

Scientific paper

THE INFLUENCE OF DANCE STRUCTURES ON THE MOTOR ABILITIES OF PRESCHOOL CHILDREN

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Abstract. *This research has been conducted with the purpose of determining to which extent it is possible to transform the motor abilities of children by dance content. The sample of children used consisted of 30 boys and 30 girls, 5.5–6.5 years old. The motor abilities were evaluated on the basis of nine variables (one for strength, two for speed, two for flexibility, two for balance, and two for coordination). The boys and girls were involved in an experiment which lasted for 48 hours and consisted of practising dance steps for three hours a week, over a period of four months. After this, the final measuring was carried out. By calculating the coefficient of the descriptive statistics, the coefficient of the T-test and the Wilks' Lambda coefficient, the data was collected. Based on the results of the research it can be concluded that there is a significant statistical difference between the initial and final measuring. In the second measuring, there is a significant difference between all the variables, except in one variable for the speed of the boys and two variables for the speed of the girls. The results showed that the given hypothesis concerning the positive influence of dance contents on some of the motor abilities of boys and girls could be accepted.*

Key words: *dance contents, motor abilities, boys, girls.*

1. INTRODUCTION

The practice of dance rhythms and simple dance structures, applicable to all ages, plays a significant role in this research. In the transformation of anthropological features, a significant part is ascribed to practicing dance rhythms and simple dance structures (Graham, 1992; Kostić, 1997; Blackman, Hunter, Hilyer & Harrison, 1988; Block & Davis, 1996). The existing research connected to the application of dance was carried out on different samples of examinees (Miletić, 1999). The results show that when it comes

to the samples consisting of grown-ups, the success achieved at dancing depends on motor abilities. There are numerous discussions and much research which examine different dance programs for children (Lundahl, 1979; Boucher, 1979; Cox & Burroughs, 1979; Peters-Rohre, 1981; Gallant & Mutrie, 1981).

Therefore, there is a need to determine the characteristic influence of certain motor abilities and skills on the dance performance of preschool children, as well as the characteristic dance-training effects on motor abilities. The process goes both ways. Motor performance of children in preschool and in those who have just started school is strongly influenced by the frequency of movement, by explosive strength, coordination and repetitive strength (Katić, Maleš, & Miletić, 2001). Ackerman (1998) suggests that basic motor abilities and skills are of crucial importance in the early phases of the motor developing process and Poest, Williams, Witt, & Atwood (1990) report that providing young children with carefully planned movement experiences will enhance fundamental movement skills. Music or rhythmical accompaniment may enable the acquisition of fundamental motor skills (Brown, Shril, & Gench, 1981). According to previous investigations, it seems that a music and movement programme can significantly improve the quality of certain complex locomotor skills (Derri, Tsapakidou, Zachopoulou, & Kioumourtzoglou, 2001; Green, 2000). But there is the problem of quality and the selection based on scientific fact, of the dance structures in preschool educational programmes. Dance structures should vary more in their structures and should be appropriate for the age of children involved, especially in regards to content. At the same time, they should be made so that they are in accordance with the desired anthropological transformations.

The aim of this study is to determine the possible influence of dance structures on basic motor abilities. The obtained results can be very helpful in the early stages of the dance training process, as well as in the sport selection process.

The aim of this research is to determine the influence of dance structures on the motor abilities of preschool children.

It is supposed that concrete dance structures will have a positive influence on the motor abilities of preschool children.

2. METHODS

The subject sample

The sample of subjects consisted of 30 girls and 30 boys (aged from 5,5 to 6,5 years). The girls and boys were selected randomly from the population of preschool children. All the subjects were participating in a preschool dance programme. A 10 % absence from class was tolerated during the experiment.

The sample of variables

The sample of variables consisted of nine motor tests that were suggested: for assessing explosive strength: the standing long jump (cm); for assessing movement frequency: hand tapping (f) and the front bend – roll up - touch (f); for assessing flexibility: the side bend on the trunk (cm) and the sit and reach (cm); for assessing balance: the side walk on the bar (s) and back walk on the floor (s); for assessing coordination: *little school* (s) and the figure-of-eight with bending (s).

A description of the experiment

Both prior to and after the four-month experimental dance training programme for preschool children, implemented three times a week (a total of 48 training sessions), the motor abilities of children were tested.

The dance training programme had four components: folk dances for preschool children, standard social dances for preschool children, rhythmic games and dance improvisations with different music patterns. The basic aim of the dance training kinesiologic treatment for preschool children was to teach and improve their basic dance movements and choreographies for public performances. The other aim was to stimulate positive transformations of anthropological features in the preschool children who were practicing the dance structures.

Training sessions were divided into two parts: learning dance structures and practicing the learned skills. Folk dances, standard social dances and rhythmic games with improvisations were distributed evenly throughout the dance training programme, which numbered a total of 48 training sessions. The final public performance of the children was based on all three component parts of the applied dance training programme.

The method of data processing

For establishing the quality of motor abilities, basic statistic descriptive parameters were calculated: the arithmetic mean (AM), standard deviation (SD), minimum (MIN), maximum (MAX) and variance (VAR).

For establishing the differences between the initial and final status of the subjects (done separately for the male and female subjects) the coefficients of the T- test, Wilks' Lambda, Chi-square and P (importance), were calculated. For the same reason, a cluster column graph for the initial and final status of motor abilities was calculated separately for the male and female subjects, based on the arithmetic mean.

3. THE RESULTS AND THE DISCUSSION

In Table 1 the comparison of initial and final descriptive statistical parameters of the results that the participants (boys) achieved in the applied motor tests are presented. According to the T – test coefficients, the boys' motor abilities in the final measuring, compared with the initial measuring, had, in general, improved significantly. The test applied for assessing movement frequency (the front bend-roll up-touch) was the only one without any statistically significant changes between the initial and final status of the boys' motor abilities. The statistical parameters for the other motor abilities show significant changes caused by the implementation of the training programme for preschool children.

Table 1. Basic statistics (the initial and final measuring) - boys

Vars	MIN		MAX		AM		SD		VAR	
	I	II	I	II	I	II	I	II	I	II
Long jump (cm)	65.0	63.0	121.0	136.0	93.4	105.4	17.2	19.2	296.9	368.2
Hand tapping (f)	6.0	6.0	13.0	14.0	8.8	9.3	1.57	1.84	2.4	3.4
Roll up - touch(f)	15.0	17.0	30.0	32.0	22.2	24.6	3.5	3.7	12.2	14.0
Side bend (cm)	24.0	23.0	46.0	54.0	33.9	37.9	5.8	8.2	33.9	67.4
Sit and reach (cm)	12.0	11.0	29.0	26.0	17.3	19.4	3.5	4.0	12.5	16.4
Side walk-bar (s)	45.0	37.0	170.0	135.0	72.9	60.5	26.0	26.5	676.9	703.9
Back walk-floor (s)	96.0	57.0	250.0	250.0	147.7	124.3	39.6	45.9	1569.0	2109.0
<i>Little school</i> (s)	37.0	39.0	110.0	100.0	70.9	61.7	16.9	13.9	286.7	193.9
Figure <i>eight</i> (s)	195.0	179.0	346.0	330.0	260.6	238.2	40.5	44.4	1643.6	1974.4

The differences between the analysed boys' motor abilities at the initial and final status (Table 2), are presented in the order of their significance: movement frequency (hand tapping), explosive strength (the standing long jump), coordination (*little school*, figure *eight* with bending), flexibility (the sit and reach, the side bend on the trunk) and balance (side walk on a bar, back walk on the floor) variables.

Table 2. The T-test coefficients (initial and final measuring) - boys

Vars	T-test	P
Long jump (cm)	-2.56	.01
Hand tapping (f)	- .97	.33
Roll up - touch (f)	-2.59	.01
Side bend (cm)	-2.19	.03
Sit and reach (cm)	-2.05	.04
Side walk-bar (s)	1.94	.05
Back walk-floor (s)	2.10	.04
<i>Little school</i> (s)	2.32	.02
Figure <i>eight</i> (s)	2.32	.02

The Wilks' Lambda coefficient (Table 3) confirms the hypothesis about the positive influence of a dance programme on the motor abilities of boys.

Table 3. Wilks' Lambda coefficients (initial and final measuring) - boys

Wilks' Lambda	Chi-square	Df	P
.713	18.11	9	.03

It is evident that the dance programmes have been applied correctly. The dance structures were appropriate for the subjects' age; therefore, we can suppose that their application will cause qualitative stimuli to the motor status of the six-year-old boys.

The comparison of the initial and final descriptive statistical parameters of the girls' results (Table 4) indicated significant differences, just as with the boys.

Table 4. Basic statistics (initial and final measuring) - girls

Vars	MIN		MAX		AM		SD		VAR	
	I	II	I	II	I	II	I	II	I	II
Long jump (cm)	50.0	57.0	120.0	136.0	79.8	90.7	14.9	16.9	224.9	288.9
Hand tapping (f)	7.0	6.0	11.0	15.0	9.1	9.7	1.1	1.5	1.2	2.4
Roll up - touch(f)	17.0	18.0	28.0	31.0	21.2	22.2	2.9	3.3	8.6	11.3
Side bend (cm)	25.0	28.0	51.0	57.0	38.9	43.4	6.8	6.9	46.3	47.9
Sit and reach (cm)	13.0	14.0	23.0	29.0	18.1	20.1	3.2	3.5	10.2	12.2
Side walk-bar (s)	35.0	31.0	135.0	130.0	79.9	67.4	23.1	19.8	536.4	394.9
Back walk-floor (s)	90.0	57.0	181.0	170.0	128.6	112.5	24.4	28.2	599.6	800.1
<i>Little school</i> (s)	52.0	39.0	140.0	130.0	81.6	66.4	20.4	22.6	417.4	514.9
Figure <i>eight</i> (s)	226.0	137.0	457.0	330.0	289.1	239.7	53.1	43.0	2826.0	1600.9

Motor abilities were generally improved (according to the T-test coefficients), but with different effects on the final motor abilities status. The changes are presented in order of their significances (Table 5): coordination (*little school*, figure *eight* with banding), explosive strength (standing long jump), flexibility (sit and reach, side bend on the trunk) and balance (side walk on the bar, back walk on the floor) variables. Significant differences between the initial and final motor status with girls in regards to the variables for assessing frequency of movement were not found.

Table 5. T-test coefficients (initial and final measuring) - girls

Vars	T-test	P
Long jump (cm)	-2.63	.01
Hand tapping (f)	-1.61	.11
Roll up - touch (f)	-1.26	.21
Side bend (cm)	-2.57	.01
Sit and reach (cm)	-2.29	.02
Side walk-bar (s)	2.24	.02
Back walk-floor (s)	2.35	.02
<i>Little school</i> (s)	2.71	.00
Figure <i>eight</i> (s)	4.06	.00

The Wilks' Lambda coefficient (Table 6) confirms the hypothesis about the positive influence of a dance programme on the motor abilities of girls.

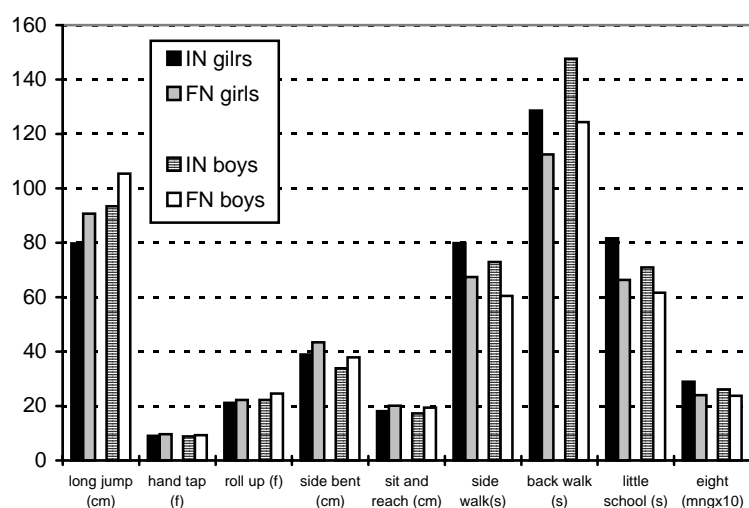
Table 6. Wilks' Lambda coefficient (initial and final measuring) - girls

Wilks' Lambda	Chi-square	Df	P
.562	30.83	9	.00

According to this result, it is evident that the applied dance programme for preschool children differently affects boys and girls. Dance practice evokes positive transformations of motor abilities in both genders, but the structure and intensity of the transformations differs in boys and girls.

The comparison of the initial and final motor status of girls and boys (Graf.1) indicates the characteristic differences between genders. The girls were dominant in per-

forming tests for assessing flexibility and coordination (in both the initial and final measuring), and the boys achieved better results in performing tests for assessing explosive strength and frequency of movement.



Graph 1. A clustered column graph based on arithmetic mean, for the initial and final status of motor abilities, presented separately for subjects

Katić (2003) has already established that the same kinesiological treatment can differently affect seven-year-old boys and girls, and he identified the morphological – motor variables to be addressed by general and differentiated programs of kinesiological education in order for them to be achieved during the development of the child's body as a whole. Obviously, the morphological – motor development should be observed through the interaction of morphological and motor systems, thereby employing target kinesiological treatments to bring the structures of these systems into optimal inter – relationships.

The dance training programme in a preschool should maintain the already attained development and support further development of the relevant motor abilities. Accordingly, further programmes should tend to eliminate developmental deficits in the overall motor status of children.

It is important to point out that dances of different rhythms cause different stimuli to the motor status of the subjects and this should be taken into consideration when selecting dance structures in preschool physical education.

The role of music is very important to the process of learning used in this study. A student learns motor skills better with rhythmic accompaniment (Beisman, 1967). Music produces a relaxed and enjoyable atmosphere for the students to learn in. Preferred music has the ability to awaken pleasant associations, possibly masking unpleasant stimuli (such as heavy breathing associated with exertion) or serve as a distraction to internal feelings associate with discomfort. It has clearly been demonstrated that music can reduce the

factors contributing to pain and stress, tension and anxiety (Maslar, 1986). Therefore, we can suppose that music accompaniment throughout the dance learning programme used in this study, helped to improve the learning process as well as the subjects' motor abilities (according to Derri et al., 2001). Future investigations are necessary to explain this hypothesis on six-year-old children.

4. CONCLUSION

The experimental dance training programme for preschool children was used with the main purpose of teaching and improving the basic dance movements and choreographies for public performance, as well as for stimulating the positive transformations of motor abilities.

The aim of this investigation was to determine the influence of a dance training programme on certain motor abilities of preschool boys and girls. The motor abilities were evaluated with a group of nine standard motor tests. The differences between the initial and final status of the subjects' motor abilities were analysed on the basis of T-test significance and the parameters for differentiating between measurements (Wilk's Lambda).

According to the results obtained in this study, motor abilities of the final measuring, compared with those of the initial measuring (for both genders), had significantly, and generally improved with the exception of the tests applied for assessing frequency of movement. Dance structures were appropriate for the subjects' age; therefore, we can suppose that their use will cause qualitative stimuli to the motor status of six-year-old boys and girls.

Moreover, the used dance programme for preschool children differently affects boys and girls. The comparison of the initial and final motor status of the girls and boys indicates that the girls were dominant in performing tests for assessing flexibility and coordination and that the boys achieved better results in performing tests for assessing explosive strength and movement frequency.

According to the obtained results, it is advisable to include dance structures in preschool PE programmes as kinesiologic operators. Their use in physical education would contribute to better motor abilities in boys and girls.

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UTICAJ PLESNIH STRUKTURA NA MOTORIČKE SPOSOBNOSTI DECE PREDŠKOLSKOG UZRASTA

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Istraživanje je sprovedeno sa svrhom da se utvrdi u kojoj meri je moguće menjati motoričke sposobnosti plesnim sadržajima. Uzorak ispitanika činilo je 30 dečaka i 30 devojčica, starih između šest i sedam godina. Motoričke sposobnosti su procenjene na bazi devet varijabli (jedna za snagu, dve za brzinu, dve za fleksibilnost, dve za ravnotežu, dve za koordinaciju). Dečaci i devojčice su bili uključeni u eksperimentalan tretman koji je bio sačinjen od vežbanja plesnih sadržaja, tri sata nedeljno, tokom četiri meseca. Izvedeno je 48 sati plesa. Posle ovoga izvršeno je drugo merenje motoričkih sposobnosti. Za procenjivanje razlika između merenja izračunati su koeficijenti deskriptivne statistike, koeficijent T-testa i Wilks' Lambda. Bazirano na rezultatima istraživanja može se zaključiti da postoji značajna statistička razlika između početnog i krajnjeg merenja. Na drugom merenju postoji značajna razlika u svim varijablama, osim jedne varijable brzine za dečake i dve varijable brzine za devojčice. Time je potvrđena postavljena hipoteza o postojanju pozitivnog uticaja plesnih sadržaja na motoričke sposobnosti dečaka i devojčica predškolskog uzrasta.

Ključne reči: plesni sadržaj, motoričke sposobnosti, dečaci, devojčice.