

## SELECTION IN SWIMMING TRAINING — THEORETICAL STUDY

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**Abstract.** The aim of this research study is to summarize the notion of preference and selection, which are considered to be the key element of sports training, whatever the discipline.

This review provides a theoretical study on the subject. The introduction section deals with the abovementioned terminology, whereas the main paragraph predominantly discusses the process of preference and selection in swimming.

Pre-school period (6–7 years of age) is the most significant for swimming selection. Such selection should be led by adequately qualified trainers with long-standing experience in professional training of young swimmers. Young swimming candidates should be characterized by higher-level motor skills, which in turn affect the time/efficiency of acquiring new swimming techniques and sport level. In selection process, it is advised/important to utilize tests which predominantly determine the level of specific motor skills such as: speed, strength, agility, motor coordination, suppleness, and so-called 'water feeling'. The above mentioned motor skills play an important role in sport training and sport performance. During selection process, sports team trainers should pay special attention to child's body posture and its length parameters, specifically body's height, length of upper and lower extremities, length of hands and feet, width parameters of the shoulders and chest. First Grade school swimming classes enrollment is also a crucial factor in identifying sport talents. The selection process should be transparent, have clear health, somatic, as well as motoric requirements, which then affect the pace and effectiveness of acquiring swimming skills and sport level.

**Key words:** selection, profiling, competitive swimming

### Introduction

Selection and profiling of candidates is a key compound element in the competitive sports training system (Eider 1984b; Raczek 1986; Sachnowski et al. 2005; Pac- Pomarnacki 2008; Bergier 2011). It consists of searching sporting talents with particular somatic, motor, and psychological skills required for specific/individual/appropriate sport discipline, who are later selected on the basis of their ability to achieve good results in sport performance.

Every given sport discipline is characterized by individual traits known to determine the so-called 'sporting champion profile', and for these reasons it is so important to select such individuals for competitive sports who show particular characteristics/prerequisites as early as at selection process (Kosmol and Sozański 1999; Sachnowski et

al. 2005). A close study of the sporting achievements as well as available qualities (age, height and body mass) of the Olympic medalists and finalists may constitute valuable source of information for coaches involved in selection and profiling of candidates along with coaches responsible for training at various levels of sport level (Sachnowski et al. 2005; Karpiński and Opyrchał 2008; Karpiński and Rejdych 2008).

### Profiling and selection in sport

All athletes strive to achieve sport championship in a given sport discipline. For most, it can guarantee an opportunity to take part in the biggest sporting competition – the Olympics. Only world-class athletes can accomplish their long-term sport aims (Eider J.; Eider P. 2012).

To know particular qualities of the Olympic medalists and finalists in a given sport discipline is a valuable source of information for sport coaches. Hence it is mainly their responsibility to search for future sports champions, special attention should be paid to the following factors:

- proper selection and profiling process of youth and children (Haleczko et al. 2010a, 2010b; Rakowski 2010),
- proper functioning of the selection procedures (Sawczyn et al. 1997; Leonard 2002; Bergier 2011),
- the selection system taking account of profile qualities changes of sport championship (Karpiński and Rejdych 2008; Karpiński and Opyrchał 2008).

The term 'sport selection' is widely present in the studies of numerous authors, interpreting this terminology similarly (Sozański 1993, 1994, 1999; Przybylski 1997; Sawczyn et al. 1997; Kochanowicz 1999; Niemczyk 2000; Haleczko et al. 2010a; Siewierski et al. 2011).

Naglak (1987) considers sport selection to be a one-shot action, in which the baseline qualities are of low, medium, and high level. As a result of sport selection process, we can diversify four groups of children: talented, untalented – rejected, talented – unlawfully rejected, and talented – unlawfully qualified for further sport training.

Turecki (1988: 30) defines selection as a "long-term selection procedure conducted at different training periods, covering initial selection for: a given sport discipline, sports team, as well as selecting participants for the actual sport tournament. Each stage covers the tasks related to the broad requirements of a given sport discipline". Particular attention is being paid to initial selection, when/where coaches analyze large groups of children at stipulated age in terms of their predisposition to practice a given sport discipline (i.e. anthropometric and coordination measurements).

Szopa and Śrutowski (1990: 5) consider «(initial) selection to be one of the most controversial but at the same time one of the most important problems/issues. It should lead to the selection of/to selecting the individuals who have special predispositions for a given sport discipline».

Sozański (1993: 40), on the other hand, regards the selection process to be "such a procedure, which enables identification of the most talented and promising individuals in a given age category".

According to Ważny (1994: 36–37), initial selection is "the first phase of selection process, consisting of directing individuals to a given sport discipline, in which they are most likely to achieve sport performance level of at least average level. Selection criteria constitute a most commonly estimated set of leading qualities for a given sport discipline".

Litwiniuk (1995: 126), similarly to Szopa and Śrutowski (1990), define selection as a "procedure which enables identification of the most talented and promising individuals in a given age category. It is a series of organizational

and propaganda activities aimed at directing individuals to a given sport discipline, in accordance with their main interests and prognostic abilities". According to Litwiniuk (1995), sport training selection of children may be/shall be carried out in the form of natural (self-initiated enrollment and start/commencement of the training process) or artificial selection (selection process on the basis of special tests, examinations, sport level progression evaluation tests). The problem of selecting children and youth to sports training is a widely present subject in the specialized literature. Most of it deals with the evaluation of candidates selection to sport classes and schools, along with sport clubs (Siewierski 2006; Haleczko et al. 2010b; Siewierski et al. 2011)

Few authors (i.e. Painta 1984; Kosendiak 2008; Bergier 2011) use the term "sport recruitment" instead of "sport selection" in their studies. Although there is a little difference in the terminology, training interpretations are exactly the same. As pointed out by Chomiak and Migasiewicz (1998: 409) "both terms are equal, their separation, however, often aims at localizing/situating the process under discussion in the long-term coaching process".

So far, two forms of athlete selection have been accounted in the coaching practice. Firstly, there is the so-called natural, spontaneous selection, which is a self-initiated enrollment and start/commencement of the training process. Secondly, there is an artificial selection, based on tests defining children's age, health, body structure (with special attention to anthropometric parameters required in a given sports discipline), and physical endurance level (motor suitability in particular) (Sozański 1993, 1994, 1999).

Following the initial sport selection, main selection is the next stage in the selection process. According to Pilicz (1971: 7) "Main selection is a dynamic process aimed at selecting from among choices those individuals, who have optimal physical and psychological qualities needed to succeed in a given sport discipline".

Sozański (1994: 34) claims that "Sport selection is an organized activity, in which individuals with future elite athlete qualities are chosen.

Ważny (1994: 127) believes sport selection to be "a set of actions aimed at selecting and profiling most talented individuals in a given sport discipline...". The selection process should be directed towards finding the qualities of the so-called "sport champion profile".

Karwacki (2000: 109), on the other hand, defines selection as a long term process of "searching for the most talented individuals, and coaching and profiling them in a way that will help achieve outstanding sport performance".

Sport selection topic (in the given sport disciplines) is present, among others, in the works of Burns and Gaines (1996), Wieczorek (2000, 2001), Opyrchal et al. (2005), Haleczka et al. (2010a), Siewierski et al. (2011).

Dividing selection process into sections, stages occurs/appears, among others, in the works of Zaciorski and Bułgakow (1975), Sozański (1981, 1994, 1999), who classify three main selection types:

- sport discipline – oriented selection – aimed at choosing child's predisposed sport discipline,
- team forming – aimed at selection and formation of a sport team of many kinds/sorts (rowing, team sport games), including, accordingly to our study, the formation of swimming relay race,
- sport selection – concerns elite-level athletes, from which country's representatives are chosen (Olympic Games, World Championships, European Championships, etc.).

Sozański (1981), on the other hand, distinguishes three stages of sport selection, including:

- initial selection – utilized in most sport disciplines among children aged 10–11. It is aimed at comprehensive sport training,
- main selection – utilized among children after the 2–3-year-long period of comprehensive training,

- specialist selection – this stage of sport selection mainly involves predisposition evaluation in a given discipline. It applies to athletes with a 4–5-year coaching period.

It is worth mentioning that the above-mentioned age limits and coaching period are flexible. Thus, in the coaching process, individual differences among the trainees should be taken into consideration.

Among the selection criteria, Sozański (1981) distinguishes: somatic build, motoric skills (they do not appear under this name in the present motoricity nomenclature), physical endurance, sport results, psychological predispositions, elite athlete evaluation.

In other research studies (Sozański 1993, 1994, Kosmol and Sozański 1999) three main selection types have been distinguished:

- natural selection (spontaneous) – all healthy individuals are accepted to enroll for a discipline of choice, they can opt out from the initial selection at any time,
- intuitive selection – is led by physical education teachers, coaches, who, on the basis of their expert knowledge and practical experience, know the specificity of a given sports discipline and are able to choose talented children,
- directed selection – this selection type brings along the reduction of individuals starting sport training, maintaining the number of the ones meeting the prognostic criteria (Sozański 1994).

According to Kosmol and Sozański (1999), comprehensive selection is made up of four stages:

- pre-selection – comprehensive observation of children at pre-school age, i.e. during motor skills activities at a pre-school,
- initial selection – based on searching for talents, directing them towards comprehensive training, on the basis of their health, basic parameters of somatic characteristics, and physical endurance,
- main selection – is aimed at selecting talented children, characterized by high-level somatic predispositions. It is based on observation, test results, and sport competitions,
- specialist selection – aimed mainly at the evaluation of predispositions for a given sport discipline. It marks the beginning of the specialist training stage (Kosmol and Sozański 1999).

### **Selection and profiling in competitive swimming**

Swimming is an Olympic discipline since 1896. Over many years, the swimming technique of a particular swimming style has been changing (Bartkowiak 1976), along with the number of events (Lipoński 2006). During the last summer Olympics in London in 2012, there have been 17 female and male swimming events respectively; with 102 Olympic medals to win (Igrzyska XXX Olimpiady 2012). Swimming is therefore a sport discipline in which such a great number of medals could be won. Taking all the above into consideration, National Olympic Committees (i.e. Polish Olympic Committee), and their Swimming Associations (i.e. Polish Swimming Association) are very much interested in the participation of their representatives in the Olympic Games – the biggest sporting event in the world. Only the best of the bests, having particular qualities (age, somatic, motor, capacity, psychological related etc.) and adequate training win Olympic medals, world or European championships.

Getting athletes to an elite level is a long-term process (Sweetenham and Atkinson 2003; Leonard 2008), which is usually completed after a 8–10-year period of intensive training according to Platonow (1997) and Wiczorek (2001), 10–12 accordingly to Bartkowiak (1997), or 10–15 according to Wiederek (2000). Olympic athletes age analyses (Kosmol 1997; Opyrchał and Karpiński 1997; Karpiński and Opyrchał 2008) indicate that „the average

age range/limit is increasing, also among the Olympic medalists” (Karpiński and Opyrchał 2008: 12). Similarly, average height and body mass of the competitors are on the rise, compared to the parameters of the remaining swimmers (Opyrchał and Karpiński 1997; Karpiński and Opyrchał 2008; Socha 2008). That is why it is so important to constantly analyze available characteristics (such as age, height, and body mass) of Olympic or world champions in swimming as it enables coaches to „evaluate the changes of the profile characteristics of a sport champion” (Karpiński and Opyrchał 2008: 8) and to modify the training process accordingly.

Selection and profiling in competitive swimming are present in many research studies (Strzelczyk 1983; Eider 1984a; Nowacka-Chiari 2005; Opyrchał et al. 2005; Socha 2008; Siewierski et al. 2011; Ziara 2011; Leko and Grčieacute-Zubčević 2013).

Selection phase is the most important, because it is during this stage coaches should search for healthy children, at a right age, having adequate somatic build and physical endurance. Right candidates selection is also an important issue, as it is this choice that is responsible for finding such athletes who will achieve great sport results – satisfying both for the athlete and the coach (Piechaczek et al. 2000).

Competitive swimming is a part of such sport discipline category, in which swimming training as well as comprehensive training is introduced at a very early stage (Eider 2009; Maglischo 1993; Grandge and Gordon 2004; Rakowski 2010; Eider J. and Eider P. 2012). Platonow (1997) conducted a very detailed analysis of the starting age of swimming training among the best swimmers of the world. The study showed that most of the women (girls) started their training at the age of 6–10, whilst men (boys) started at the age of 8–12 (detailed values available in Table 1).

**Table 1.** Starting age of swimming training among world’s best swimmers (Platonow 1997: 14)

Sex	Swimming training starting age (years)	Percent of individuals examined
Male (n = 118)	3–7	17,8
	8–12	70,3
	13–16	13,6
Female (n = 82)	3–5	7,3
	6–10	92,6
	11–12	1,2

The percent of examined individuals exceeds 100% – original data.

Wiederek (1996), on the other hand, conducted some research among the swimmers of Polish sport clubs, the Sport Championship Schools. Based on the data analysis in Table 2, it turns out that 49.3% of the surveyed people started their swimming education in pre-school, 38,7% in the 1st and 2nd grades of primary education, with only 12,0% in later years. In another study, Wiederek (2000) points out that the first stage of training consists of swimming training of children aged 8–9 (Table 3).

Olympic swimmers from Szczecin, on the other hand, started their swimming education at the age of 5–7 (Troszczyński 2003; Eider 2004, 2009; Eider J. and Eider P. 2012), and at the age of 16–21 they already were Olympics participants (Table 4).

During competitive swimming selection it is advised to search for individuals with prognostic somatic parameters, especially height (Bomba 1994; Piechaczek et al. 2000; Wieczorek 2001). This trait is mainly genetically-conditions so it is important to take parents’ parameters into consideration (Sachnowski et al. 2005). It is

confirmed by most of the authors (Chomiak and Migasiewicz 1998; Stachowicz et al. 2011; Zarzeczny et al. 2011), that children classified for competitive swimming training are taller than non-practicing peers. Height is an important factor in achieving better swimming results, which is confirmed by the analyses of Olympics finalists' body structure (Karpiński and Opyrchal 2008; Socha 2008).

**Table 2.** Swimming education starting point (Wiederek 1996: 103)

Ordinal number	Specifications	Number	Sex	Pre-school	1–2 Grade	2 Grade upwards
1.	National team and seniors	16	K	8	8	–
		39	M	19	14	6
2.	National team and juniors	15	K	7	8	–
		14	M	5	8	1
3.	Juniors	24	K	3	13	8
		42	M	16	23	3
Total		150		58	74	18

**Table 3.** PZP coaching plan for the years 2000–2004 (Wiederek 2000, p. 196)

Stage	Swimming level	Age	Grade (year)	School	Age category
1.	Swimming education	8–9	II, III	Primary	children
2.	Improving swimming skills	10,11	IV, V	Primary	children
3.	Basic swimming	12,13	V, VI	Primary	youngsters
4.	Competitive swimming	14,15,16	I, II, III	Middle School	young juniors
5.	Competitive swimming	17,18,19	I, II, III	Secondary	juniors
6.	Competitive swimming	20,21	I, II	Higher Education	youth
7.	Competitive swimming	<21	<II	Higher Education	seniors

**Table 4.** Swimming education and Olympics participation starting point of Szczecin's Olympic swimmers

Ordinal number	Full name	Starting age		The Olympic Games (year)	Sport discipline	Results
		SESA	PA			
1.	Dorota Brzozowska	5	16	Moscow 1980	200 m freestyle	V
2.	Marta Włodkowska	5	19	Barcelona 1997	400 m individual medley	XXIV
3.	Katarzyna Baranowska	6	21	Beijing 2008	200 m individual medley	VIII
			19	Athens 2004	400 m freestyle	IX
4.	Przemysław Stańczyk	7	23	Beijing 2008	400 m freestyle 4 × 200 m freestyle – relay race	XIX XIV
			21	Beijing 2008	1500 m freestyle	IX
5.	Mateusz Sawrymowicz	7	25	London 2012	400 m freestyle 1500 m freestyle	XXI VII
			6	20	London 2012	4 × 100 m individual medley – relay race

SESA – swimming education starting age; PA – Olympic Games participation age; B – bench warmer.

Source: Troszczyński 2003, Eider 2004, 2009, Eider J, Eider P. 2012

General health condition of a child (candidate) is a very important criterium during swimming training selection (Wieczorek 2001; Sachnowski et al. 2005; Siewierski et al. 2011). Collecting basic information from the candidate, and detailed information from the parents, greatly improves accurate selection of candidates predisposed to achieve high sport level in swimming. However, the economic-financial situation in most swimming clubs do not allow for specialist medical examinations at selection stage. "It should be remembered that even the tiniest health issues can deepen during intensive training regime, putting away the perspective of achieving high sport results" (Wieczorek 2001: 16).

Numerous studies have shown that when selecting children for swimming training, we should follow the values of stable characteristics, genetically-conditioned, not dependent on the training process (Ryguła and Wojtylak 1999; Wieczorek 2001; Sachnowski et al. 2005), including height, upper and lower limbs length, as well as the length of hands and feet (Bomba 1994; Chomiak and Migasiewicz 1997). Body's height is a significant factor in achieving good results, which has been confirmed by research analyses (Pernak 1998; Karpiński and Opyrchał 2008; Socha 2008).

When selecting children for swimming training, special attention should be paid in choosing those who are characterized by talents in sport and swimming (Pac-Pomarnacki 2008). According to an ex professional swimmer Klimek-Włodarczyk, we can use the term sport talent towards "an individual who has inborn, natural predispositions to swimming – having the so-called 'feeling of the water' skill as well as high motoric, physiological, and psychological abilities" (Pac-Pomarnacki 2008: 116). It is worth bearing in mind that only a few candidates have prognostic-developmental traits of a swimming champion profile (Karpiński and Opyrchał 2008).

Selection in swimming training is present throughout a long-term coaching process. It consists of seven selection levels, interconnected with the training's stages (Table 5) (Sachnowski et al. 2005).

**Table 5.** Selection levels, interconnected with the training's stages (Sachnowski et al. 2005: 6)

Selection levels and their key aims	Selection stages
Baseline: the rationality of swimming education evaluation	baseline
Preliminary: evaluation of effective sport advancement perspectives	preliminary
Intermediary: sport championship abilities evaluation in a given swimming style	specialist preliminary
Basic (stage one): international level results abilities evaluation	better sport performance
Basic (stage two): championship material evaluation	maximal use of one's abilities
Final (stage one): maintaining sports mastery evaluation	maintaining sports mastery
Final (stage two): gradual sport performance decrease and its evaluation	gradual achievements decrease

### Baseline selection

According to practitioners and theoreticians of swimming (Litwinikuk 1995; Bartkowiak 1997; Sachnowski et al. 2005), baseline selection should be conducted among children that are able to swim aged 8–9. Among selection criteria, there are: health condition, stable somatic parameters, motor skills values, flexibility, „feeling of the water”, sport family traditions.

Possessing the so-called "feeling of the water" ability speeds up the acquirement of a swimming technique, as well as achieving better sport results (Bartkowiak 1995; Starosta and Rostkowska 2001a, 2001b; Pac- Pomarnacki 2008). Bartkowiak (1976: 260) describes „feeling of the water” as a „huge sensitivity of hands to changing water

pressure in key hands movements phases". Starosta (1993: 18) explains this term as: „a high level of coordination skills, enabling full adjustment to water environment, and rational movements utilizing the minimum energy". The structural concept of "feeling of the water" is made up of the following components: kinesthetic diversifying of motion, rhythmicity of motion, spatial orientation, quick reaction/response, balance (Starosta 1993). It is a "coordinated concurrence of various senses, i.e. visual, auditory, tactile, motor, and vestibular" (Starosta et al. 2003: 18). Previously conducted survey studies among coaches have shown that "the feeling of the water" could be both inborn or acquired (Starosta and Rostkowska 2001b).

### **Preliminary selection**

This selection phase relates to children aged 10–11, who have accomplished 2-year swimming training, of which the most talented with sought-for qualities (guaranteeing the elite status achievements) are selected. Coaches should consider the fact that „Successes in childhood or adolescence cannot guarantee the elite status achievements in the years to come, due to the differences among children as a result of differential pace of reaching physical maturity" (Bulgakowa and Woroncow 1980: 39).

### **Intermediary selection**

Concerning children aged 13–14, who already have 5–6-year training experience 13–14. The main aim of this selection type is to evaluate the predispositions of swimmers in a given competition. Specialist tests conducted both in water and on land help to evaluate the sport level of swimmers. Special research equipment is also helpful in the evaluation of a swimming technique level and motion parameters. Coaches analyze the progression of sport results very amply with the regard to individual sport experience and applied training loads (Sachnowski et al. 2005).

### **Main evaluation (stage one)**

Occurs after prior 8–10-year swimming training among girls aged 16–17 and boys aged 17–18. This selection is mainly aimed at detailed analysis of athletes' motivation in achieving sport elite status, functional and psychological resistance to implemented training loads (Sachnowski et al. 2005).

### **Main evaluation (stage two)**

This selection applies to athletes with approx. 10–12-year training experience. It is conducted among 18–19-year-old female swimmers and 19–20-year-old male swimmers. The above-mentioned age ranges can vary (this is caused by the fact that swimmers have their own individual, various sport levels). The functioning coaching team with their leading trainer at the forefront, evaluate predicted sport results, which can then guarantee successes at main sport events such as the Olympics Games or world championships. (Table 5). Scientific personnel plays a key role as a „selection advisor" (e.g. doctor, psychologist, physiologist, bio-mechanic, biochemist, physiotherapist), who supervise the effective training process concerning i.e. training loads, biological regeneration, or nutrition.

### **Final selection (stage one)**

Concerns the analysis of time period in which high level of sport performance can be maintained. It is dependent on various factors, including: age, health condition (e.g. experienced injuries), financial motivation, family

situation (wives, husbands, their children), psychological exhaustion due to long-term sport kind of lifestyle (e.g. training camps away from home and family for long periods of time, same training environment), financial security.

### **Final selection (stage two)**

During the last selection stage, future aims are established, i.e. possible time frames of swimming career, swimming competition participation, having regard to regression of the represented sport level (Sachnowski et al. 2005).

### **Conclusions**

1. Pre-school period (6–7-years of age) is the most significant for swimming selection, among large child population.
2. Such selection should be led by adequately qualified trainers with long-standing experience in professional training of young swimmers.
3. Young future swimmers should have high levels of motor skills, which speeds up the acquirement of a swimming technique, as well as achieving better sport results
4. When selecting children for swimming training, special evaluation tests should be implemented to determine: speed, strength, agility, motor coordination, flexibility, and the so-called "feeling of the water". All these factors play a key role in sports training, and are helpful in achieving good results.
5. When selecting children for swimming training, coaches should pay special attention to length parameters such as: height, upper and lower limbs length, hands and feet length, and width characteristics of shoulders and chest.
6. First grade swimming schools enrollment should be based on clear and transparent rules, health, somatic, performance requirements, influencing: speed, swimming skills teaching quality, and sport level.

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**Cite this article as:** Eider P. Selection in swimming training – theoretical study. *Centr Eur J Sport Sci Med*. 2014; 5 (1): 65–75.