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THE INFLUENCE OF EURHYTHMICS METHOD (SELECTED TASKS AND EXERCISES OF DALCROZE'S METHOD) ON MOTOR SKILLS AND A SENSE OF PULSE – PILOT STUDY

"Among many methods of music education there is one amazing and versatile – Dalcrozian Eurhythmics"

A. Galikowska-Gajewska

Summary

We introduced elements of Dalcroze method in the second, fourth and sixth year of Primary music school solfeggio class, aiming to explore possibilities of enhancing student's motoric and rhythmic performance in selected tasks. Indicators of performance score for each student were submitted to teachers' ratings. In statistical analysis, overall teachers' ratings of students' performances for each of the indicators were aggregated, separately for pretest and posttest assessment. Factor analyses (Maximum likelihood method, Promax rotation) of those pretest and posttest ratings on each indicator yielded analog two-factor structure. Two factors, motoric and rhythm, were moderately correlated.

While both groups performed better in posttest, experimental group managed to reach statistically significant increase in rhythmic performance. However, the difference in pretest and posttest motoric performance between the two groups, remained approximately the same. Thus, experimental group has progressed more, both in motoric and rhythmic performance, while only the difference in rhythmic performance yielded statistical significance.

Explanations could be looked for in the features of the sample, considering significant difference in pretest motoric performance in favor of the experimental group. Nevertheless, this pilot study gave us some insights into the underlying factors of our students'motoric and rhythmic performance (nature vs./and nurture) and at least some evidence in favor of movement playing a greater role in standard solfeggio curriculum in primary music school.

Keywords: Dalcroze method, motoric and rhythmic performance, movement, solfeggio, primary music school

Introduction

Emil Jaques-Dalcroze, at the beginning of the 20th century, created a system which is universal, simple and transparent in terms of education system principles for professionals and amateurs, a system in which human body is the basic tool for expressing music (Galikowska-Gajewska, 2018: 90).

Emil Jaques-Dalcroze lived for music and made everything that was expected to happen in human body dependent on music. "My whole system of education by rhythm is based on music, because music has a strong psychic force which, by its power of evoking action and then regulating it, can harmonise our whole being" (Brzozowska – Kuczkiewicz 1991: 31).

Dalcroze's method consists of three elements: Eurhythmics, Solfège, and Improvisation. All those pieces consist the wonderful and easy way to discover the reachness of the musical world. The basis of activities during every Eurhythmics lessons is the search for connection between music and body. Thus, what is basic in this kind of education, is the relationship between the music and movement. One of the main goals of Dalcroze's education is "(… creating in the organism simple and fast communication between all of the centers of movement and thoughts (1909)" (Institut Jacques-Dalcroze, 2005).

The majority of rhythmic and musical issues are introduced in an aural and practical manner, without theoretical aspect. This is the application of the following order of teaching Eurhythmics, put forward by Emil-Jaques Dalcroze: *theory follows practice*."The whole method is based on the principle that theory should follow practice, that children should not be taught rules until they have had experience the facts which have given rise to them" (Jaques-Dalcroze, 2000: 63).

What does it mean according to Dalcroze's method? It means it establishes the following sequence:

I listen to music – I feel it – I do it – I name it – I keep it – I remember it.

Eurhythmics, whose underlying principle is the close relation between music and movement, makes pupils sensitive to its particular elements, such as rhythm, meter, space, melody, dynamics, articulation, timbre and structure of a musical piece. *The simplest way to define this method is to say that it is based on following music and the sounds which become the impulse for movement.*

The uniqueness of Eurhythmics is to be perceived also in the context of its comprehensive impact on the human activity, in the physical, psychological and mental sphere. Furthermore, performing Dalcroze's exercises requires the involvement of various activity types such as: auditory, spatial-motor, intellectual and emotional (M. Petrović et al., 2018: 47). Auditory-movement coordination during Eurhythmics classes rests on the movement response to the music and the changes in music process. The music which the students hear should be reflected in their movement.

"The aim of all exercises in Eurhythmics is to strengthen the power of concentration, to accustom the body to hold itself, as it were, at high pressure in readiness to execute orders from the brain, to connect the conscious with the subconscious, and to augment the sub-conscious faculties with the fruits of special culture designed for the purpose. In addition, these exercises tend to create more numerous habitual motions and new reflexes, to obtain the maximum effect by a minimum of effort, and so to purify the spirit, strengthen the will – power and install order and clarity in the organism" (Jaques-Dalcroze, 2000: 62-63).

Research

After six years of successful collaboration between the Faculty of Choral Conducting, Church Music, Artistic Education, Eurhythmics and Jazz at the Academy of Music in Gdansk and the Faculty of Music, University of Arts in Belgrade, we started a project „Introducing and disseminating Emile Jaques-Dalcroze Method in Serbia" in 2017. Since the connection between music and body is the base of all activities in Emil Jaques-Dalcroze method, we started our research dedicated to introduce *elements* of Dalcroze's method in solfeggio classes in the elementary music school. The first phase included pilot study „The influence of Eurhythmics method (selected tasks and exercises of Dalcroze's method) on motor skills and a sense of pulse" at the Music school „Dr Vojislav Vučković" in Belgrade.

Our *main aim* was to check out if we can enhance rhythmic perception, appreciation and performance of our participants, with the selected tasks and exercises of Dalcroze method.

Specifically, we wanted to improve gross motor coordination and pulse tracking of our participants, in order to enhance rhythm performance of the curriculum task at the end of the year. Participants were students of 2nd, 4th and 6th grade in Music school „Dr Vojislav Vučković" in Belgrade, 8 to 13 years old. They had two tasks:

a. Pulse tracking task following Grig`s „In the Hall of the Mountain King" piece from his suite "Per Gynt".

b. Polyrhythmia task: performing rhythmic exercise in two voices, taken from 2nd, 4th and 6th grade of National music curriculum.

Experimental design was based on experimental and control group. While control group was provided with traditional solfeggio curriculum content, experimental group had 15 minutes of each solfeggio class (twice a week) for the selected tasks and exercises of Dalcroze's method, from the end of September 2017 to the end of April 2018, summing up between 55 and 60 class hours. It makes around 15 hours of Dalcroze's exercises in 2017/18 school year. Exercises were performed by the 1st – 3rd grade pupils from "Witold Lutosławski" State Music School 1st degree in Starogard, Poland.

We expected significantly better performance of the experimental group in both tasks, due to expected benefits od Dalcroze exercises.

Pretest and posttest performance were rated on four degree scale by three evaluators /teachers of solfeggio from Belgrade music schools. (Assessment list is given in the Appendix)

Evaluation criteria were: pulse tracking precision and movement skill in both tasks**,** with accuracy of performance in second one.

Results

Measures of absolute agreement and differences between three ratings for pretest and posttest are presented in table 1.

Table 1

Measures of absolute agreement and differences between three ratings for pretest and posttest

	variables	*ICC*	*F* (*df1*, *df2*)	*p*	*average differences in ratings*
Pretest	GApp1	.889**	0.811 (2,74)	.446	no differences
	GAil1	.750**	1.000 (2,74)	.370	no differences
	GAsp1	.612**	32.682 (2,74)	.001	I rater > II, III rater (p < .001)
	GBapp1	.908**	0.035 (2,74)	.965	no differences
	GBail1	.814**	4.461 (2,72)	.013	II rater > III rater (p = .029)
	GBasp1	.817**	5.601 (2,72)	.004	I rater > II rater (p = .003)
	GBbpp1	.824**	4.038 (2,74)	.019	III rater > II rater (p = .029)
	GBbil1	.891**	13.804 (2,72)	.001	I rater > II, III rater (p < .001)
	GBbsp1	.799**	11.440 (2,74)	.001	I rater > II rater (p = .040)
	DRpp1	.831**	1.139 (2,74)	.323	no differences
	DRtt1	.921**	0.195 (2,174)	.823	no differences
	DRsp1	.812**	2.832 (2,174)	.062	no differences
Posttest	GApp2	.854**	2.272 (2,174)	.106	no differences
	GAil2	no variance	1.000 (2,174)	.370	no differences
	GAsp2	.642**	56.674 (2,174)	.001	differences between all three raters (p < .001)
	GBapp2	.953**	0.429 (2,174)	.652	no differences
	GBail2	.743**	1.237 (2,172)	.293	no differences
	GBasp2	.903**	17.777 (2,174)	.001	I and III raters > II rater (p < .001)
	GBbpp2	.949**	0.021 (2,174)	.979	no differences
	GBbil2	.853**	8.543 (2,172)	.001	I rater > II (p = .025), III rater (p = .003)
	GBbsp2	.915**	7.071 (2,174)	.001	I and III raters > II rater (p = .029; p = .001)
	DRpp2	.924**	4.748 (2,170)	.010	I rater > II rater (p = .023)
	DRtt2	.943**	0.514 (2,170)	.599	no differences
	DRsp2	.899**	11.579 (2,170)	.001	III rater > I and II rater (p < .001)

Note. *ICC* – Intraclass correlation coefficients (Two-way random model, absolute agreement type); *F* – *F* test; *df* – degrees of freedom.

The average *ICC* for pretest ratings was .824 ($p < .001$) and for posttest ratings .887 ($p < .001$) pointing to the satisfactory level of ratings' agreement (variables marked in red were not included in the average measure of *ICC*).

Maximum likelihood method of extraction was used along with Promax rotation of the factor axis. Using Guttman-Kaiser and scree criteria two factors were retained (Figure 1). These factors accounted for 61.65% of the variance of aggregated pretest ratings. Factor loadings are presented in table 2.

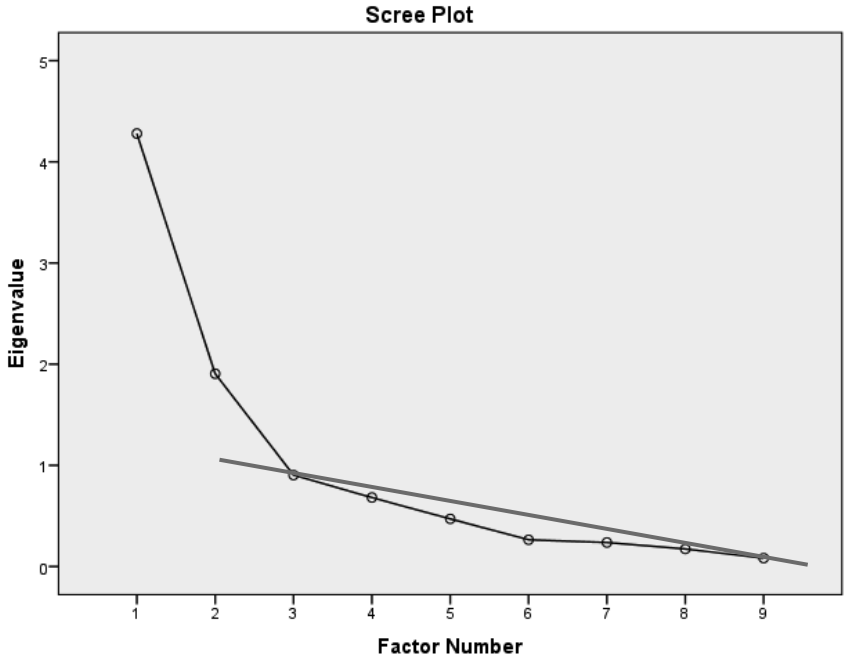

Figure 1. Scree plot for pretest ratings

Table 2

Pattern matrix and communalities for pretest ratings

variables	factor 1	factor 2	*H*
GApp1	.119	**.374**	.189
GAsp1	**.525**	.103	.329
GBapp1	**.710**	.140	.602

GBasp1	**.981**	-.019	.949
GBbpp1	**.723**	.026	.538
GBbsp1	**.832**	-.128	.625
DRpp1	-.080	**.876**	.718
DRtt1	-.023	**.917**	.826
DRsp1	.084	**.843**	.773

Note. h – communalities

Factor analysis was conducted on posttest ratings as well. The same extraction method and rotation was used. Both Guttman-Kaiser and scree plot (Figure 2) suggested retention of two latent dimensions which accounted for 73.54% of ratings' variance. Factor loadings and communalities are presented in table 3.

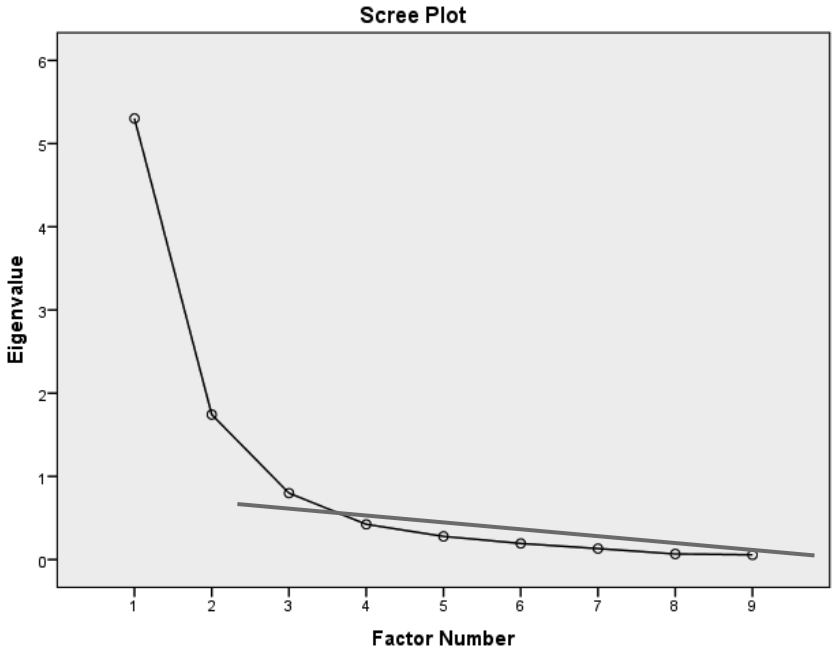

Figure 2. Scree plot for posttest ratings

Table 3

Pattern matrix and communalities for posttest ratings

variables	factor 1	factor 2	*H*
GApp2	**.399**	.148	.242
GAsp2	**.753**	-.192	.455
GBapp2	**.837**	.061	.758
GBasp2	**.993**	-.039	.948
GBbpp2	**.660**	.258	.677
GBbsp2	**.911**	-.001	.830
DRpp2	-.044	**.968**	.896
DRtt2	-.061	**.951**	.849
DRsp2	.060	**.950**	.965

Note. h – communalities

Relatively high correlation between extracted factors was obtained $r = .512$.

Two factors obtained for pretest and posttest ratings indicated the analog latent structure of ratings and factors' content. In line with the principal loadings, the first factor was named Motoric dimension and the second Rhythm dimension.

Based on these results two scores for each time-point were calculated and used in the following analyses in order to test the hypothesis that the ratings of experimental group will be higher in comparison with the rating of the control group. Descriptive statistics for both groups are presented in table 4.

Table 4

Descriptive statistics

variables	Experimental group $N = 38$[1]		Control group $N = 50$	
	M	SD	M	SD
Motoric 1	2.75	0.57	2.45	0.65

[1] One missing score for posttest Rhythm for participant no. 36 was estimated by regression method using participants score on Rhythm pretest.

Motoric 2	3.13	0.72	2.71	0.77
Rhythm 1	2.48	0.90	2.01	0.76
Rhythm 2	3.33	0.89	2.30	0.97

Regarding motoric performance, the mixed model analysis of variance revealed significant main effect of group [$F_{(1,86)} = 7.498$, $p = .008$, $\eta^2 = .080$], as well as the main effect of motoric factor [$F_{(1,86)} = 25.732$, $p < .001$, $\eta^2 = .230$], while the group *x* motoric interaction did not reach statistical significance [$F_{(1,86)} = 0.846$, $p = .360$, $\eta^2 = .010$] (Figure 3). In other words, while both groups had better performance in posttest, the difference in motoric performance observed in pretest between the two groups, in favor of the experimental group, remained approximately the same in the posttest with no apparent benefit of treatment for the participants from this group.

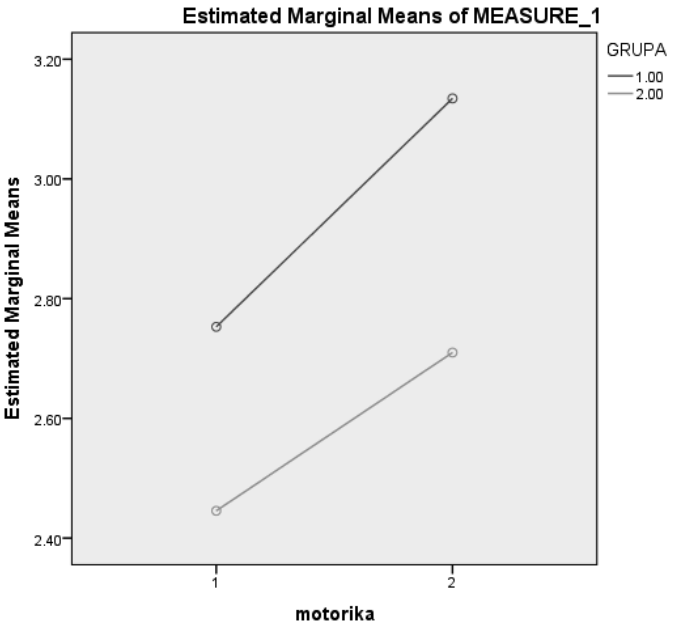

Figure 3. Mean values in motoric performance score for experimental (1) and control (2) group

On the other hand, both main effects of group [$F_{(1,86)} = 21.886$, $p < .001$, $\eta^2 = .203$] and Rhythm .[$F_{(1,86)} = 31.623$, $p < .001$, $\eta^2 = .269$] proved to be significant, as well as the group *x* rhythm interaction [$F_{(1,86)} = 7.447$, $p = .008$, $\eta^2 = .080$]. Thus,

while both groups had better performance in posttest, the treatment that the experimental group was exposed to, led to a significant increase in the initial difference in favor of this group in the posttest (Figure 4).

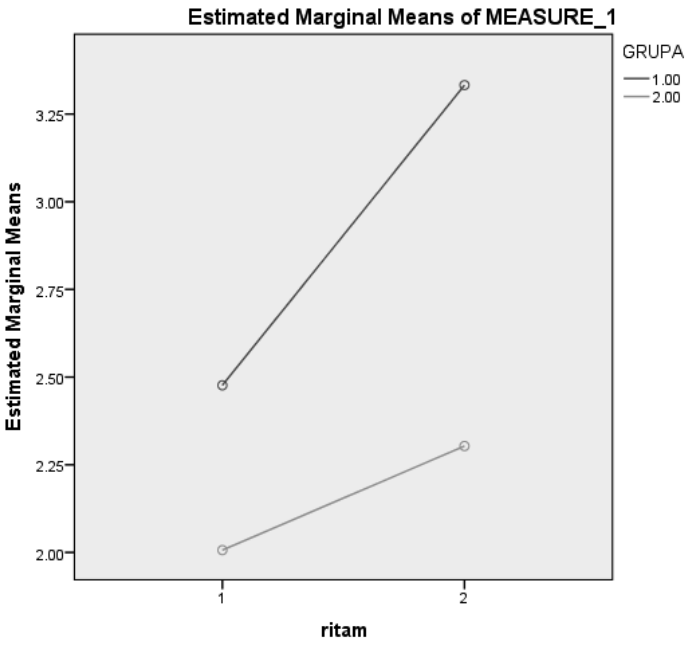

Figure 4. Mean values in rhythm score for experimental (1) and control (2) group

Conclusion

While both groups had better performance in posttest, experimental group has progressed more, both in motoric and rhythmic performance. However, only the posttest scores in rhythmic performance compared with the pretest for experimental group yielded significant difference.

Reasons could be looked for in the nature of our sample and our pilot study. While we can hypothesize that introducing selected movement exercises from Dalcroze method did participate in better overall posttest performance of the experimental group, improvement found in the posttest performance of control group testifies for natural developmental raise in motor abilities in children of the given age (8 to 13 years). Furthermore, overall pretest score for experimental group in motorics (pulse tracking and coordination) was notably higher than the one in control group and, presumably, too high to be exceeded in 15 hours of Dalcroze's exercises in a school year. Thus, our pilot study gave us some insights into the underlying factors of our students' motoric and rhythmic performance (nature vs./and nurture) and at least some evidence in favor of movement playing a greater role in standard solfeggio curriculum in Primary music school.

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УТИЦАЈ МЕТОДЕ ЕУРИТМИЈЕ (ОДАБРАНИ ЗАДАЦИ И ВЕЖБЕ ИЗ ДАЛКРОЗ МЕТОДЕ) НА МОТОРНЕ ВЕШТИНЕ И ОСЕЋАЈ ПУЛСА - ПИЛОТ СТУДИЈА

Увели смо елементе Е. Ј. Далкроз методе у наставу солфеђа у другом, четвртом и шестом разреду основне музичке школе, с циљем да испитамо могућности унапређења моторног и ритмичког извођења ученика у посебно одабраним задацима. Показатељи постигнућа сваког ученика пре и после увођења елемената Далкроз методе у експерименталној групи дати су наставницима на процену. У статистичкој анализи, ове процене подвргнуте су факторској анализи (Метод највеће вероватноће, Промакс ротација), те је добијена аналогна двофакторска структура. Два фактора, моторика и ритам, умерено су повезани. Иако су обе групе имале боље постигнуће у посттесту, експериментална група забележила је статистички значајан пораст у односу на претест у ритмичком извођењу. У моторном извођењу , међутим, разлика између експерименталне и контролне групе пре и после увођења елемената Далкроз методе, није била значајна. Дакле, експериментална група је више напредовала, како у моторном , тако и у ритмичком извођењу, али је само разлика у ритмичком постигнућу достигла ниво статистичке значајности. Објашњење би се могло тражити у природи самог узорка, с обзиром на значајну разлику у почетном постигнућу експерименталне групе у моторичком извођењу. Ипак, ово пилот истраживање омогућило нам је увид у неке од фактора моторне и ритмичке успешности ученика (природа и/или учење) и почетне доказе у корист позитивног дејства увођења покрета у стандардни програм наставне солфеђа у основној музичкој школи.

Кључне речи: Далкроз метод, моторно и ритмичко извођење, покрет, солфеђо, основна музичка школа