ANALYSES OF RELEVANT ISSUES OF TALENT DEVELOPMENT, SELECTION AND SUCCESS IN SWIMMING

Doctoral Thesis

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INTRODUCTION

Today's success- and result-oriented sport demands the presence of highly motivated athletes of extraordinary skills. Sports have recently become increasingly specialised, therefore athletes with such general or specific and hereditary or acquired skills and characteristics are needed that are important for that specific type of sport (Révész and colleagues, 2005a). Due to the selection of the athletes having the most suitable skills for professional sport expectations are ever higher with respect to scientific knowledge regarding selection and talent management and to the measurement of the skills important for a specific sport and also to define the parameters of paying off as accurately as possible.

In recent decades our swimmers have earned medals at almost all world wide competitions. Since Alfréd Hajós, the first Hungarian Olympic champion of the sport our swimmers have won 23 Olympic gold medals, 17 world champion titles and 57 European champion titles until today (until the Beijing Olympics). It is the second most successful sport of Hungary among Olympic sports, it is one of the most well-known and popular sporting activities (Hencsei and colleagues, 2005), thus it does not only provide satisfaction for the professional sport and its fans, but it is also a much-liked recreational activity of amateur athletes as well. The media also recognises the potential of swimming, therefore the transmission of competitions, their inclusion in the different types of media is notable.

Generally it can be deemed a successful sport. However, the precondition of success is a systematically chiselled and executed selection and talent management system (Williams and colleagues, 2004). Besides the search for new talent, professional sports also require the continuous measuring of young athletes to promote the selection and paying off procedures. It is well known that athletes with the best skills are necessary to achieve an extraordinary performance, however, there is no doubt that the quality and quantity of training and the environment are also decisive factors in this process.

This thesis is aimed at defining the talent-characteristics of swimming as a sport and the questions of paying off, and it shall also analyse the connections between the methods of selection and the process of talent management. Besides the coach-athlete relationship and the characteristics of the qualities of coaches shall also be analysed. In our research we also tried to find the answer to why have we been continuously able to achieve international successes being the small country that we are. Are our athletes this talented, are the excellent coaches to

be thanked, or is the proper ratio of the two the key to success? Does one have to be born for outstanding achievements or is there some kind of a mystery behind all successes?

REVIEW OF THE LITERATURE

While reviewing the corresponding literature we have found several studies presenting the history of intelligence- and talent-searches (Neisser and colleagues 1996; Balogh, 2003, 2004; Ranschburg, 2004), however, a sport-oriented approach to talent research, talent models have proved to be much rarer (Czeizel, 2003; Révész and colleagues, 2005a). Thus a sport-oriented talent examination is not impossible to come across, in the case of numerous sports the definition of talent for that specific sport is almost completely absent from both domestic and international scientific literature.

Piirto (1994, 1999), in his theory, bases the components of talent on genetics. In his opinion the genetic basis is obvious as strong definer of talent. However, the development of performance is not solely determined by genetics-based characteristics, but are influences by multiple parameters, which he named aspects. The base of the pyramid model is the genetic aspect, providing a stabile foundation for further development. Heading towards the tip of the pyramid emotional, cognitive, talent and environmental aspects are built on this foundation. The author specifies the talent aspect as including those specific areas where talent has a concrete possibility to flourish. Sport appears as one of these areas, where above-average results can be achieved by developing skills.

The Components, Concept of Talent

Exactly defining the concept of talent is not an easy task, not even for examiners, researchers of the topic. In addition to this in everyday life the expression is also often used to describe an extraordinary performance, even though this does not necessarily mean talent. There are several reasons for the task of defining talent being so difficult, of which two must be mentioned (Bóta, 2002). One is that the concept is a rather complex one, the other being that it largely depends on society and culture, i.e. it is a question of conventions (Gyarmathy, 2003; Herskovits and Gyarmathy, 1994).

Dependence on the environment is further strengthened by the procedures used when identifying talent, which are usually neither uniform nor standardised today. In the identification methods standard methods, such as the measurement of intelligence may be included, however, this does not provide enough information for each area where talent can manifest. Another question is whether by discussing the performance of a talented individual

quantitative or qualitative differences of skill are considered. According to Gyarmathy (1998) it is impossible to answer this question as the ratio of the appearance of these cannot be measured unequivocally.

Based on the characteristics and criteria those can be successful in a sport who have hereditary biological foundations and psychomotor skills corresponding to the given sporting activity, which can be developed by training and preparation as effects of the environment to such a level that provides a possibility to reach extraordinary achievements on the long run. For this the athlete possesses all psychomotor, anthropometric and psychological skills without which he/she would not be able to reach extraordinary achievements on the long run.

Management of Sporting Talents, the Periods of Talent Development

Bloom (1985) and Côté (1999) have different opinions regarding the steps of talent development and the main activity forms of these steps. Both researchers have split the talent management process into three stages, however, these emphasise different characteristics of content. Specific years of lifetime have not been assigned to these stages, as such are different for each sport.

Bloom (1985) named to first steps of the relationship with the sport the *stage of initiation*. During this stage sport primarily means playful forms of movement, the activity is characterised by playfulness and fun. It is because of this that during this stage the roles of the parents and the coach are of extraordinary importance.

The second is the *stage of development*, in which the tone of the trainings becomes more serious, training hours become longer and specification begins for specific disciplines. It is during this stage that competitiveness is introduced, giving a whole new dimension to sport.

During the *stage of perfection* the athlete becomes more and more in charge of making sport decisions, the leading role of the parent and the coach becomes less important. The athlete becomes more self-confident, focussing completely on the sporting activity and maximal sport performance.

Côté (1999) attempted to further develop the theoretical framework, especially by examining, through quantitative, research the role of the family in the process of talent development, as Bloom, also naming three periods. For him the *sampling* years are the first significant period, partially resembling the first stage of Bloom. However, here the aim is to have the youth try as many different sports as possible, which will later help to choose the sport most suitable for that person.

Côté calls the second period *specializing years*, during which the athlete does not keep developing his/her skills in a sole discipline, but may pursue several similar sports at the same time.

During the *investment years* athletes complete significantly more and more intensive training work than before, here the performance is focussed on exercising the sport, for which the dedication and inner motivation of the athlete is indispensable.

Psychological Components of Sport Talent

In high level performances the psychological characteristics of the athletes are defining factors. During the lengthy process of preparing for professional sport the psychological components of the personality of the athlete, such as motivation, coping strategies, stress resistance, adaptability, all influence the success and result of the preparation. This is why it is worthwhile to expand the scope of research and to interpret and use in a discipline-specific way in practice (Révész and colleagues, 2005b).

For the high level performance required by professional sport, motivation is indispensable, the role of which is significant during sporting activities. Motivation, as it has humanspecific characteristics, can be split into two groups (Weiss, 1985). These are the groups of extrinsic and intrinsic motivation. According to the classic approach, these two basic types of humanspecific motivation are not cumulative, but rather exclusive, i.e. only one of the two can be in the background of a specific act.

According to Ntoumanis (2001, 2002) athletes with intrinsic motivation have better self-evaluation, these athletes are capable of bigger efforts in their sport if the given task is an appropriate challenge for them or if they can choose the level of difficulty of the tasks to be executed.

According to Theeboom and colleagues (1995) teachers, coaches play an important role in elevating intrinsic motivation to a high level. This depends primarily on the school- or training environment, created by the teacher or the coach.

Other types of questionnaires have also been developed to measure the direction of motivation, which are also based on school environment. Ames and Archer (1988) were the first to start to examine the role of motivation in a school environment.

They have identified two basic aims, one being *task/ mastery*, the other *ego/ performance*. These motivational directions appear in different ways during performance, in which individuals themselves form their own ability to perform, sense their own performance to be successful in that given activity (Nicholls, 1989). Task- and ego-orientation mean

fundamentally different goals and thereby different emotions. Earlier research has confirmed, that a Task-oriented environment strengthens motivation and athletes self-confidence. (Duda, 1998), and there is a connection between being goal-oriented and self-confident. This means that Task-oriented athletes are more prone to achieve a better performance because they have higher motivation both during the preparation and the competition.

According to Goudas (1998) athletes are more motivated in a Task-oriented environment, they better meet expectations and make a greater effort to achieve success, and have a lower level of anxiety.

For Ego-oriented individuals it is a problem to have his/her skills compared to those of someone else and to have to prove something. These persons get anxious if they have to prove or achieve, and on the other hand feel they have success if they have reached it or surpassed their peers with less effort.

Research relating to the coping mechanisms of athletes are of a similarly wide range as the examinations regarding motivation. The application of coping mechanisms is subject to the person, and their level influences performance (Smith and colleagues, 1995a). The Minesota Multiphasic Inventory (MMPI, Spielberger, 1966) used earlier and the 16 factor personality tests of Cattel (Cattel, 1965) were not perfectly fit for examining athletes and for the definition of the psychological components of performance, therefore devising the Athletic Coping Skills Inventory-28 (ACSI-28), easily usable in sport as well, paved the way for surveying the coping mechanisms (Smith and colleagues, 1990). The ACSI-28 survey does no test all psychological components of performance, however, it is fit for self-evaluations an the measurement of coping mechanisms (Bebestos and Antoniou, 2003; Smith and Christensen, 1995).

AIMS

The primary aim of this research is to acquire new data regarding the training, selection and talent management of swimmers. The paper touches several areas (pedagogy, psychology, sociology), the usage of the results of these areas the knowledge of the professionals working in this discipline can grow, while the absences in professional literature can decrease. All questions of selection and talent management cannot be dealt with herein. Our research focuses mainly on measuring the pedagogical side of training (coach-athlete relationship, choosing a discipline) and on certain areas of selection and paying off (anthropometric, psychological, psychomotor).

Using the results covered, our aim is to define the talent characteristics of this discipline, on the basis of which the factors of the talent for this discipline may also become definable.

Following the introduction to the circumstances of choosing a discipline and the characteristics of professional sport, our aim is to become familiar with the current system of selection and talent management and the analysis thereof from a professional sport standpoint.

Furthermore it is also our aim to pedagogically and psychologically assess professional athletes, with the results of which the characteristics of the motivational environment important for certain psychological characteristics of professional athletes and for the development of results.

Regarding the coach-athlete relationship it is our aim to explore the coach's characteristics necessary for success, to describe the coach-athlete relationship and to gain knowledge regarding the environmental effects surrounding the athlete.

It is a highlighted aim of our work to define certain psychological, psychomotor and anthropometric characteristics of successful athletes who have paid off and to set forth the criteria of paying off.

HYPOTHESIS

On the basis of the researched problem, the questions of research and our aims we have set forth the following hypothesis regarding the topics of this paper.

Hypothesis Relating to Talent, Selection and Coach-Athlete Relationship:

H_1: We assume that coaches identify talented competitors as athletes with excellent conditional skills, quick and successful movement learning abilities and with good psychological characteristics.

H_2: We assume that from the point of view of the athlete, the coach-athlete relationship is the most similar to the teacher-student relationship.

H_3: We assume that the most important components of the complex work of coaches are: knowledge of the profession, individual treatment of the athletes and motivation.

Hypothesis Relating to Talent Management, Success:

H_4: We assume that the factors that set successful athletes most apart from not successful athletes are anthropometric characteristics (height, weight) and the body surfaces necessary for propulsion.

H_5: We assume that athletes successful in general psychomotor tests give better performance than those not successful.

H_6: We assume that in the special discipline tests successful athletes give better performance than their not successful peers.

H_7: We assume that in the discipline-specific psychomotor tests successful athletes give better performance than their not successful peers.

Hypothesis Relating to the Psychological Characteristics of Swimmers

H_8: We assume that successful athletes have significantly better results regarding the psychological factors measurable with the ACSI-28 test.

H_9: We assume that the motivational environment of swimming is characteristically a Task-oriented environment and the Task-oriented values of successful athletes are significantly higher.

H_{10}: We assume that it is characteristic of swimmers to have a higher level of intrinsic motivation and that the intrinsic motivational values of successful athletes are significantly better than those of not successful athletes.

METHODS

The Sampling Procedure

The sample of athletes relating to our research can be divided into two parts, which cover our research areas. On one hand we have examined swimmers currently actively participating in competitive swimming, while on the other hand swimmers who have withdrawn from competitions but have participated successfully at domestic and international competitions. Besides the athletes the other half of our research sample consisted of swimming coaches currently working in the domestic swimming disciplines.

Because of the strong competitive character of this topic we consider those to belong into the full population who are contained as certified competitors in the official competition system of the Hungarian Swimming Association (MÚSZ). With regard to this topic the professionals, coaches participating in preparing the competitors are those who are directly participating in preparing, training the competitors included in the sample.

The official association list of the MÚSZ of the year 2008 served as the basis for selecting the sample. The list is complete and contains all associations that take part in the competition system of the MÚSZ. With the help of the register of the association we have applied a probability, layered sampling method with a random starting point (Babbie, 2003).

When creating the layers we have also considered the characteristics of the geographical location of the associations and we have separated them into groups of the counties and the capital on the basis of this. The logic and the characteristics of the sampling make it possible for us to draw conclusions from the representative sample that are valid for the population (Falus, 2003).

For the follow-up based success examinations we have used the data of the discipline from the surveying system introduced in the early '80s by the former National Physical Education and Sports Office (OTSH). The anthropometric and psychomotor tests of the athletes were completed in 1984. When choosing the age group (11-12 years of age) included in the examination we have employed an expert sampling procedure (Babbie, 2003), at which we considered the selection system characteristic of the discipline, which places the selection of the competition distance and the swimming style to around adolescence.

In the case of surveying, the logic to including the coaches in the sample is partly the same as for the athletes, i.e. we have surveyed the coaches of the associations which were included in the examination sample. Currently no similar report on coaches exists that would help the inclusion in the sample, however, the logic to the sampling procedure ensures randomness.

Characteristics of the Sample

During our research we sent 670 survey forms during the second half of 2007 and the first half of 2008 to associations, of which 63.3% was returned, i.e. we have examined 424 (N=424 persons) athletes. 214 men (50.4%) and 210 women (49.6%) were questioned. Their average age was 14.42 years, with a deviation of 2.48. Competitors from 7 age groups have participated in the survey. Considering the characteristics of swimming we have created 3 age groups (*Child, Adolescent, Adult*).

In the case of the follow-up based success research we have examined the data of athletes of 11-12 years of age (N=351) participating in the survey. We have followed the career of the athletes previously surveyed from the year 1984. We have analysed the minutes of all competitions where the athletes have taken part. For success we kept the criteria that apply to the athletes participating in the research regarding the years 2007/2008.

The coaches involved with the research are currently still active in the associations that were included in the survey. Of the 70 persons included in the sample, 46 were men (65.7%) and 24 women (34.3%). Regarding experience 18 persons have less than 5 years' experience (27.69%), 14 persons have 5-10 years' experience (21.54%), 8 persons have 10-15 years'

experience (12.31%), 9 persons have 15-20 years' experience (13.85%), 4 persons have 20-25 years' experience (6.15%) and 12 persons have over 25 years of experience (18.46%).

The Applied Methods

In our research we used several methods frequently employed in researches of social sciences. For researching the athletes we chose the surveying method, the questionnaires including a pedagogic and sociological one we have devised to explore the circumstances of the discipline of swimming. The questions covered the sporting habits of the parents, the choosing of the discipline, the methods of selection and the coach-athlete relationship.

Of the psychological tests we employed the ACSI-28 /Athletic Coping Skills Invertory/ (Schmidt and colleagues, 1995b) questionnaire, which consists of 28 questions and measures the coping strategies of the athletes with a self-evaluation scale. The questionnaire is reliable psychometrically, usable for exploring the relationship between the athlete and its environment and the intrinsic characteristics of the athlete, for collecting data. The questions of the sub-scales measure *coping with adversity, peaking under pressure, goal setting, mental preparation, freedom from worry, concentration, confidence and achievement motivation and coachability*.

For the psychological survey we employed the Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2, Newton and colleagues, 2000). This PMSCQ-2 questionnaire consists of 33 questions, containing two main scales (Task, Ego) and within those 3-3 sub-scales. The sub-scales belonging under *Task* main scale are *Cooperative learning, Important role* and *Effort, improvement.* The sub-scales of *Ego* are *Punishment for mistakes, Unequal recognition* and *Intra team rivalry*.

The Sport Motivation Scale (Pelletier and colleagues, 1995) employs three scales to measure the motivations of the athlete. For our research we used the Hungarian version of this (Tsang and colleagues, 2005), which measures amotivation, extrinsic and intrinsic motivation.

RESULTS

For the examination of the questions of selection and talent management we analysed the questionnaires filled out by the coaches. In the first step we were curious about what the coaches considered as talent. We approached this question from the side of results and successfulness, examined through 23 questions. The coaches had to evaluate on a scale of 1-5 to what extent they agree with the definitions given.

The coaches consider the existing skills of the athletes more significant than the external factors. The five most important factors of success are *Resistance to competition and training stress* (4.38), *Performance orientation* (4.20), *Stress resistance* (4.16), *Coach-athlete relationship* (4.10) and in fifth place two factors, *Ability to learn competition technique* (4.00) and *Moral support from the parents* (4.00).

Regarding the coach-athlete relationship an evaluation scale of 1-5 had to be used, about the role of the coach in the life of the athlete. Possible answers included *Friend, Teacher, Family member, Responsible for professional work, Role model* and a person who *Helps in life*. It was the *Motivator* role (4.23) that got the highest value for coach roles, those questioned considered this role to be the most important. On the basis of average values *Teacher* (3.55) and *Role model* (3.36) have emerged with high scores. *Friend* (2.81)*, Responsible for professional work* (2.77) and Helping role (2.65) have not emerged as important roles.

Examining the coach-athlete relationship even further we asked when the coach can be successful, what factors influence working together. We dedicated a separate part to the successfulness and tasks of the coach.

According to the opinion of the coaches a history in sport does not significantly influence successfulness as a coach. Neither *Professional sport* (2.30)*,* nor *Competitive sport* (3.41), nor *History in swimming* (2.53) are a precondition of success. Similarly, no great significance is attributed to *Education* (3.57), however, *Continuous trainings* appear to be a more dominant factor (4.41). *Individual treatment of the competitors* (4.57), *Motivating* (4.67), *Preparing for success* (4.53) and *failure* (4.13) and *Help in easing the stress* (training, competition) have received high scores and therefore can be mentioned among the factors determining success.

In the case of anthropometric characteristics it can be said that there is a difference between successful and not successful athletes in the case of three parameters. These are the width of the left hand and the length of the right and the left arm. In the case of characteristics having significant differences, successful athletes are characterised by greater values in every case, and the sizes of the body areas necessary for propulsion, e.g. in the case of length of foot, width of hand, length of arm, of successful athletes were greater.

When examining the results of the general psychomotor tests we found no significant differences between the results of the tests. The test results achieved by successful and not successful athletes do not differ from each other statistically in a substantial way.

However, when examining the psychomotor tests of the discipline we found significant differences everywhere, except for the 25 m breaststroke and the gliding tests.

In the case of 800 m freestyle, serving to test endurance, successful athletes swam the distance faster by over one minute (675.41) than not successful athletes (736.54). In the case of 200 m medley the difference between the average results achieved by successful and not successful athletes was 27 seconds.

The differences weren't this significant for swimming using only the arms. In the case of arms-only freestyle and backstroke the difference was less than 2 seconds, whereas for arms-only butterfly it was well over 2 seconds. For swimming using only the legs the differences were bigger, the differences measured at legs-only butterfly neared 3 seconds.

After the analysis of the special discipline tests we found significant differences with regards to all of the tests. In holding their breath back, successful athletes could go on without taking a breath for a period nearly 5 seconds longer.

With respect to the movement range of the joints important for swimming they have performed better as well, the mobility of the joints of the successful athletes was better in every case. One of the most striking differences between the two groups was notable in the results of the tests of the flexibility of the shoulders.

According to the sub-scales of the ACSI-28 test, the swimmers achieved nearly average results in four cases out of the seven sub-scales. We received results very close to the average (10.0) in the case of sub-scales *Coping with adversity* (10.64)*, Peaking under pressure* (10.52)*, Goal setting, mental preparation* (9.89) and *Freedom from worry* (10.88). In the case of sub-scales *Concentration* (12.05)*, Confidence and achievement motivation* (12.14) *and Coachability* (12,80) the athletes have values above average.

In terms of success a significant difference is only notable in the case of the *Peaking under pressure* sub-scale. The average result of the successful athletes suggests, that they can *Peak under pressure* better (11.23) than non successful athletes (10.28). In the case of sub-scales *Coping with adversity, Goal setting, mental preparation, Concentration, Freedom from worry, Confidence and achievement motivation* and *Coachability* we found no statistically interpretable difference.

With the help of the PMCSQ-2 questionnaire, the Task and Ego motivational directions of the athlete can be measured. On the basis of the summary of the results it can be said that the athletes are more *Task* oriented (3.92) and that the values of the sub-scales belonging to the *Task* main scale are higher. The value of the *Ego* main scale (2.57) suggests that swimmers are not characterised by Ego orientation. Of the sub-scales of the *Task* orientation the value of the *Effort, improvement* sub-scale (4.20) is the highest. Regarding success we found differences in the cases of the *Punishment for mistakes, Unequal recognition* and

Effort, improvement sub-scales and the *Ego* main scale. The result of the *Punishment for mistakes* sub-scale of the successful athletes (2.42) is significantly higher than that of the non successful athletes (2.22). Successful athletes feel more that they receive *Unequal recognition* (2.76) than non successful athletes (2.55), however the *Effort, improvement* value of successful athletes (4.28) is significantly higher than that of the non successful athletes (4.17).

The SMS questionnaire is used for examining the motivations of the athletes, as it contains three sub-scales. Of these sub-scales the amount of intrinsic and extrinsic motivation and of amotivation determine the motivational direction of the athlete. Following the analysis of the sub-scales of the questionnaire, it can be said that the level of *Amotivation* is low (2.42), whereas the level of *Extrinsic motivation* (4.56) and of *Intrinsic motivation* (4.45) is almost the same, but still, Extrinsic motivation is more characteristic. On the basis of the analysis conducted with an independent t-test we found no significant differences between successful and non successful athletes, neither between male and female athletes.

CONCLUSIONS

Selection and Talent Management

We assumed (H_1) that coaches identify talented competitors as athletes with excellent conditional skills, quick and successful movement learning abilities and with good psychological characteristics.

This assumption was only partly verified, as coaches did highlight psychological characteristics, i.e. coping with the stress of competitions and trainings, performance motivation and successful movement learning abilities when defining a talented athlete, however, conditional skills were not included among the most important factors.

The Pedagogical Approach to the Question

We assumed (H_2) that from the point of view of the athlete, the coach-athlete relationship is the most similar to the teacher-student relationship.

This assumption was verified, as athletes are most likely to compare the coach to a teacher. An analysis of the age groups shows that this role is diminishing with older athletes and adults rather consider the coach as a friend.

We assumed (H_3) that the most important components of the complex work of coaches are: knowledge of the profession, individual treatment of the athletes and motivation.

We uphold this assumption as knowledge of the profession, individual treatment of the athletes and motivation all appeared as the most important factors characterising the work of a coach. Knowledge of the profession is a precondition of successful work, without which the work of the coach cannot be successful. This is supplemented by the individual treatment of the athletes, which is also important during the preparations.

Success in Swimming

We assumed (H_4), that the factors that set successful athletes most apart from not successful athletes are anthropometric characteristics (height, weight) and the body surfaces necessary for propulsion.

We can only accept this assumption in part, as we have found no significant difference between successful and non successful athletes in the case of anthropometric characteristics, and even in the case of body surfaces necessary for propulsion we have only found a significant difference with regards to the width of the hand and the length of the arm.

We assumed (H_5) that athletes successful in general psychomotor tests give better performance than those not successful.

This assumption must be abandoned as there is no statistically highlightable difference between successful and non successful athletes in the case of general psychomotor tests. This result also goes on to verify the specific nature of swimming, the general psychomotor tests do not suffice for setting forth the criteria, for defining the necessary skills.

We assumed (H_6) that in the special discipline tests successful athletes give better performance than their not successful peers.

We uphold this assumption as successful athletes have achieved better results during the special discipline tests than the non successful ones, therefore, using these results it becomes possible to define certain criteria of selection and preparation, since the results of the measurements show what results the athlete must achieve at each test.

We assumed (H_7) that in the discipline-specific psychomotor tests successful athletes give better performance than their not successful peers.

We uphold this assumption as successful athletes have achieved better results during the discipline-specific psychomotor tests than the non successful ones. These tests can be

applied with better results in the selection procedure, as the criteria of success are easy to define.

Psychological Characteristics of Swimmers

We assumed (H_8), that successful athletes have significantly better results regarding the psychological factors measurable with the ACSI-28 test.

We can only accept this assumption in part, as successful athletes show results significantly better than those of non successful swimmers only in the case of sub-scale *Peaking under pressure*. This factor is a defining part of the achievement, on the basis of which we can say that those who are successful are more able to prepare themselves mentally for a competition and once there, to peak under pressure.

We assumed (H_9) that the motivational environment of swimming is characteristically a Task-oriented environment and the Task-oriented values of successful athletes are significantly higher.

We can only accept the first half of this assumption. The motivational environment of swimmers is characterised by Task-orientation, however, successful athletes do not have a significantly higher amount. This substantially means that the environment (climate) is a supporter, it aids development and provides the athletes with a possibility to keep developing further.

We assumed (H_{10}), that it is characteristic of swimmers to have a higher level of intrinsic motivation and that the intrinsic motivational values of successful athletes are significantly better than those of not successful athletes.

This assumption must be abandoned as swimmers have a higher extrinsic motivational value, and successful athletes do not have significantly higher inner motivational values.

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