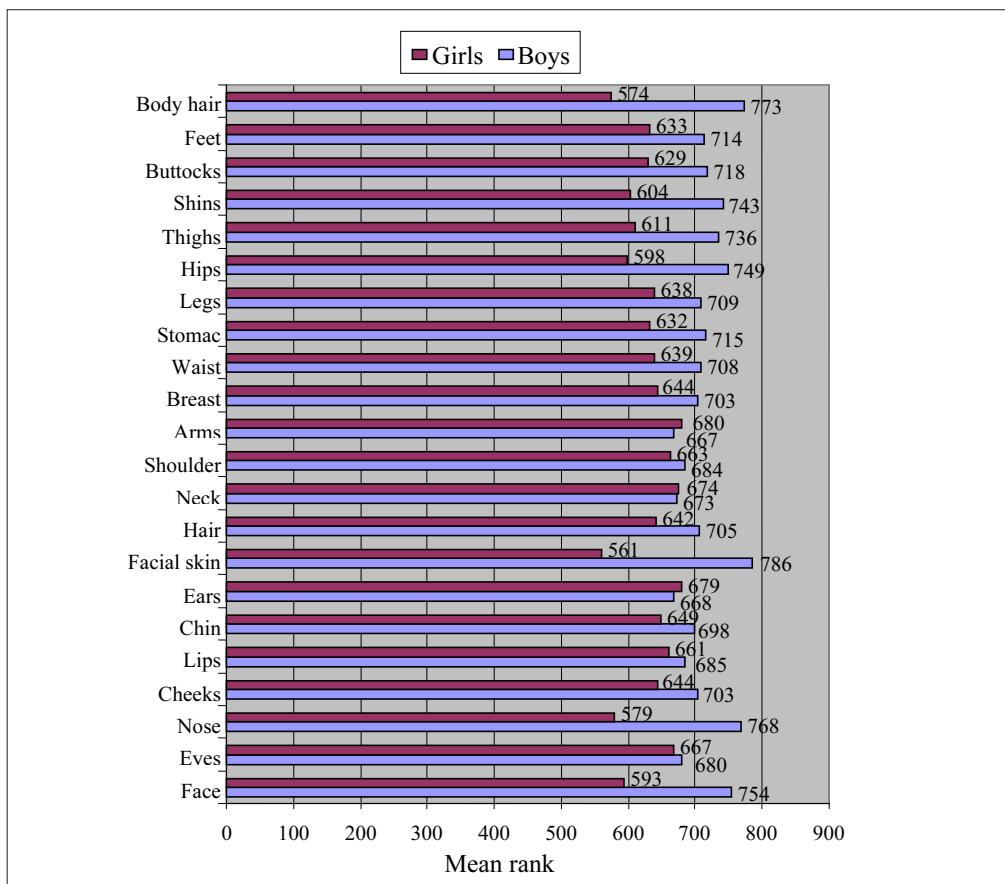


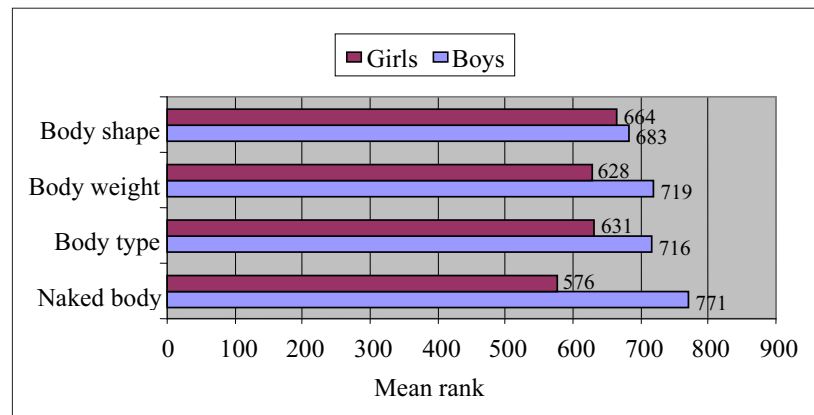
Figure 2. Adolescents' body image assessment results (mean rank is presented in accordance with MannWhitney (U) test criterion)

facial skin ($p < 0.001$), body hair ($p < 0.001$), feet ($p < 0.001$), cheeks ($p < 0.001$), ears ($p < 0.001$), hair ($p < 0.001$), chin ($p < 0.001$), lips ($p < 0.001$), eyes ($p < 0.001$), neck ($p < 0.001$). Having assessed the questionnaire items using *Friedman's* criterion it was determined that the differences

were statistically significant ($\chi^2 = 16329$; $df = 25$; $p = 0.000$).

Gender differences in body image perception among 8th grade pupils (Figure 2) revealed that girls tended to be more dissatisfied with their face ($U = 172289,500$; $p < 0.001$), nose ($U = 163292,000$;

Figure 3. Adolescents' body image assessment results (mean rank is presented in accordance with MannWhitney (U) test criterion)



$p < 0.001$), cheeks ($U = 206748,000$; $p = 0.003$), facial skin ($U = 150840,500$; $p < 0.001$), hair ($U = 205523,000$; $p = 0.001$), body hair ($U = 160012,500$; $p < 0.001$), which depend on adolescents' genotype, as well as breasts ($U = 206717,000$; $p = 0.004$), waist ($U = 203616,000$; $p = 0.001$), stomach ($U = 199037,000$; $p < 0.001$), legs ($U = 202790,000$; $p = 0.001$), hips ($U = 176005,500$; $p < 0.001$), thighs ($U = 184430,500$; $p < 0.001$), shins ($U = 179827,000$; $p < 0.001$), buttocks ($U = 196810,500$; $p < 0.001$), feet ($U = 199549,000$; $p < 0.001$), which depended on adolescents' phenotype.

Data in Figure 3 showed that girls more than boys were more dissatisfied with their naked body ($U = 161082,500$; $p < 0.001$), body type ($U = 198292,000$; $p < 0.001$), and body weight ($U = 196259,000$; $p < 0.001$).

Body type, body weight and body shape depended on adolescents' phenotype, which could be altered by physical exercises, physical activities and healthy eating.

DISCUSSION

In terms of body image dissatisfaction, gender differences play a significant role. By the present research we aimed to analyze whether body image perception among 8th grade pupils is different in the aspect of gender. The present diagnostic research as well as other studies conducted by foreign scientists shed some light on the presumption that adolescent girls tend to be more dissatisfied with their body image. It has been estimated that seven out of ten girls express their dissatisfaction with their body image by pursuing an idea of a thinner body. Boys tend to be dissatisfied with their body image, as they seek

to be bigger, taller and more muscular (Evans et al., 2008). The study reveals that starting from 20 to 95 percent of adolescent boys and adult men feel a great dissatisfaction with their body image, especially due to body shape and type (Watkins et al., 2008). If boys and men want to achieve a body image of ideal type and weight, they use unhealthy compensatory behavior (such as malnutrition, excessively high loads during physical activities) very often (Blond, 2008). Our research results revealed that adolescents placed a great focus on their body weight and body shape. Research results revealed that issues related with the body image and weight were very important to acknowledge and understand because difficulties that emerge during early adolescence might remain during adult years (Swami et al., 2008). Body image is the most significant factor for self-definition, especially for girls (Pelegri, Petroski, 2010). Adolescents (especially girls) believe that physical appearance and perception (evaluation) of other people are important factors for self-judgment. It has been established that body image development and body changes have an effect on movement (McCabe et al., 2006). Sports (movement) have influence on body image (Avalos, Tylka, 2005, 2006; Swami et al., 2008). Research revealed that in many cases adolescents' psychosocial development and body image correlated with their pursuance of a stereotypical slim body image (Hargreaves, Tiggemann, 2006). Studies also determined a relation between body image and a negative association, especially for the adolescent girls (Pelegri, Petroski, 2010). In the studies of body image Scientists emphasized that the formation of a positive body image was essential (Evans et al., 2008). There are studies which analyzed a positive body image aspect – body perception (Avalos, Tylka, 2005, 2006;

Swami et al., 2008). Results of conducted studies have revealed that development of a positive body image during early adolescence is very important and relevant as an ability to take care of your body image is one of the most significant tasks allowing to ensure adolescents' positive cognitive, social and physical changes. For this ability to become a life standard, it is necessary to develop it from the moment adolescent start taking a better care and are more concerned about their body image, which is during the early adolescence (Hargreaves et al., 2006; McCabe, Tiggemann, 2006; Blond, 2008; Evans et al., 2008; Pelegrini, Petroski, 2010).

CONCLUSIONS AND PERSPECTIVES

1. Having assessed the body image of 8th grade pupils, it was established that adolescents tended to be more dissatisfied with their stomach ($p < 0.001$), arms ($p < 0.001$), shoulders ($p < 0.001$), legs ($p < 0.001$), thighs ($p < 0.001$), hips ($p < 0.001$) and buttocks ($p < 0.001$).

2. Differences in body image perception among 8th grade pupils depended on their gender, i. e. girls compared to boys ($p < 0.001$), tended to be more dissatisfied with their body image.

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VIII KLASĖS MOKINIŲ KŪNO SAVIVAIZDŽIO VERTINIMO SKIRTUMAI LYTIES POŽIŪRIU

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Tyrimais įrodyta, kad mergaičių nepasitenkinimas kūno savivaizdžiu dažnai rodo norą būti plonesnėmis, berniukų – norą būti stambesniais, aukštesniais, turėti daugiau raumenų ir gražias kūno formas. Teigiama, kad paaugliai turi labai konkretų kūno savivaizdį, kuris siejamas su jų pačių išivaizdavimais. Visgi tyrimų, nagrinėjančių kūno savivaizdžio ypatumus, t. y. konkrečių kūno savivaizdžio dalių vertinimo, vis dar trūksta. *Hipotezė* – VIII klasės mokinių pasitenkinimo lygis konkrečiomis kūno savivaizdžio dalimis skiriasi; jų kūno savivaizdžio vertinimas skiriasi lyties požiūriu.

Tikslas – atskleisti VIII klasės mokinių kūno savivaizdžio vertinimo skirtumus lyties požiūriu.

Metodai. Tyrimas atliktas 2012 metų kovo–balandžio–gegužės mėnesiais. Paimta tikimybinė atsitiktinė VIII klasės mokinių imtis iš 24 bendrojo ugdymo mokyklų, esančių įvairiuose Lietuvos miestuose. Tiriamąją imtį sudarė 1347 (berniukai – $n = 674$, mergaitės – $n = 673$) VIII klasės mokiniai. Diagnostiniam tyrimui atlikti buvo naudota autorės sudaryta kūno savivaizdžio vertinimo anketa, remiantis V. Rittner (1986), R. Jankauskienės (2001), A. Zaborskio ir kt. (1996), A. Zaborskio, J. Makari (2001), R. Russell (2004), W. D. Brettschneider, T. Kleine, G. Klimek (2003), D. M. Garner (2004), A. Miškinytės (2011) anketomis.

Rezultatai. Tyrimo rezultatai leidžia teigti, kad respondentai labiau nepatenkinti kūno savivaizdžio dalimis, kurios priklauso nuo paauglių fenotipo, t. y. pilvu, rankomis, pečiais, kojomis, šlaunimis, klubais, sėdmenimis, liemeniu, blauzdomis, krūtine ($p < 0,001$). Kūno savivaizdžio vertinimo skirtumai lyties požiūriu atskleidė, kad mergaitės yra labiau nepatenkintos savo veidu ($p < 0,001$), nosimi ($p < 0,001$), skruostais ($p = 0,003$), veido oda ($p < 0,001$), plaukais ($p = 0,001$), krūtine ($p = 0,004$), liemeniu ($p = 0,001$), pilvu ($p < 0,001$), kojomis ($p = 0,001$), klubais ($p < 0,001$), šlaunimis ($p < 0,001$), blauzdomis ($p < 0,001$), sėdmenimis ($p < 0,001$), pėdomis ($p < 0,001$), nuogu kūnu ($p < 0,001$), kūno sudėjimu ($p < 0,001$), kūno svoriu ($p < 0,001$).

Aptarimas ir išvados. VIII klasės mokinių kūno savivaizdžio vertinimo skirtumai priklauso nuo lyties, t. y. mergaitės, lyginant su berniukais ($p < 0,001$), labiau nepatenkintos savo kūno savivaizdžiu.

Raktažodžiai: kūno savivaizdis, paauglystė, kūno svoris, kūno sudėjimas, kūno forma.

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ATTITUDES OF PHYSICAL EDUCATION TEACHERS AND STUDENTS TOWARDS MANIFESTATIONS OF TOLERANCE

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ABSTRACT

Research background and hypothesis. In academic literature construct of tolerance has not been sufficiently revealed, limits of tolerance are not clear, especially they vary in different cultures. There is a noticeable increase in the number of children from various ethnic groups in Lithuanian schools. Therefore, multidimensional knowledge of various manifestations of tolerance/intolerance is of great importance.

Research aim was to reveal attitudes of PE teachers and students towards manifestations of tolerance/intolerance.

Research methods. In our research questionnaire was applied with six groups of tolerance manifestations distinguished altogether with 36 related statements. There were six other statements according to six groups of tolerance manifestations for the potential behavior of participants. Validity of the questionnaire was examined calculating Cronbach's constant α : for the first part of the questionnaire Cronbach's $\alpha = 0.87$, and for the second – $\alpha = 0.79$. Values of χ^2 and Student's t criterion were calculated. The sample of the research included 243 students of IX–XII classes from regional schools, 129 students of the same age from city schools, 47 physical education teachers from city schools and 38 teachers from regional schools.

Research results. We found statistically significant difference ($p < 0.05$) between positive attitudes towards tolerance among students from city schools and positive attitudes among students from regional schools. Statistically significant difference between positive attitudes towards tolerance for PE teachers from city schools and positive attitudes for those from regional schools was not found ($p > 0.05$). However, there were statistically significant differences between positive attitudes towards tolerance of students from city schools and PE teachers from city schools ($\chi^2(5) = 37.27$; $p < 0.05$), also between positive attitudes towards tolerance of students from regional schools and PE teachers from regional schools ($\chi^2(5) = 37.27$; $p < 0.05$). We found statistically significant difference ($t = 3.81$; $p < 0.05$) between tolerance estimators of students and PE teachers from city schools. On the other hand, relevant differences between tolerance estimators of students from city schools and from regional schools, and differences between tolerance estimators of PE teachers from city schools and from regional schools were not found ($p > 0.05$).

Discussion and conclusion: in fact, attitudes towards intolerance, which are incident to the PE teachers from city schools and their colleagues from regional schools, did not differ, but they contrasted with students' attitudes. In cases of intolerance manifestations, students from city schools would be more passive than students from regional schools, but PE teachers from city schools would be more active than their students.

Keywords: tolerance, intolerance, social distance.

INTRODUCTION

Tolerance is hailed as the one of the basic principles of liberal, democratic society. Its significance is clearly marked in “Declaration of Principles on Tolerance” proclaimed by the UNESCO. Notion of tolerance is widely and comprehensively discussed in

philosophical, psychological, sociological and ecological discourses. Because of great variety and diversity of theoretical perspectives, there is no universally accepted conception of tolerance.

A number of foreign authors substantially contributed to the examination of tolerance:

A. Tesser and D. Shaffer (1990); T. P. Hannigan (1990); M. B. Gasser (1994); M. B. Gasser and R. N. Tan (1999); W. P. Vogt (1997); B. Johnson et al. (2007); B. Gniewosz and P. Noack (2008); J. F. Dovidio et al. (2009); J. Binder et al. (2009); N. Denson (2009), and others.

In Lithuania various attitudes of tolerance were discussed by K. Stoškus (1987), V. Žemaitis (2005), R. Plečkaitis (1998), and others. The problem of tolerance, as it appears in secondary schools, was analyzed by E. Bakonis et al. (2004), A. Sprindžiūnas (2004), A. Kurienė (2007), V. Valentinavičius (2010), and others.

Secondary schools programmes and education standards (2003) emphasize that tolerance in school life is an important precondition for preparing students to live in constantly changing environment helping them to find appropriate forms of self-expression and self-realization, stimulating the formation of mature, creative and responsible individuality.

A. Dumčienė (2004), A. Sprindžiūnas (2004) and other scientists emphasize the point that individual's adequate relation with himself/herself (i. e. taking the form of authentic existence and conceding this right to other human beings) is one of the most important factors in the development of tolerance.

According to J. Browne-Dianis (2011), tolerance is precisely what a child needs not only for learning and survival, but also for prosperity of the individuality.

Research results of V. Valentinavičius (2010) revealed attitudes of students and teachers towards certain social groups. It was observed that they most of all distanced themselves socially from the disabled people and homosexuals. However, this research, like others mentioned above, lacks analysis of tolerance/intolerance manifestations in physical education lessons.

The "Declaration of Principles on Tolerance" emphasizes the necessity of active position against intolerance, emphasizes the duty to inculcate and cultivate respect for all human rights and fundamental freedoms without reference to one's race, gender, language, nationality, religion and physical condition.

According to A. Dumčienė (2004), tolerance is a means of adaptation and self-realization, a way to live and let others live, a necessary condition for improvement in the individual and social spheres. Therefore, educational practice of PE teacher should become one of the most important activities oriented towards cultivation of tolerance.

Conception of tolerance associates with the notion of intolerance. V. Žemaitis (2005) points out that intolerance manifests as defiance of people which have different beliefs and opinions, overt or covert antagonism towards them. Intolerant persons think that only they are right, virtuous, and treat others as amoral, sinful people. Such views result from intellectual and spiritual narrowness, dogmatism and fanaticism, and, eventually, result in social confrontation.

Tolerance, being not an end in itself but the means to other goals (i. e. Truth and the Good), is a strategy for acquiring desirable things and fulfilling our material and immaterial needs without neglecting desires and needs of other people (Plečkaitis, 1998).

Social tolerance is a condition for peaceful and appropriate collaboration of different people. In democratic societies, it is a matter of great importance to grant equality of citizens in all spheres of their life without reference to their race, gender, background, belonging to one or another social stratum, etc. Social tolerance commits people to fight against all forms of discrimination and violations of human rights. Its content is equality of citizens in all spheres of social life. M. B. Gasser and R. N. Tan (1999) conceptualizes social tolerance using the notion of social distance.

Cultural tolerance is defined as individual attitude toward culture which is understood as foreign traditions and social norms (Gasser, Tan, 1999).

Specifying the object of analysis, usually such kinds of tolerance are distinguished: formal tolerance – i. e. conceding alternative, different opinion without endorsement of its content; substantive tolerance – i. e. acknowledgement and approval of views of other people.

W. P. Vogt (1997) distinguishes five levels in the construct of the individual tolerance: personal traits, views, beliefs, obligations, and practice.

According to A. Sprindžiūnas (2004), human beings are naturally intolerant towards each other; therefore it is a matter of great importance to learn tolerance during lifetime.

R. Plečkaitis (1998) distinguishes three essential conditions of tolerance. One can tolerate only those opinions and deeds which one treats adversely and negatively, which are unacceptable and unpleasant. The second condition: belief or understanding that there is an opportunity to resist what one treats negatively. Bearing or forbearance, which results from fear or helplessness, should not be treated as

tolerant position. Self-determination willingly and consciously endures what seems unacceptable but necessary condition of tolerance.

In question concerning the limits of tolerance is the main problem for examination of the phenomenon of tolerance and its specific features, but it remains a matter of controversy and professional discussion in various fields. **The aim of the research** was to reveal attitudes of PE teachers and students towards manifestations of tolerance/intolerance.

The aim of the tolerance education is to resist influences that lead to fear and exclusion of others, and help young people to develop capacities for independent judgment, critical thinking and ethical reasoning (*Declaration of Principles on Tolerance*, 2005).

The aim of the research was to reveal attitudes of PE teachers and students towards manifestations of tolerance/intolerance.

Object of the research: attitudes of PE teachers and students towards manifestations of tolerance/intolerance.

Hypothesis: students are more tolerant than PE teachers.

Novelty of the research. Academic literature concentrates on political, religious and ethnical aspects of teenagers' tolerance/intolerance; however, there is a lack of the examination of tolerance oriented toward the aspects of physical education. Novelty is due to duality: on the one hand, it is a matter of relevance to reveal what participants think and feel; on the other hand, our research discovers what participants would do in cases of tolerance/intolerance manifestations.

Relevance of the research. Rapidly changing social environment, pervasive ideas of multiculturalism actually, influence the appearance of cultural tolerance. Results of V. Valentinavičius (2010) research show that, in respect of tolerance, current situation is quite problematic. During physical education lessons specific interactions and collaboration take place, therefore, the attitudes revealed towards tolerance/intolerance manifestations can contribute to the science of education. In their everyday work educators could rest on the insights offered by our research.

RESEARCH METHODS

On the grounds of the analysis of philosophical, psychological and pedagogical literature, also with the reference to the recommendations of M. B. Gasser (1994), M. B. Gasser and R. N. Tan

(1999) for constructing the scales of social-cultural distance, a two-part questionnaire was composed and applied in the research.

The first part of the questionnaire was internally oriented ("What do I think and how do I feel?"), and the second part was externally oriented ("What will I do in this environment?").

In the first part of tolerance construct, with the reference to the commonly-used methodology of social attitudes research (Binder et al., 2009), six groups of tolerance manifestations were distinguished. They referred to the tolerance/attitudes of students/teachers towards other students: with different appearance (clothing, hairstyle); with different sexual orientation; from other ethnic groups; with drugs and alcohol addiction; disability; different opinions from those prevailing in the community. In the first part of the questionnaire there were 36 statements, and participants could convey their attitudes towards them choosing one of three alternatives: Positive, Neutral, and Negative. Participants were asked about their attitudes towards the presence of the representatives of the aforementioned groups in physical education lessons.

In the second part six statements were introduced according to six groups of tolerance manifestations, and responses to them had to reveal potential behaviors of participants in given situations (five-point Likert scale). For example, such statement as "If I saw intolerant behavior towards the disabled, I would object". Answer variants: Always; Maybe yes; I don't know; Maybe no; Never (in data processing these answers were given values 1, 2, 3, 4, 5). The closer is the estimator to value 1, the more active is negative reaction to the manifestation of intolerance; the closer is the estimator to the maximum value of 5, the slighter is the reaction. The medium value 4 shows that participant does not know how he/she would behave.

The validity of the questionnaire was tested by calculating Cronbach's coefficient α : for the first part of the questionnaire Cronbach's $\alpha = 0.87$; for the second – Cronbach's $\alpha = 0.79$.

SPSS 12 software package was used to calculate the means of χ^2 and Student's t criterion.

The sample of the research consisted of four groups: 243 students of IX–XII classes from regional schools, 129 students of the same age from city schools, 47 physical education teachers (aged 36.5 ± 13.8) from city schools and 38 teachers (aged 47.2 ± 10.5) from regional schools. The research was

carried out applying the questionnaire survey with the permission of school authorities. Participation in the research was voluntary and anonymous.

RESEARCH RESULTS

The results of the questionnaire survey (the first part of the questionnaire) are presented in Figure 1 (students' attitudes) and Figure 2 (teachers' attitudes).

There was statistically significant difference ($\chi^2(5) = 20.82$; $p < 0.05$) between positive attitudes towards tolerance of students from city schools and attitudes of students from regional schools.

There was no statistically significant difference between positive attitudes of PE teachers from city schools and attitudes of teachers from regional schools ($\chi^2(5) = 8.03$; $p > 0.05$). However, there were statistically significant differences between positive attitudes towards tolerance of students from city schools and attitudes of PE teachers from city schools ($\chi^2(5) = 37.27$; $p < 0.05$), also between positive attitudes towards tolerance of students

from regional schools and attitudes of PE teachers from regional schools ($\chi^2(5) = 37.27$; $p < 0.05$).

Data acquired through questioning revealed students' (Figure 3) and teachers' (Figure 4) expected reactions to the manifestation of intolerance.

There was statistically significant difference ($t = 3.81$; $p < 0.05$) between tolerance estimators of students and PE teachers from city schools. Significant differences between tolerance estimators of students from city schools and from regional schools, and differences between tolerance estimators of PE teachers from city schools and from regional schools, were not found ($p > 0.05$).

According to the groups of tolerance manifestations, means of students' estimators and their standard deviations are displayed in Figure 5, and means of teacher's estimators and their standard deviations – in Figure 6.

There was no conventional structure of the multidimensional construct of tolerance. Therefore, mean estimators of tolerance were calculated. They are displayed in Table.

Figure 1. Distribution of students' positive attitudes (%)

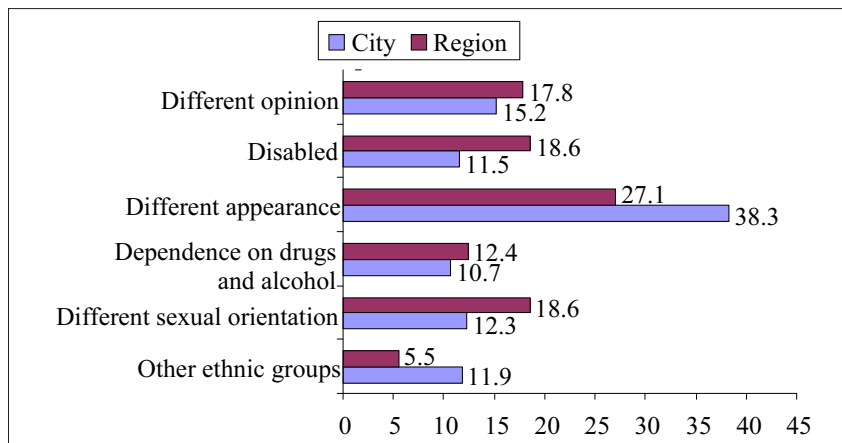
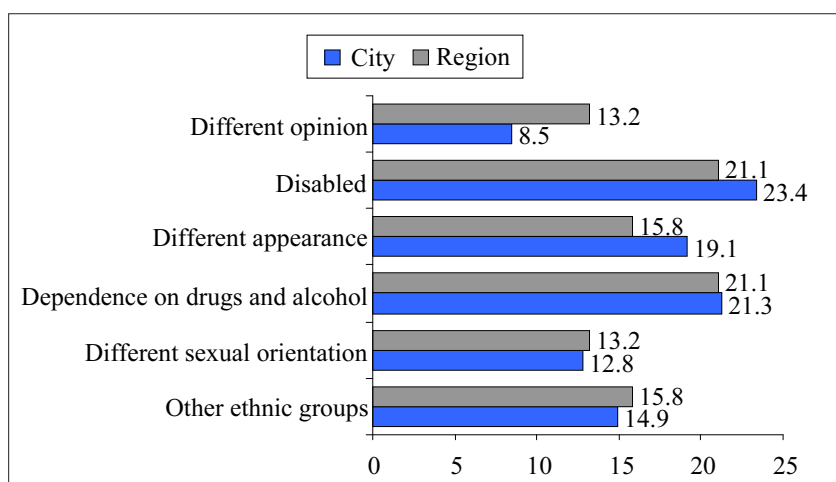


Figure 2. Distribution of teachers' positive attitudes (%)



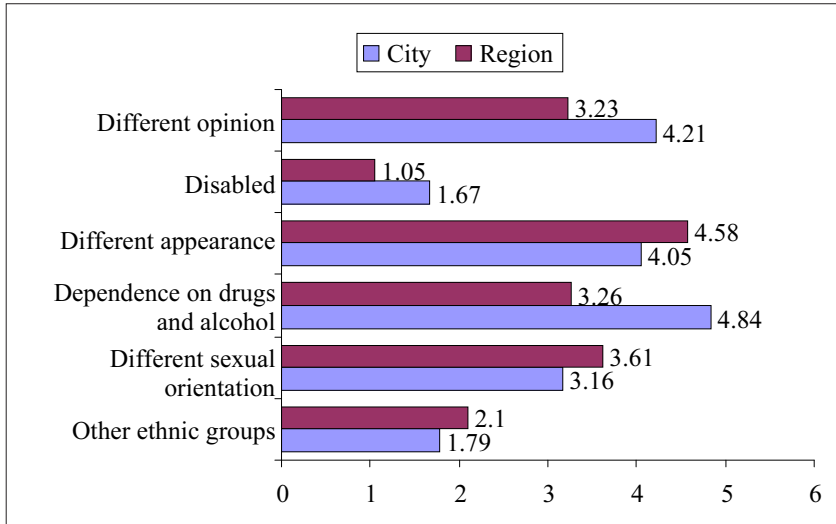


Figure 3. Distribution of the estimators of students' expected reactions to the manifestation of intolerance

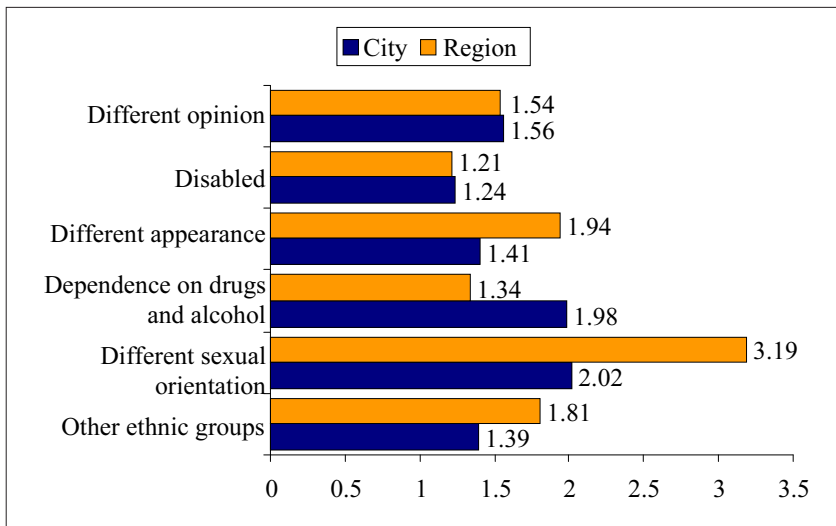


Figure 4. Distribution of the estimators of teachers' expected reactions to the manifestation of intolerance

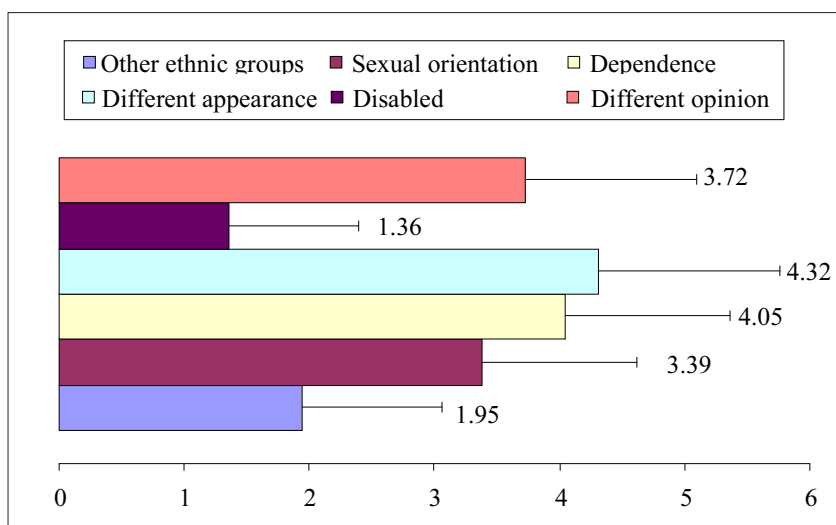


Figure 5. Mean estimators of students' tolerance according to the groups of tolerance manifestations

Figure 6. Mean estimators of teachers' tolerance according to the groups of tolerance manifestations

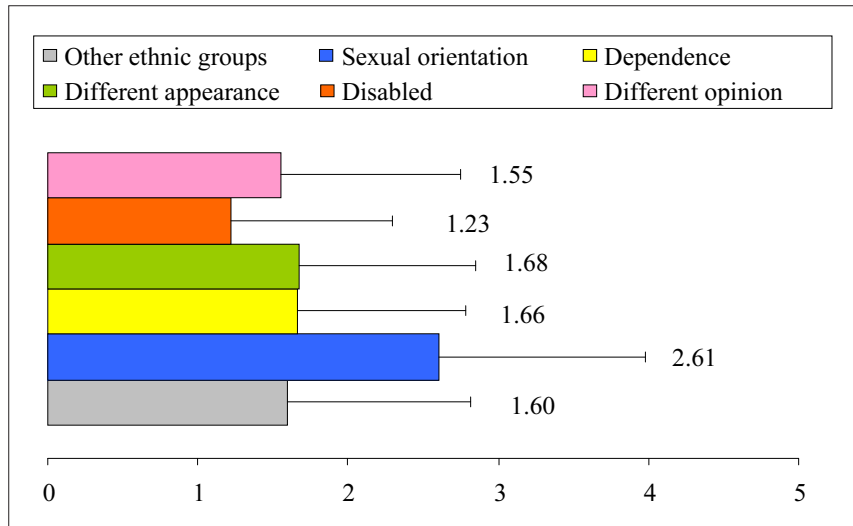


Table. Mean estimators of tolerance and SD

Location of school	Students	Teachers
City	3.29 ± 1.32	1.6 ± 0.33
Region	2.97 ± 1.23	1.84 ± 0.72

DISCUSSION

Students from city and regional schools are least tolerant towards representatives from other ethnic groups in physical education lessons (11.9 and 5.5%, respectively). They are most of all tolerant towards students with different appearance (38.3 and 27.1%). Differences between attitudes of students from city and regional schools can be explained by differences of their psychological-emotional environment. According to other researchers (Gniewosz, Noack, 2008), environment affects the formation of tolerance among students significantly.

PE teachers, both from city schools and regional schools, are most of all tolerant towards disabled students (25.9 and 22.2%, respectively). They are significantly less tolerant towards persons with other sexual orientation (only 11% of them are positively minded). Teachers' attitudes presuppose influence of the psychological-emotional environment to the treatment of tolerance/intolerance manifestations. However, acquired results should be assessed with discretion because teachers, being stressed and lacking support of colleagues, tend to exaggerate and inadequately judge their students (Beaudoin, 2011).

Few students and PE teachers have positive attitudes towards persons with other sexual orientation, and this generalization does not contradict to the results of aforementioned research (Valentinavičius, 2010).

Differences of observed attitudes can be partly explained in terms of social categorization theory, according to which, in the process of classification, the group, into which individual subsumes himself/herself, is understood as indiscrete, and, on the other hand, differences of external group are exaggerated. As T. P. Hanningan (1990) suggests, there are important factors which influence the way we evaluate other people, i. e. our authoritarianism, ethnocentrism, openness to new experience and tolerance for uncertainties.

According to M. B. Gasser and R. N. Tan (1999), disposition to act in the face of intolerance manifestations is a relevant characteristics to the assessment of tolerance. As the data of the questionnaire survey shows, students from city and regional schools strongly tend to react against intolerance towards the disabled and representatives of other ethnic groups. Very rarely would they react against intolerance towards persons with different

appearance and dependence on drugs and alcohol. Although these are conditional estimators, in case of the students from city schools, there is a weaker tendency to actively resist manifestations of intolerance compared to the tendency of students from regional schools (estimators are 3.29 ± 1.32 and 2.97 , respectively). However, the difference between estimators is not statistically significant ($p > 0.05$). PE teachers from city and regional schools tend to react more strongly (estimators are 1.6 ± 0.33 and 1.84 ± 0.72 , respectively; the less estimator, the more negative reaction against intolerance manifestations). Dispersion of students is significantly larger than the one in case of teachers. Some authors (Tesser, Shaffer, 1990) criticize the application of scales in the assessment of social distance; on the other hand, they concede that acquired results reflect the presence of social distance between groups.

According to J. Browne-Dianis (2011), it is quite problematic to cultivate tolerance in school, as teachers sometimes judge their students

inadequately. However, N. Denson (2009) points out that purposefully organized education and sufficient information on cultural variety positively affects social attitudes and interaction among social groups.

CONCLUSIONS AND PERSPECTIVES

There is statistically significant difference ($p < 0.05$) between the attitudes of students from city schools towards various manifestations of tolerance and the attitudes which are typical of students from regional schools. Attitudes towards intolerance, which are incident to the PE teachers from city schools and their colleagues from regional schools, do not differ, but they contrast with students' attitudes. In cases of intolerance manifestations, students from city schools are more passive than students from regional schools, but PE teachers from city schools are more active than their students.

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KŪNO KULTŪROS MOKYTOJŲ IR MOKINIŲ POŽIŪRIAI Į TOLERANCIJOS APRAIŠKAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Mokslinėje literatūroje nėra atskleistas tolerancijos konstruktas, neapibrėžtos tolerancijos ribos, juolab jos įvairuoja skirtingose kultūrose. Lietuvos mokyklose gausėja įvairių etninių grupių migrantų vaikų, tad tolerancijai ugdyti vertingos žinios įvairiais jos apraiškos būdais.

Tikslas – išsiaiškinti tolerancijos apraiškas per kūno kultūros pamokas.

Metodai. Duomenims surinkti naudota anketa, kurioje išskirtos šešios tolerancijos apraiškų grupės ir jas galimai atskleisiantys 36 teiginiai. Papildomai pateiktos šešių tolerancijos apraiškų grupių teiginiai galimai atskleisiantys tiriamojo elgesį duotojoje situacijoje. Anketos patikimumas tikrintas paskaičiuojant Kronbacho α koeficientą: pirmos klausimyno dalies Kronbacho $\alpha = 0,87$, antros – $0,79$. Skaičiuotos χ^2 kvadrato ir Stjudento t kriterijaus reikšmės, naudotas SPSS 12 programų paketas.

Buvo apklausti 243 miesto mokyklų ir 129 rajono mokyklų IX–XII klasių mokiniai bei 47 miesto ir 38 rajono mokyklų kūno kultūros mokytojai.

Rezultatai. Tarp miesto ir rajono mokyklų mokinių pozityvaus požiūrio į toleranciją nustatytas statistiškai patikimas skirtumas ($p < 0,05$). Tarp miesto ir rajono mokyklų kūno kultūros mokytojų pozityvaus požiūrio į toleranciją reikšmingo skirtumo nenustatyta ($p > 0,05$). Tačiau nustatytas statistiškai reikšmingas pozityvaus požiūrio į toleranciją skirtumas ir tarp miesto mokyklų mokinių bei kūno kultūros mokytojų ($\chi^2(5) = 37,27$; $p < 0,05$), ir tarp rajono mokyklų mokinių bei kūno kultūros mokytojų ($\chi^2(5) = 37,27$; $p < 0,05$). Statistiškai reikšmingas skirtumas ($t = 3,81$; $p < 0,05$) aptiktas tarp miesto mokyklų mokinių ir kūno kultūros mokytojų tolerancijos įverčių, o tarp miesto ir rajono mokinių bei tarp miesto ir rajono kūno kultūros mokytojų tolerancijos įverčių reikšmingo skirtumo nenustatyta ($p > 0,05$).

Aptarimas ir išvados. Miesto ir rajono mokyklų kūno kultūros mokytojų požiūris į netolerancijos apraiškas iš esmės nesiskiria, tačiau skiriasi nuo mokinių. Miesto mokyklų mokiniai netolerancijos pasireiškimo atvejais būtų pasyvesni nei rajono mokyklų mokiniai, kūno kultūros mokytojai aktyvesni už mokinius.

Raktažodžiai: tolerancija, netolerancija, socialinė atskirtis.

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MODELING OF AN OBSERVATION CHECKLIST OF MOTOR BEHAVIOR

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ABSTRACT

Research background and hypothesis. The study started with the hypothesis that direct observation of a child could be used as part of assessment of various internal problems. The results of recent observational studies on depressed children show that explicit behavioral symptoms of depression, such as psychomotor agitation, can be systematically observed during standardized procedures.

Research aim. The aim of the study was to construct a checklist of motor behavior for children aged 11–12 years with internal problems.

Research methods. Items for the checklist were recorded from DSM-IV and ISD-100. Children of 11–12 years ($n = 75$) were videotaped whilst participating in physical education lessons. Achenbach's Child Behavior Checklist (Youth Self-Report for Ages 11–18 (YSR) and Teachers' Report Form for Ages 5–18 (TRF)) were applied to the sample as well. The results from YRS and TRF were used for the development of validity statistics. Reliability statistics was calculated as well.

Research results. The 14 statements were selected for the development of observation of motor behavior for children with internal problems. Result showed that the internal consistency (Cronbach's $\alpha = 0.79$) and reliability ($ICC = 0.81$) of the checklist were good. The insignificant result of dispersion among the observer group ($F = 7.233$, $(df = 4) p = 0.423$) showed that the observers agreed when assessing children.

Discussion and conclusions. The instrument will be useful in screening children with possible internal problems and assisting in intervention planning aimed at influencing motor behavior. The study has a number of limitations – the sample is too small, the more extensive check of validity and reliability is required.

Keywords: observation, internal problems, protocol of motor behavior, validity, reliability.

INTRODUCTION

Motor development may be defined as the change of motor behavior during life due to various processes that determine this change. A child's motor development is closely related to the child's psychosocial development that encompasses emotions, personality, and interrelations with other people that surround him/her. Consequently all people express their personalities as they move, and motor behavior may be corrected seeking for an advantage for the whole personality. Evaluation of children's motor behavior differs from physiological measurements, physical capability tests, and even from children's motor development tests, assessed with the help of quantitative values. J. D. Cone (1978) grouped the

assessment of motor behavior into two categories: 1) direct assessment defined by observation in natural children's environment or in situations, analogous to natural environments, and self-observation; and 2) indirect assessment defined by various surveys, reports, and questionnaires. Many scientists (Mol Lous et al., 2002; Fortes et al., 2005; Thomas, Nelson, 2005; Causgrove Dunn, Dunn, 2006) state that direct assessment methods are most suitable in research that studies children with emotional and behavior disorders.

Self-reports, reports, questionnaires and checklists are created for the assessment of depression, anxiety, and other internal problems. However, all assessment methods have drawbacks.

For this reason and because anxiety and depression are not tangible assessment objects, many scientists (Puura et al., 1998; Seligman, Ollendick, 1998; Saleem, Mehmood, 2011) came to the conclusion that internal disorders should be identified using as many different assessment methods as possible. Short and quickly filled reports or questionnaires may just repeat each other, while, when filling in self-reports, children may be dishonest and may give those answers, which are supposed to be socially acceptable (Thomas, Nelson, 2005). It is also important to collect information from different informants because parents, teachers, and other specialists (social workers, medical professionals, specialists of adapted physical activity, etc.) observe children's behavior in different contexts, and their answers usually do not correlate well among themselves (Puura et al., 1998; Pool, Hourcade, 2011). Therefore various assessment methods, which would be applied in different environments and by which it would be possible to gather information from different sources, must be researched more exhaustively and should be used more often in scientific research and practice. Motor behavior is not usually included or is not emphasized in many currently known self-reports, reports, questionnaires, and checklists for the assessment of internal problems. Results of several last scientific papers (Mol Lous et al., 2002; Pool, Hourcade, 2011), where the direct observation method was used, showed that psychomotor excitement or suppression might be observed systematically in standardized game situations. When analyzing observation checklists, J. R. Thomas and J. R. Nelson (2005) noticed that children behaved more casually and more naturally in natural environments (such as a playground or a class) than at a specialist's, behind the closed door. We used these assumptions to develop our *hypothesis* that direct observation of motor behavior in a natural environment may be used as one of the methods for identification and assessment of various internal problems. *Research aim* was to create a motor behavior observation checklist for children aged 11–12 with internal problems.

RESEARCH METHODS

The subjects. We used convenience and systematic sampling. First, we selected the secondary school, where administration and physical education teacher agreed to participate in the study; and second, the subjects had to be 11–12

years old. The study included 75 students from secondary schools: 41 of them were boys (aged 11.95 ± 0.31) and 34 were girls (aged 11.86 ± 0.42).

Research methods: 1) coding of motor behavior – diagnostic criteria of various anxiety and mood disorders described in diagnostic classifications, were used for the creation of a specific motor behavior list that reflected internal problems: DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders, 4th edition*, American Psychiatric Association, 1994) and ICD-10 (*The ICD-10 Classification of Mental and Behavioral Disorders: Diagnostic Criteria for Research, World Health Organization, 1993*); 2) observation; 3) videotaping; 4) *Teacher's Report Form* and *Youth Self Report Form* (Achenbach, 1991) for 11–18-year-old youths. Eight syndromes were distinguished in the reports, and they were divided into internal and external problems. These reports are valid and reliable for the population of Lithuanian children (Žukauskienė et al., 2003).

Statistical analysis was performed using *Statistical Package for Social Sciences (SPSS)* version 11.0. Averages of values of selected statements for the future checklist and correlation of each statement with the *item to total correlation* were calculated. Reliability, the internal consistency of the checklist, based on Cronbach's α , and concurrence of opinions between separate observers, using the *ICC (intraclass correlation coefficient)*, were calculated. When assessing validity, the Pearson's correlation coefficient between the sum of values of the new checklist and the subscales of internal and external problems of the 11–18-year-old Youth Self Report Form, and between the new checklist and internal and external subscales of the Teacher's Report Form was calculated.

Organization of research. The coding of statements that define motor behavior was done by a group of three experts (specialists of adapted physical activity and psychomotor functions, and a psychologist). Another group of experts that assessed all statements was chosen based on the following criteria: higher education, experience of at least two years of working with children, a possibility to observe children in movement situations, possession of practical and theoretical knowledge related to behavioral disorders and motor development, and motivation to participate in the research. Independent specialists of various areas of the second expert group (one specialist of adapted physical activity, two special pedagogues

and two qualified doctors in psychotherapy – psychology, one coach, one game specialist, one physiotherapist, and two social workers) assessed each statement, and a motor behavior observation checklist was composed. The research objects ($n = 75$) were filmed in class after receiving the permission of school administration, the teacher of physical education, and the children's parents. Seeking to decrease the filming effect that might change the behavior of the ones being filmed (Thomas, Nelson, 2005); the teacher was asked not to change the usual course of the lesson. It was explained that the lesson itself would not be assessed, and that it was important for the researchers to record moving children. The material, used in the research, was filmed during repeated filming, with the assumption that an already familiar process of filming during the lesson once again would distract children less. Numbers were tagged to children's shirts according to their list in the school journal. The children's names and surnames were not used anywhere in the research seeking to ensure their anonymity. On the same day of the filming the Teacher's Report Form was distributed to teachers, and the 11–18-year-old Youth Self Report was distributed to the same set of children. The physical education teacher was asked to observe the same researched children and to assess them using the newly composed observation checklist. The teacher observed the children during four lessons. The tape with the children participating in a physical education lesson was watched by six groups of students, consisting of three persons in each. The students were not specially instructed; they were only informed shortly about emotional and behavioral, especially internal, problems and their outcomes. Students observed 12 randomly chosen children (four out of each class), and they filled in the checklist after 10 minutes of observation.

RESEARCH RESULTS

A group of three experts, using diagnostic systems DSM-IV (1994) and ICD-10 (1993), selected 68 statements that defined motor behavior of children with internal problems. These statements were evaluated by eight qualified specialists (2nd group of experts) with the help of a 5-point system: 1 – don't agree, 2 – slightly agree, 3 – don't know, 4 – partly agree, 5 – fully agree. During the selection of statements for the final checklist, attention was given to: 1) statements, which were assessed by experts as the most noticeable in a

movement situation, were left; their value average ranged from 3.75 to 5 (51 statements were left in the scale); 2) seeking to avoid statements assessed in a contradictory way by the experts, all statements, the item to total correlation of which was less than 0.40, were removed (26 statements were left); 3) in the last step each statement was analyzed separately, going back to diagnostic criteria, using thinking and not relying blindly on mathematical analysis (for example, both statements “a child is acting in an unorganized way” and “a child is moving as if aimlessly” described motor behavior which corresponded to the diagnostic criteria “unorganized behavior”; having decided that the statement “a child moves aimlessly” reflected the observed motor behavior better, the latter statement was left in the final list of statements). A list of 14 statements which were presented in the observation checklist was composed. The observation checklist form was chosen based on B. Lowenthal's (2001) suggestions. A decision was made to present basic information about the observer, the observed subjects, and explanatory information in the observation checklist. For the assessment of certain behavior, the 5-point *Likert scale* was chosen. The second expert group recommended defining assessment in such a way that after summing up the values undisturbed behavior would receive the smallest result, and the final result of the composed observation checklist would be the sum of assessment of all statements.

Motor behavior of almost all research participants was similar, and they did not have internal problems. Values of observation by the physical education teacher of all researched children were used to identify *internal consistency* of the checklist (see Table 1).

The result showed that the *internal consistency* of the checklist was good (Cronbach's $\alpha = 0.79$). The concurrence of opinions of separate observers is very important for the confirmation of the reliability of the checklist, for the identification of which the *ICC (intraclass correlation coefficient)* was chosen; and the ICC reflects the concurrence of opinions of separate observers when assessing the same research subject, as well as the consistency of the opinion of a certain observer when assessing all research subjects (the observed). Children's observation values of six student groups were used for the calculation of the *ICC*, which reflected *average correlation* among observers. Therefore before the calculation of the intraclass correlation

Table 1. The internal consistency of the checklist

Statements	Scale mean	Scale variance	Corrected item	Cronbach's Alpha
The child looks sad (unhappy)	19.613	34.943	0.3299	0.7857
The child is pulling his/her clothes	19.613	38.592	-0.0962	0.8093
The child looks distracted	19.213	34.305	0.1869	0.8073
The child is unsubmitive	19.133	33.279	0.3390	0.7873
The child prefers individual tasks	19.253	30.678	0.7214	0.7521
The child is frequently trying sit on a bench or somewhere else	19.613	35.835	0.3456	0.7858
The child's movements are constricted	19.5733	35.0132	0.3959	0.7821
The child moves like without a goal	19.560	35.196	0.3684	0.7836
The child demonstrates turns of anger	19.453	34.549	0.4384	0.7791
The child "stuck" to the teacher or another adult	19.493	35.524	0.2715	0.7896
The child's movements are unusually slow	18.933	29.279	0.5983	0.7601
The child begins to move only encouraged by an adult	19.253	31.976	0.4739	0.7738
The child is completely indifferent to the achievements and failures	19.253	30.678	0.6371	0.7579
The child does not interact with other children	19.133	29.063	0.7509	0.7444

coefficient, Pearson's correlation among all observers' groups was assessed.

Since the third group's assessment did not concur at all with the assessment of the fourth, fifth and sixth groups (Table 2), this group was removed from further reliability analysis. A *two way random effect model (absolute agreement)* was used to calculate the intraclass correlation coefficient (ICC). This model is most often used to check reliability when there is a need to define if the instrument is also suitable for other persons who have similar characteristics, and when there is no interaction between the observed and the observers. Based on the value of the intraclass coefficient (ICC = 0.81) it is possible to state that the *reliability* of the new checklist was good. The insignificant result of dispersion among the observer group ($F = 7.233$, $(df = 4)$ $p = 0.423$) shows that the observers agreed when assessing children. The dispersion of values of the observed children around the average did not influence the size of the *intraclass correlation coefficient*, and the children's sample was sufficiently heterogeneous.

The content of the observation checklist concurred with DSM-IV and ICD-10 categories, intended to diagnose anxiety, depression, and social phobia. This confirmed the validity of the contents of the new checklist. The statements, as observed in movement situations using the diagnostic

criteria of the diagnostic systems mentioned above, were defined and assessed by the expert team, thus ensuring the validity of all statements. Seeking to check the validity of the construct (checklist) of expression of children's internal problems in motor behavior, two assumptions were made: 1) the sum of the values of the subscales of internal problems of the Teacher's Report Form (6–18 years) and 11–18-year-old Youth Self Report Form should moderately correlate with the sum of values of the checklist of observation of motor functions, and 2) the sum of children's values in the subscales of external problems of the Teacher's Report Form (6–18 years) and 11–18-year-old Youth Self Report Form should not be related to the sum of values of the observation checklist.

Having checked the first assumption, we received that the data of the observation checklist moderately correlated with the data of the subscales of internal problems; a stronger relation was with the data of the subscales of internal problems of reports filled in by children (see Table 2). Having checked the second assumption that the sum of children's values in the subscales of external problems of the Teacher's Report Form (6–18 years) and 11–18-year-old Youth Self Report Form should not be related to the sum of values of the observation checklist, it was found that the sum of values of the observation checklist weakly correlated with the values of the

	N	Correlation coefficient	P
Observation protocol and subscale of internal problems (filled in by teachers)	75	0.42**	0.000
Observation protocol and subscale of internal problems (filled in by children)	75	0.46**	0.000
Observation protocol and subscale of external problems (filled in by teachers)	75	0.26*	0.022
Observation protocol and subscale of external problems (filled in by children)	75	0.37**	0.001

Table 2. Correlation between checklist and subscales of internal and external problems

subscale of external problems of teachers' external problems, but the relation between the observation checklist and values of the children's external problems subscale was acceptable (see Table 2).

DISCUSSION

Having composed a new assessment checklist it is important to explore, if this instrument may be used and if it may be expected that it provides the information that is expected to be received thus, it is important to analyze the reliability and validity of the new construct (Hinkle et al., 2003; Thomas, Nelson, 2005). More often it is emphasized that, when stating that one or another instrument is valid, research generalizations should be narrowed down to population and environment, for which the measuring instrument was created (Linacre, 2000; Ulrich, 2002). Due to the reasons mentioned above three separate methods (categories) to prove validity were used.

Validity *content-related evidence* reflects the degree to which the test tasks, questions or a checklist's statements reflect a certain defined area or entity. Content validity is usually generalized by logical validity (Yaghmale, 2003). In order to ensure the validity of the new checklist's contents, the following actions should be taken: a) to define the area of interest; b) to select an expert team which could assess the instrument using the set criteria; c) to select suitable statements for the test. The validity of the contents of this new checklist was proved exactly in this sequence.

It should be noted that another method of choosing statements for a new checklist was also tried. F. C. Verhulst (2003) distinguishes a *top-down approach* and a *bottom-up approach* for choosing statements for a new assessment instrument. According to this distribution, the top-down approach was chosen to create this checklist. It means that a group of experts decided, which statements described motor behaviour of children

with internal problems using diagnostic systems, and they suggested these statements for the future report. Another bottom-up approach of choosing statements is based on empiricism, i. e. a group of people observe children with internal problems and create a list of their typical motor behaviour which is later analyzed with the help of the factor analysis method. F. C. Verhulst (2003) and T. M. Achenbach (1991) state that such sequence of checklist construction allows to break free from the imperfection of diagnostic systems and to take a new look at emotional and behavioural disorders. The bottom-up approach of choosing statements was not chosen because for this approach a bigger amount of more exhaustive research is needed for confirmation of validity of the suggested checklist.

Seeking to retain the validity of the checklist's content and to provide it with empiricism, the advice of J. Yun and D. A. Ulrich (2002) was used. Experts of different specialities were chosen for the assessment and correction of statements. The criteria of expert selection may seem not strict enough, but the future instrument is not meant for diagnosis, and conclusions, received with its help, will not have serious outcomes for a child's development. Since the future checklist is intended for observation of motor behaviour, the most important criteria for selection of experts was the ability to observe motor behaviour. The experts were asked to attribute a degree to each statement, by which it is observed in a movement situation. Since an assumption was made that diagnostic criteria described behaviour of children with internal problems per se, there was a request to disassociate from the assessment of contents of the statement. The decision which statement should be left in the final version was quite difficult because the general internal consistency of the scale of 68 statements was high (Cronbach's $\alpha = 0.929$), and that means that the experts agreed that most of the statements were observed in a movement situation. But in this case it should be emphasized that this

index is influenced by the length of the scale. The longer the scale, the bigger its internal consistency (Portney, Watkins, 2000). Then other methods of statistical analysis were used in order to select statements, which would be easily observed in a movement situation and would not be repetitive. Therefore, averages of expert values were used to remove the statements which were assessed as not observed in a movement situation. All statements with an average of less than 3.75 were removed, and so the checklist became shorter. Then the discrimination index was calculated. A. Anastasi and S. Urbina (1997) state that the sufficient value of this index for certain tests is 0.2, but statements with the correlation of 0.35 with other statements were left in this checklist, because the test was intended to measure a unified construct. Based on the recommendations of D. A. Ulrich (2002), the remaining statements were selected with the help of logical thinking. Going back to diagnostic criteria and discussion of the place of the analyzed statement in the checklist, there was an attempt for the future checklist to encompass all internal problems observed in a movement situation. B. Lowenthal's (2001) suggestions were used when forming the checklist, but of course there is a need for further development of the checklist form.

The compiled checklist was tested twice. Both times useful advice was received for further work with the checklist, and data were collected for further examination of validity and reliability. But only theoretical validity is not sufficient in order to claim that the new checklist is valid. Seeking for stronger proof, the *construct identification validity* of the new checklist was also assessed. Construct validity is the degree, by which the test measures the theoretical construct or feature (Anastasi, Urbina, 1997). In this case a question was raised if the checklist could in fact help identify expressions of children's internal problems in motor behaviour. The received results allow to state that the new checklist is valid for the observed sample of children; it may be used to assess the observed motor behaviour of children with internal problems. The value from 0.4 to 0.5 of the correlation coefficient may be interpreted as an average relation between the data received from the observation checklist and data of the subscales of internal problems. This is also confirmed by data presented in scientific literature when discussing low values of correlation coefficients, having in mind the information received from different informants. Literature states that there might be a weak connection ($r \approx 0.2-0.3$) among

answers of informants who observe children in different contexts, among answer results of parents and children, and among children themselves and among parents or teachers (Puura et al., 1998). That means that in this case the correlation ($r = 0.46$) among answers of children and observation results of the physical education teacher is sufficient. The correlation coefficient is stronger also because the physical education teacher who filled in the checklists did not know the children and had not communicated with them before.

A reliable instrument is such an instrument which acts with a predictable stability in fixed circumstances (Portney, Watkins, 2000). Internal consistency of homogeneity of the checklist is one of the most important characteristics that ensures reliability enabling to decide if all statements of the checklist are homogeneous, or if some of them are attributable to another area (Portney, Watkins, 2000). The internal consistency of the checklist's Cronbach's α increased from 0.79 to 0.83 after the removal of two statements from the checklist. Probably the statement "the child is "glued" to the teacher or another adult" should be removed from the checklist when the checklist is improved because, after giving it a lot of thought, it is really difficult to assess this statement on a 5-point scale according to the intensity of the manifestation of "being "glued" to someone". Before removing the statement "a child experiences fits of anger" research with a more heterogeneous population should be performed, including children with serious internal problems in the research.

Determination of the reliability index among separate assessors allows to state that results received by an assessor reflect the real result of the assessed, and results may be interpreted and applied with bigger confidence (Portney, Watkins, 2000). Reliability among separate observers was calculated using the intraclass correlation coefficient. A good accordance value was received ($ICC = 0.81$). But as the checklist is developed, it is useful to discuss two questions: a) selection and interpretation of the intraclass correlation coefficient model. Basically the ICC index was selected due to its advantages over the simple correlation coefficient. L. G. Portney and M. P. Watkins (2000) distinguish two main advantages: 1) when a simple correlation is calculated, only two observers may be compared at once, whereas the ICC index allows to compare the compatibility of the opinion of many observers at once; 2) a simple correlation coefficient cannot distinguish the dispersion component from the data with no regard if the dispersion is because

of an error factor or because of real differences in data. The ICC is one of the suitable indices, when a Likert type scale is used for assessment. Since it was planned beforehand that it was important to prove that other similar observers could receive similar results, the ICC calculation model was chosen, where each person was assessed by the same number of observers. It is expected that observers reflect a population of similar observers because there is an aim to generalize that students, who have got acquainted with children's motor development, could use this checklist. Although the sample of assessors is not accidental, nevertheless L. G. Portney and M. P. Watkins (2000) recommend choosing the ICC calculation model that was used because in another case it would be possible to state that results are reliable only for those observers who have performed the observation. A question may arise, why children were observed by students, and not a physical education teacher or a specialist of applied physical activity. Such selection was determined by two reasons: a) firstly, there is the problem of research organisation: it would be quite hard to collect a sufficiently big group of physical education teachers, and it would be even more difficult to collect a group of specialists of applied physical activity; b) secondly, an assumption was raised that if reliable results were received among students who had little practice of work with children with special needs, this would ensure the results among specialists with bigger experience to be also reliable. Of course, the latter assumption should be tested. Other indicators that ensure reliability of a checklist could also be calculated (for example, the index of repeated testing, stability in time). Besides, specificity and sensitivity of the checklist should be

analysed also, identifying which value defines that a child needs help of qualified specialists.

CONCLUSIONS AND PERSPECTIVES

Using diagnostic systems DSM-IV and ICD-10, a list of 68 statements was composed that codes the expression of internal problems in motor behaviour. Having performed statistical and empirical analysis of all statements, a checklist of 14 statements for observation of the expression of internal problems in motor behaviour was composed.

Observation data about motor behaviour of 11–12-year-old children was gathered, using the composed checklist. The data showed that the researched children did not have internal problems. Statements that might describe motor behaviour of children with internal problems better than other statements were distinguished.

Based on Cronbach's α ($\alpha = 0.79$), a satisfactory internal consistency of the checklist was determined. After the removal of two statements from the checklist, the internal consistency increased to good ($\alpha = 0.83$). Research with a clinical sample would allow to conclude about the heterogeneity of the statements mentioned above more strongly. A good concurrence level among different observers was identified with the help of the intraclass correlation coefficient ($ICC = 0.81$).

Having assessed the validity of the checklist's content, statements, and the construct, it was determined that the checklist was valid for the determination of expressions of internal problems in motor behaviour for the sample of the observed children.

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MOTORINIO ELGESIO PROTOKOLO MODELIAVIMAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Tyrimas pradėtas remiantis hipoteze, kad tiesioginis vaiko stebėjimas gali būti vidinių problemų vertinimo dalis. Vaikų, sergančių depresija, tyrimų rezultatai rodo ryškius elgesio depresijos simptomus, pavyzdžiui, standartizuotų procedūrų metu galima stebėti psichomotorinį sujaudinimą.

Tikslas – sukurti motorinio elgesio stebėjimo protokolą koduojant specifinį vaikų, turinčių vidinių sutrikimų, elgesį.

Metodai. Buvo tiriami 11–12 metų vaikai ($n = 75$), kurių dalyvavimas kūno kultūros pamokoje buvo nufilmuotas. Motorinio elgesio kodavimui naudoti teiginiai iš DSM-IV ir ICD-10. Sudaryto protokolo informatyvumui patikrinti buvo naudojami Mokytojo vertinimo klausimynas ir 11–18 metų Jaunuolio savęs vertinimo lapas (TRF). Protokolo patikimumas taip pat buvo patikrintas.

Rezultatai. Iš 68 teiginių, nusakančių vaikų motorinį elgesį, buvo atrinkta 14 ir sudarytas protokolas, nusakantis vaikų, turinčių vidinių problemų, motorinį elgesį. Tyrimo rezultatai parodė, kad sudaryto protokolo vidinis suderinamumas (Cronbach $\alpha = 0,79$) ir patikimumas ($ICC = 0,81$) yra geras. Nereikšmingas stebėtojų dispersijos rezultatas ($F = 7,233$, ($df = 4$) $p = 0,423$) rodo, kad jie, vertindami vaikus, sutarė.

Aptarimas ir išvados. Stebėtų vaikų imties rezultatų protokolas yra informatyvus ir naudingas nustatant potencialias vaikų vidines problemas bei padedant planuoti intervencijas, lemiančias motorinį vaikų elgesį. Tyrimas turėjo keletą apribojimų – mažas tiriamųjų skaičius, reikalinga išsamesnė protokolo informatyvumo bei patikimumo analizė.

Raktažodžiai: stebėjimas, vidinės problemos, motorinio elgesio protokolas, patikimumas, informatyvumas.

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THE IMPACT OF EDUCATIONAL COUNSELING ON THE ALTERATION OF ATHLETIC IDENTITY AMONG ADOLESCENTS

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ABSTRACT

Research background and hypothesis. The article deals with the manifestation of athletic identity of senior students of secondary schools as a major precondition for the development of physical education among adolescents and health-favouring lifelong physical activity (Anderson, 2004; Bélanger, et al., 2011). The hypothesis of the paper is that under educational counseling, the evaluations of athletic identity among adolescents increase.

Research aim was find out the impact of educational counseling (EC) on the alteration of athletic identity (AI) of adolescents.

Research methods. In order to evaluate AI among adolescents, a methodology of EC was employed. To reveal issues faced by adolescents, questions of four types were employed: Exception, Miracle, Coping and Scale questions together with PA definition questions (*International Physical Activity Questionnaire short form*). The evaluation of AI was performed with the *Athletic Identity Questionnaire for Adolescents* as developed by C. B. Anderson, L. C. Mâsse and A. C. Hergenroeder (2007) consisting of forty statements which were evaluated in the Likert scale from 1 to 5 by the research participants.

The research involved 553 students (294 females and 259 males) whose age average was 16.75 ± 1.11 years. The students were randomly assigned to EC impact (253 students) and comparison (300 individuals) groups. The members of the impact group were counseled from one to six times regarding PA and other problems while the adolescents constituting the comparison group merely indicated their PA and other issues; they were not counseled.

Research results. The evaluation of AI and its constituent parts in the impact and comparison groups were not statistically significant before EC ($p > 0.05$).

During the period of EC, the values of AI and its constituents regarding the importance of PA and incentives to be involved in PA statistically significantly improved in the adolescents facing problems connected with PA of the impact group.

EC was more efficient for those adolescents who were not sufficiently involved in classes of physical education. They showed significant ($p < 0.05$) improvement not only in terms of AI but also concerning the values of the importance of PA and the evaluations of social incentives (general incentives).

Discussion and conclusions. EC positively impacted the alteration of AI among adolescents. During the period of EC, statistically significant ($p < 0.05$) improvement was observed in the evaluations of AI regarding its constituent parts, the importance of PA and incentives for PA among the adolescents who had been facing problems linked to PA. The AI values statistically significantly ($p < 0.05$) increased in both males and females during the period of EC. The impact of EC on the athletic identity was insignificant ($p > 0.05$) in adolescents exhibiting problems in communication with teachers of physical education.

Keywords: educational counseling, athletic identity, physical activity.

INTRODUCTION

During the period of adolescence, self-identification and the evolution of the identity of the personality represent a process of crucial importance (Shek, Wong, 2011). During this period, further development of adults, their value attitudes and consequently

their behavior are also shaped (Shek, Wong, 2011). During adolescence, both females and males are concerned about their looks, weight and body shapes, they feel less satisfied with their personal “self” (Lawler, Nixon, 2011).

The self-reflection directs the attention of an individual in a certain direction and relates with the self-esteem of the individual. The clearly conceived physical self directs the adolescent to clearly motivated behavior regarding being physically active or inactive (Weiss, Williams, 2004).

The self-reflection of the physical “self” becomes more and more important in everyday life, especially among the youth and adolescents (Laus et al., 2011).

When regarding the realization of one’s “self” as a multidimensional component, athletic identity represents its inseparable part; according to C. B. Andersen (2004), it consists of four segments: looks, importance, competence and incentives (for physical activity). These segments may be laid out in several levels exhibiting a principle of hierarchy. The present research highlights incentives by parents and friends. When promoting physical activity among adolescents, the importance of social incentives is singled out (Bélanger et al., 2011). It is believed (Anderson et al., 2007) that constituents of athletic identity are related to the physical activity of adolescents.

It has been observed that those adolescents whose athletic identity is more prominent do better in their studies, miss fewer classes and have less behavioral problems at school (Videon, 2002). On the other hand, individuals denoted by more prominent athletic identity get involved in athletic activity more frequently (Tasiemski et al., 2004).

The aim of the research was to discover the impact of educational counseling on the alteration of athletic identity in adolescents.

The object of the research was the alteration of athletic identity among adolescents.

The hypothesis was that under the impact of educational counseling, values of athletic identity among adolescents would improve.

RESEARCH METHODS

A methodology of educational counseling on the grounds of the method of *solution focused brief counseling* (Simon, Berg, 1999) was applied in order to evaluate its impact on the athletic identity

of adolescents. The philosophy of educational counseling is based on the idea that an adolescent possesses many strengths and is able to change himself/herself and his/her life.

The methodology of educational counseling is oriented towards solutions in a developing troublesome situation from the point of view of the adolescent; the empathic attitude of the counselor to the global outlook of the adolescent, the employment of the strengths and internal powers and the establishment of positive relationship between the adolescent and the counselor are applied; specific and clear objectives are outlined during the course of counseling.

In order to reveal problems faced by adolescents, questions of four types were employed:

Exception questions enable the adolescent to spot the moments when the problem which is the cause of counseling is not present and to reflect the moments when the outlined difficulty is not manifested or is rarer/ less prominent or not so significant.

Miracle questions (miracles are often expected in counseling sessions) evoke situations when the problem to be solved is nonexistent anymore. The behavior of the client is sought to be discovered in a situation when the problem no longer exists and it becomes the objective when seeking the fulfillment of adolescent’s objectives and expectations. Questions also prompt the adolescent to undertake responsibility of making objectives and expectations come true.

Coping questions seek to reveal the strengths of the adolescent by discovering how s/he manages to achieve the state so that the situation does not get worse. Coping questions are most useful when the adolescent is unmotivated to deal with his/her problem or believes that there is no solution in his/her situation.

Scale questions are employed to get the adolescent evaluate the complexity of his/her problem and his/her determination to change or do something to decrease the problem.

Activity definition questions strive to find out the behavior of the adolescent when the problem is no longer present. The definition of activities helps to evaluate changes as the expectations and objectives of the adolescent are more clearly defined and transparent.

At the end of an educational counseling session, the adolescent is presented with assignments in the

form of suggestions contributing to “reorientation” of the adolescent towards individual search for the solution of the problem.

In order to **evaluate physical activity**, the adapted (Lekečinskaitė, 2009) seven-question short form of the *International Physical Activity Questionnaire* was employed. This is the most efficient and widely used method for the establishment of subjectively measured physical activity of an individual (Lee et al., 2011).

The evaluation of athletic identity was performed with the adapted *Athletic Identity Questionnaire for Adolescents* (Anderson et al., 2007) constituting 40 statements (e. g. *After illness or injury, I begin exercising/doing physical activity again as soon as possible* or *I really like to be physically active*) assessed in Likert scale from 1 to 5 by the research subjects; 1 = I completely disagree with the statement; 2 = I partially disagree with the statement; 3 = I neither agree nor disagree with the statement; 4 = I partially agree with the statement; 5 = I fully agree with the statement. The Lithuanian scale adaptation was made by the authors of the article preparing double translation and cooperating with Prof. C. B. Anderson.

The total internal consistency of the 40 statements of the *Athletic identity questionnaire for adolescents* was verified by Cronbach’s alpha of 0.934 while its separate subscales exhibited the following numerical values: looks (Cronbach’s alpha 0.820), competence (Cronbach’s alpha 0.808), importance (Cronbach’s alpha 0.887), general incentive (Cronbach’s alpha 0.912), incentive by parents (Cronbach’s alpha 0.844) and incentive by friends (Cronbach’s alpha 0.857); hence the questionnaire was suitable for use in the research.

Before performing calculations, the correspondence of data distribution to the regular distribution was checked by employing Kolmogorov-Smirnov and Shapiro-Wilk criteria.

The verification of statistical significance of value average differences was calculated with Student’s *t* criterion at the level of significance $p < 0.05$ by employing SPSS version 17.0.

PARTICIPANTS OF THE RESEARCH

The research involved 553 students (294 females and 259 males) whose age average was 16.75 ± 1.11 years. The students were randomly

assigned to education counseling impact (253 students) and comparison (300 students) groups. The age and group distribution of male and female participants was not statistically significant ($p > 0.05$). The members of the impact group were counseled from one to six times regarding physical activity and other problems (the average number of counseling sessions was 3.93 ± 0.98 regarding physical activity and other problems) while the adolescents constituting the comparison group merely indicated their physical activity and other problems; they were not counseled. Permission from principles of the participating schools were obtained; all the students participated in the research voluntarily and were aware of the confidentiality of the research data.

RESEARCH RESULTS

The data of the impact group and comparison group in terms of athletic identity of the adolescents facing problems connected with physical activity and the constituent elements of athletic identity are presented in Table 1.

The values of athletic identity and its constituents before educational counseling were not statistically significantly different among the impact and comparison group adolescents ($p > 0.05$).

The data on the level of athletic identity and its constituents in males and females are presented in Table 2.

The results of the research revealed that athletic identity of males was statistically significantly more prominent in comparison with females. Differences were established when comparing specific constituents in the male and female groups as well. It was found that males valued their athletic competence and the importance of physical activity. The general incentive and the incentive produced by parents to be physically active manifested at a statistically significantly higher level in males than in females. Significant differences were not observed between males and females only in the evaluation of their sporty looks and regarding the friends’ incentive to be physically active.

Data on the alteration of athletic identity and its constituent elements in adolescents of the impact group facing problems connected with physical activity during the period of educational counseling EC (M, SD) are presented in Table 3.

During the period of educational counseling, the values of athletic identity and its constituents,

Table 1. Values of athletic identity and its constituents before educational counseling (M, SD)

Variables	Impact group	Comparison group	t	p
Athletic identity	3.45 ± 0.62	3.48 ± 0.73)	0.31	0.752
Constituents of athletic identity				
Competence	3.88 ± 0.76	3.86 ± 0.86	-0.15	0.875
Looks	3.65 ± 0.84	3.79 ± 0.96	1.29	0.196
Importance	3.50 ± 0.88	3.53 ± 0.93	0.28	0.778
Incentive by parents	3.14 ± 0.93	3.00 ± 0.96	-1.19	0.232
Incentive by friends	2.72 ± 0.92	2.83 ± 0.97	1.00	0.314
Incentive, general	2.79 ± 0.80	2.74 ± 0.81	-0.50	0.616

Table 2. Manifestation of athletic identity and its constituent elements in males and females (M, SD)

Variables	Males	Females	t	p
Athletic identity	3.62 ± 0.71	3.37 ± 0.68	4.21	0.0001
Constituents of athletic identity				
Competence	4.06 ± 0.76	3.73 ± 0.86	4.78	0.0001
Looks	3.80 ± 1.05	3.76 ± 0.81	0.47	0.633
Importance	3.82 ± 0.87	3.31 ± 0.90	6.71	0.0001
Incentive by parents	3.18 ± 0.93	2.89 ± 0.94	3.57	0.0001
Incentive by friends	2.85 ± 0.95	2.81 ± 0.96	0.55	0.579
Incentive, general	2.83 ± 0.76	2.70 ± 0.82	1.99	0.046

Table 3. The alteration of athletic identity and its constituent elements in adolescents of the impact group facing problems with physical activity during the period of educational counseling (M, SD)

Variables	Before EC	After EC	t	p
Athletic identity	3.45 ± 0.62	3.53 ± 0.59	-4.22	0.0001
Constituents of athletic identity				
Competence	3.88 ± 0.76	3.91 ± 0.77	-0.71	0.479
Looks	3.65 ± 0.84	3.67 ± 0.85	-1.42	0.158
Importance	3.50 ± 0.88	3.75 ± 0.87	-4.65	0.0001
Incentive by parents	3.14 ± 0.93	3.12 ± 0.89	0.37	0.721
Incentive by friends	2.72 ± 0.92	2.71 ± 0.92	0.40	0.685
Incentive, general	2.79 ± 0.80	2.82 ± 0.78	-2.90	0.005

the importance of physical activity and the incentive to be physically active improved statistically significantly ($p < 0.05$) among the adolescents of the impact group facing problems linked to physical activity.

In the comparison group, neither athletic identity nor its constituents exhibited statistically significant changes ($p > 0.05$).

In terms of the aspect of gender, values of athletic identity in both males and females during the period of educational counseling improved statistically significantly ($p < 0.05$). However, when evaluating specific constituents of athletic identity, certain differences were observed. Both males and females exhibited significant ($p < 0.05$)

improvement of physical activity evaluations, while only females showed statistically significant increase in social (general) incentive.

The impact of educational counseling on athletic identity was insignificant ($p > 0.05$) in those adolescents who were facing problems in communication with teachers of physical education.

Educational counseling was more efficient in adolescents who had been involved in physical education classes insufficiently. They significantly ($p < 0.05$) increased the evaluations not only of the athletic identity but also those of the importance of physical activity and the social (general) incentive.

DISCUSSION

The obtained results of the research reveal that the social incentive to be physically active receives lower evaluation among adolescents than other constituents of athletic identity. Regarding the need of an adolescent to be physically active, the social environment plays one of the key roles (Bélanger et al., 2011).

The method of educational counseling is directed towards behavioral changes in the adolescent; as other researchers suggest (Peterson, 2005; Anshel, Seipel, 2009), such counseling can alter even previously acquired incorrect life habits.

During the period of counseling, motivation, i. e. the inclination of students to do something in order to decrease the urgency of the problem, gradually increased from the first session onwards, which marks the positive disposition of adolescents to deal with the arising problems in the physical activity and other topical fields. Thus, it is likely that students consider educational counseling to be acceptable; this incites students to look for solutions and to substitute non-adaptive behavior by constructive behavior. It also promotes their willingness to address a counselor next time with a new problem arising, provided it cannot be solved by the student him/herself.

The obtained results of the research suggest that with the help of educational counseling, physical activity and other urgent problems may be efficiently solved as the subjective evaluation of the pointed out problems systematically decreased from the first counseling session onwards. After three sessions, moderate or prominent changes (i. e. the subjective solution of the problem) were indicated by 65.6 per cent of the counseled individuals. Similar results were obtained by other

authors (Shefler, 2000; Kvarme et al., 2010; Niemi, Tiuraniemi, 2010).

Part of the students seeking counseling regarding problems connected with physical activity also faced difficulties in communication with teachers of physical education, this was not an exceptional case typical of only this research. The qualitative research by V. Fominienė (2007) showed that during classes of physical education, communication and cooperation problems frequently occurred. It is likely that the arising obstacles of pedagogical communication in the educational process should be dealt with by applying additional educational measures, i. e. educational counseling thus ensuring proper promotion of physical activity among students.

The least significant changes in athletic identity after educational counseling were observed among those students who were involved in counseling regarding problems in interaction with teachers of physical education, while the most prominent changes took place regarding insufficient involvement in classes of physical education. Hence the most vulnerable group of students whose athletic identity prior to educational counseling was the least prominent indicated the greatest changes in athletic identity after educational counseling.

During the research, part of the students participated only in two counseling sessions claiming that they achieved the previously stated objectives. From our point of view, this indicates that the solution of certain urgent problems among adolescents may be efficiently provided by the method of educational counseling. Other researchers express the same opinion (Shefler, 2000; Pourebrahim et al., 2011).

The results of this research corroborate data provided by other authors indicating that the efficiency of educational counseling is unrelated with the gender of the counseled individual (Goštautas et al., 2005). Educational counseling provides an adolescent with an alternative of behavior as orientation towards solutions is undertaken in the current troublesome (from the adolescent's point of view) situation instead of accusation of the adolescent regarding improper behavior or his/ her previous failures. Hence, the counseled individual rather than the counselor creates the efficiency of the method (Williamson, 2008).

Adolescents are given coherent questions; thus the counselor not only gathers information on the problems faced by the adolescent, but also creates a favorable environment of cooperation. This helps with the development of an empathic attitude of the counselor towards the global outlook of the adolescent and the creation of the positive relationship between the adolescent and the counselor providing preconditions of outlining specific and clear objectives in the process of counseling (Frels et al., 2009).

After educational counseling, manifestation of athletic identity and physical activity in adolescents was positively altered. In the course of this educational experiment, an impact on the development of the positive physical “self” was planned. As the feeling of athletic identity is under permanent development (Tasiemski et al., 2004), its promotion is feasible anytime. Better results are likely to be achieved if athletic identity is promoted since childhood, for example, since primary school. Yet it is not clear whether the method of educational counseling could be suitable for children and adolescents of various ages.

The results of the research revealed that educational counseling was a suitable method for dealing with problems of physical activity in students and pedagogical communication obstacles during the physical education classes. This is also highlighted in other research claiming that educational counseling may be efficient in dealing with physical activity problems (Williams, Streat, 2005; Lin et al., 2010).

Other researchers stress the efficiency of this method in the cases of its application by teachers (Murphy, 1994), psychologists (Williams, Streat,

2005), social pedagogues or society health developers (Franklin et al., 2008).

When considering the peculiarities of the age of adolescence and the inconsistency of problems or the changes in personality, it is possible to claim that educational counseling should be applied not only as a one-time tool of the stimulation of the education process but rather as a regular supportive measure.

CONCLUSIONS AND PERSPECTIVES

1. Educational counseling positively affects changes in the athletic identity of adolescents.

2. During the period of educational counseling, the evaluations of athletic identity and its components, the importance of physical activity and incentives to undertake physical activity increased statistically significantly ($p < 0.05$) among adolescents facing problems connected with physical activity.

3. The evaluations of athletic identity in males and females during the period of educational counseling improved statistically significantly ($p < 0.05$).

4. The impact of educational counseling on the athletic identity was insignificant ($p > 0.05$) in those adolescents who had problems in communication with teachers of physical education.

The future prospects of the research are related with the investigation of the suitability of the method of educational counseling for children and adolescents in various age groups.

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EDUKACINIO KONSULTAVIMO POVEIKIS PAAUGLIŲ SPORTINIO TAPATUMO KAITAI

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Straipsnyje nagrinėjama vyresniųjų klasių moksleivių sportinio tapatumo raiška kaip svarbi prielaida ugdant jaunuolių kūno kultūrą ir sveikatai palankų fizinį aktyvumą visam gyvenimui (Anderson, 2004; Bélanger, et al., 2011). Hipotezė: dėl edukacinio konsultavimo paauglių sportinio tapatumo įverčiai gerėja.

Tikslas – išsiaiškinti edukacinio konsultavimo poveikį paauglių sportinio tapatumo kaitai.

Metodai. Paauglių sportiniam tapatumui paveikti naudota edukacinio konsultavimo metodika. Paauglio problemai atskleisti buvo naudojami keturių rūšių klausimai: Išimčių, Stebuklo, Susidorojimo, Skalės ir Veiksmų apibūdinimo. Fiziniam aktyvumui vertinti naudota adaptuota trumpoji IPAQ septynių klausimų forma, sportinio tapatumo vertinimui – adaptuotas *Athletic Identity Questionnaire for Adolescents* (Anderson et al., 2007) klausimynas iš 40 teiginių, kuriuos konsultuojamieji vertino Likert skalėje nuo 1 iki 5.

Buvo tiriami 553 moksleiviai (amžiaus vidurkis – $16,75 \pm 1,11$ m.), tarp kurių 294 merginos ir 259 vaikinai. Moksleiviai atsitiktinės atrankos būdu buvo paskirstyti į edukacinio konsultavimo poveikio (253 paaugliai) ir lyginamąją (300 paauglių) grupes. Poveikio grupės tiriamieji konsultuoti dėl fizinio aktyvumo ir kitų problemų nuo 1 iki 6 kartų, o lyginamosios grupės paaugliai nurodė turį fizinio aktyvumo ir kitų problemų, bet nebuvo konsultuoti.

Rezultatai. Sportinio tapatumo ir jo komponentų įverčiai prieš edukacinį konsultavimo poveikio ir lyginamosios grupės paauglių reikšmingai nesiskyrė ($p > 0,05$).

Edukacinio konsultavimo laikotarpiu statistiškai reikšmingai ($p < 0,05$) pagerėjo poveikio grupės fizinio aktyvumo problemų turėjusių paauglių sportinio tapatumo, jo komponentų fizinio aktyvumo svarbos ir fizinio aktyvumo paskatos įverčiai.

Edukacinis konsultavimas buvo veiksmingesnis tarp paauglių, nepakankamai įsitraukusių į kūno kultūros pamokas. Reikšmingai ($p < 0,05$) pagerėjo ne tik jų sportinio tapatumo, bet ir fizinio aktyvumo svarbos bei socialinės paskatos (bendros paskatos) įverčiai.

Aptarimas ir išvados. Edukacinis konsultavimas teigiamai veikia paauglių sportinio tapatumo kaitą. Edukacinio konsultavimo laikotarpiu statistiškai reikšmingai ($p < 0,05$) pagerėjo fizinio aktyvumo problemų turėjusių paauglių sportinio tapatumo bei jo komponentų fizinio aktyvumo svarbos ir paskatos įverčiai. Merginų ir vaikinų sportinio tapatumo įverčiai edukacinio konsultavimo laikotarpiu pagerėjo statistiškai reikšmingai ($p < 0,05$). Edukacinis konsultavimas reikšmingai nepaveikė sportinio tapatumo ($p > 0,05$) tų paauglių, kurie turėjo bendravimo su kūno kultūros mokytojais problemų.

Raktažodžiai: edukacinis konsultavimas, moksleiviai, sportinis tapatumas, fizinis aktyvumas.

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MODELS AND INTERACTION OF INTENSIVE TRAINING AND SPORT PERFORMANCE OF 14–15-YEAR-OLD ATHLETES IN RHYTHMIC GYMNASTICS

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ABSTRACT

Research background and hypothesis. The efficacy of athlete's sport performance depends on the targeted training in certain periods, organization, management, individual adaptation of an athlete to the loads of training and competitions.

Research aim of this work was to determine the impact of intensive training on sport performance of 14–15 year old athletes in rhythmic gymnastics and their optimization.

Research methods. The experiment resulted in modeling two different training programs and establishing the structure of the content of the training programs, as well as athletes' sports performance. The training loads protocols registered the time for choreography, element mastering, competitive routines and athletic training in each training session. The efficacy of the training programs was established registering the realization of competitive activities under competitive conditions according to the number of points received by the gymnast of each training program and according to the place won. When we tried to establish if the training sessions and competitive loads matched the specificity of competitive activities, we registered the changes in the athletes' heart rate during different training sessions.

Research results. Training of athletes in two training programs was different – their training loads were not significantly different – from 672 to 697 hours a year, as well as the indices of the training days – from 5.4 to 5.6 days a week, but the training content differed significantly. In most effective training program choreographic training dominated (30.9%). Statistically significant differences ($p < 0.05$) were found in the indices of explosive strength and muscular power, specific endurance and coordination movement abilities. At the beginning of the season and at the end of it the realization of the body movement technique performing routines with different tools was not different ($p > 0.05$).

Discussion and conclusion. Sports performance of 14–15-year-old athletes in rhythmic gymnastics was mostly influenced by the time for mastering competitive routines ($r = 0.836$); however, the research did not establish differences in intensifying training. Besides the importance of integral athletic fitness, explosive strength, and strength endurance, the research established the significance of aerobic fitness ($r = 0.704$) for sports performance. Moreover, the significance of body composition indices increased in comparison with previous training years: body height ($r = -0.819$), body weight ($r = -0.657$), and BMI ($r = -0.836$).

Keywords: rhythmic gymnastics, training, performance, metamodel.

INTRODUCTION

Rational harmonization of training loads and intensity time is a precondition of successful management of training athletes (Mester, Perl, 2000). It depends on the targeted training in certain periods, organization, management, individual adaptation of an athlete to the loads of training and competitions (Mester, Perl, 2000; Edelmann-Nusser

et al., 2002). If the requirements of athlete training mentioned above are followed, there are premises for their successful participation in the most important international competitions.

While registering and analyzing competitive activities it is possible to establish the level of their interaction with different components of athlete

training (Mester, Perl, 2000; Edelmann-Nusser et al., 2002; Avalos et al., 2003; Perl, 2004; Bügner, 2005; Hellard et al., 2006). Besides, registering and analyzing competitive activities enable us to foresee the tendencies of a sport, forecast sports results, and plan the trends of athlete training. J. Perl (2001, 2004) called this interaction of training loads and performance the *Metamodel* – the theoretical interaction of training and sport performance – when we need to find an optimal model of athlete training which would allow achieving the highest level of sport performance.

Rhythmic gymnastics is a sport which requires early selection of athletes (Лисицкая et al., 1982; Balyi, 2001; Карпенко, 2003; Balyi, Hamilton, 2004), intensive training in the periods of childhood and adolescence (Jastrejbmskaia, Titov, 1999; Карпенко, 2003) and early termination of the sports career (Стамбулова, 1999). In the period of sports performance perfection and seeking for high sports results (Лисицкая и др., 1982; Douda et al., 2002; Карпенко, 2003) the training loads of 14–15-year-old athletes in rhythmic gymnastics become greater and more intensive (Fan et al., 2004).

Most research of this kind has been carried out in swimming (Edelmann-Nusser et al., 2002; Avalos et al., 2003; Bügner, 2005; Hellard et al., 2006) and track-and-field athletics (Banister et al., 1999). In our previous research (Rutkauskaite, Skarbalius, 2009, 2011) the adaptation to physical loads, intensity of training loads and competitive activities of the rhythmic gymnastics have been studied, but for 11–14-year-old gymnasts. That is why the **aim** of this work was to determine the impact of specific training on sport performance of 14–15-year-old athletes in rhythmic gymnastics.

RESEARCH METHODS

Subjects and experiment design. The research involved the training of 14–15-year-old athletes ($n = 10$) in rhythmic gymnastics from the National and Kaunas city teams (Lithuania) (Table 1). The experiment resulted in modeling two (A and B) different training programs (5 gymnasts in each training program) and establishing the structure of the content of the training programs for all macrocycle (48-week duration), as well as athletes' sports performance. The training loads protocols registered the time for choreography, elements learning, competitive routines and athletic training in each training session (Лисицкая и др., 1982; Jastrjemskaia, Titov, 1999).

The efficacy of the training programs was established registering the realization of competitive activities under competitive conditions, according to the number of points received by the gymnast of each training program, according to the place won (the points awarded in the descending order). Participation of gymnasts in competitions was different because not all of them succeeded in winning the right to participate in more important competitions – national and international.

Research hypothesis (H_0) was that different training programs (Tables 2 and 3) have the same impact on sports performance. The alternative hypothesis was that different training programs have different impact on sport performance (H_1). Independent variables were the duration, content, volume, intensity of training loads, and the dependent variable was athletes' sport performance.

The following **research methods** were used in this research:

- **Anthropometry.** Height in the standing position and body mass components (body mass, body mass index BMI, subcutaneous body fat layer in percent (%), and kilograms (kg))(TANITA BODY ANALYSER TBF–300);
- **Physical fitness.** Athletic fitness of female athletes was estimated applying tests of flexibility (tests of “bridge” and “splits”), complex abilities of flexibility and balance (test of “leg keeping”), muscular endurance (push-ups, sit-ups and lifting legs), specific endurance (test of “jumping into rope with double turns”), coordination abilities (“10 seconds running into the rope”) and explosive strength (standing long jump on both feet). Research presented absolute values of estimation of movement abilities, and the values estimated in points. The integral index estimating athletic fitness was received summing up the points of each test (Лисицкая и др., 1982; Jetrejamskaja, Titov, 1999; Говорова, Плекшань, 2001; Карпенко, 2003).
- Gymnasts' **mental fitness** (subjective fitness for the competition – self-confidence) was evaluated before each competition. Self-confidence was evaluated applying the methodology based on the *Dembo-Rubinschtein* scale. Each subject evaluated herself before every competition: 10 points indicated the best mental fitness, and 1

Before experiment ($\bar{x} \pm SD$)					
Training groups	Age, years	Height, cm	Body mass, kg	BMI	Body fat, %
A (n = 5)	14.4 ± 0.55	172.0 ± 5.09	54.3 ± 3.25	18.3 ± 0.65	13.5 ± 2.59
B (n = 5)	14.2 ± 0.84	163.4 ± 4.44	50.0 ± 3.79	18.7 ± 1.07	13.6 ± 3.36
Mean ($\bar{x} \pm SD$)	14.9 ± 0.67	167.7 ± 6.39	52.1 ± 4.04	18.5 ± 0.85	13.5 ± 2.83
Kolmogorov–Smirnov Z test; p level	F = 0.2; p > 0.05 **	F = 8.07; p < 0.05 *	F = 3.81; p > 0.05 *	F = 0.38; p > 0.05	F = 0.001; p > 0.05

Table 1. Anthropometric characteristics of subjects ($\bar{x} \pm SD$)

Note. * – statistically significant difference between different training programs after the experiment; ** – statistically significant difference after the experiment.

point showed that the athlete was totally unprepared for the competition.

- Changes of gymnasts’ **technical fitness** were registered during competitions according to the declared and realized coefficients of technical fitness – Difficulty values and Artistic values.
- **Aerobic capacity.** The aerobic capacity of gymnasts was evaluated using the continuously intermittent treadmill test. During the whole research we registered vegetative and gaseous circulation indices with the help of gas analyzers (“Cortex 3B” and “Oxycon Mobile” – Jaeger & Germany) and heart rate measurement (heart rate measurer with memory Polar S601). 5 minutes after the beginning of the research capillary blood samples were taken from the fingertips to estimate the concentration of lactates using analyzer “Eksan-G Universal” (Kulis et al., 1988).
- The *training load intensity* were determined using:
- Heart rate measurement – registering heart beat rate using heart rate measurer with memory (Polar Team System; Finland).
- Biochemical blood testing: analyzer “Eksan-G” was used to estimate the concentration of lactates in the blood.
- Pedagogical observation. The competitive activities of gymnasts were recorded using digital video camera (50Hz frequency, Sony Digital 8-TRV320E).

Methods of mathematical statistics. In order to compare the data the mean (\bar{x}) and the standard deviation (SD) were calculated. *Kolmogorov-Smirnov test* was applied when there were not many tested categories of variables, it was used to evaluate the differences and the statistical significance of value differences. The following significance levels of statistical conclusions were used: p < 0.05 – significant; p < 0.01 – highly

significant; p < 0.001 – absolutely significant conclusion. Causal relations were determined applying correlation analysis (Pearson’s correlation coefficient r). The significance of training and fitness factors was established by factor analysis (principal factor analysis – communalities = multiple r²). All calculations were performed using computer programs MS Excel and STATISTICA. Experimental data were described using 52 variables, 51 of which were the aspects of training and fitness (X) and one was the final indicator of the efficacy of competitive activities (the mean of the points achieved by each gymnast) – Y. The principal factor analysis (communalities = r squares) was performed to estimate the interaction of the structure, the content and the volume of the complicated training process and fitness.

RESEARCH RESULTS

Training. The yearly macro-cycle for training 14–15-year-old athletes in rhythmic gymnastics consisted of 286 training sessions in program B and 302 training sessions in program A. The yearly training load did not differ significantly (from 672 to 697 hours) (Table 2).

No statistically significant differences were established in the number of training days in the competitive and the preparatory periods (p > 0.05). Different kinds of training dominated in different training programs: competitive routines in program A (35.1%), and choreographic training in program B (30.9%) (Table 3).

The training intensity in both training programs did not differ significantly during the micro-cycles (p > 0.05). Training load intensity was different in different micro-cycles. The most intensive training occurred in the accented micro-cycle (the longest duration of one training session, the biggest sum of heart beats during the whole training session, the highest maximal, average and minimal heart rate). The intensity of the training loads in this micro-

Table 2. Training loads of different training programs of 14–15-year-old athletes in rhythmic gymnastics

Parameters of training loads	Training groups ($\bar{x} \pm SD$)		Mean ($\bar{x} \pm SD$)	Kolmogorov–Smirnov Z test; p level
	A	B		
Number of training sessions a year	302	286	289 \pm 11.31	
Number of macro-cycle hours	697	672	675.6 \pm 77.68	
Number of training sessions a week	5.6 \pm 0.73	5.4 \pm 0.81	5.5 \pm 0.78	p = 0.10
Number of hours a week	12.5 \pm 2.70	12.3 \pm 2.44	12.4 \pm 2.56	p = 0.10
Number of competitions a year (from – to, and average)	5–10 7.8 \pm 2.58	2–12 8.4 \pm 3.91	2–12 8.1 \pm 3.14	
Number of competition days	29 days (duration of loads of competition days \sim 3 h)			

Table 3. Content (%) of training loads of different training programs of 14–15 year old athletes in rhythmic gymnastics

Content of training loads	Training groups ($\bar{x} \pm SD$)		Mean ($\bar{x} \pm SD$)	Kolmogorov–Smirnov Z test; p level
	A	B		
Choreography	26.06 \pm 5.86	30.94 \pm 3.58	28.48 \pm 5.43	p < 0.001
Elements	20.59 \pm 5.93	19.90 \pm 4.60	20.25 \pm 5.29	p > 0.05
Competition routines	35.06 \pm 12.24	26.84 \pm 9.94	30.99 \pm 11.85	p < 0.001
Athletic training	18.27 \pm 5.58	22.30 \pm 6.64	20.27 \pm 6.42	p < 0.001

cycle was close to the intensity in the competitive period (established in the city competitions). In the accented micro-cycle the heart beat rate of athletes in both training programs was higher than in the competition period activities (p > 0.05).

Sport performance. The most effective program was B (358 points), with dominating time for choreographic training (30.9%). At the beginning and at the end of the experiment the integral index of athletic fitness in points did not differ statistically significantly (p > 0.05) in both training programs. However, statistically significant differences (p < 0.025) were established in the indices of explosive strength, coordination abilities, and specific endurance. After the experiment statistical differences between the training groups were found only in gymnasts' specific endurance (p < 0.05).

At the beginning of the season the realization of body movement with different tools technique was not different (p > 0.05), but at the end of the season body movement technique of gymnasts in group A was better (the mean coefficient of technique was 3.82 points) (p < 0.001), compared to group B (3.32). The indices of movement with tools technique in both groups were only slightly different at the beginning of the season (p > 0.05): from coefficient 3.62 \pm 0.67 (ribbon) to coefficient 4.60 \pm 0.76 (hoop) on average. At the end of the

season the highest mean coefficients of the difficult movement with tools technique were achieved by athletes in program A (4.43 \pm 0.88).

The indices of aerobic fitness in both programs were not statistically significantly different (p > 0.05). In program A the athletes' maximal oxygen consumption (VO_{2max} – 50.46 ml · min⁻¹ · kg⁻¹) was by 2.86 ml · min⁻¹ · kg⁻¹ greater than in program B (47.60). Though the average HR_{max} index of athletes in program E was greater (200.66 \pm 10.51 ml · min⁻¹ · kg⁻¹) than in program A (196.65 \pm 5.03), but the established differences between athletes in both training programs were not statistically significant (p > 0.05). In both training programs the general energy consumption in competitive activities was different. Though athletes in the more effective training program B were more self-confident, the indices of self-confidence of athletes in both training programs differed rather slightly (p < 0.05).

Interaction of training and sport performance. Comparisons of training and fitness models in the experiment were not alienated from each other and did not exceed the critical limits of standard deviation of experimental (research) distribution (diagrammatical representation of model data was performed using SIMCA-P program). It allowed comparing available training models to athletes' training and fitness. The data of summarized values of each gymnasts in the

experiment were not alienated from each other and did not exceed the critical limits of standard deviation of experimental distribution, but more gymnasts from group B were over average (Figure 1).

The greatest interdependence between the training load (hours per hour) and the body composition was established in the training process in program B. It was found that with the increase of the training load the body weight ($r = -0.384$), the body fat ($r = -0.116$) and the body mass index decreased. The impact of training

loads for the best athletes in both training groups was controversial: in program A the increased training load diminished the body weight, body fat (%) and body mass index of the best gymnast, and in program B it was vice versa – all those indices increased. The average athletes' body movement technique in group B was worse than in group A at the end of the season, but gymnasts in training program B demonstrated more even body movement and movement with tools technique (Figure. 2).

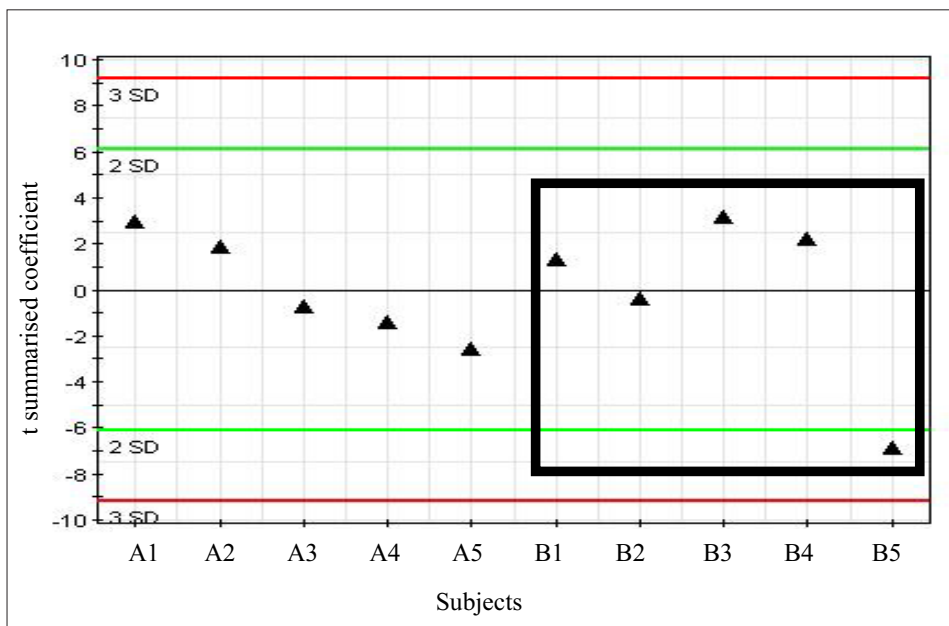


Figure 1. Comparisons of training and fitness models (diagrammatical representation of model data was performed using SIMCA-P program)

Note. Marked are summarized training and fitness variables of most effective training program (B) gymnasts – they are greater than average. A1–A5, B1–B5 – comparison of training and fitness for gymnasts from different training groups. $t[1]$ – variable which summarizes all (training and fitness) variables.

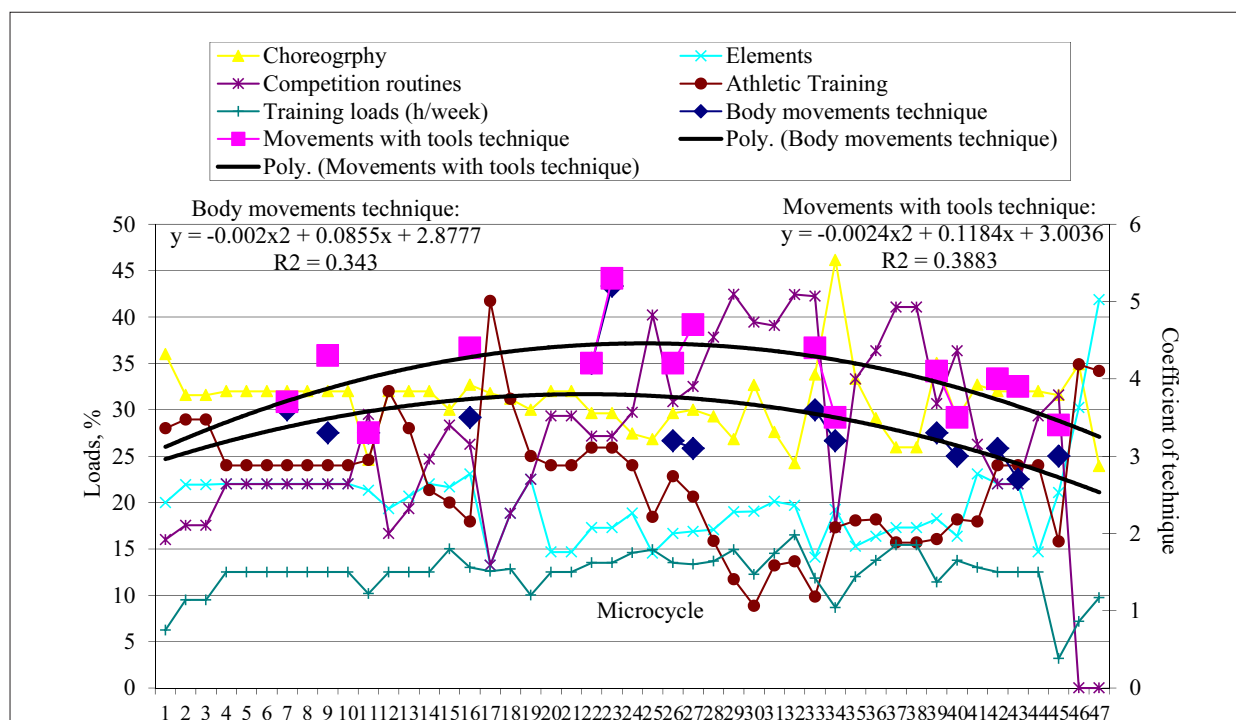


Figure 2. Changes in the training loads (%), training content and the difficulty of technique in different micro-cycles in the most effective training program for 14–15-year-old gymnasts in the experiment of athlete training intensification

Time for mastering competitive routines in program A was effective for body movement technique ($y = -0.0008x^2 + 0.0551x - 0.4007$; $r^2 = 0.5221$), but it was not so effective in program B ($y = 0.0003x^2 - 0.0125x - 0.0579$; $r^2 = 0.1421$). Mastering competitive routines, which dominated in program A, influenced movement with tools technique ($y = -0.0008x^2 + 0.0511x - 0.3621$; $r^2 = 0.4659$). However, mastering competitive routines was not so significant for body movement technique for gymnasts in program B ($y = 0.0004x^2 - 0.0069x - 0.2206$; $r^2 = 0.314$).

From the 16th micro-cycle the structure of the most effective training program in the competition period was the following: 30.7% of choreographic training, 17.8% of mastering of elements, 31.4% of mastering competition routines, and 20.1% of athletic training. Such structure of the training content enabled the 14–15-year-old gymnasts to improve their body movement technique indices by 16.7%, but the movement with tools technique fell off by 5%. It was established that the indices of the difficulty of the technique kept decreasing till the end of the season (the rest 7 micro-cycles). Higher results could have been achieved due to minor changes in the training content and training load in different micro-cycles (Figure. 2).

DISCUSSION

The trends in the changes of training high performance athletes (Balyi, 2001; Balyi, Hamilton, 2004), specific features of the developments of rhythmic gymnastics (Krug, 1996; Jastrejbmskaia, Titov, 1999; Knoll et al., 2000; Карпенко, 2003), as well as the upturn of sports results motivate us to look for new, scientifically grounded sports technologies, methods and forms of training. In this experiment the training loads for athletes were 697 hours in a macro-cycle and 12.5 hours a week (training program A), and 672 hours in a macro-cycle, 12.3 hours a week for program B. Comparing with elite gymnasts (Карпенко, 2003; Худолей, 2004), the training loads were not so high.

The training loads applied to both training programs were rather similar (12.54 hours per week in program A, and 12.27 hours per week in program B), but they had different impact on athletes' technical fitness. Researchers (Hohmann et al., 2000; Perl, 2001) claim that each system reacts differently to the applied impact according to its own adaptation processes, thus the training

loads of the same volume and content can have a different impact on athletes sports performance (Perl, 2001, 2004; Bügner, 2005). The worse quality of body movement technique could be explained by the increased body weight of athletes, which might have affected the experts' evaluations (Popovic, 2000; Pietrzyk, 2003).

In this experiment the training programs included *choreography* (47.91 min 4.08 times a week in program A, and 56.35 min 4 times a week in program B). As some researchers suggest (Лисицкая и др., 1982; Jastrjemskaia, Titov, 1999; Apatow, 2001; Карпенко, 2003) the time for choreographic training should not be reduced because it could cause deterioration in technical fitness. According to J. Perl (2001, 2004), the mean variations in the inner systems (sports performance) can be caused by inadequate training loads (Thomas, Busso, 2005). The increased time for mastering competition routines in our experiment (from 18.5 to 46.2%) determined the level of technical fitness. On the other hand, reducing training loads and increasing intensity could produce better results (Banister et al., 1999; Kubukeli et al., 2002). In this experiment the gymnasts increased their body fat, and this could have influenced the indices of their athletic and technical fitness. Besides, more body fat and bigger body weight negatively affect the evaluations of the referees (Popovic, 2000; Nordin et al., 2003; Pietrzyk, 2003).

In the most effective training program the indices of difficulty of technique and training loads were slightly lower than the same indices in the less effective training program. In this period of physical training, it is worth noting the significance of the factors of training content and training load. However, registered training loads allowed establishing only the general tendencies of the improvement of sports performance in training athletes (Bügner, 2005), a more detailed analysis of interaction of training and sports performance is possible in a case study registering the plan of individual training (Banister et al., 1999; Avalos et al., 2003), and testing sports performance more often (Mester, Perl, 2000; Perl, 2001, 2004).

CONCLUSION AND PERSPECTIVES

Sports performance of 14–15-year-old athletes in rhythmic gymnastics was mostly influenced by the time for mastering competitive routines

($r = 0.836$), however, the research did not establish differences in intensifying training. Besides the importance of integral athletic fitness, explosive strength, and strength endurance, the research established the significance of aerobic fitness

($r = 0.704$) for sports performance. Moreover, the significance of body composition indices increased in comparison with previous training years: body height ($r = -0.819$), body weight ($r = -0.657$), and BMI ($r = -0.836$).

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MENINĖS GIMNASTIKOS SPORTININKIŲ (14–15 METŲ) INTENSYVAUS RENGIMO IR PARENGTUMO OPTIMIZAVIMAS

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Sportininkų ugdymo veiksmingumas priklauso nuo kryptingo rengimo vyksmo tam tikrais sportininkų rengimo etapais, valdymo, individualios sportininko adaptacijos prie pratybių ir varžybų krūvių.

Tikslas – išsiaiškinti specialiojo rengimo poveikį 14–15 metų meninės gimnastikos sportininkų parengtumo optimizavimui.

Metodai. Eksperimento metu buvo modeliuojama dviejų skirtingų rengimo programų struktūra ir registruotas sportininkų parengtumas (atletinis, techninis ir psichinis). Krūvių protokoluose buvo registruojamas choreografinis, elementų mokymuisi, varžybiniam pratimams ir atletiniam rengimui skirtas laikas per kiekvienas pratybas. Rengimo programų veiksmingumas nustatytas registruojant varžybinės veiklos realizavimą varžybų sąlygomis pagal kiekvienos rengimo programos gimnastės gaunamus taškus ir kiekvieną iškovotą vietą (nustatytą taškų skyrimą mažėjančia tvarka). Norint išsiaiškinti, ar pratybių ir varžybų krūviai atitiko varžybinės veiklos specifiką, buvo registruojamas pulso kitimas skirtingų pratybių metu.

Rezultatai. Įvairių programų sportininkės treniravosi skirtingai – reikšmingai nesiskyrė taikomų krūvių (nuo 672 iki 697 h per metus) ($p < 0,001$), pratybių dienų rodikliai (nuo 5,4 iki 5,6 dienų per savaitę), tačiau statistiškai reikšmingai skyrėsi sportininkų rengimo turinys – veiksmingiausioje rengimo programoje dominavo choreografinis rengimas. Statistiškai reikšmingai skyrėsi staigiosios jėgos bei jėgos ištvėrmės, specialiosios ištvėrmės ir koordinacijos judamųjų gebėjimų rodikliai ($p < 0,05$). Kūno veiksmų ir veiksmų su įrankiais technikos realizavimas skirtingų rengimo programų metu ir sezono pradžioje bei pabaigoje nesiskyrė ($p > 0,05$).

Aptarimas ir išvados. Sportinių rezultatų siekimo etapu išryškėjo 14–15 metų meninės gimnastikos sportininkų varžybiniam pratimams tobulinti skirto laiko bei integraliojo rengimo reikšmė sportininkų varžybinės veiklos veiksmingumui. Be atletinį parengtumą apibūdinančio integraliojo rodiklio, staigiosios jėgos ir ištvėrmės rodiklių poveikio nustatyta ir aerobinio pajėgumo ($r = 0,704$) reikšmė sportiniams rezultatams. Be to, lyginant su ankstesniais eksperimentais, išryškėjo kūno kompozicijos rodiklių ir sportinių rezultatų sąsajos (ūgio – $r = -0,819$, svorio – $r = 0,657$ ir KMI – $r = 0,836$).

Raktažodžiai: meninė gimnastika, rengimas, parengtumas, metamodelis.

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PECULIARITIES OF DISTANCE PACING OF LITHUANIAN ROWERS AT THE EUROPEAN CHAMPIONSHIP 2012

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ABSTRACT

Research background and hypothesis. In rowing, not enough attention is paid to the peculiarities of distance pacing and race tactics. At the same time the annually increasing boat speeds and closeness among the results of the world and the European championship winners, the race tactics can be of decisive importance. Although many scientific articles on Lithuanian rowing have already been published, there are not enough scientific studies on the peculiarities of distance pacing of Lithuanian rowers.

Research aim was to determine the peculiarities of distance pacing of Lithuanian rowers at the European championship 2012.

Research methods. The following study methods were used: literature review and competition records analysis. In accordance with the technical records of the European championship 2012 (<http://www.worldrowing.com/results/>), the average speed in the distance and speed changes in different sections of 84 crews were analysed. The peculiarities of distance pacing and tactics variants of the Lithuanian men single scull, double scull and women single scull and the best European rowers were compared.

Research results. Lithuanian rowers were the fastest in the first 500 m section of the distance and applied 1–3 and 1–4 tactical variants. The speed changes at the European championship 2012 were 1.70–2.69%. At the European championship 2012, the crews who took 4–6th places were more likely to exceed their average distance speed in the first section of the distance than the crews who took places 1–3 ($p < 0.05$).

Discussion and conclusions. Speed changes in the distance of Lithuanian men single scull and double scull rowers were one of the lowest and the average pace was the highest compared to the records of other finalists. The speed changes in distance of women single scull rowers were among the highest while the average pace was the lowest compared to the records of other Final A participants. Although Lithuanian women single scull rowers had high speed changes in the distance and their rowing pace was low, high average speed in the whole distance allowed them winning at the European championship.

Keywords: boat speed, tactics, number of strokes.

INTRODUCTION

Obviously, race strategy is not a dominating factor that determines performance in rowing. Higher physiological work capacity and better technique give undoubtable advantages (Kleshnev, 2001). The sport of rowing has produced little scientific research on the effect of different pacing strategies on performance (Garland, 2005). This is perhaps surprising given

the popular belief that pacing strategies have major effects on performance in most sports, and although there may be little physiological difference between elite competitors, athletes may win or lose depending on their pacing strategy (Foster et al., 1994; Fukuba, Whipp, 1999).

In competitive rowing, it is tactically and psychologically advantageous to gain placement at

the front of the race by increasing effort at the start. This will allow the rowers, who

look backwards down the course, to be able to monitor the position of other boats and react to any sudden advances from other competitors, and also allows them to avoid the wake of other boats (Garland, 2005). In some sports, there is some evidence that a fast start is the optimal strategy (Foster et al., 1994; De Koning et al., 1999; Bishop et al., 2002) whereas in other sports a slow start may be beneficial (Mattern et al., 2001). There are several studies on the pacing strategies of elite rowers (Kleshnev, 2001, 2012; Kollman, 2001; Garland, 2005). The competition practise and tactics of rowers in the world championships and the Olympic Games have been analyzed by the Lithuanian researchers, too (Venclovaitė, Raslanas, 2006; Alekrinskis et al., 2007; Venclovaitė, 2008; Šližauskienė et al., 2010). The authors claim (Garland, 2005) that there are no significant differences between men and women rowers and winners in distance pacing nature. After analyzing the tactics of the final A participants at the London Olympic Games rowing regatta, V. Kleshnev (2012) determined that there was no significant difference between the finalists: the winners, bronze medalists and 5th place takers used very similar race strategies. This suggests that now the races were won because of proportionally faster boat speeds in all sections of the race.

Although many scientific publications on Lithuanian rowing have already been published, there are not enough scientific studies on the peculiarities of distance pace of Lithuanian rowers. We think that it might be useful to not only analyze the peculiarities of distance pacing of the best world rowers but also of the best Lithuanian rowers who were successful at the European championship and won medals. That is why our aim was to determine the peculiarities of the distance pacing of the Lithuanian rowers at the European Championship 2012.

RESEARCH METHODS

The following study methods were used: literature review and competition record analysis. In accordance with the technical records of the European championship 2012 (<http://www.worldrowing.com/results/>), the peculiarities of distance pacing and tactics variants of the Lithuanian men single scull, double scull and women single scull and the best European rowers

were compared. The average speed in distance and speed changes in different sections of the distance of six women boat classes (36 crews) and eight men boat classes (48 crews) in the final A at the European championship 2012 were analysed in comparison with the average speed in distance. On the basis of the methods worked out by V. Kleshnev (2001) twelve tactical variants were singled out. Every tactical variant was marked by two figures: the fastest and the slowest 500 m segment in the 2000 m distance. For example, the tactical variant “1–4” means that the 1st 500 m segment was the fastest and the 4th final 500 m segment was the slowest. According to the GPS data provided at the webpage of the International rowing federation (<http://www.worldrowing.com/results/>), the average distance pace in men single scull, men double scull and women single scull classes was calculated.

To ensure a normal sample distribution, the Kolmogorov-Smirnov test was applied. The data are presented as means and standard deviations. Statistical significance was set at $p < 0.05$. To determine the reliability of differences of averages between the indexes of separate groups, the Student's (t) test for independent samples was applied. For performing statistical analyses we used *Microsoft Office Excel 2007* and *SPSS Statistics 17.0*.

RESEARCH RESULTS

The Lithuanian rower won in the European championship 2012 in single scull class by finishing the 2000-metre distance at the speed of 4.79 m/s (Table 1). The same average speed was demonstrated by the rower who took the second place, however his speed changes (%) in the distance were higher (2.54%) than those of the Lithuanian rower (1.97%). All men single scull rowers were faster in the first section of the distance compared it with their average distance speed, and on the second and third distance sections they were behind their average distance speed. In the fourth distance section, only the rowers who took the first and the fifth places were behind their average speed in distance, and other participants of final A exceeded their average distance speed. The rowers who took the second and the third places applied tactical variants with the fastest fourth section of the distance (4–2), and the rowers who took other places applied tactical variants with the fastest first 500-metre section (1–4, 1–2, 1–3).

Table. The race parameters of the men single scull, men double scull rowers and women single scull rowers in the final A at the European Championship 2012

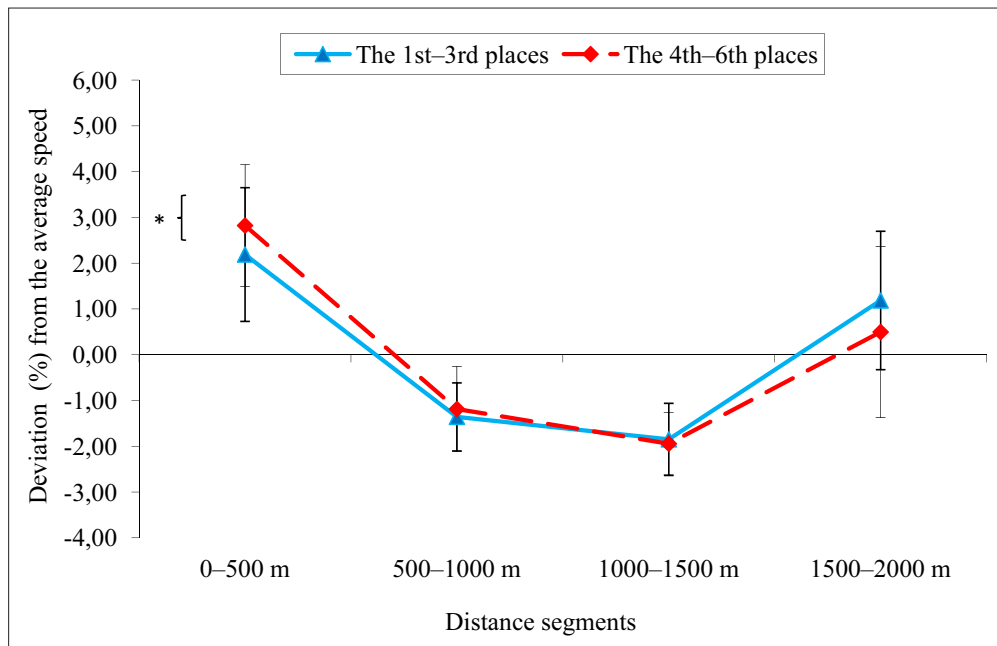
Country	Athletes	Place	Average distance speed, m/s.	Boat speed deviation (%) from the average distance speed in the specified 500 m sections				Speed changes, %	Tactical variant
				1	2	3	4		
Men single scull									
LTU	M. Griškoniš	1 st place	4.79	2.92	-0.91	-0.47	-1.43	1.97	1-4
CRO	D. Martin	2 nd place	4.79	0.23	-2.13	-1.47	3.56	2.54	4-2
BUL	G. Bozhilov	3 rd place	4.77	1.75	-2.83	-1.54	2.83	2.67	4-2
GBR	G. Thomas	4 th place	4.71	2.11	-2.01	-0.29	0.28	1.70	1-2
BEL	T. Maeyens	5 th place	4.68	2.01	0.13	-1.25	-0.82	1.45	1-3
HUN	P. Galambos	6 th place	4.65	3.08	-1.04	-2.42	0.55	2.36	1-3
Men double scull									
CRO	M. Sinkovic V. Sinkovic	1 st place	5.34	2.91	-1.75	-2.54	1.59	2.61	1-3
ITA	A. Sartori R. Battisti	2 nd place	5.33	2.03	-3.01	-2.02	3.28	3.06	4-2
NOR	N. J. Hoff K. Borch	3 rd place	5.29	2.29	-1.35	-1.95	1.13	2.01	1-3
LTU	R. Maščinskis S. Ritter	4 th place	5.27	2.96	-2.23	-2.23	1.71	2.69	1-3
SRB	M. Marjanovic A. Filipovic	5 th place	5.27	2.98	-2.03	-2.62	1.91	2.80	1-3
POL	K. Wasielewski W. Chabel	6 th place	5.15	6.04	1.05	-1.32	-5.12	4.67	1-4
Women single scull									
LTU	D. Vištartaitė	1 st place	4.38	1.51	-1.42	-1.48	1.48	1.70	1-3
SRB	I. Obradovic	2 nd place	4.35	-1.46	-0.37	0.31	1.56	1.26	4-1
EST	K. Pajusalu	3 rd place	4.33	1.64	-0.93	-0.29	-0.38	1.12	1-2
RUS	J. Levina	4 th place	4.28	1.68	-0.77	-0.61	-0.27	1.13	1-2
NOR	T. Gjoertz	5 th place	4.26	1.27	-0.58	-0.89	0.23	0.97	1-3
BUL	L. M. Rusinova	6 th place	4.21	3.53	0.28	-1.33	-2.29	2.55	1-4

The Lithuanian men double scull took the fourth place at the European championship this year. They were almost 5 seconds behind the winners from Croatia and almost 2 seconds behind the bronze winners from Norway (Table). Lithuanians as most of the participants applied 1-3 tactical variants, which means that their first 500-metre section was the fastest, and the third 500 m section was the slowest. The Italians who took the second place had the fastest fourth 500-metre section and the slowest second 500-metre sections (tactical variant 4-2). The speed changes of the Lithuanian double scull rowers in the distance were 2.69%, they were similar to those of the winners 2.61%. The highest speed changes in the distance were of the Polish rowers (4.67%), and the lowest – of to the Norwegians who took the third place (2.01%).

The Lithuanian women single scull rower who became the champion finished the distance at the average speed of 4.38 m/s. Although her speed changes in the distance were among the highest (1.70%) compared to other finalists, she was able to take the first place (Table). The rower who took the sixth place had the highest speed changes in the distance (2.55%) while rowers who took 2-5th places had only 0.97-1.26% speed changes.

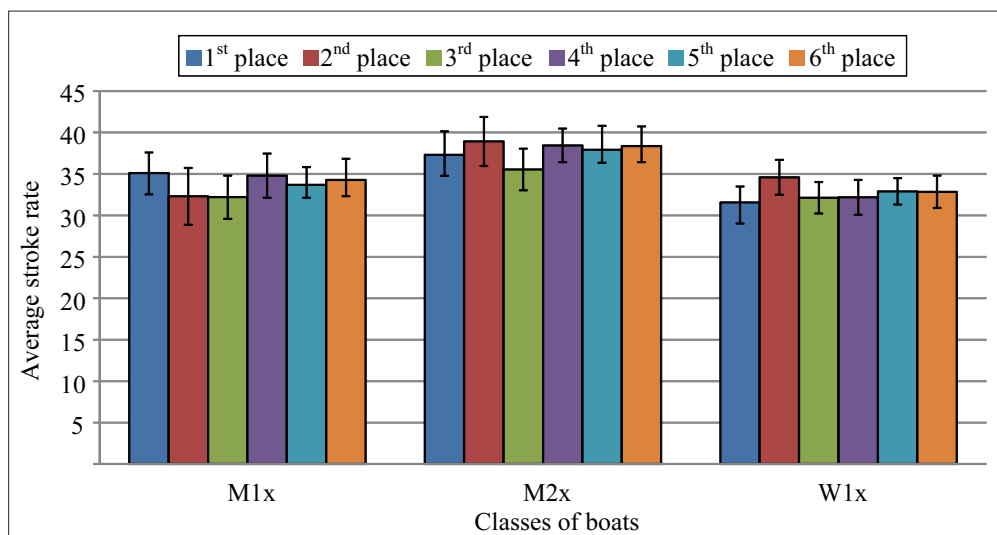
While comparing the speed changes in the distance of the crews who took 1-3rd and 4-6th places at the European Championship 2012, it was determined that crews who took 4-6th places exceeded their average distance speed more in the first section of the distance than those who took 1-3rd places ($p < 0.05$), and in the fourth section the crews who took 1-3rd places were able to exceed

Figure 1. Speed changes in the distance of men and women crews in Final A at the European Championship 2012 according to places taken



Note. * – $p < 0.05$, deviations in speed in the respective segments of the crews who had taken the 1st–3rd places and the 4–6th places compared.

Figure 2. The average pace of men single sculls, double sculls and women single sculls in final A at the European championship 2012 according to the places taken



Note. M1x – men single scull, M2x – men double scull, W1x – women single scull.

their average speed more than those who took 4–6th places (Figure 1). The speed changes of crews who took 1–3 places in separate sections of the distance were as follows: +2.19, -1.36, -1.85, +1.19%. The speed changes of rowers who took 4–6th places at the European championship 2012 were as follows: +2.82, -1.19, -1.94, +0.50%.

We compared the average pace of rowers in men single sculls, double sculls and women single sculls who took different places (Figure 2). We determined that the average pace of the Lithuanian men crews was one the highest compared with the crews who took other places. The average pace of the Lithuanian men single scull was 35.1 ± 2.5 strokes/min and men double sculls – 38.5 ± 2.0

strokes/min. At the same time the average pace in distance of the Lithuanian women single scull was the lowest (31.6 ± 2.6 strokes/min) compared with other participants in the final.

DISCUSSION

Elite competitive 2000 m rowing races take 330–460 seconds to complete. This duration falls between the two extremes of the range of pacing strategy studies previously published. S. W. Garland (2005) observed that a fast start was the strategy adopted by elite rowers, similar to that observed previously for races lasting 120–290 seconds (Foster et al., 1994; De Koning et al.,

1999). V. Kleshnev (2011) established that winners are relatively faster in the 1st section of the race, than silver and bronze medallists, but 2nd, 3rd and 4th place-takers usually have faster final section of the race (average data over 11 years (1993–2004)). However, the study results of the World Rowing Championship 2011 show that winners in Olympic events have shown relatively slower speed over the first 500 m than all other finalists. This trend is opposite to what was found in previous World regattas (Kleshnev, 2011). Our research also showed that at the European championship 2012 the crews who took 1st–3rd places were relatively slow in the first 500 metres than those who took 4th–6th places if to compare it with their average speed in the distance. At the same time the crews who took 1st–3rd places were relatively fast in the last 500 metres than those who took 4th–6th places compared with their average speed in the distance. The findings of the studies on the previous Olympic Games show (Venclovaitė, Raslanas, 2006) that women crews who took different places in the final A of the Olympic Games used the same fast start tactics, while the distance pacing of men crews who took different places in the Olympic Games differed.

In rowing, the most decisive factor is the start pacing. “If you lost the first 500 m, there is nothing you can do” says G. Losavio (Лосавио, 1997, p. 30) and gives an example: in the World Championship 1995 a very strong Swiss single scull rower Kseno Miuler was at the bottom of the list in the final until the quarter line of the last section. He hoped to make a great pacing at the finish and did it: he improved a personal time of the first section of the distance by 8 s. But that did not help, he came last. A year later, at the Atlanta Olympic Games 1996, he used a completely different tactics. In the final he started at the fastest speed from the start and won. He beat the second-place winner Canadian Porter by 3 s. This was due to the active start (Лосавио, 1996). This tactics was also applied by the Lithuanian single scull rowers who became winners at the European Championship 2012. They took the leading positions from the beginning and did this till the finish. Men double scull rowers were in the fourth place after the first 500 m. They were the fourth after the finish, too.

L. Aleksandravičius (1981) claims that if there is only one encounter with the competitor planned while choosing the tactics variant, the ability to unexpectedly surprise the competitor, i. e. to come

upon him/her, plays an important role. However, if there are several encounters planned (preparatory, semi-final stages, etc.), much attention should be paid to the nature of the competitor’s distance pacing while choosing the tactics.

In the final heats, the Lithuanian rowers applied 1–3 and 1–4 tactical variants. This confirms the data of other authors. Men and women crews in the final A of the World Championships 2005, 2006 and the Olympic Games 2008 usually used 1–3 tactical variant (Venclovaitė, 2008; Šližauskienė et al., 2010). V. Kleshnev (2011) claims that the most popular tactical variant of the winners is 1–4, and the one of the silver and bronze medallists – 4–1. We determined similar trends, too: the crews who took the second and third places used 4–1 and 4–2 tactical variants with the fastest last 500 metres.

At the beginning of rowing evolution the famous British coach Steve Fairbairn said: “Miles make champions” (Ферберн, 1958). However, many coaches still use this motto. The champions are not made by the miles and kilometres during the training sessions (every rower covers enough of them), but by the ability to discourage the competitors with your speed, make them chase you and fight in-between. This is how all the crews who won in the Atlanta Olympic Games competed. And only this type of tactics may guarantee the victory in regattas, says G. Losavio (Лосавио, 1997).

The other rowing specialist V. Kleshnev (2011) gives some recommendations on choosing tactics: choose the race strategy with faster start section if you are going to win (or die) or choose the race strategy with faster finish and more even distribution of efforts if you want to maximise your result.

As V. Kleshnev (2001) states, the physiological factor should not be forgotten. Energy production in rowing is provided from aerobic sources for 70–80%. Quick increase of oxygen consumption requires significant anaerobic workload at the start of the race. The anaerobic source is more powerful, therefore the first piece of the race should be faster than others. However, it should not be too fast, otherwise rowers would have to tolerate very high oxygen debt and lactate concentration during the race.

During the training session 15–40 strokes per minute are made, while during the race single scull rowers make 32–38 strokes per minute, duration of the stroke is 0.6–2.2 s. In multi-seat boats the rowing pace at start may be 48 strokes

per minute (Secher, 1993). Taller and bigger athletes can produce more work per stroke, which means that their distance per stroke is longer. Smaller athletes can not achieve such a long stroke distance, so they have to use higher stroke rate to compete with others (Kleshnev, 2006). However, our findings showed that men double scull rowers who were the tallest had the highest average pace in distance – 38.5 strokes/min, and women single scull rower who was the smallest in height had the distance finished in the lowest average pace – 31.6 strokes/min. Although the speed changes in the distance of the Lithuanian women single scull rower were high and she had the lowest average rowing pace, she kept up with the high average speed of the whole distance and was able to win at the European championships. More rational allocation of powers in achieving lower speed

changes in distance would allow her to use her possibilities even more successfully.

CONCLUSIONS AND PERSPECTIVES

It was determined that the Lithuanian rowers finished the distance in the Final A at the European Championship 2012 differently. The speed changes in the distance of men single scull and double scull rowers were among the lowest compared to those of other finalists, and women single scull rowers' speed changes in the distance were among the highest. The average pace of the Lithuanian men crews was the highest compared to the one of other participants of Final A, and women single scull had the lowest pace compared to other participants of Final A.

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LIETUVOS IRKLUOTOJŲ VARŽYBŲ NUOTOLIO ĮVEIKIMO YPATUMAI 2012 METŲ EUROPOS ČEMPIONATE

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Irklavimo sporte skiriamas nepakankamas dėmesys nuotolio įveikimo ypatumams ir lenktynių taktikai. Tuo tarpu kasmet didėjant pasaulio ir Europos čempionatų finalininkų valties greičiui ir rezultatų glaudumui, lemiamos reikšmės gali turėti lenktynių taktika. Nors Lietuvos irklautojų klausimais mokslinių publikacijų yra paskelbta nemažai, Lietuvos irklautojų varžybų nuotolio įveikimo ypatumai tiriami nepakankamai.

Tikslas – nustatyti Lietuvos irklautojų varžybų nuotolio įveikimo ypatumus 2012 m. Europos čempionate.

Metodai. Taikyti šie tyrimo metodai: literatūros šaltinių analizė, varžybų protokolų analizė. Remiantis 2012 m. Europos irklavimo čempionatų techniniais protokolais (<http://www.worldrowing.com/results/>), išnagrinėtas 84 įgulų vidutinis nuotolio įveikimo greitis ir greičio pokyčiai skirtingose nuotolio dalyse. Palyginta Lietuvos vyrų vienvietės, porinės dvivietės ir moterų vienvietės irklautojų bei geriausių Europos irklautojų nuotolio įveikimo ypatumai ir taikomi taktikos variantai.

Rezultatai. Lietuvos irklautojai greičiausiai įveikė pirmą 500 m nuotolio dalį ir taikė 1–3 ir 1–4 taktikos variantus. 2012 m. Europos čempionate Lietuvos irklautojų nuotolio įveikimo greičio pokyčiai siekė 1,70–2,69%. 2012 m. Europos čempionate 4–6 vietas užėmusios įgulos pirmoje nuotolio dalyje labiau viršijo savo vidutinį nuotolio įveikimo greitį, negu 1–3 vietas užėmusios įgulos ($p < 0,05$).

Aptarimas ir išvados. Lietuvos vienvietės ir dvivietės irklautojų nuotolio įveikimo greičio pokyčiai buvo vieni mažiausių, o vidutinis tempas – didžiausias, lyginant su kitais finalistais. Moterų vienvietės irklautojos nuotolio įveikimo greičio pokyčiai buvo vieni didžiausių, o vidutinis tempas – mažiausias, lyginant su kitomis A finalo dalyvėmis. Nors Lietuvos vienvietininkės nuotolio įveikimo greičio pokyčiai buvo dideli ir mažas irklavimo tempas, išlaikytas didelis vidutinis viso nuotolio įveikimo greitis leido įtikinamai nugalėti Europos čempionate.

Raktažodžiai: valties greitis, taktika, yrių skaičius.

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MANIFESTATION OF PROSOCIAL AND ANTISOCIAL BEHAVIOUR IN A YOUTH GIRLS BASKETBALL MATCH

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ABSTRACT

Research background and hypothesis. Examining behavior in a youth girls basketball match it was hypothesized that players and coaches' behaviors would differ in relation with players' age, course and the final outcome of the match.

Research aim was to explore the manifestation of observed prosocial and antisocial behaviors in a youth girls basketball match.

Research methods. Fourty games were observed: 20 matches by U15 and 20 matches by U17 age groups.

Research results. Younger players more often argued with the referees ($p = 0.03$), used physical aggression ($p = 0.04$). In the second half of the game players more often quarreled with referees ($p = 0.05$), welcomed unsuccessful actions of the rivals ($p = 0.03$). When the difference in the final result of the game was low, players more argued with the referees ($p = 0.001$) and used physical aggression ($p = 0.01$). Coaches working with younger players showed disrespect to them more often ($p = 0.001$). Such behaviours were more often at the beginning of the game ($p = 0.001$) and when the difference in the final result of the game was low ($p = 0.04$).

Discussion and conclusions. Research did not confirm that younger basketball players more often demonstrated respect to referee's decisions and opponents. Research confirmed that antisocial behaviors of players were more common in the second half of the match and when the difference in the final result was less. Research confirmed that coaches who worked with younger players demonstrated more antisocial behavior and that such behavior was more common when there was less difference in the results of the match.

Keywords: basketball players and coaches' behavior assessment, players' age, course of the game, final outcome of the game.

INTRODUCTION

Sport represents one of the most important organized leisure activities for school aged children and adolescents (Rutten et al., 2008). As results show, almost one third of schoolchildren participate in sports activities (Silva et al., 2008; Tomik et al., 2012). Participation in organized youth sports yields specific experiences for children and provides them with new opportunities. Young athletes not only get opportunities to acquire specific skills and knowledge they need to perform their sports; they are also exposed to the moral values that are the foundation of sports-related rules and norms (Simon, 2000). It should be noted that in recent years the analysis of sports influence

on adolescents' moral development has focused on athlete's prosocial and antisocial behaviours.

Prosocial behaviour has been defined as voluntary behaviour intended to help or benefit another individual while antisocial behaviour has been defined as voluntary behaviour intended to harm or disadvantage another individual (Eisenberg, Fabes, 1998). Prosocial behaviour includes such acts as helping a player off the floor or congratulating a teammate for good play while antisocial behaviour includes acts like trying to injure an opponent or arguing with a teammate. It should be noted that in recent years a number of studies have been carried out to clarify the determinants of prosocial and

antisocial behaviour. It has been established that task orientation and perceived mastery climate are positive predictors of prosocial behaviour, whereas ego orientation and perceived performance climate positively predicted antisocial behaviour (Kavussanu, 2006). Other studies suggest that moral disengagement has strong positive relationship with antisocial behaviour towards both teammates and opponents (Boardley, Kavussanu, 2009). It has also been established that coaching style, specifically autonomy-supportive coaching style is associated with prosocial behaviour of athletes (Hodge, Lonsdale, 2011). Some recent studies have found that prosocial attitudes in sport are predicted positively by moral and competence values, whereas antisocial attitudes are predicted positively by status and negatively by moral values (Lee et al., 2008). Research shows that adolescent athletes' prosocial behaviour is associated with sportpersonship attitudes and moral reasoning about sports dilemmas (Shields et al., 2007).

In summary we could conclude that most of these studies aim to analyze relationships between athletes' moral behaviour and contextual or personal factors. On the other hand, the focus is on athletes' actual behaviours in sports fights. However, there is a lack of studies directly recording and analyzing manifestations of athletes' behaviours. We can mention some studies dealing with aggression (Jones et al., 2005; Vaez Mousavi, Shojaei, 2005; Traclet et al., 2011) and prosocial as well as antisocial behaviours during competitions (Kavussanu et al., 2006; Kavussanu et al., 2009). Some studies mentioned above included both schoolchildren and adults (Kavussanu et al., 2009) or only boys (Kavussanu et al., 2006). Therefore, first of all this study aimed at clarifying basketball players' expression of prosocial and antisocial behaviours during the basketball game. As the coach leads the team in the course of the game during the match, the study analyzed the coach's behavior and its expression in the interface with the athletes' behaviours. Studying the behaviors of athletes during the match, we tested several hypotheses: (H1), younger female basketball players more frequently demonstrate respect for referees and contestants than the older ones, (H2) antisocial behavior of basketball players is more common in the second half of the match, (H3), the smaller the difference between the scores at the end of the match, the less respect for the opponent and the referees' decisions is noticed, and (H4) coaches training younger basketball players show more disrespect to players and referees during the match

and such behavior is more characteristic when the match ends with a smaller difference.

RESEARCH METHODS

Basketball players' behaviours were measured through observational techniques. Based on the behaviour evaluation method employed in previous studies (Šukys et al., 2011) and preliminary observations of several basketball matches, a list of prosocial and antisocial behaviours was compiled. The evaluation of prosocial behaviours of basketball players allowed distinguishing the following forms: players' respect to referees (compliance with a foul, compatibility with other referee's decisions), respect to competitors (athletes' apologies after unauthorized actions against an opponent, help when they fall on the ground), and the etiquette of the game (such actions as greeting before and after the game, congratulating a teammate on making a successful shot or passing the ball). It should be noted that while distinguishing the last factor, the etiquette of the game, we referred to the studies by other researchers (Wells et al., 2008) who evaluated such actions e. g. the ones mentioned above as elements of game etiquette. Evaluating the antisocial behaviour of athletes we distinguished the following forms: disrespect to referees (noncompliance with a foul, objection to other referee's decisions), anger (being angry with teammates and competitors), conflicts using physical force (pushing teammates or opponents), physical aggression against an opponent, i. e. actions aiming at achieving certain goals but the outcome of which is usually a foul (e. g. the player bars the way, trips the opponent up, etc.), obscene vocabulary used by athletes, welcoming opponents' failures (clapping hands when opponent misses a free shot, releases the ball off the court, etc.) and players' quarrels (when arguing with opponents, team members, the coach). Antisocial behaviour of coaches was evaluated according to these groups of actions: disrespect for athletes (shouting at them, calling incorrect names), disrespect to referee's decisions (arguments with referees, commenting their decisions), obscene vocabulary of referees, and an extra group – coach's uncontrolled anger (hitting hand against the wall, trampling underfoot, throwing the table, etc.).

Although the reliability of observational data was assessed in the previous study (Šukys et al., 2011), after the adjustment of the observational protocol reliability was re-evaluated. In order to measure reliability of the data we estimated inter-

observer reliability which was based on the scores of two observers who recorded the same information while simultaneously and independently observing the same individual or group behaviour (Sattler, Hoge, 2006). Although several procedures are available for measuring inter-observer reliability, we applied percentage agreement calculation. We carried out five control observations when the match was observed by two observers. Then we evaluated the percentage agreement of data recorded by both observers. As the observation took place directly during the match recording behaviours on the protocol, and not watching video-recorded materials, so we did not seek that the agreement was necessarily 100%. No less than 86% agreement was detected evaluating each case of behaviour.

Research participants and procedure.

The selected research participants were teams of schoolgirls participating in Lithuanian pupils' basketball league. It should be noted that the league included 97 teams of pupils of different age. We chose the age group of 13–17 years. They were divided into two age groups: U15 (age range 14–15 years) and U17 (age range 16–17 years). In the Basketball Tournament this age group was represented by 43 teams, 23 teams were involved in observation. We observed 40 matches: 20 matches by U15 age group (11 teams) and 20 by U17 age group (12 teams) accordingly. Observation took place in 2011. The organizers of the league were informed about the research, and their consent to observe the matches was received. The matches were observed in the cities of Kaunas, Vilnius and Šiauliai.

Statistical analysis. Analysis was conducted using statistical package *SPSS for Windows 17.0*. We registered the number of cases of behaviours during the whole research as well as the mean values per one game. Student's *t* test was applied to verify the hypothesis about the differences in athletes and coaches' behaviours depending on basketball players' age and on the final result of the match. The differences in behaviours in the first and the second halves were assessed using Paired – Samples *t* test. Correlations between the variables of the research were estimated calculating Pearson's correlation coefficient. Statistical significance of differences was set at $p < 0.05$.

RESEARCH RESULTS

Our research revealed that during a match the mean frequency value of prosocial behaviours demonstrated by basketball players was 101.65

(SD = 12.99) times, and the mean frequency value of antisocial behaviours – 71.85 (SD = 19.49) times. The assessment of separate behaviours showed that on average basketball players showed respect to a referee 54.18 (SD = 7.70) times a match, they demonstrated game etiquette 46.08 (SD = 11.14) times and respect to their opponents only 1.4 (SD = 1.71) times. The evaluation of antisocial behaviours revealed that during a game the basketball players contradicted to the referee 13.23 (SD = 5.49) times on average, they got angry with other players 6.93 (SD = 3.57) times, used physical aggression 37.50 (SD = 7.94) times, used obscene words 3.90 (SD = 2.47) times, welcomed rivals' failures 8.55 (SD = 6.76) times and quarrelled 1.58 (SD = 1.34) times per game. The coaches showed disrespect to athletes 39.35 (SD = 12.15) times per game on average, they used obscene words 2.50 (SD = 2.90) times and quarrelled with referees 2.85 (SD = 2.29) times.

Our investigation did not reveal differences in the evaluation of prosocial behaviour demonstrated by different age basketball players during the match (Table 1). However, we observed that the younger basketball players demonstrated more antisocial behaviour during the match ($t = 2.04$, $p < 0.05$). Accordingly, antisocial behaviour was more characteristic of their coaches during the match ($t = 3.49$, $p < 0.001$). Observation revealed no behavioural differences in basketball players in the course of the match. However, statistically significant differences were established in the assessment of coaches' antisocial behaviour which often occurred in the first part of the match ($t = 3.46$, $p < 0.001$). Entering into detail of the data in Table 1 we see that players and coaches' behaviour differed most depending on the final result of the game.

Exploring the behaviour of players of different ages and their coaches during the match, it was found that younger players more often than the older ones argued with the referees during the match ($t = 2.20$, $p < 0.05$), used physical aggression ($t = 2.17$, $p < 0.05$) (Table 2). Coaches training younger basketball players also often showed disrespect for their trainees ($t = 4.02$; $p < 0.001$). According to the survey, basketball players more often disagreed with the referees in the second part of the game than at the beginning of the match ($t = -2.06$, $p < 0.05$), they more often welcomed unsuccessful actions of the rivals ($t = -2.33$, $p < 0.05$). However, assessing the behaviour of the coaches it was established that they were more angry with their trainees in the first part of the game

Table 1. Absolute and mean frequency values of basketball players and coaches' behaviours during the game in the aspect of the players' age, the course of the game and final result

Research participants	Basketball players and coaches' behaviour					
	Prosocial behaviour of basketball players		Antisocial behaviour of basketball players		Antisocial behaviour of basketball coaches	
	N	M (SD)	N	M (SD)	N	M (SD)
14–15-year-old players	2111	105.55 (12.00)	1558	77.90 (22.33)* ^a	1063	53.15 (15.34)*** ^a
16–17-year-old players	1955	97.75 (13.05)	1316	65.80 (14.29)	752	37.60 (12.75)
First half of the games	2029	50.73 (7.68)	1399	34.98 (10.57)	992	24.80 (10.02)*** ^b
Second half of the game	2037	50.93 (7.82)	1475	36.88 (11.51)	823	20.58 (7.57)
The final result differs in less than 10 points ¹	1790	111.88 (9.24)*** ^c	1348	84.25 (18.86)*** ^c	827	51.69 (15.28) ^c
The final result differs in 10 points and more	2276	94.83 (10.46)	1526	63.58 (15.29)	988	41.17 (15.34)

Notes. Sixteen matches ended with a less difference than 10 points, and 24 matches – 10 points and more. The absolute values show the total number of registered actions in all matches observed. a – statistically significant difference comparing behaviours of players of different age and their coaches who trained them; b – statistically significant difference comparing behaviours of players and their coaches in the first and second halves of the game; c – statistically significant difference comparing behaviours of players and their coaches during the game despite their final result. * – $p < 0.05$; *** – $p < 0.001$.

($t = 3.92$, $p < 0.001$) and used obscene vocabulary ($t = 2.80$, $p < 0.01$). Our observation revealed that when the difference in the final result of the game was low, athletes showed more behaviour linked to the etiquette of the game ($t = 4.22$, $p < 0.001$), but they also more argued with the referees ($t = 4.16$, $p < 0.001$), welcomed unsuccessful actions of the rivals ($t = 4.24$, $p < 0.001$) and used physical aggression ($t = 2.56$, $p < 0.01$). Accordingly, the coaches also more often disagreed with the referees during the matches which ended in less than a 10-point difference ($t = 3.83$, $p < 0.001$). Moreover, in these matches coaches more often showed disrespect for their trainees ($t = 2.09$, $p < 0.05$).

The study also sought to determine the interrelationship between the coaches and basketball players' behaviour during the match. The findings showed that coaches' contradictions to referees correlated with such behaviours of players as quarrels with referees ($r = 0.67$, $p < 0.01$), welcoming opponents' failures ($r = 0.49$, $p < 0.01$), physical aggression ($r = 0.50$, $p < 0.01$) and quarrels with opponents ($r = 0.38$, $p < 0.01$). Besides, we found a correlation between the use of obscene words of coaches and athletes during the game ($r = 0.49$, $p < 0.01$). Accordingly, coaches' disrespect for athletes related to quarrels with referees ($r = 0.59$, $p < 0.01$), physical aggression ($r = 0.59$, $p < 0.01$) and the use of obscene words ($r = 0.38$, $p < 0.01$). It should be noted that the coach's disrespect for trainees is associated with the coaches' disputes with referees ($r = 0.53$, $p < 0.01$) and used obscenities ($r = 0.63$, $p < 0.01$).

DISCUSSION

The study aimed at analysing the manifestation of basketball players' prosocial and antisocial behaviours during the game as well as establishing the manifestation of coaches' antisocial behaviour and its relations with athletes' behaviour. At the beginning of our research we expected younger basketball players to demonstrate respect to referees more often compared to the older ones, i. e. prosocial behaviour during the sports contest was more characteristic of them. This hypothesis was based in reference with previous research which found that antisocial behaviour in general and some forms of it (expression of aggression) were more typical of older athletes (Kavussanu et al., 2006; Papageorgiou et al., 2008; Šukys et al., 2011). Such tendencies were linked to athletes' experience which helped them circumvent the rules, put pressure on referees or imitate progress (Kavussanu et al., 2009). Besides, more experience is related to higher competition in achieving higher results, at the same time justifying seeking for victory at any cost (Conroy et al., 2001). However, our research did not confirm this hypothesis, i. e. prosocial behaviour was not characteristic of younger basketball players during the game, and some forms of antisocial behaviour, as objections to referees, physical aggression, were even more common. This could be explained by the lack of game experience. The less experience the basketball player has, the more often she commits a foul because she is not able to defend herself without breaking the rules. Similarly, the less

Table 2. Absolute values and mean frequency values of observed detail behaviour during the game in the aspect of the girls players' age, the course of the game and final outcome

Basketball players and coaches' behaviour	Basketball players' age			Halves of the game		Final result ¹	
	13-14 years	17-18 years		First half	Second half	Difference > 10 points	Difference ≤ 10 points
	N (M, SD)	N (M, SD)		N (M, SD)	N (M, SD)	N (M, SD)	N (M, SD)
<i>Basketball players' behaviour</i>							
Respect to referee's decisions	1117 (55.85, 5.88)	1050 (52.50; 9.01)		1079 (26.98, 4.20)	1088 (27.20, 4.63)	908 (56.75, 6.03)	1259 (52.46, 8.31)
Respect to opponents	32 (1.60, 1.93)	24 (1.20; 1.47)		25 (0.63, 1.05)	31 (0.78, 1.17)	23 (1.44, 1.46)	33 (1.38, 1.88)
Game etiquette	962 (48.10, 11.72)	881 (44.05; 10.43)		925 (23.13, 6.40)	918 (22.95, 6.66)	859 (53.69, 8.34)	984 (41.0, 9.89)***c
Contradictions to the referee	301 (15.05, 3.30)	228 (11.40, 4.16)*a		240 (6.00, 3.34)	289 (7.23, 3.31) *b	271 (16.94, 5.08)	258 (10.75, 4.28)**c
Demonstration of anger	150 (7.50, 3.90)	127 (6.35, 3.20)		142 (3.55, 2.30)	135 (3.38, 2.45)	111 (6.94, 3.11)	166 (6.92, 3.91) ^c
Reactive aggression	3 (0.15, 0.37)	4 (0.20; 0.52)		2 (0.05, 0.22)	5 (0.13, 0.33)	3 (0.19, 0.40)	4 (0.17, 0.48)
Physical aggression	802 (40.10, 7.57)	698 (34.90, 7.61)*a		750 (18.75, 4.68)	750 (18.75, 4.38)	659 (41.19, 7.24)	841 (35.04, 7.55)**c
Obscene words	79 (-95, 2.35)	77 (3.85, 2.64)		86 (2.15, 1.67)	70 (1.75, 1.41)	64 (4.00, 2.61)	92 (3.83, 2.43) ^c
Welcoming opponents' failures	187 (9.35, 7.24)	155 (7.75, 6.33)		151 (3.78, 2.99)	191 (4.78, 4.20) *b	211 (13.19, 7.09)	131 (5.46, 4.45)**c
Quarrels	36 (1.80, 1.61)	27 (1.35, 0.99)		28 (0.70, 0.79)	35 (0.88, 0.99)	29 (1.81, 1.56)	34 (1.42, 1.18)
<i>Coaches' behaviour</i>							
Coach's disrespect to players	918 (45.90, 11.33)	656 (32.80, 9.18)**a		862 (21.55, 7.81)	712 (17.80, 5.58)***b	705 (44.06, 11.22)	869 (36.21, 11.94)*c
Coach's disrespect to referees	66 (3.30, 2.70)	48 (2.40, 1.76)		52 (1.30, 0.99)	62 (1.55, 1.63)	69 (4.31, 2.63)	45 (1.88, 1.39)***c
Obscene words	61 (3.05, 3.00)	39 (1.95, 2.76)		62 (1.55, 1.81)	38 (0.95, 1.36) **b	44 (2.75, 3.02)	56 (2.33, 2.87)
Coach's uncontrolled behaviour	18 (0.90, 1.29)	9 (0.45, 1.19)		16 (0.40, 0.87)	11 (0.28, 0.85)	9 (0.56, 0.89)	18 (0.75, 1.45)

Notes. 1 – Sixteen matches ended with a less difference than 10 points, and 24 matches – 10 points and more. The absolute values show the total number of registered actions in all matches observed. a – statistically significant difference comparing behaviours of players of different age and their coaches who trained them; b – statistically significant difference comparing behaviours of players and their coaches in the first and second halves of the game; c – statistically significant difference comparing behaviours of players and their coaches during the game despite their final result. * – p < 0.05; *** – p < 0.001.

the player is experienced, the less she knows the rules of the game and the more often she makes mistakes, but she is unable to admit it and thus she contradicts to referees disagreeing with their decisions (denies making steps or breaking the rule of double dribbling the ball). This is in accord with the research data of T. M. Loughead and L. M. Leith (2001) claiming that younger ice-hockey players use instrumental aggression trying to compensate the lack of skills with it. It is worth noting that using curse words during the match among basketball players of different age does not differ, but in the similar research with boys it was established that older basketball players used curse words significantly more often during the game (Šukys et al., 2011).

It was also expected to find that antisocial behaviour of basketball players was more common in the second half of the game. This supposition was raised referring to the research data which show that in the second half of the match, the game becomes more aggressive (Vaez Mousavi, Shojaei, 2005), and the players more often contradict to referees (Šukys et al., 2011). It should be noted that the results of the observation of girls–basketball players revealed an analogous tendency confirming our supposition, i. e. in the second part of the game the girls more often argued with referees. On the other hand, it is very important to take the branch of sports into consideration while evaluating changes in the players' behaviour in the course of the game. For example, studying the evolution of rugby players' expression of aggression during the match, no differences were established (Jones et al., 2005).

The analysis of the data of basketball players' behaviours depending on the final score of the match was expected to reveal that the smaller the difference in the score at the end of the match, the less respect is given to opponents and the referee's decisions. It was established that when the game ended in less than a 10 point score difference, cases of antisocial behaviour of basketball players became more often, including contradictions to referees, physical aggression during fouls, welcoming opponents' failures. These data are not surprising because more even results highlight the aggressive fight which is sensitive to any action on the court, for example, aggressive actions of opponents can encourage returning like for like (Conroy et al., 2001). However, we can find research data testifying that winning teams also use much aggression, sometimes even more than

losing teams (Vaez Mousavi, Shojaei, 2005). This is explained by athletes' attempt to keep control of the game and not to lose the match. Although, as it was mentioned above, the persistent fight when the result is equal can be associated with a higher tension, but the overall stress/strain is not necessarily related to athletes' aggressive behaviour (Cairano et al., 2007).

The study also analysed the coach's behaviour during the match. Observation revealed that the hypothesis raised at the beginning of the research was confirmed, i.e. coaches training younger basketball players more often demonstrate disrespect to them. It should be noted that this hypothesis was raised on the basis of analogous research observing behaviours of basketball coaches working with boys (Šukys et al., 2011). Analysis of coaching behaviour during the match showed that in the first of the match the coach's dishonourable conduct is more often and it is linked to the disrespect for the players and the use of obscene words. Such behaviours of coaches can be related to the tension prevailing at the beginning of the match, as well as disappointment with the players who make mistakes more often due to the thrill of the start.

The study also confirmed the hypothesis that in a more tensed match (when the difference in score is not high) coaches tended to lose temper in this way demonstrating disrespect to trainees. We suppose that such behaviour is influenced by their wish to win when the victory is so close. In such matches it might be difficult to control emotions. On the other hand, this kind of behaviour might be the strategy chosen by the coaches themselves, i.e. coaches argue with referees consciously trying to put pressure on them and incline their decisions for the sake of their teams. This supposition is partly confirmed by research claiming that elite women's ice hockey coaches taught and demonstrated aggressive techniques to their athletes to gain an advantage in competition (Bloom, Vanier, 2004).

The study also established the relationship between antisocial behaviour of coaches and athletes in the course of the game. The findings were not unexpected. As coaches play an important role in developing the moral climate in the team, they are expected to teach children to behave prosocially. However, research shows that coaches use strategies to reduce moral responsibility and legitimize dishonourable actions of the players saying that deception is part of the game, aggression is a response to the aggressive actions

of competitors and so on (Romand, Pantaleon, 2007). Personal coaching behaviour also affects the behaviour of players. It has been found that coaches' aggressive verbal communication determines athletes' disgraceful behaviour (Martin et al., 2007) or encourages believing that sportsmanship is not a value (Arthur-Banning et al., 2009). In fact, in our study, the data obtained suggest that coach's antisocial behaviour is associated with antisocial behaviour of players regardless of athletes' gender. This assumption refers to the similar relationships between coaches and boys players' antisocial behaviour during the match established in the previous study (Šukys et al., 2011).

Our research not only revealed some tendencies of the girls basketball players and coaches' conduct during the match, but it also showed further research perspectives. It would be appropriate to evaluate players and coaches' behaviours separately for each team. This would provide the opportunity to analyse the expression of anti-social and prosocial behaviour of the winning

and the losing team. Besides, while assessing the behaviour of coaches during the game, it would be appropriate to compare male and female coaches because they have different communication styles (Martin et al., 2007).

CONCLUSIONS AND PERSPECTIVES

Younger girl basketball players less frequently agree with the referees' decisions and more often show aggression competing with their opponents. In general, antisocial behaviour is typical of those matches ending in a lower difference in the score. More often the coach demonstrates disrespect to younger basketball players, and they argue with referees and use obscene words in the first half of the match. Coaches are often angrier with trainees and referees in the games that end in a lower difference in the score. The study revealed that the coach's disrespect for referees and athletes correlated with antisocial behaviour of players during the match.

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PROSOCIALAUS IR ANTISOCIALAUS ELGESIO RAIŠKA MERGAIČIŲ KREPŠINIO RUNGTYNIŲ METU

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SANTRAUKA

Tyrimo pagrindimas ir hipotezė. Gilinantis į prosocialaus ir antisocialaus elgesio raišką krepšinio rungtynių metu, kelta prielaida, kad krepšininkų ir trenerių elgesys skirsis priklausomai nuo žaidėjų amžiaus, rungtynių eigos bei galutinio rezultato.

Tikslas – išsiaiškinti prosocialaus ir antisocialaus elgesio raišką mergaičių krepšinio rungtynių metu.

Metodai. Tiriant buvo naudotas stebėjimo metodas. Stebėta 40 (23 komandos) U15 ir U17 amžiaus grupių mergaičių rungtynių.

Rezultatai. Tyrimas parodė, kad jaunesnės krepšininkės dažniau prieštarauja teisėjų sprendimams ($p < 0,05$), naudoja fizinę agresiją ($p < 0,05$). Antroje rungtynių dalyje krepšininkės dažniau ginčijasi su teisėjais nei rungtynių pradžioje ($p < 0,05$), džiaugiasi nesėkmingais varžovių veiksmais ($p < 0,05$). Nustatyta, kad ginčai su teisėjais ($p < 0,001$), fizinė agresija ($p < 0,01$) būdingesni tose rungtynėse, kurios baigiasi mažesniu skirtumu. Dažniau nepagarbą treneris demonstruoja jaunesnėms krepšininkėms ($p < 0,001$), ir toks trenerių elgesys būdingesnis pirmoje rungtynių dalyje ($p < 0,001$). Treneriai dažniau rodo nepagarbą savo auklėtinėms ($p < 0,05$) ir ginčijasi su teisėjais ($p < 0,001$) tose rungtynėse, kurios baigiasi nedideliu taškų skirtumu.

Aptarimas ir išvados. Tyrimas nepatvirtino keltos hipotezės, kad jaunesnės krepšininkės dažniau demonstruoja pagarbą teisėjams ir varžovams nei vyresnės. Pasitvirtino keltos hipotezės, kad antroje rungtynių dalyje krepšininkės demonstruoja daugiau antisocialaus elgesio ir jų elgesys skiriasi priklausomai nuo rungtynių galutinio rezultato. Tyrimas patvirtino keltą prielaidą, kad jaunesnės krepšininkės treniruojantys treneriai demonstruoja daugiau nepagarbos žaidėjams bei teisėjams rungtynių metu, ir toks elgesys būdingesnis tose rungtynėse, kurios baigiasi mažesniu skirtumu.

Raktažodžiai: krepšininkų ir trenerio elgesio vertinimas, žaidėjų amžius, rungtynių eiga, rungtynių galutinis rezultatas.

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- 3.3. The title page should contain: a) a short and informative title of the article (no more than 80 characters without spaces); b) the first names and family names of the authors; c) the name and the address of the institution and the department where the work was done; d) the name, address, phone number, E-mail number, etc. of the author to whom correspondence should be sent. If a blind review is requested a second title page that contains only the title is needed. The title page should be signed by all authors of the article.
- 3.4. Abstracts in the Lithuanian and English languages are supplied on separate sheets of paper. This sheet also should contain keywords.
- 3.5. Every table (no more than three – four tables are recommended) should have a short subtitle with a sequential number given above the table (the tables are numbered in the same sequence as that of references given in the text). All explanations should be in the text of the article or in a short footnote added to the table. The symbols and abbreviations given in the tables should coincide with the ones used in the text. The location of the table should be indicated in the left-hand margin (in pencil).
- 3.6. All figures (no more than four-five figures) are to be numbered consecutively giving the sequential number in Arabic numerals, e. g. Figure 1. The location of the figure should be indicated in the left-hand margin of the manuscript (in pencil). The figures should be presented in open file formats so that they could be edited.
- 3.7. References should be listed in alphabetical order taking account of the first author. First the references in Latin characters are given, then – in Russian (Cyrillic) characters. For journal (research) articles the following information should be included: a) author names (surnames followed by initials), b) the date of publication, c) the title of the article with the same spelling and accent marks as in the original, d) the journal title in full, e) the volume number, f) inclusive page numbers. When five or more authors are named, list only the first three adding “et al.”

For books the chapter title, chapter authors, editors of the book, publisher’s name and location (institution, city) should be also included.

In the case when there are several references of the same author published in the same year, they must be marked by letters, e. g. 1990 a, 1990 b, etc. in the list of references and in the article, too.

Examples of the correct format are as follows

Bergman, P. G. (1993). Relativity. In *The New Encyclopedia Britannica* (Vol. 26, pp. 501–508). Chicago: Encyclopedia Britannica.

Bjork, R. A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H. L. Roediger III, F. I. M. Craik (Eds.), *Varieties of Memory & Consciousness* (pp. 309–330). Hillsdale, N J: Erlbaum.

Deci, E. L., Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dientsbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on Motivation* (pp. 237–228). Lincoln: University of Nebraska Press.

Gibbs, J. T., Huang, L. N. (Eds.). (1991). *Children of Color: Psychological Interventions with Minority Youth*. San Francisco: Jossey–Bass.

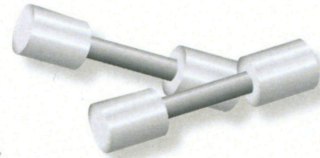
McDonald, C., Chenoweth, L. (2009). Leadership: A crucial ingredient in unstable times. *Social Work & Society*, 7 [04 08 2006]. Internet link: <http://www.socwork.net/2009/1/articles/mcdonaldchenoweth>

Ratkevičius, A., Skurvydas, A., Lexell, J. (1995). Submaximal exercise-induced impairment of human muscle to develop and maintain force at low frequencies of electrical stimulation. *European Journal of Applied Physiology*, 70, 294–300.

Town, G. P. (1985). *Science of Triathlon Training and Competition*. Champaign, Illinois: Human Kinetics.



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Aleksas Stanislovaitis, Jūratė Stanislovaitienė,
Jonas Poderys, Sigitas Kamandulis
Renata Rutkauskaitė**



Sports Coaching (Basics)

Studijų knyga suteikia naujausių sporto mokslo žinių apie sportininkų testavimą, treniruotės planavimą, fizinių ypatybių (ištvermės, jėgos, pusiausvyros, lankstumo ir kt.) treniravimą. Knygoje remiamasi geriausių pasaulio trenerių ir sportininkų teorine bei praktine patirtimi. Aprašoma, kaip pasirinkti veiksmingiausias treniravimo metodus, atsižvelgiant į treniruočių metu organizme vykstančius fiziologinius ir biocheminius procesus. Kiekviename skyriuje pateikiamos užduotys ir patikros klausimai aptartai temai apžvelgti.

Nuoširdžiai sveikiname!

Congratulations!



Lietuvos kūno kultūros akademijos doktorantę **Auriją Kalasauskienę**, 2012 m. rugsėjo 20 d. Lietuvos kūno kultūros akademijoje apgynusią biomedicinos mokslų (biologijos) daktaro disertaciją tema „Galvos smegenų kraujotakos autoreguliacijos reakcijų tyrimų ramybėje ir fizinio krūvio metu sąsajos“.

Vadovė doc. dr. Gražina Krutulytė.

We congratulate **Aurija Kalasauskienė**, the student of doctoral studies at the Lithuanian Academy of Physical Education, to have defended her thesis “Association between cerebrovascular autoregulation at rest and during exercise” (Biomedical Sciences, Biology) at the Lithuanian Academy of Physical Education on September 20, 2012.

Scientific advisor Assoc. Prof. Dr. Gražina Krutulytė.



Lietuvos kūno kultūros akademijos doktorantę **Simoną Pajaujienę**, 2012 m. gruodžio 14 d. Lietuvos kūno kultūros akademijoje apgynusią socialinių mokslų (edukologijos) daktaro disertaciją tema „Paauglių požiūris ir edukacinės programos poveikis jo koregavimui“.

Mokslinė vadovė prof. dr. Rasa Jankauskienė.

We congratulate **Simona Pajaujienė**, the student of doctoral studies at the Lithuanian Academy of Physical Education, to have defended her thesis “Adolescents’ body image and analysis of effectiveness of body image improvement program” (Social sciences, Educational Sciences) at the Lithuanian Academy of Physical Education on December 14, 2012.

Scientific supervisor Prof. Dr. Rasa Jankauskienė.

