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**MODERN INITIAL SELECTION OF 7-8 YEARS OLD GIRLS FOR**  
**TABLE TENNIS**

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***Abstract***

This article provides information on the reform of the initial sports selection of 7-8 years old girls for table tennis by using modern criteria. To obtain reliable information reflecting the state of the hereditary and morphological influence of parents on their own children, it was taken into account the heredity of girls for developing morphological criteria. In accordance with the objectives of the study, there were experimentally substantiated the psychomotor tests for the initial sports selection of 7-8 years old girls for table tennis training, which allowed assessing the state of their motor skills. Among the various motor tests widely used in practice, only those who had a high (reliable) degree of correlation with the psychomotor data of children were selected. The present article reflects the experimental data on the formation of the criteria to identify the physical condition and psychomotor condition of 7-8 years old girls, characterising their accumulated motor experience according to their age, corresponding to the modern initial sports selection for table tennis. The experimentally developed criteria for the selection of 7-8 years old girls should be modern, relevant and representative, and they should be reviewed every 5 years by academic entities in the field of sports.

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**Keywords:** Criteria, functional motor condition, table tennis, physical condition, initial sports selection.



## **1. Introduction**

Within the modern stage of identification of talented sports children, it will be applied only the scientific approaches and achievements of pedagogy, physiology, psychology, sports training and other basic disciplines which contain both the psychomotor and functional features of children's development age (Balsevich, 2006; Bulgakova & Rumyantsev, 1995; Bulgakova et al., 1969; Volkov, 1974).

During the sports selection of children for certain sports, there are used well-known and task-specific tests which reflect the physical, physiological, mental and motor condition of the body (Blagush, 1982; Balsevich, 2006; Bulgakova et al., 1969).

## **2. Problem Statement**

In sports games, an important criterion, among others, is represented by the morphological features of the physical development of children's body, which indirectly reflect both the previous motor experience and the degree of mastery of motor abilities for the future. This criterion can be applied to table tennis, too. During the selection, it should be taken into account the weight-related development indices, according to the Quetelet index, including for the 7-8 year old girls.

However, many experts have recently expressed the opinion (which agrees with ours) that, during the morphological selection of children, attention must be paid to the hereditary influence of their parents, which ultimately determines the further optimisation of sports training (Volkov & Filin, 1986).

## **3. Research Questions**

1. To study the development trends of table tennis in the Republic of Moldova and the existing functional and pedagogical capabilities of children for their selection for sport activities.

2. To substantiate the sports diagnosis of girls aged 7-8 years based on the hereditary signs of physical development and the psychomotor manifestations for the initial sports selection for table tennis.

3. To shape the main directions of reforming the selection of 7-8 years old girls for table tennis and to scientifically substantiate effective criteria for their diagnosis.

## **4. Purpose of the Study**

The purpose of the study consists in the selection of 7-8 years old girls for table tennis according to the hereditary characteristics of physical development and the psychomotor manifestations.

## **5. Research Methods**

1. Analysis of literary sources
2. Pedagogical supervision
3. Pedagogical experiment
4. Method of control test
5. Methods of mathematical and statistical processing.

## 6. Findings

The development of morphological criteria, by taking into account the heredity, should not become complicated and involve an increased number of tests. It is recommended to apply more informative new tests which, on the one hand, simplify the process of selection, and on the other hand, contribute to obtaining reliable information regarding the hereditary influence. We assumed that there might be a certain hereditary dependence between the Quetelet index of parents and their children, which would provisionally reflect some conjugate criterion. While studying various scientific works, it was found that Manolachi experimentally developed and tested such a method for calculating the “conjugacy coefficient” of selection criteria and successfully applied it to the initial sports selection of children judo players.

It has been assumed that this simple and sufficient informative method can be applied to the selection of 7-8 years old girls for playing table tennis. The essence of this method consists of the following: at the coach’s request, the girls notify about the weight and height of their parents; these values are included into an appropriate table. To calculate the average Quetelet index, it is necessary to divide the weight of each parent by his/her height (weight in kg / height in cm), add the results and divide by 2. Further, the weight and height of the daughter are measured and the weight-height parameters (the Quetelet index) are calculated. Then, according to the formula below, the obtained average Quetelet index of parents is divided to the Quetelet index of their daughter; thus, the conjugacy coefficient (Cc) is obtained.

$$\frac{\text{Average Quetelet index of parents} \\ (\text{mother} + \text{father}) / 2}{\text{Quetelet index of their daughter}} = \text{Cc (conjugacy coefficient)}$$

After this test, the girls are selected according to the “conjugacy coefficient” (Cc). In this order, it is measured the gradation where the coefficient of conjugacy is attributed and it is concluded on the selection of the child. The experimentally developed gradations of the indicators of relative body weight and height for the monitored girls and their parents, using the Cc, have the following values:

- 1.28 and less: the child’s body is very influenced by heredity; in the future, there is a probability of body weight lack in relation to his/her own growth.
- 1.29-1.68: in the future, it is possible for the child to have optimal weight-height parameters associated with heredity;
- 1.69 and more: the child is so influenced by heredity that, in the future, it is possible for him/her to have excessive body weight in relation to his/her own growth.

If the Cc indicator is below the value of 1.28 or above 1.69, the relevant applicant is transferred to the “reserve” group.

Thus, by using this method, it was studied the weight-height relationships between 7-8 years old girls and their parents, and according to the above formula, there were obtained reliable indicators of the conjugacy coefficient (Table 01). The participants in the experiment were 30 girls aged 7-8 years, who corresponded to the norms, according to the Quetelet index (0.20-0.30).

**Table 01.** Experimental selection of 7-8 years old girls / conjugated parameters of the Quetelet index through the conjugacy coefficient (Cc)

No.	Quetelet index			Children's weight/height	Conjugacy coefficient (Cc)	Selection
	Parents		$\bar{X}$			
	Father's weight/height	Mother's weight/height				
1	0.317	0.393	0.355	0.25	1.42	+
2	0.330	0.450	0.390	0.24	1.62	+
3	0.469	0.365	0.417	0.30	1.39	+
4	0.368	0.452	0.410	0.27	1.52	+
5	0.405	0.313	0.359	0.26	1.38	+
6	0.420	0.344	0.382	0.24	1.59	+
7	0.390	0.330	0.360	0.29	1.24	-
8	0.435	0.370	0.403	0.30	1.34	+
9	0.428	0.388	0.408	0.28	1.46	+
10	0.420	0.332	0.376	0.25	1.50	+
11	0.340	0.294	0.317	0.23	1.38	+
12	0.423	0.359	0.391	0.29	1.35	+
13	0.390	0.316	0.353	0.21	1.68	+
14	0.329	0.439	0.384	0.23	1.67	+
15	0.402	0.480	0.441	0.30	1.47	+
16	0.440	0.310	0.375	0.30	1.25	-
17	0.372	0.346	0.359	0.26	1.38	+
18	0.542	0.466	0.504	0.30	1.68	+
19	0.596	0.430	0.513	0.30	1.71	-
20	0.310	0.390	0.350	0.23	1.52	+
21	0.450	0.360	0.405	0.30	1.35	+
22	0.435	0.370	0.403	0.30	1.34	+
23	0.445	0.485	0.465	0.26	1.79	-
24	0.290	0.384	0.337	0.20	1.68	+
25	0.407	0.305	0.356	0.26	1.37	+
26	0.371	0.293	0.332	0.25	1.33	+
27	0.311	0.357	0.334	0.20	1.67	+
28	0.375	0.435	0.405	0.27	1.50	+
29	0.490	0.386	0.438	0.30	1.46	+
30	0.513	0.411	0.462	0.30	1.54	+

According to these values, most of the participants could be selected for practicing table tennis. At the same time, within the final morphological selection of the girls, we were guided by the “norm” indicators of the conjugacy coefficients (1.28-1.69) characterising the optimal influence of heredity, which, in the corresponding column of the “Selection” table, was marked with “+”. The conjugacy coefficients that did not correspond to the “norm” were marked with “-” (red colour in the table), and these children were catalogued as not having passed the morphological selection, possibly due to the negative impact of their heredity.

Also, as shown in Table 01, 4 girls (13%) out of the total of 30 did not pass the hereditary morphological selection; their index was higher than the norm, between 1.71 and 1.79, respectively, with an estimated excess of their future body weight. Further monitoring of these unselected girls confirmed our assumptions and, based on the Quetelet index (~ 0.36-0.38), they were included in the category of the initial stage of obesity.

Thus, within the selection practice, the study of children's weight-height indices based only on the Quetelet index is not always justified. In our opinion, this indicator should be associated with the parents' Quetelet index, which will reduce (as can be seen from our example) the negative prognosis up to 13% and will optimise the table tennis training. In the situation where a child does not have one or both parents, the final decision on the selection is always taken by the coach.

In accordance with the study objectives, we also experimentally demonstrated the role of psychomotor tests for the initial sports selection of 7-8 years old girls for table tennis training, which allowed us to evaluate their motor skills. Among various motor tests widely used in practice, we selected only those having a high (reliable) degree of correlation with children's psychomotor parameters. We are deeply convinced that studying the psychomotor parameters, as a leading factor of motor potential, combined with the motor abilities of children of this age, will ensure the evaluation of their suitability for a successful table tennis practice. At the same time, the selected motor tests should be sufficiently reliable and informative to identify the girls' motor manifestations of speed, speed-strength, coordination and other abilities, the sensitive and sufficient development of which will contribute to a more successful and effective solution of the motor issues within the first stage of training. The list of these tests is presented in Table 02.

**Table 02.** Criteria of psychomotor selection of 7-8 years old girls / table tennis

No.	Test	Selection criteria
1	Shuttle run 3x10m (s)	from 10.00 s and less
2	Long jump (cm)	from 120.00 cm and more
3	Strength of the right hand (kg)	from 9.00 kg and more
4	Strength of the left hand (kg)	from 8.00 kg and more
5	Power Ball (2kg) Chest Launch (cm)	from 250.00 cm and more
6	Throw a volleyball, crouch, stand up and catch the ball (10 sec)	from 4.00 times and more
7	Lift and lean the body forward from the lying position for 10 sec.	from 12.00 and more
8	Roll back and forth with a turn for 10 sec.	from 4.00 times and more
9	Simple sensorimotor reaction to light (ms)	from 0.37 ms and less
10	Simple sensorimotor reaction to sound (ms)	from 0.40 ms and less
11	Complex visual-motor reaction to RDO (ms)	from 10.00 times and more
12	Tapping test (average number of touches during 4 time sessions - within 40 seconds)	from 188.00 touches and more

The testing was conducted in relatively standard conditions using a common methodology. More than this, following the test (on a sample of 156 persons), there were developed criteria for the psychomotor initial selection. Thus, after the first stage of selection of 7-8 years old girls, according to the criterion of morphological condition and taking into account the hereditary factor, a group of 26 girls was admitted to the second stage of selection, where their psychomotor state was evaluated. At the same time, after the completion of tests, the results were compared with the selection criteria. If the result shown during each test was equal to or higher than the lower limit of her psychomotor criterion, the tested girl successfully passed the stage of selection for table tennis. If the test results were lower than the selection criteria (at least in one of the tests), the "candidate" was excluded from the further competition.

**Table 03.** Experimental selection of 7-8 years old girls for table tennis, in terms of psychomotor abilities in comparison with confidence criteria (sample – 26 persons)

No.	Testing results of the psychomotor abilities												Selection
	Shuttle run 3x10m (s)	Long jump (cm)	Strength of the right hand (kg)	Strength of the left hand (kg)	Power Ball (2kg) Chest Launch (cm)	Throw a volleyball, crouch, stand up and catch the ball (10 sec.)	Lift and lean the body forward from the lying position for 10 sec.	Roll back and forth with a turn for 10 sec.	Simple sensorimotor reaction to sound (c)	Simple sensorimotor reaction to light (ms)	Complex visual-motor reaction to RDO (ms)	Tapping test (average number of touches during 4 time sessions - within 40 sec.)	
1	9.81	130.0	9.00	9.00	263.0	4.00	12.00	5.00	0.38	0.35	10.00	190	+
2	9.96	139.0	10.0	8.00	259.0	6.00	13.00	6.00	0.35	0.30	9.93	201	+
3	10.2	117.0	9.00	8.00	235.0	3.00	11.00	3.00	0.42	0.38	10.86	175	-
4	10.0	132.0	11.0	10.0	250.0	5.00	13.00	6.00	0.37	0.36	10.00	195	+
5	9.90	134.0	9.00	9.00	277.0	5.00	12.00	4.00	0.39	0.37	9.85	188	+
6	9.77	135.0	10.0	9.00	283.0	4.00	13.00	6.00	0.40	0.36	9.90	191	+
7	10.0	138.0	9.00	8.00	256.0	6.00	12.00	5.00	0.40	0.35	10.00	197	+
8	10.3	118.0	8.00	7.00	233.0	3.00	12.00	3.00	0.40	0.38	10.76	180	-
9	9.80	137.0	10.0	10.0	266.0	5.00	14.00	6.00	0.36	0.37	9.94	199	+
10	9.98	140.0	9.00	9.00	271.0	6.00	13.00	5.00	0.36	0.32	10.00	212	+
11	10.0	120.0	11.0	10.0	280.0	6.00	12.00	6.00	0.40	0.37	10.00	200	+
12	9.79	140.0	9.00	9.00	265.0	4.00	13.00	4.00	0.37	0.37	9.98	193	+
13	9.88	128.0	10.0	9.00	263.0	5.00	12.00	6.00	0.40	0.36	10.00	192	+
14	10.1	125.0	8.00	7.00	237.0	4.00	10.00	3.00	0.44	0.38	10.36	165	-
15	9.80	141.0	9.00	9.00	260.0	4.00	13.00	5.00	0.40	0.36	9.88	188	+
16	10.3	106.0	8.00	7.00	244.0	3.00	12.00	3.00	0.44	0.39	10.11	185	-
17	10.0	132.0	9.00	8.00	250.0	4.00	12.00	6.00	0.39	0.35	10.00	200	+
18	9.89	127.0	9.00	9.00	260.0	5.00	13.00	4.00	0.40	0.37	10.00	190	+
19	10.0	116.0	9.00	9.00	230.0	3.00	10.00	3.00	0.43	0.40	10.33	186	-
20	9.90	125.0	9.00	8.00	261.0	5.00	13.00	6.00	0.38	0.36	9.96	193	+
21	10.0	137.0	9.00	8.00	278.0	5.00	13.00	5.00	0.38	0.36	9.90	205	+
22	10.0	141.0	10.0	9.00	274.0	5.00	12.00	4.00	0.40	0.36	10.00	197	+
23	10.5	118.0	8.00	8.00	230.0	3.00	10.00	4.00	0.44	0.41	11.00	169	-
24	10.0	135.0	9.00	9.00	277.0	5.00	12.00	5.00	0.39	0.37	10.00	201	+
25	10.2	113.0	7.00	7.00	259.0	4.00	10.00	3.00	0.40	0.43	10.87	178	-
26	9.87	130.0	9.00	8.00	250.0	5.00	13.00	6.00	0.37	0.35	9.85	210	+

The results of the psychomotor selection of girls for table tennis are presented in Table 03. At the same time, in the “Selection” column of the indicated table, the “+” sign represents a successful selection, and the “-” sign represents a fail (red colour in the table). Analysing the process of sports selection of candidates based on the psychomotor parameters, it should be noted that a significant majority of girls

(19) have successfully passed the test and were selected for the second stage. The results of other 7 girls for the psychomotor parameters did not meet the selection criteria. It is important to mention that the majority of girls who do not pass this stage have insufficient power (“strength of the hands” test), speed-power (“long jump” test, “throw a ball”, “lift and lean the body forward”), coordination abilities (“throw a volleyball, crouch, stand up and catch the ball”, “roll back and forth with a turn”), etc. The results obtained by the girls under the numbers 3, 8, 14, 16, 19, 23, 25 did not meet the selection criteria. This suggests that the accumulated motor experience is not yet enough for intensive table tennis.

Thus, the experimental selection of 7-8 years old girls based on their psychomotor abilities has shown that the majority (73.10%) have sufficient age-related motor preparedness and experience to solve problems in the initial table tennis training, and at the same time, some of the test participants (26.90%) have not reached the required level of motor condition. Therefore, based on the psychomotor condition, only 19 participants out of the total of 26 were selected for table tennis improvement.

## **7. Conclusion**

1. The conditions of modern society make the number of children who would like to practice different kinds of sports drop every year, and of those who would like to practice sports, the majority is either unhealthy or have an insufficient level of physical training. That is why, now more than ever, the issue of the initial sports selection of children, including table tennis, is very important.

2. The modern initial sports selection of girls aged 7-8 years for table tennis is conducted in the following manner: hereditary signs of morphological development; psychomotor manifestation; functional and motor condition.

3. The morphological, functional and psychomotor development of children of 7-8 years old allows them to successfully participate in the competitive initial sports selection for table tennis and progress in the subsequent stages of sports development.

4. In our opinion, the conducted scientific research on the development and application of the criteria to the physical and psychomotor development contribute to a more efficient initial selection of children for table tennis.

### **Recommendations**

1. The experimentally developed criteria for the selection of 7-8 years old girls should be modern, relevant, representative, and should be reviewed every 5 years by academic entities in the field of sports.

2. Studying the hereditary signs of physical development of children using the Manolachi method (2009) also allows, with a confidence probability of 95%, to predict the perspectives of the morphological state of 7-8 years old girls and their sporting opportunities for the intensive practice of table tennis.

3. During the initial sports selection of 7-8 years old girls, it is necessary to study their motor readiness and psychomotor state, which can informatively reflect their previous motor experience and thereby influence the results of the selection.

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