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Michael Phelps as a model of a champion in swimming

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Introduction

Sozanski's 'model champion' consists of certain amount of abstract terms which make the one and only compilation of characteristics that determinate the theoretical champion (in the present and in the future)[1]. The status of the attributes is not permanent, it undergoes constant alternations, depending on the discipline. The most common features are: age, experience, morphological qualities, technical and tactical skills, fitness, theoretical and psychological efficiency.

The role of a coach should not be underestimated on this occasion. The level of competence of the sportsperson has to constantly be upgraded as it is not a constancy. This model can of course serve as a kind of indicator, where and how to make progress as far as the performance is concerned, but on the same should not be entirely copied by not even a single athlete, for the are no two identical adaptation reactions of different organisms. An athlete's career is a base for optimization of training. The crucial matter is systematic and progressive guidance among juniors. At this point a question arises: What was the course of Phelps's career that he managed to achieve each and every of his successes? Which of the factors had the most powerful influence on the extraordinary and unprecedented achievements?

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[1] H. Sozański, *Basic theory of sports training*, Warszawa 1999.

Materials and methods

In order to analyze the careers of Michael Phelps used a method of document analysis and diagnostic survey. Analysis of documents consisted of a protocol of Michael Phelps competition results in the years 1995–2009, the documentation describing the progression of training from 7 to 17 years of age. Diagnostic survey concerned the biography, anthropological features, aspects of adaptive physiological – biochemical and diet and psyche.

Life

Michael Phelps is an American. He lives in Baltimore, Maryland. He was born on 30 June 1985. He is 193 cm tall, weighs 88 kg and his BMI is 23,66. He is a representative of Club Wolverine. Bob Bowman coaches him. Phelps is a son of a former policeman – Fred, and Baltimore School's principal and teacher in one person – Deborah. His parents got divorced in 1994. Michaels has got two older sisters: Hilary and Whitney. Both of them have been somehow into swimming. The latter has even been entered for the national team in 1994 (Atlanta) but unfortunately, an injury prevented her from taking part in the Olympic Games eventually. At the age of 7, young Phelps was diagnosed with ADHD, which in other words is a hyperactivity disorder. When he was a young boy, Michael could not keep his balance. It were his sisters who stimulated him to become interested in swimming. It occurred, that this sport was a remedy for his illness and enabled him to exploit his talent and abilities.

Build

Phelps's anthropometrical features predispose him to attain very good results in swimming. He is 193 cm tall, he has a range of 201 cm when his arms are spread, his shoe size is 48,5. The length of his legs is typical for a 182 cm – tall person and his torso is typical somebody who is 205 cm tall. The lack of proportions is an ally in this situation for it enables him to have better body position when he is in the water.

Coach B. Gillet – Arizona Sport Ranch Coordinator claims that professional coach should be able to categorize the anthropometrical features of a particular athlete, so that it is possible for him to choose the best possible swimming styles and contests for that given swimmer. Gillet is unusual in his ideas, for he describes the data necessary to categorize swimmers as 'genes-battery'. This information includes records about the family: parents, siblings, aunts and uncles. For example Gillet wants to know about what kind of sports the parents did, whether and when they achieved success in their discipline, if of course at all, what are their measurements, at what age did they grow the fastest, were they overweight, what are the family's dietary habits. Such information is then used as a means for defining the

stability of the genes. If a coach can predict the development of a swimmer, he is prepared for the physical changes that theoretically will occur.

Bartosz Kiziorowski – a multi-medalist at the European and World Championships and an Olympic finalist aptly describes the importance of the anthropometrical features: 'In the USA coaches' work is in 90% based on selecting swimmers according to their proportions. When it became clear that Phelps had been winning contests thanks to his body build, which simply gave him advantage over his opponents, we, together with coach Bottom started focusing on this issue, when choosing members of the Berkeley Team. Height, stamina, speed are indeed significant, but nonetheless, build is too. A lot of coaches have this fact in their minds now. Everyone tries to find Phelps's counterpart.

Michael Phelps – physiology and biochemistry

Phelps was made for swimming. His heart pumps 30 l of blood per minute and his lungs are capable of storing 12 l of air. Gienadijus Sokolovas, from Lithuania, the main physiologist in the USA national team claims that Michael Phelps is able to regenerate after 10 minutes and on the same restore the optimal level of the lactic acid in his bloodstream, and to regain the full biochemical balance after 22–23 minutes of effortless swimming. Jon Urbanchek from Michigan University states that the ability to regenerate after a short period of time is the most crucial characteristic of a sportsperson. Such logic is definitely well-grounded as it is rather a standard procedure that swimmers undergo training twice a day and must remain ready to continue participating in different kinds of physical activity, even after they have finished their day-plan. Biological regeneration, supplementation and diet also play important role to help swimmers stay healthy[2].

Diet and energy expenditure of Michael Phelps

Michael Phelps eats 12 000 calories a day, while a normal person around 2000. Each meal Phelps, at least 4000 calories. These are examples of meals of Phelps:

Breakfast: 3 fried egg sandwiches, an omelet with 5 eggs, 3 toast, a bowl of porridge, 3 pancakes with chocolate cookies, 2 cups of coffee.

Lunch: a bowl of pasta, 2 sandwiches with ham and cheese, 1000 calories energy drink.

Supper: a bowl of pasta, big pizza, 1000 calories energy drink[3].

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[2] I. Celejowa, *Rekord na talerzu czyli tajniki kuchni sportowca*, Warszawa 1990; M. Colgan, *Optimum Sports Nutrition*, New York 1993; F. Hatfield, M. Zuckier, *Improving Tissue Healing Nutritionally*, California 1990; E. W. Maglischo, *Swimming Fastest*, Champaign 2003.

In an interview, Michael Phelps said of himself: "Actually, I eat what I want. I do not have a strict diet. I try to push yourself, as much as possible. To be honest, it's hard to maintain my weight goes, still losing weight"[4].

In another interview, NBC said: "Eat, sleep and swim, that's all I can"[5].

Everyone knows increased training load increase causes an increase in energy expenditure swimmers. In studies conducted by many researchers have shown that daily energy expenditure swimmers ranges from 3600–6100 calories, depending on age, sex, size, load, and their swimming and swimming speed[6].

Mentality of Phelps

Mentality of Michael Phelps coach Bob Bowman says this: "Michael is a born athlete, always fights to the end, do not give up. What distinguishes him from others is the lack of fear of the result. For him, the phrase" impossible "does not exist". Michael Bowman is still giving to understand that it needs to improve and set new goals. Phelps never felt that it is the best. He was always under pressure that he must go to the next higher level. After each race followed flowing of, stretching, and focus on the next start. Finally, there was the desire to fight, no fear of the race and before the riders from the track side. According to many authors the same physical training today is not able to fully prepare for a competitive sport at every stage of athlete development[7].

These days, when fractions of a second differentiated space for leading events of swimming, there is an element of physical preparation in determining who wins, but appropriate training in areas of the player psychology. Although the main purpose of mental training is to increase the effectiveness of sports training, it is the specificity of today, especially high performance, sports makes mental training also

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[4] http://supergigant.blox.pl/2008/08/Dieta-Phelpsa.html (cited on: 15.03.2014).

[5] http://www.sfd.pl/Dieta_Michaela_Phelpsa__12_000_kcal_!!!-t428596.html (cited on: 15.03.2014).

[6] A. C. Grandjeana, *Nutrition for swimmers*, "Clinics in Sporsts Medicine" 1986, No. 5, p. 65–76; D. L. Costil, M. G. Flynn, J. P. Kirwan, J. A. Houmard, J. B. Mitchell, R. Thomas, *Effects of repeated days of intensified training on muscle glycogen and swimming performance*, „Medicine & Science in Sports & Exercise" 1988, No. 20, p. 249–254; D. R. Lamb, K. F. Rinehardt, R. L. Bartels, W. M. Sherman, J. T. Snook, *Dietary carbohydrate and intensity of interval swim training*, „The American Journal of Clinical Nutrition" 1990, No. 53, p. 1058–1063; J. P. Troup, *Studies by the International Center for Aquatic Research (ICAR)*, Colorado Springs 1989.

[7] M. Rakowski, *Nowoczesny trening pływacki*, Rumia 2008; J. Friel, *Triathlon. Biblia treningu*, Warszawa 2010; S. R. Weinberg, D. Gould, *Foundations of sport and exercise psychology* (4th edition), Champaign 2007; T. Sankowski, J. Gracz, *Psychologia aktywności sportowej*, Poznań 2007; T. Morris, J. Summers, *Psychologia sportu. Strategie i techniki*, Warszawa 1998; H. R., *Cox Sport psychology. Concepts and applications*, Missouri 2007; J. Kłodecka-Różalska, *Psychologiczne uwarunkowania osiągnięć kobiet i mężczyzn*, „Sport Wyczynowy" 2002, nr 3–4.

plays a role controller stressful incentives. It is known that emotional state may positively or negatively influence the outcome of sports. Players' emotional states can be observed before the start. The swimming too little nervousness can slow movements, and too much stimulation will lead to muscle tension, changes of technology, which would negatively affect the outcome of sports (The Foundation of Coaching, USA Swimming, 2000). In order to increase efficiency should start to recognize the emotional state of the player, or whether it is more extrovert or an introvert and an appropriate agitation or slowing down the player's emotional state. Also in young athletes proper preparation before the start of the psychic can improve their results. It was found that children having a little faith in its capabilities, and a negative attitude to take off more often relate the poor performance in sports competitions. Strong commitment by the coach and player in shaping the psychology from the beginning of the start of his career is desirable and possible. The following statement of Michael Phelps says that everything is possible. "I would not say that something is impossible. I think that everything is possible, as long as it engages your mind, your job and your time."

Career

Coaches and scientists have long been engaged in tracking and analyzing the careers of players who have attained the highest scores in sport[8]. They were based on the analysis of sports performance at the player's career.

Here are the various stages of development of the careers of Michael Phelps:

- training loads in each year, leading coaches, sports club;
- the results of sports career.

1. Age 7 to 8

- Stroke Clinic (1 x 60 min in a week), coach – Cathy Lears;
- North Baltimore Aquatic Club (NBAC) Level 1 (3 x 60 minutes per week), coach – Julie Gorman;
- played baseball, football, lacrosse.

2. Age 9 to 10

- NBAC Level 2 (4 x 75 min per week), coach – Keith Shertle;
- NBAC Level 3 (5 x 90 min per week), coach – Tom Himes;
- played baseball, football, lacrosse.

3. Age 11 to 12

- NBAC Level 4 (5 x 120 min per week), NBAC Level 5 (7 x 150 min per week), coach – Bob Bowman.

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[8] K. W. Reinhardt, *1000 Olimpiasieger*, Köln 2007.

4. Age 13 to 15

– NBAC Senior Performance Level: Winter (7 x 150 min per week), 2 x 90 min in the morning (6 weeks, January – February), summer (10 x 120 – 150 min per week).

5. Age 16 to 17

– NBAC Senior Performance Level: Winter (6 x 180 min per week 1 x 120 min per week 3 x 105 min per week), Summer 11 x 120–180 min per week[9].

Analyzing the course of training loads in the volume of Michael Phelps can see a systematic increase in the number of training units from 7 to 17 years of age. Sports scores, obtained during the years 1995–2009 are presented in tables 1 and 2.

Table 1. Michael Phelps sports scores in 1995–2002 to 50 m swimming pool in different age categories

	Year	1995	1996	1997	1998	1999	2000	2001	2002
	Age	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17
Competition	50 freestyle				27.01		25.15		
	100 freestyle	1:06.32		59.96	59.25				
	200 freestyle	2:22.07		2:09.12	2:07.29		1:55.37	1:51.73	1:52.36
	400 freestyle			44:29:7	4:24.27	4:11.61	3:58.80	3:57.38	3:55.32
	800 freestyle					8:31.25	8:16.10	8:14.59	8:20.34
	1500 freestyle					16:00.08	15:39.10	15:35.40	15:39.50
	100 back-stroke	1:16.27		1:05.91	1:07.00		1:01.21	59.49	
	200 back-stroke						2:11.92	2:00.57	
	200 breast-stroke						2:27.42		
	100 butterfly	1:10.48	1:06.27	1:04.34	1:04.17	57.50	55.78	52.98	51.88
	200 butterfly					2:04.68	1:56.50	1:54.58	1:54.86
	200 medley	2:42.17		2:23.18	2:22.13	2:14.88	2:06.50	2:00.86	2:03.44
	400 medley					4:31.84	4:24.77	4:15.20	4:11.09

[9] The Development of Michael Phelps. Presented by Coach Bob Bowman, University of Michigan, 15.12.2005.

Table 2. Michael Phelps sports scores in 2003–2009 to 50 m swimming pool in different age categories

Year	2003	2004	2005	2006	2007	2008	2009
Age	**17–18**	**18–19**	**19–20**	**20–21**	**21–22**	**22–23**	**23–24**
50 freestyle							
100 freestyle			48.93	48.83	48.42	47.51	47.81
200 freestyle	1:45.99	1:45.32	1:45.20	1:45.50	1:42.86	1:42.96	1:42.22
400 freestyle			3:47.79				
800 freestyle							
1500 free-style							
100 back-stroke				54.15	53.01	53.42	
200 back-stroke				1:56.81	1:54.65	1:55.84	
200 breast-stroke							
100 butterfly	51.10	51.25	51.34	51.51	50.77	50.58	49.82
200 butterfly	1:53.93	1:54.04	1:55.26	1:53.80	1:52.09	1:52.03	1:51.51
200 medley	1:55.94	1:57.14	1:56.68	1:55.84	1:54.09	1:54.23	
400 medley	4:09.09	4:08.25	4:12.71	4:10.16	4:06.22	4:03.84	

(The left margin contains the rotated label **Competition** spanning the rows.)

Results

Analyzing the course of athletic performance in the career of Michael Phelps in tables 1 and 2 can see the results of a systematic progression. You should also pay attention to the versatility of the stylish and ranged during the races. Michael swam all the styles and distances from 50 m to 1500 m also need to remember that in the older age categories, stylish versatility as a basis for forming a more perfect habit, is an essential element of the training for the achievement of the olympic championship in swimming. Michael Phelps perfectly satisfied this basic requirement swimming training

Table 3. Medals at the Olympic Games in Athens

Distance	Style	Time	Record
200 m	freestyle	1:45,32	American record
100 m	butterfly	0:51,25	olimpic record
200 m	butterfly	1:54,04	olimpic record
200 m	medley	1:57,14	olimpic record
400 m	medley	4:08,26	word record
relay 4 x 100 m	freestyle	3:14,62	
relay 4 x 200 m	freestyle	7:07,33	
relay 4 x 100 m	medley	3:30,68	

In 2003 the World Championships in Barcelona, he won six medals (four gold, two bronze). At the Olympic Games in Athens was close to achieving his dream of winning eight gold medals. In part, they realized, won eight but not all of them were gold. He finished third in the 200 meters freestyle relay and 4 x 100 meters freestyle. After the Games in Athens, he moved to Ann Arbor where he studied at the University of Michigan and began training at Club Wolverine.

In 2005 the World Championships in Montreal, he won five gold and one silver medal. He lost only 100 meters butterfly with Ian Crocker. At the World Championships in Melbourne in 2007, he managed to win in seven contests. Eight gold medals were likely to come for Michael, but in qualifying for the relay 4 x 100 m medley relay American made a false start.

For the Beijing Olympics, Michael was preparing for a long time. Before them, devoted himself entirely to swimming. Said his coach at the time he left maybe two or three workouts. He practiced every day, regardless of holidays, birthdays, etc. He swam up to 15 km every day, sometimes with weights on your thighs. Michael Phelps won eight gold medals in Beijing, beating not only the record of Mark Spitz, but also record the number of Olympic gold medals with their 14-th on your account[10].

Discussion

1. It is the world cup record in terms of gold medals won[11].
2. Phelps set the record for the number of gold medals won at the olympic games (14), and during one olympic games (8).
3. Between 12 and 17 years of age he trained an average of 52 days more per year than its U.S. rivals. How is this possible? The calculation is simple – every Sunday, when everyone was free, he flowed his miles
4. He beat the world record in 200 m butterfly at 15 years and 9 months (the youngest man who broke the world record in swimming).
5. It is the first athlete in history to qualify for the olympics in 6 individual competitions.
6. In 2003, 2004, 2006, 2007 and 2008 Michael Phelps was recognized as the best swimmer in the world. Repeatedly elected him the best U.S. swimmer and athlete of the year.

Currently, Michael Fred Phelps is recognized as the best swimmer in the world, is the best Olympian in history, and you can tell what the best athlete at the moment active in sports. Looking at the achievement of this player is hard to disagree with this opinion. It is a model for young students to swim and represent the sport

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[10] http://pl.wikipedia.org/wiki/Michael_Phelps (cited on: 15.03.2014).
[11] http://www.michaelphelps.com (cited on: 15.03.2014).

as best they can. Represents the ideal type of athlete, though there he slip, for which he regretted. When you go to swim retire, we'll have to wait long for another star in its format.

Michael Phelps's statement concerning the olympic games in 2012. "London is my last Olympics". In London in 2012, the last time in the Olympic experience – declared in Vancouver 14-times Olympic champion swimmer Michael Phelps. *I promised myself that will end his career at the age of 30 years. At the Olympics in London, I was 27, so a simple calculation shows that for the next catch no longer –* said Phelps, who at the invitation of one of the sponsors of the event appeared in Vancouver. He also said that London did not repeat the feat in Beijing, where he won eight gold medals. *I do not repeat, because I am not going to occur in many disciplines. Decide on those where my chances are greatest –* he declared[12].

Conclusions

First recruitment and selection of athletes to the sport of swimming must incorporate a greater degree of future anthropometric characteristics of swimmers. Second Progression of training load and performance of Michael Phelps may be an example of a systematic and planned work training the trainer. Third physiology – the body's biochemical determinants of adaptive Michael Phelps may be an example of the possibility of regenerating the body of the float. 4th Michael Phelps psyche, shaped from the beginning of the start of his career, could have a significant impact on the desire to train swimming, self-esteem, conscientiousness and diligence, despite the many problems in life (family and health). 5th the versatility of the stylish Michael Phelps, realized from an early age had a decisive influence on the results obtained during the Olympic Games.

References

Celejowa I., *Rekord na talerzu czyli tajniki kuchni sportowca*, Warszawa 1990.

Colgan M., *Optimum Sports Nutrition*, New York 1993.

Costil D. L., Flynn M. G., Kirwan J. P., Houmard J. A., Mitchell J. B., Thomas R., *Effects of repeated days of intensified training on muscle glycogen and swimming performance*, "Medicine & Science in Sports & Exercise" 1988, No. 20.

Cox H. R., *Sport psychology. Concepts and applications*, Missouri 2007.

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[12] http://www.sport.pl/plywanie/1,64995.7582521,Michael_Phelps__Londyn_to_moje_ostatnie_igrzyska.html (cited on: 15.03.2014).

Friel J., *Triathlon. Biblia treningu*, Warszawa 2010.

Grandjeana A. C., *Nutrition for swimmers*, "Clinics in Sports Medicine" 1986, No. 5.

Hatfield F., Zuckier M., *Improving Tissue Healing Nutritionally*, California 1990.

Kłodecka-Różalska J., *Psychologiczne uwarunkowania osiągnięć kobiet i mężczyzn*, "Sport Wyczynowy" 2002, nr 3–4.

Lamb D. R., Rinehardt K. F., Bartels R. L., Sherman W. M., Snook J. T., *Dietary carbohydrate and intensity of interval swim training*, "The American Journal of Clinical Nutrition" 1990, No. 53.

Maglischo E. W., *Swimming Fastest*, Champaign 2003.

Morris T., Summers J., *Psychologia sportu. Strategie i techniki*, Warszawa 1998.

Phelps M., Abrahamson A., *No Limits. The Will to Succeed*, New York 2008.

Rakowski M., *Nowoczesny trening pływacki*, Rumia 2008.

Reinhardt K.W., *1000 Olimpiasieger*, Köln 2007.

Sankowski T., Gracz J., *Psychologia aktywności sportowej*, Poznań 2007.

Sozański H., *Basic theory of sports training*, Warszawa 1999.

The USA Swimming Progression for Athlete and Coach Development, Colorado Springs 2000.

Troup J. P., *Studies by the International Center for Aquatic Research (ICAR)*, Colorado Springs 1989.

Troup J. P., *A descriptive analysis of the undulating breaststroke technique in swimming*, "The World of Swimming" 1991, nr 4.

Ważny Z., *Modelowe wskaźniki cech mistrzostwa sportowego*, Warszawa 1989.

Weinberg S. R., Gould D., *Foundations of sport and exercise psychology* (4th edition), Champaign 2007.

http://www.michaelphelps.com (cited on: 15.03.2014).

http://www.answers.com/topic/michael-phelps (cited on: 15.03.2014).

http://pl.wikipedia.org/wiki/Michael_Phelps (cited on: 15.03.2014).

http://www.plywanie.net (cited on: 15.03.2014).

http://www.fit.pl/gwiazdyfit/dieta_michaela_phelpsa,179,19,19,1127,4336,0,0,0.html (cited on: 15.03.2014).

http://supergigant.blox.pl/2008/08/Dieta-Phelpsa.html (cited on: 15.03.2014).

http://www.sfd.pl/Dieta_Michaela_Phelpsa__12_000_kcal_!!!-t428596.html (cited on: 15.03.2014).

http://www.sport.pl (cited on: 15.03.2014).

http://www.jockbio.com/Bios/Phelps/Phelps_bio.html (cited on: 15.03.2014).

http://www.mapsofworld.com/olympics/great-olympians/aquatics/michael-phelps.html (cited on: 15.03.2014).

http://www.sport.pl/plywanie/1,64995.7582521,Michael_Phelps__Londyn_to_moje_ostatnie_igrzyska.html (cited on: 15.03.2014).

Summary

The article is an analysis of a performance of a swimmer who managed to win eight gold olympic medals in one tournament (China, 2008). The research has been conducted over anthropometrical, physiological, biochemical and psychological parameters of an athlete as well as his diet. Additionally, some attention was drawn to the training load, its changes, consequences and influence on the swimmer's career.