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## MONITORING OF PROPER FORMATION OF MOTOR SKILLS OF SWIMMING IN MEN AND WOMEN IN THE WORLD CHAMPIONSHIPS ON WATER SPORTS FOR THE I-II STAGES OF 1973-2019

# GANCHAR OLEKSIY<sup>1</sup>, GANCHAR IVAN<sup>2</sup>, CIORBA CONSTANTIN<sup>3</sup>, MEDYNSKY SERGEI<sup>4</sup>, ARKHIPOV ALEXANDER <sup>5</sup>, CHERNYAVSKIY OLEG <sup>1</sup>, CHERKUN IGOR<sup>2</sup>

#### Abstracts

The International Swimming Federation – FINA, almost always includes styles of swimming in the world swimming Championships program. So far, with the 1973-2019 there has been almost 18 world swimming Championships, the program of which was sporting and marathon swimming. It is therefore very important to know the real assessment of the participants of prestigious competitions to determine the real condition of the development of styles of swimming among young people of different age.

*The purpose* of the research is to determine the level and degree of formation of motor skills of swimming by swimmers-winners based on monitoring of the final results of the world's swim on all the Championships of the water sports that have occurred since 1973-2019. It is found out with men and women of different ages at 8 Championships of the world swimming on the I stage in 1973-1991, and among 10 facts on the II stage in 1993-2019.

*Material.* The results of the finalists were compiled and analyzed at the I stage in 1973-1998: Among 390 men and 366 women, who became the winners of these prestigious competitions in the World Championships water sports, including swimming. At the II stage of the world swimming Championships in 2001-2019, the state of the motor skills of swimming, which was found out among 723 men and 702 women, who received gold, silver and bronze medals among the strongest swimmers-winners in the world.

*Results.* For the first time the dynamics was found out of reliable formation of motor skills of swimming with the ability of overcoming different ways of swimming depending on gender difference of participants at age over 21-20 (men,  $x \pm m = 21,42 \pm 1,25$ ; women,  $x \pm m = 19,95 \pm 1,84$ ; t = 0,02, p > 0,05) final starts on the I stage of the world swimming Championships in 1973-1998, and the total difference of average swimming speed is over -0,16 m/s (men,  $x \pm m = 1,71 \pm 0,16$ ; women,  $x \pm m = 1,55 \pm 0,14$ ; t = 5,17, p < 0,05). First of all, the dynamics of the formation of motor skills of swimming on the ability of mastering different styles of swimming depending on gender difference of participants at age 25-23 (men,  $x \pm m = 25,28 \pm 1,10$ ; women,  $x \pm m = 22,73 \pm 1,27$ ; t = 2,27, p < 0,05) at the II stage of the world swimming Championships in 2001-2019, and the total difference of the average speed of swimming is over -0.17 m/s (men,  $x \pm m = 1,80 \pm 0,18$ ; women,  $x \pm m = 1,63 \pm 0,15$ ; t = 3,29, p < 0,05).

*Conclusions.* The received data will make a substantial professional and informational contribution to further improvement of the existing system of physical education and sports in a gender-sensitive approach to the training of youth and their improvement in physical raising and sport. This will be useful for finding out the rating of performance of the strongest swimmers on the example of prestigious competitions, which are certainly indicators at the summer final starts of swimming at all the world swimming Championships in 1973-1999 on the I stage, as well as on II Stage in 2001-2019. This also details trends of gradual long-term development of the formation of motor skills of swimming among young people of different age.

*Key words:* World Swimming Championships, men-swimmers, women-swimmers, swimming courses, state of achievement, average speed, estimation of achievements, difference of indicators.

#### Introduction

At the present stage of the International Federation of Swimming (Fr. Federations Internationals de Natation, abbreviated FINA, for the

<sup>1</sup>Institute of Naval Forces of the National University "Odessa Maritime Academy," Odessa, Ukraine,

<sup>2</sup>National University "Odessa Maritime Academy," Odessa, Ukraine <sup>3</sup>Stata Padagogical University, L Croange, Kishingy, Papublic of Meldova

<sup>3</sup>State Pedagogical University. I. Creanga, Kishinev, Republic of Moldova, <sup>4</sup>State University of Physical culture named after Ivan Baberskyi,

<sup>5</sup>Dragomanov National Pedagogical University, Kyiv, Ukraine

Corresponding author: ciorbaconst@yahoo.com

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Ukrainian transcription-FINA), is an organization that unites most of the national swimming federations and defines the state of the national swimming federations





of the world, which affects the main directions of development of the most popular water sports, where at this time there is swimming, synchronous swimming, water polo, swimming on the open water. Under the auspices of FINA, the World Water Sports Championships and other international competitions are held.

The FINA headquarters is located in the Swiss Lausanne. FINA has officially recognized the IOC and is one of its partners in swimming competitions at the Olympic Games. Currently, the members of this prestigious organization are 201 National Swimming Federations around the world. According to literature and practice, swimming is one of the most popular and mass sports among young people and adults. Therefore, the International Federation of Swimming – FINA almost always includes swimming in the World Water Sports Championships program. It was sufficiently expanded from the I World Championship in 1973, and in 2019 they were XVIII.

World Water Sports Championships are the largest international competitions in the FINA's control and include swimming in the pool and on open water – Marathon swimming starting from 1991, as well as jumping into water, water polo and synchronous swimming. The program of swimming was supplemented and expanded, ranging from 29 to 34 styles by 1991, and to 50 styles in general among women and men. This allows many swimmers to take part in these very prestigious competitions of modernity. In this regard, it is necessary to allocate the first steps in the development and formation of **Analysis of recent researches and publications**.

In existing publications on the theory and methodology of physical education and sport, specific information on the state of modern parameters of differences in the formation of swimming skills among young people and adults, taking into account their gender, is very episodic and fragmented (Ganchar, 2015-a, 2015-b, 2015-c, 2015-d, 2015-e, 2017, Ganchar-2018). While there are quite reasonable publications about specifics of teaching women and men the possibilities of forming swimming skills, like domestic authors (Platonov-2002, Fyrsov-1976), and also given in foreign **Formulation of the research purpose**.

The purpose of the research is to determine the level and degree of formation of motor skills of swimming among swimmers-winners based on monitoring of the final results of the world's swim on all the championships of the water sports that have occurred since 1973-2019. Based on the study tasks, it is proposed to choose the appropriate object of study: the dynamics of the skills of swimming among youth the program of the World Water Sports Championships and as for swimming for 1973-1998 years, as well as the stage (from 29-32 types of competitions), and from 2001 to modern times (from 34 to 50 species programs).

The program of these competitions has expanded and supplemented, ranging from 29 to 34 types of swimming program for 1973-1991 years, as well as with 34 types of programs in 1994 to 42 in 2013. This allows many swimmers to take part in expanding the number of starts held in the international arena, including at the expense of marathon voyage, as well as the addition of new independent countries. From 1978 to 1998 the World Water Sports Championships were held once every 4 years, and from 2001 the World Water Sports Championships is held every 2 odd years.

At the present stage of the development of sport swimming more reliable data on the values of various possibilities of realization of potential physical abilities in achieving the best results of men and women representatives of gender, age and professional training, Improve the motor swimming skills to cover different distances, apply different ways of swimming. Objective information about the similarity and difference of formation of motor skills of swimming among representatives of different gender, age and qualifications will allow optimum justification, develop and introduce objective criteria for application of their readiness to adoption of normative and evaluative functions in various parts of the modern system of physical education and sport.

informative sources of literature and practice (Maglischo, 2003, Hannula, 2001, Schubert, 1990, www.fina.org, www.swimrankings.net, www.omegatiming.com).

Thus, the most interesting and useful for professionals and swimming enthusiasts can be the peculiarities of a certain existing difference between the results of women and men, which is observed at a very prestigious event, which is the World Water Sports Championships, the main component of which is swimming and covering distances in the marathon swimming on the open water.

and adults in the long-term educational stages of sport swimming skills forming. The subject of research has become similarities and differences in swimming skills among representatives of different gender and age in the World Water Sports Championships, from the beginning to the present time from 1973 to 2019.





The research objectives were: 1) defining differences in the levels of a swim skill among the skilled swimmers in accordance with the practice of making prestigious competitions in the World swimming Championships from the past to the

#### **Research methods:**

Theoretical analysis of literature concerning the problem (15 sources of literature and experience of practice, well-known specialists and specialists), generalization of documentary materials (the official protocols of all conducted World Championships at 1-2 stages, which took place respectively in 1959-1991 and from 1993-2019, posted on the web-sites: www.fina.org www.swimrankings.net; www.omegatiming.com; The comparative ascertain experiment (with its help received data which allowed to compare the generalized average indicators in the

#### Results of the study and their discussion

Consideration of the final starts for the years 1973-1998 allows to study the state of formation of motor skills of swimming among the strongest swimmerswinners at different distances, and also to determine present: from 1973-1998 and from 2001-2019 years at 1-2 stages of their conduct; 2) Introduction of the most significant results of the studies into the modern practice experience for possible improvement of swimming qualification in different age groups.

achievements of swimmers-winners at 1-2 stages of the World swimming Championships from 1973-1998 and 2001-2019, accordingly, among the men (390 + 723) and women (366 + 702) at all distances of sports and marathon swimming, who received gold, silver and bronze medals among the strongest swimmerswinners), mathematical statistics (to determine the average indicators in the achievements of swimmers at different distances, the calculation of their authenticity at the level P = < > 0.05).

the peculiarities of dynamics of results between men and women in different age groups (Table 1).

Table 1, Summary table of the average results of winners and prize-winners of the final swim and their age at the World swimming Championships held from 1973-1998

Swimmers results		Distance, way of swimming	Age of swimmers			
men	women	differences		men	women	± difference
22,46	25,31	2,83	50 m freestyle	23	21	+2
50,21	56,24	5,61	100 m freestyle	22	20	+2
1.49,98	2.00,61	10,93	200 m freestyle	20	18	+1
3.51,94	4.11,55	19,69	400 m freestyle	20	18	+1
15.16,93	8.35,63	1,64/1,55 a/s*	1500/800 m freestyle	19	18	+1
56,51	1.02,65	6,14	100 m backstroke	20	18	+2
2.01,66	2.13,61	11,95	200 m backstroke	24	19	+3
1.02,98	1.10,70	7,72	100 m breaststroke	22	19	+3
2.16,38	2.31,74	15,36	200 m breaststroke	22	18	+4
54,32	1.00,50	6,18	100 m butterfly	20	19	+1
1.59,36	2.11,22	11,86	200 m butterfly	19	19	0
2.03,97	2.16,02	12,05	200 m medley	21	18	+3
4.22,40	4.46,15	23,75	400 m medley	21	18	+3
3.22,38	3.46,32	23,94	$4 \times 100$ m freestyle	22	19	+3
7.24,88	8.03,17	38,29	$4 \times 200$ m freestyle	21	21	0
3.44,30	4.10,87	26,57	$4 \times 100$ m medley	22	19	+3
2:52.23,5	57.41,2	a/s*-1,44 m/s	mixed relay-3 x 5000 m	21	20	+1
55.26,9	1:00.46,6	5.19,7	5000 m marathon	21	22	-1
5.15.79.5	5:35.28.6	19.49,1	25000 m marathon	24	27	-3
16:26.28,3	5:28.76,1	a/s*-1,26 m/s	mixed relay 3 x 25000 m	25	28	-3
Notes: the "a/s *" icon recognized the average voyage speed for the participant of the race: 2 men + 1 women						
Difference in age: men, $x \pm m = 21,42 \pm 1.25$ ; women, $x \pm m = 19,95 \pm 1,84$ ; $t = 0.02$ , $p > 0.05$						





The biggest difference of the age of the participants between men and women was in 15 cases ranging from 1-4 years. The lack of age difference between men and women was observed in 2 cases: 200 m butterfly and relay 4 x 200 m freestyle (men,  $x \pm m = 21,42 \pm 1.25$ ; women,  $x \pm m = 19,95 \pm 1,84$ ; t = 0,02, p > 0.05). Meanwhile, the predominance of age of women over men occurred in 3 cases, namely: in the marathon swimming at 5000 m and 25000 m, as

well as the marathon relay 3 x 25000 m for a range of 1 to 3 years. The absolute values of average swimming speed showed a long-term trend of stable difference in men outcomes from women according to an increase in length of the covered distance. Consequently, the results of the swimmers-winners should be considered in the ratio of the average speed of swimming at the distances, as well as one or another way of swimming (Table 2).

Table 2. The dynamics of the differences in the formation of swimming skills for men and women of the winners of
the World swimming Championships held from 1973-1998

Distance, m, styles of	Average swimming speed,	The difference between the	Differences of distance	Difference of		
swimming	distance: time,	average speed of swimming,	and styles of swimming,	results, m/s,		
	men/women, m/s	men/women, m/s	m/s, men/women, m/s	men/women		
50 m freestyle	50:22,46-50:25,31	2,23-1,98=0,25				
100 m freestyle	100:50,21-100:56,24	1,99-1,78=0,21	0,21			
200 m freestyle	200:1.49,98-200:2.00,61	1,82-1,66=0,16				
400 m freestyle	400:3.51,94-400:4.11,55	1,72-1,59=0,13	0.11			
800 m freestyle	1500:15.16,93-800:8.35,63	1,64-1,55=0,09	0,11			
100 m backstroke	100:56,51-100:62,65	1,77-1,60=0,17	0.15			
200 m backstroke	200:2,01,66-200:2.13,61	1,64-1,50=0,14	0,15			
100 m breaststroke	100:1.02,98-100:1.10,70	1,59-1,41=0,18	0.16			
200 m breaststroke	200:2.16,08-200:2.31,74	1,47-1,32=0,15	0,10	0.16 +0.15		
100 m butterfly	100:54,32-100:1.00,50	1,84-1,65=0,19	0.18	$0,10\pm0,13$ t- 5.17		
200 m butterfly	200:1.59,36-200:2.11,22	1,68-1,52=0,16	0,18	t= 3,17, p<0,05		
200 m medley	200:2.03,77-200:2.16,02	1,62-1,47=0,15	0.13			
400 m medley	400:4.22,40-400:4.46,15	1,52-1,40=0,12	0,15			
$4 \times 100$ m freestyle	400:3.22,38-400:3.46,32	1,98-1,77=0,21				
$4 \times 200 \text{ m}$ freestyle 800:7.44,30-800:8.03,17 1,84 $4 \times 100 \text{ m}$ medley 400:3.44.30-400:4.10.87 1.78		1,84-1,72=0,12	0,17			
$4 \times 100 \text{ m medley}$	400:3.44,30-400:4.10,87	1,78-1,59=0,19				
mixed 3x 5000 m	5 km: 172.23.5 = a/s * 1.44 m/s	1,44 m/s				
marathon 5000 m	5 km: 55.26,9-5 km: 60.46,6	1,58-1,48=0,10	0.10			
marathon 25000 m	25 km: 315.79, 5-25 km: 5.35,28	km: 315.79, 5-25 km: 5.35,28 1,39-1,30=0,09				
mixed 3x 25000 m	5 km: 328.76, 1 = a/s * 1.26 m/s	1,26 m/s				
Notes: the "a/s *" icon recognized the average swimming speed for a participant of the race: 2 men. + 1 women						
The difference between the average swimming speed: men, $x \pm m = 1,71 \pm 0,16$ ; women, $x \pm m = 1,55 \pm 0,14$ ; $t = 5,17$ , $p < 0,05$						

Table 3 shows the general results of the differences in the average speed of covering the distances in different styles of swimming among men and women, and the age of participants in the final swim in different styles of swimming at the World swimming Championships during 1973-1998, at their first stage. This clearly shows the indicators of the formation of swimming skills in table 3 data of the general results of the differences in the average speed of covering distances in various styles of swimming among men and women. Men have a higher level of results than women: at 50 m freestyle – 0,25 m/s, at least is over – 0,10 m/s at the distances of marathon swimming 5000-25000 m.

Thus, the difference is 0,15 m/s. Also, men have a higher level of results than women: at 50-100-200 m freestyle -0,21 m/s, then 100-200 m butterfly -0,18 m/s, then in the relay session -0.17 m/s, then in the swimming breaststroke -0,16 m/s, and also in swimming on the backstroke -0,15 m/s, lower rates of the average speed of swimming have become a characteristic feature for swimming at the distances of medley swimming -0,13 m/s and at the distances of lod swimming freestyle -0,11 m/s, and also at distances of Marathon Swimming -0,16 m/s. Total average swimming speed is over -0,16 m/s (Table 3).





Table 3. Dynamics differences of the results of the formation of swimming skills for men and women of the Winners at the World swimming Championships held from 1973-1998

Distance, m. style of	Average swimming speed.	The difference between	Differences of distance	Difference of		
swimming	distance: time, m/s, men/women	the average speeds of	and styles of swimming,	results, m/s,		
, C		swimming, men/women.	m/s, men/women	men/women.		
50 m freestyle	50:22,46-50:25,31	2,23-1,98=0,25	0,25			
100 m freestyle	100:50,21-100:56,24	1,99-1,78=0,21				
100 m backstroke	100:56,51-100:62,65	1,77-1,60=0,17	0.19			
100 m breaststroke	100:1.02,98-100:1.10,70	-100:1.10,70 1,59-1,41=0,18				
100 m butterfly	100:54,32-100:1.00,50	1,84-1,65=0,19				
200 m freestyle	200:1.49,98-200:2.00,61	1,82-1,66=0,16				
200 m backstroke	200:2,01,66-200:2.13,61	1,64-1,50=0,14				
200 m breaststroke	200:2.16,08-200:2.31,74	1,47-1,32=0,15	0,15			
200 m butterfly	200:1.59,36-200:2.11,22	1,68-1,52=0,16		0,16.±0,15		
200 m medley	200:2.03,77-200:2.16,02	1,62-1,47=0,15				
400 m freestyle	400:3.51,94-400:4.11,55	1,72-1,59=0,13		t=5,1/,		
400 m medley	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		0.16	p<0,05		
$4 \times 100$ m freestyle			0,10			
$4 \times 100$ m medley	400:3.44,30-400:4.10,87	1,78-1,59=0,19				
1500/800 m freestyle	1500:15.16,93-800:8.35,63	1,64-1,55=0,09	0.10			
$4 \times 200$ m freestyle	800:7.44,30-800:8.03,17	1,84-1,72=0,12	0,10			
mixed relay 3x 5000 m	5 km: 172.23.5 = a/s * 1.37 m/s	* 1.37 m/s				
marathon 5000 m	5 km: 55.26,9-5 km: 60.46,6	1,58-1,48=0,10	0.00			
marathon 25000 m	25 km: 315.79, 5-25 km: 335,28	1,32-1,24=0,08	0,09			
mixed relay 3x 25000 m	5 km: 328.76, 1 = a/s * 1,26 m/s	* 1.26 m/s				
Notes: the "a/s *" icon recognized the average voyage speed for a participant of the race: 2 men + 1 women						
The difference between the average swimming speed: men, $x \pm m = 1,71 \pm 0,16$ ; women, $x \pm m = 1,55 \pm 0,14$ ; $t = 5,17$ , $p < 0.05$						

So, the difference in the parameters of medium speed swimming among men and women at different distances is characterized by certain degree of formation of motor skills of swimming at different distances. The slightest inherent difference at a medium and long distance swimming free style 800-1500 m and a distance of marathon swimming -0,10m/s, then at distances of 200 m in different styles of swimming -0.15 m/s, then in swimming 400 m different styles of swimming - 0,16 m/s, and the biggest difference in the formation of skills is recorded in swimming 50 m - 0,25 m/s, the maximum difference is at least -0.25 m/s -0.10 m/s = 0.15 m/s, and the total difference is - 0.16 m/s (men,  $x \pm m = 1,71 \pm 0,16$ ; women,  $x \pm m = 1,55 \pm$ 0,14; t = 5,17, p < 0,05).

In considering the results at the final elders of the World swimming Championships in 2001-2019, average results were found at different distances, which are characteristic of the majority of participants among men and women, taking into account their age (men,  $x \pm m = 25,28 \pm 1,10$ ; women,  $x \pm m = 22,73 \pm 1,27$ ; t = 2,27, p < 0,05). Therefore, the examination of final starts at the II stage from 2001-2019, allows studying the state of formation of motor skills of swimming among the strongest swimmers-winners at different distances. It will also help to identify the peculiarities of the dynamics of the results of motor skills of swimming among men and women in different age groups (Table 4). Examination of the final starts at the present stage allows to study the condition of formation of swimming skills among the strongest swimmers-winners at different distances, and also to define the peculiarities of the dynamics of the results of motor skills of swimming among the men and women in different age groups (Table 4).

The biggest difference of the age of the participants was between the men and women in 14 competitions ranging from 1-2-3 years. The reduction in the age of men compared to women was observed in 1 case of the marathon swimming mixed relay (men,  $x \pm m = 25,28 \pm 1,10$ ; women,  $x \pm m = 22,73 \pm 1,27$ ; t = 2,27, p < 0,05). Meanwhile, there is also a lack of any predominance of the age of women over men and vice versa, the superiority of men over women, which is quite characteristic presented in 5 cases at these very prestigious world competitions. The absolute values of the average swimming speed showed a lasting trend in stabilizing of the results of men over women according to an increase in length of the covered distance.



Table 4. Summary table of the average results and winners of the final swim and the age of the World swimming Championships at the II stage held from 2001-2019

Swimmers results		Distance, styles of swimming	Age of swimmers		immers	
men	women	differences		men	women	$\pm$ differences
21,64	24,34	2,70	50 m freestyle	25	25	0
47,94	53,39	5,45	100 m freestyle	24	23	+1-
1.45,16	1.56,26	11,10	200 m freestyle	23	22	+1-
3.43,43	4.03,50	20,07	400 m freestyle	23	22	+1-
7.42,95	8.19,86	36,91	800 m freestyle	22	21	+1-
14.44,91	15.52,45	1.07,54	1500 m freestyle	22	22	0
24,72	27,85	3,13	50 m backstroke	25	23	+2-
53,18	59,43	6,25	100 m backstroke	24	22	+2-
1.54,99	2.07,28	12,29	200 m backstroke	23	21	+2-
27,10	30,36	3,26	50 m breaststroke	25	23	+2-
59,26	1.06,10	6,84	100 m breaststroke	24	21	+3-
2.08,93	2.22,94	14,01	200 m breaststroke	23	22	+1-
23,12	25,67	2,55	50 m butterfly	26	25	+1-
51,01	57,09	6,08	100 m butterfly	23	23	0
1.54,22	2.06,18	11,96	200 m butterfly	23	22	+1-
1.56,72	2.09,58	12,86	200 m medley	24	21	+3-
4.10,05	4.34,47	24,42	400 m medley	22	22	0
3.12,45	3.35,00	22,55	$4 \times 100$ m freestyle	25	23	+2-
7.05,41	7.49,99	44,58	$4 \times 200$ m freestyle	22	21	+1-
3.31,95	3.56,53	24,58	$4 \times 100$ m medley	24	22	+2-
53,85,5	2 men+1women	-	mixed relay – 3 x 5000 m	25	-	-
54.50,8	58.18,6	3.67,8	5000 m marathon	25	24	+1-
1:52.01,8	2:01.09,6	9.07,8	10000 m marathon	25	26	-1+
5:09.28,6	5:29.48,5	20.19,9	25000 m marathon	27	27	0
57.15,3	2 men +1 women	-	mixed relay-3 x 25000 m	25	-	-
54.18,3	2  men + 2  women	-	mixed relay 4x12500 м	27	-	-
3.22,45	2  men + 2  women	-	mixed relay 4x100 freestyle	24	-	-
2.41,50	2 men +2 women	-	mixed relay 4x100 medley	24	-	-
Notes: the "a/s *" icon shows the average swimming speed for the participant: 2 men + 1 women						
Difference in age: men, $x \pm m = 25,28 \pm 1,10$ ; women, $x \pm m = 22,73 \pm 1,27$ ; $t = 2,27$ , $p < 0,05$						

Consequently, the results of the swimmerswinners should be considered in the ratio of the average speed of swimming at different distances, as well as one or another way of swimming, which may characterize a certain level of reliable formation of motor swimming skills. This also applies to certain average indicators of the results of the formation of motor skills of swimming among the winners of the final swim at the various distances of swimming, which were presented in the World swimming Championships held in 2001-2019 among the most qualified swimmers.

Table 5 shows the general results of the differences in the average speed of covering different distances in different swimming styles among men and women swimmers-winners of the final swim and the age of the world championships participants in

swimming at the II stage held in 2001-2019 years. Men have a higher level of results than women: on 50 m freestyle – 0.26 m/s, minimum is – 0,09 m/s in the marathon swimming 25000 m, the difference is more than – 0,17 m/s. This is evidenced by the figures of the 5 table, which shows the average results of the differences in the speed of covering the distances in different swimming styles among men and women – 0,17 m/s (men,  $x \pm m = 1,80 \pm 0,18$ ; women,  $x \pm m = 1,63 \pm 0,15$ ; t = 3,29, p < 0,05).

So men have a higher level of results than women: in 50-100-200 m freestyle -0,22 m/s, then 50-100-200 m backstroke -0,20 m/s, then 50-100-200 m butterfly -0,20 m/s, as well as in the relay swimming -0,17 m/s and then at the distances of 50-100-200 m breaststroke -0,17 m/s. Lower rate differences of average speed swimming have become a feature for swimming at





the distances medley swimming 200-400 m - 0,16 m/s, on the distances longer swimming 400-800-1500 m freestyle - 0,13 m/s. Although the slightest difference in the formation of motor skills of swimming by setting the

value of the average swimming speed was presented only at the marathon distances of 5000-10000-25000 m, over - 0,10 m/s (Table 5).

Table 5. Dynamics of the differences in the formation of swimming skills in men and women winners of the World swimming Championships at the II stage held from 2001-2019 years

Distance, m. styles of	Average swimming speed.	The difference	Differences of	Difference of		
swimming	distance: time, m/s,	between the average	distance and styles	results,		
e	men/women	speed of swimming,	of swimming, m/s,	men/women, m/s		
		men/women, m/s	men/women, m/s	,		
50 m freestyle	50:21,64 -50:24,34	2,31-2,05=0,26				
100 m freestyle	100:47,94-100:53,39	2,08-1,87=0,21	0,22			
200 m freestyle	200:1.45,16-200:1.56,26	1,90-1,72=0,18				
400 m freestyle	400:3.43,43-400:4.03,50	1,79-1,64=0,15				
800 m freestyle	800:7.42,95-800:8.19,86	1,73-1,60=0,13	0,13			
1500 m freestyle	1500:14.44,91-1500:15.52,45	1,69-1,57=0,12				
50 m backstroke	50:24,72-50:27,85	2.02-1.80=0,22				
100 m backstroke	100:53,18-100:59,43	1,88-1,68=0,20	0,20			
200 m backstroke	200:1,54,99-200:2.07,28	1,74-1,57=0,17				
50 m breaststroke	50:27,10-50:30,36	1,85-1,65=0,20				
100 m breaststroke	100:59,26-100:1.06,10	1,69-1,51=0,18	0,17			
200 m breaststroke	200:2.08,93-200:2.22,94	1,55-1,40=0,15				
100 m butterfly	50:23,12-50:25,67	2,16-1,95=0,21				
100 m butterfly	100:51,01-100:57,09	1,96-1,75=0,21	0,20	$0,17\pm0,16$ t= 3.29.		
200 m butterfly	200:1.54,22-200:2.06,18	1,75-1,58=0,17				
200 m medley	200:1.56,72-200:2.09,58	1,71-1,54=0,17	0.16	p<0.05		
400 m medley	400:4.10,05-400:4.34,47	1,60-1,45=0,15	0,10	F *,**		
$4 \times 100$ m freestyle	400:3.12,45-400:3.35,00	2,08-1,86=0,22				
$4 \times 200$ m freestyle	800:7.05,41-800:7.29,99	1,88-1,77=0,10	0,17			
$4 \times 100$ m medley	400:3.31,95-400:3.56,53	1,89-1,69=0,20				
mixed 4 x 100 m freestyle	400:3.22,45= a/s*1,98 m/s	1.98	0.19			
mixed 4 x 100 m medley	400:2.41,50= a/s*1,80 m/s	1,80	0,18			
mixed 3 x 5000 m	5 km: 53.85.5 =a/s* - 1,53 m/s	1,53				
mixed 3 x 25000 m	25 km: 328.76.1 = a/s*1,26 m/s	1,26	0,27			
mixed 4 x 12500 m	25 km:54.18,3= a/s*1,53 m/s	1,53				
marathon 5000 m	5 km:54.50,8-5 km:58.18,6 1,52-1,42=0,10			]		
marathon 10000 m	10 km:112.01,8-10 km:121.09,7	1,44-1,36=0,12	0,10			
marathon 25000 m	25 km:309.28,6-25 km:329.48,5	1,35-1,26=0,09				
Notes: the "a/s *" icon shows the average swimming speed for the participant: 2 men+ 1 women						
The difference between the average swimming speed, m/s: men, $x \pm m = 1,80 \pm 0,18$ ; women, $x \pm m = 1,63 \pm 0,15$ ; $t = 3,29$ , $p < 0,05$						

At the same time, the difference between the results of average speed parameters in men and women at different distances is somewhat characterized by the degree of development of motor skills of swimming at different distances of swimming for a long period at modern periodical, the II stage of World championships in 2001-2019, as the most prestigious sporting events, which objectively and comprehensively reflect the existing state of formation of these motor skills of swimming (Table 6).

According to the results of the pedagogical study among high-class swimmers, the highest difference inherent to them in sprinter -50 m in different styles -0,23 m/s and at medium and long distances swimming free style of 800-1500 m -0,12 m/s, at 100 m distance swimming -0,20 m/s, in swimming 400 m different styles -0,18 m/s and 200 m in different styles -0,17 m/s; and the smallest difference is fixed in the marathon swimming -0,20 m/s, where the maximum and minimum rates -0,23





m/s - 0,10 m/s = 0,15 m/s. Meanwhile, the difference in the results of average speed parameters in men and women at different distances to some extent characterizes the degree of formation of motor skills of swimming at the level of over -0,17 m/s (Table 6).

Table 6. Dynamics of the difference between the results of the range of swimming skills in men and women winners of World swimming Championships at the II stage held from 2001-2019 years

Distance, m, styles of	Average swimming speed,	The difference between	Differences of distance	Difference of		
swimming	distance: time, men/women, m/s	the average speed of	and styles of swimming,	results,		
		swimming, men/women,	men/women, m/s	men/women,		
		m/s		m/s		
50 m freestyle	50:21,64 -50:24,34	2,31-2,05=0,26	-			
50 m backstroke	50:24,72-50:27,85	2.02-1.80=0,22	0.23			
50 m breaststroke	50:27,17-50:30,41	1,84-1,64=0,20	0,20			
50 m butterfly	50:23,12-50:25,67	2,16-1,95=0,21				
100 m freestyle	100:47,94-100:53,39	2,08-1,87=0,21				
100 m on the back	100:53,18-100:59,43	1,88-1,68=0,20	0.20			
100 m breaststroke	100:59,26-100:1.06,10	1,69-1,51=0,18	0,20			
100 m butterfly	100:51,01-100:57,09	1,96-1,75=0,21				
200 m freestyle	200:1.45,16-200:1.56,26	1,90-1,72=0,18				
200 m backstroke	200:1,54,99-200:2.07,28	1,74-1,57=0,17				
200 m breaststroke	200:2.08,93-200:2.22,94	1,55-1,40=0,15	0,17			
200 m butterfly	200:1.54,22-200:2.06,18	1,75-1,58=0,17				
200 m medley	200:1.56,72-200:2.09,58	1,71-1,54=0,17				
400 m freestyle	400:3.43,43-400:4.03,50	1,79-1,64=0,15		$0,17\pm0,16$		
400 m medley	400:4.10,05-400:4.34,47	1,60-1,45=0,15	0.19	t=3,29, $p\leq 0.05$		
4×100 m freestyle	400:3.12,45-400:3.35,00	2,08-1,86=0,22	0,18	p 10,00		
4×100 m medley	400:3.31,95-400:3.56,53	1,89-1,69=0,20				
800 m freestyle	800:7.42,95-800:8.19,86	1,73-1,60=0,13				
1500 m freestyle	1500:14.44,91-1500:15.52,45	1,69-1,57=0,12	0,12			
4×200 m freestyle	800:7.05,41-800:7.29,99	1,88-1,77=0,10				
mixed 4x100 m freestyle style	400:3.22,45= a/s * 1.98 m/s	1,98	0.18			
mixed 4x100 m medley	400:2.41,50 a/s * 1.80 m/s	1,80	0,18			
mixed 3x5000 m marathon	5 km: 53.85.5 =a/s* - 1.53 m/s	1,53				
mixed 3x25000 m marathon	25 km: 328.76.1 = a/s*1.26 m/s	1,26	0,27			
mixed 4x12500 m marathon	25 km:54.18,3= a/s*1.53 m/s	1,53				
marathon 5000 m	5 km:54.50,8-5 km:58.18,6	1,52-1,42=0,10				
marathon 10000 m	10 km:112.01,8-10km:121.09,7	1,44-1,36=0,12	0,10			
marathon 25000 m	25 km:309.28,6-25 km:329.48,5	1,35-1,26=0,09				
Notes: the "a/s *" icon marked the average speed of swimming for the participant: 2 men + 1 women						
The difference between the average swimming speed, m/s: men, $x \pm m = 1,80 \pm 0,18$ ; women, $x \pm m = 1,63 \pm 0,15$ ; $t = 3,29$ , $p < 0,05$						

Indicate that the slightest difference inherent to them in the marathon swimming -0,10 m/s, 200 m in different ways -0,17 m/s, swimming 400 m in different ways -0,18 m/s, on 100 m swimming distances -0,20 m/s, at medium and long swim

distances free style of 800-1500 m-0,21 m/s, and the greatest difference is fixed in swimming 50 m - 0,23 m/s, where the performance maximum-minimum = 0,23 m/s-0,10 m/s = 0,13 m/s. The difference between the overall average speed of swimming





among men and women in terms of skills formation is over -0,17 m/s (men, x  $\pm$  m  $= 1,80 \pm 0,18$ ; women,  $x \pm m = 1,63 \pm 0,15$ ; t = 3,29, p < 0,05).

#### The obtained data allow us to make the following general conclusions:

1) for the first time the dynamics was clarified of reliable formation of motor skills of swimming different styles depending on gender difference of participants (men,  $x \pm m = 21,42 \pm 1$ , 25; women,  $x \pm m = 19,95 \pm 1,84$ ; t = 0,02, p > 10,020,05). Final starts in the World swimming Championships in 1973-1998 years: the greatest difference is recorded in free style swimming for short and medium distances -0.21 m/s, then in swimming butterfly -0.18 m/s, in the relay, respectively -0.17 m/s, breaststroke -0.16 m/s, then in swimming on the backstroke -0,15 m/s, then in the medley swimming in different styles -0.14 m/s, for distances of middle and long swimming freestyle -0,11 m/s. Although the lowest readings are fixed between the maximum and minimum, respectively: 0,21-0,11 = 0,10 m/s, and the total difference of the average speed of swimming is over -0.16 m/s at the World Championships in 1973-1998 years (men, x  $\pm$  $m = 1,71 \pm 0,16$ ; women,  $x \pm m = 1,55 \pm 0,14$ ; t =5,17, p < 0,05);

2) carefully investigated the dynamics of the development of motor skills of swimming as opportunities to cover different distances depending on the gender differences between participants (men,  $x \pm m = 21,42 \pm 1,25$ ; women,  $x \pm m = 19,95 \pm 1,84$ ; t = 0,02, p > 0,05) final starts at the World Championships in 1973-1998 years. The greatest difference is recorded in the relay, respectively 50 m -0,25 m/s, then at 100 m -0,18 m/s, then at 400 m -0,16 m/s, in swimming at 200 m -0,15 m/s, at the distances of longer swimming -800-1500 m and relay swimming free style 4x 200 m -0,10 m/s. Thus, the overall difference is more than -0,16 m/s; (men,  $x \pm m = 1,71 \pm 0,16$ ; women,  $x \pm m = 1,55 \pm 0,14$ ; t = 5,17, p < 0,05).

3) the first time the dynamics of development of motor skills of swimming different styles depending on gender differences of participants (men,  $x \pm m =$  $25,28 \pm 1,10$ ; women,  $x \pm m = 22,73 \pm 1,27$ ; t = 2,27, p < 0,05) final starts at the World Swimming Championships in the years 2001-2019. The greatest difference is recorded in free style swimming for short and medium distances – 0,22 m/s, butterfly – 0,20 m/s, on backstroke – 0,20 m/s, breaststroke – 0,17 m/s, and relay swimming, respectively – 0,17 m/s, then in the medley swimming – 0,16 m/s, and the smallest was at the distances of longer swimming freestyle – 0,13 m/s and in marathon swimming – 0,10 m/s. So the difference of maximum and minimum average speed swimming totals, respectively: 0.22-0.10 = 0.12 m/s, and the total difference is over -0.17 m/s (men, x ± m =  $1.80 \pm 0.18$ ; women, x ± m =  $1.63 \pm 0.15$ ; t = 3.29, p < 0.05);

4) carefully investigated the dynamics of the development of motor skills of swimming on the abilities of covering different distances depending on gender difference between participants of the final starts (men,  $x \pm m = 25,28 \pm 1,10$ ; women,  $x \pm m =$  $22,73 \pm 1,27$ ; t = 2.27, p < 0,05) at the World Swimming Championships in 2001-2019 years. The largest difference is recorded at 50 m - 0.23 m/s, the distances of the long swimming 800-1500 m and relay swimming free style: 4x 200 m - 0,21 m/s, at 100 m -0,20 m/s, 400 m - 0,18 m/s, then 200 m - 0,17 m/s,and the slightest difference is observed in the marathon swimming -0.10 m/s. Thus, the difference between the maximum and minimum of the average speed of swimming is, respectively: 0,23-0,10 = 0,13 m/s, and the overall difference of indicators is more than -0.17m/s (men,  $x \pm m = 1,80 \pm 0,18$ ; women,  $x \pm m = 1,63 \pm$ 0,15; t = 3,29, p < 0,05;

5) the obtained data will make a substantial professional and informational contribution to further improvement of the existing system of physical education and sports in a sensitive gender approach to the learning and improvement process of young people in physical training and sport. This will be useful for finding out the rating of performances of the strongest swimmers on the example of prestigious competitions, which are certainly indicators at the summer final starts of swimming at all the World Swimming Championships in 1973-1999 at the I stage, as well as at the II Stage held in 2001-2019 this further details the trend of gradual long-lasting development of the formation of motor skills of sport swimming among young people of different age and gender at these very prestigious competitions from previous times to the challenges of today;

6) Further research into the selected field should focus on examining the characteristics of gender differences among the strongest swimmers in the following championships of Europe and World Universidad, which is very always important to find out professionals and real performers on the eve of the regular Olympic Games 2020. Therefore, research of topical issues related to the existing abilities of young people of all ages and gender, to the formation of motor skills of swimming will determine the degree of any certain proper and





reliable level of domination of men over women in swimming. It is possible to carefully find out and assess the dynamics of the achievements in previous years and at the present stage of appropriate scientific and methodological support for the development of

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motor skills of sport swimming among youth of all ages and gender during periods of professional training and further possible improvement of the person during life.

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