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Analysis of The Achievement Motivation Structure in Elite Endurance Athletes Using Triathlon as an Example

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ABSTRACT

The aim is to analyse the motivational component using the LMI motivation test for a group of triathletes. Furthermore, we want to identify whether and in what dimensions differences against the Czech standardization sample.
The research sample was composed of 32 national representatives in triathlon aged 20.2 ± 2.2 years.
The Exploratory Factor Analysis method and the unpaired t-test are used for analysis. The model accounts for 70.24 % of the total variance, where Factor 1 (independence) accounts for 19.84 %, Factor 2 (ambition) for 19.17 %, Factor 3 (self-assertion) for 18.66 % and Factor 4 (motivation for tasks) for 12.57 % of the total variance. Statistically significantly higher values are identified for triathletes in dimensions of engagement, flexibility, preference for difficult tasks, status orientation, competitiveness, self-control, goal setting, and in the overall achievement motivation score ($p \leq 0.01$) and compensatory effort and pride in productivity ($p \leq 0.05$).

KEYWORDS achievement motivation, Factor Analysis, LMI, Olympic triathlon

Introduction

By motivation is understood all that causes some behaviour, action or reaction (Kern, Mehl, Nolz, Peter, & Wintersperger, 1999). Clusters, i.e. groups of principal, secondary motives mutually affecting each other and frequently also mutually overlapping each other, are termed motivation. Isolated motives are virtually nonexistent. It is only in extreme cases that one need may suppress all the others (Hošek, 2006). Eckardt and Schuler (1992) consider motivation one of general signs predicting success, while some others (e.g. Atkinson, 1978) even consider motivation the most important source of variation in performance. Despite the high significance of motivation, however, only very few systematic works manifesting its effect on performance exist. The battery of tests for achievement motivation may be considered insufficient.

Based on the theories by (Heckhausen, 1989), achievement motivation used to be perceived for a long time as the resulting tendency arising from the emotional conflict between positive tendencies to approach success (expectation of success) and to avoid failure. This concept was further complemented by variables related to self-concept, self-perception (Kuhl, 1983; Weiner, 1985). The Murray's theory (Murray, 1938) and approaches based on it accentuate variable persistence, endurance and expending effort. The frequently mentioned dimensions of achievement motivation also include goal setting, independence, flexibility (Schuler & Prochaska, 2003) or the flow state (Csikszentmihalyi, 1992). In all these approaches, motivation is defined as a heterogeneous construct. It is only in a few approaches that motivation is considered a homogeneous construct (e.g. Mikula, Uray, & Schwinger, 1976; Mehrabian, 1969), Ones (1993) even considers motivation a kind of super factor. Hodge (2004) claims, that motivation primarily includes two components, the direction and intensity of effort. The direction presents targets that one tries to reach, one's reason for activity. The intensity of one's activation may oscillate from very low (drowsiness, sleep) to the maximum (all-out effort). He further splits motivation into an internally (centrally) oriented model based on individual's predispositions. These are pre-determined and very hardly changeable personality dispositions (traits). The situationally oriented model includes the effects acting on a person from the outside (presence of family members and friends, authorities, competitors, spectators). In the interaction, the above two models are combined.

The structural validity of achievement motivation is generally considered an area that has not been explored enough (Prochaska, 1998), though authors share the conclusion that motivation cannot be understood as a limited construct (Tod, Thatcher, & Rahman, 2010; Schuler & Prochaska, 2003,).

The relationship between the level of motivation and performance is far from simple. Of key importance in this relationship is the level of aspiration, i.e. the expectation of future performance (Hošek, 2006). Motivational processes are related, to a significant extent, to volitional processes. Motivation

and volition may be distinguished so that motivation is an intrapsychic process; it is a struggle of motives, considering possible alternatives and ending up with a decision. A decision, in turn, leads to implementation, i.e. a volitional act supported by a volitional process.

Volition in a narrower sense is characterized as a volitional act requiring volitional effort on the subject's part. In this concept, volition is understood as a kind of internal violence exerted to persist in an unpleasant activity under unfavourable circumstances (persistence) thus becoming a criterion of an athlete's volitional qualities. Of all psychic processes, volitional processes are the ones most dependent on the other psychic functions being a multi-dimensionally conditioned phenomenon (Hošek, 2006). The complexity of a volitional process considers cognitive, emotionally motivational and social components. At the emotional motivational level, intricately interconnected dynamic processes apply (needs, motivations, emotions, determination). At this moment, endurance performance becomes ascetic by nature, and, in this situation, volitional effort takes the lead as the energizer of a volitional process. These are most likely habitual proprioceptive impulses from working muscles where the anticipation of pleasure at the completion of an activity plays an important role. In the implementation phase of a volitional process, volitional effort arises as a tension associated with the effort to continue an activity and complete it (Tod, Thatcher, & Rahman, 2010).

Endurance (in the sense of physical activity) is defined as an ability of performing a long-lasting physical activity at some level without reducing the efficiency of this activity. Its level is limited physiologically, but in the psychological perspective it is very closely linked with the manifestations of volitional effort (Harre, 1982). Endurance in the sense of long-term resistance to fatigue is essential mainly for all types of endurance sports.

Psychologists have been analysing psychological predispositions for long-lasting endurance stresses for several decades. One of the pioneers exploring psychic predispositions for endurance exercise performance in the Soviet Union as early as the 1960s' was e.g. Rudik (1961), who considered internal morale and willpower essential predispositions. He also studied attentional performances of athletes at different levels where he identified the basic relationships between sports performance and attention. Later on, studies e.g. by Morgan and Pollock (1977), Thirer, Knowlton, Sawka, and Chang, (1978), Tenenbaum, Geron and Gruzinski (1986), or Chantal, Guay, Dobreva-Martinova and Vallerand (1996), Nideffer, Bond, Cei and Manili (2000), Ziemainz (2003) or Kovář ová & Kovář (2010) followed.

Psychic predispositions for triathlon

Kovář ová (2012) states that triathletes should a have very low level of nervous instability which enables them to cope with psychically challenging situations. On the other hand, they need a high level of achievement motivation and moral and volitional qualities. Due to the nature of the competition and training, a tendency to introversion proves to be more advantageous. In her factor model of predispositions for triathlon, Kovář ová (2012) claims that psychic predispositions represent the factor weight of 0.36 in the total weight of predispositions for triathlon, and, consequently, psychic predispositions account for 21% of the overall predispositions for swimming, 28% for cycling and 34% for running.

In terms of the personality structure according to the SPARO questionnaire (Mikšík, 2004), triathletes exhibit features of variant B, which describes a personality as an excitable or spontaneous type, characterized by internal psychic excitation (PV+). There is an inclination to dynamic interactions associated with intensive psychic energisation and high situational arousal. In men, features of variant D3 (with a coefficient -0.21) are present. This is a self-assertive type with a tendency to seek and exploit suggested possibilities to satisfy aspirations, a desire for excellence and self-fulfilment by promoting their own "self", while in women, on the contrary, features of variant B4 (with a coefficient -0.21) appear. This is an unsteadily impulsive personality type, manifested (due to its low ability to grasp and adequately handle arising situational variables of more dynamic nature with strong emotional experiencing and inclination to an immediate release of tension) by a tendency to select shortcut escape schemes from situational pressures and confusing situations. Indications of manifested femininity are also present in women (showing "womanhood"). In men, significant cognitive variability KO+ ($p \leq 0.01$) is manifested, characterised by a tendency towards a change, towards high quantity, dynamics and a variability of stimuli in their complex grasping and handling, while, in women, on the contrary, there is a significant ($p \leq 0.01$) emotional variability EM+ manifested as high excitability, a tendency towards experiencing situational stress, tension and euphoria (Kovářová, Marková, & Pánek, 2013).

Achievement-based motivational model for endurance athletes and its starting points

The Factor Analysis Method is used to analyse the relationships within the motivational structure. Factor analysis was originally used in the field of psychology. In his article about the nature of intelligence published in 1904, its founder, Charles Spearman, formulated a hypothesis of the existence of a common factor of a "general intellectual ability", which would account for the correlations between the results of different intelligence tests. Further development of factor analysis is attributed to L.L. Thurstone, who extended the Spearman's single common factor model into a multi-factor model, and other psychologists, such as R.B. Catell, G. Thomson, but also statisticians, e.g. D. N. Lawley, H. Hotelling, M. S. Bartlett, C. R. Rao, R. P. McDonald, and, among Czech authors, mainly P. Blahuš. The possibilities of using Factor Analysis have significantly spread in the last forty years to cover disciplines such as sociology, health care, marketing and others. Its use in sports science, however, is still rather rare. The primary function of factor analysis is to reduce variables. This can only be done under the condition of mutual dependences among variables and under the assumption that these dependences are the consequence of the action of a smaller number of non-measurable variables standing in the background. These variables are referred to as factors (McDonald, 1991).

The LMI achievement motivation test is currently available in the Czech Republic in a standardized form validated for the Czech population. It consists of 170 items divided into 17 dimensions (Schuler & Prochaska, 2003). In this article, the authors present a structural model for the general, non-sporting population comprising three factors (ambition, independence, motivation for tasks). These three factors account for 63 % of the total variance in the rotated model (ambition 24.3 % - independence 22.5 % - motivation for tasks 16.2 %). Factor 1 (ambition) is presented here as a syndrome of achievement effort for oneself (pride). It is saturated by dimensions of pride, status orientation, competitiveness, compensatory effort, goal setting, engagement and flow. Together with Factor 2 (independence), they contain a socio-motivational component where Factor 1 is identified by the notion of validity, and Factor 2 by the notion of power and independence. Factor 2 (independence), in turn, is saturated by independence, flexibility, fearlessness, dominance, confidence in success and preference for difficult tasks. According to the authors, Factor 1 describes the effort to achieve the performance itself, while Factor 2 represents the source of confidence that the individual will prove oneself even under unfamiliar conditions and achieve ambitious goals.

Factor 3 (motivation for tasks), on the contrary, is free from social motives being mainly characterised by permanently exerted effort, as well as a disciplined style of work and the ability of deferring a reward. It is saturated by the scale of self-control, persistence and internality, and the authors also characterise it as a sense of one's own responsibility for the success of exerted effort.

The authors also admit that the model for the surveyed group of athletes might look different, the confirmation of this as-

sumption, however, is conditioned on further research.

The objective of our study is to analyse the motivational component in a group of persons repeatedly engaged in extreme endurance exercise performance, i.e. national representatives in triathlon, using the LMI achievement motivation test, and to generate a motivational structure model for this group of athletes. Furthermore, we want to find out whether and in what dimensions there are differences against the Czech standardization sample, and whether the assumptions of the authors of the LMI questionnaire that the motivational structure model for elite athletes may differ are confirmed for this selected group.

Methods

Research sample

The surveyed group consisted of all the national representatives of the Czech Republic in short (Olympic) triathlon in the junior, young adult and senior category for 2013 in the number of 32 (10 women and 22 men) aged 20.2 ± 2.2 years. Czech standardization sample consisted of 293 (209 woman and 84 men) aged 24 ± 2.8 years.

Research questionnaire

The LMI standardised psychological questionnaire of achievement motivation was used to analyse the motivational component of performance (Schuler & Prochaska, 2003). The test consists of 170 items subdivided into 17 dimensions (scales). Their names, brief characteristics and used abbreviations are presented in Table 1.

Table 1: Basic characteristics of individual dimensions of the used LMI questionnaire

Scale name	Brief scale characteristic
Persistence	Tenacity and expending efforts to handle professional tasks.
Dominance	The tendency to exercise power and influence over others, take a leadership role.
Engagement	Personal desire to be engaged in achievements, take ample effort and perform large amounts of work.
Confidence in success	Anticipation of the results of certain behaviour, anticipation that efforts will lead to success.
Flexibility	Readiness of coping with new situations and tasks.
Flow	The ability to concentrate on problems very intensely without being disturbed by distracting stimuli.
Fearlessness	Anticipation of the result of an activity: no fear of failing at difficult tasks.
Internality	Attributing the consequences of one's activity to internal causes (autonomy).
Compensatory effort	Personal desire to expend extra effort resulting from a fear of failing.
Pride in productivity	Positive emotional state arising from one's good performance.
Eagerness to learn	Effort to strive to learn new things, i.e. extend one's knowledge.
Preference for difficult tasks	The tendency to seek challenging and risky rather than easy tasks.
Independence	The tendency to be independent in one's behaviour.
Self-control	The ability to organise oneself and perform tasks.
Status orientation	The effort to achieve an important position in social life and a leading position in the social hierarchy.
Competitiveness	The tendency to perceive competition as encouragement and motivation for better performance.
Goal setting	Being future-oriented and setting goals that must be achieved.

Statistical data processing

Like the authors of the LMI questionnaire, we will use Exploratory Factor Analysis (McDonald, 1991) to analyse mutual relationships in individual areas and among them (because of the subsequent possibility of comparing the results of both studies). It will allow us to explain the mutual correlation between the observed phenomena (individual indicators and their relationships to a specific performance) and reduce the number of variables, which will simplify the description of the phenomena.

The number of factors will be considered with respect to the Kaiser criterion. The Principal Component Method will serve for the extraction of individual factors and the creation of the model. The rotation of factors will be performed using the VARIMAX methods.

To evaluate the statistical significance of the differences between the results of triathletes and the general population the unpaired t-test for two sets was used. Statistical significance was evaluated at the level of 0.05, or 0.01 respectively.

Organisation of research

The aim of the research were first explained to trainers and then to the athletes. The test was presented to the athletes who were deliberately willing to fill it in. Prior to the start of the test, each athlete was informed on the procedure of filling in the questionnaire and briefly on the issues of achievement motivation and its identification. The time for filling in the questionnaire was unlimited. The survey was approved by the Ethics Committee of FPES CU under the reference No. 097/2012.

Results

Table 2 presents the basic statistical characteristics of individual dimensions evaluated according to the LMI questionnaire. The interpretation of individual abbreviations is listed in Table 1.

Table 2: Basic statistical characteristics of individual dimensions evaluated in the LMI questionnaire

Scale name in LMI	Mean	95% Confidence Interval for Mean		Std. Deviation	Minimum	Maximum
		Lower Bound	Upper Bound			
Persistence	45.94	43.21	48.66	7.56	31	59
Dominance	46.53	43.37	49.7	8.78	27	61
Engagement**	43.75	40.3	47.2	9.57	26	64
Confidence in success	48.00	44.77	51.23	8.96	24	63
Flexibility**	50.94	48.33	53.55	7.24	39	68
Flow	49.59	46.32	52.87	9.08	33	70
Fearlessness	40.59	37.17	44.02	9.50	21	62
Internality	48.25	45.93	50.57	6.44	38	64
Compensatory effort*	51.31	48.9	53.72	6.69	38	63
Pride in productivity*	57.97	55.12	60.82	7.91	39	70
Eagerness to learn	47.22	44.9	49.54	6.43	34	58
Preference for difficult tasks**	44.16	40.88	47.43	9.09	28	68
Independence	45.56	42.87	48.26	7.47	25	59
Self-control	44.16	41.24	47.08	8.10	29	59
Status orientation**	53.88	51.1	56.65	7.70	38	68
Competitiveness**	54.44	51.24	57.63	8.86	36	68
Goal setting**	49.16	46.2	52.11	8.20	26	62

Note: Dimensions in which statistically significant differences against the general population were found are printed in bold.
****statistically significant difference (p<0.01)**
*** statistically significant difference (p<0.05)**

Comparing the results of triathletes against the Czech population group (LMI) using the t-test, statistically significant higher values were identified in triathletes in dimensions of engagement ($t = 4.31$; $p \leq 0.01$), flexibility ($t = 2.98$; $p \leq 0.01$), compensatory effort ($t = 2.50$; $p \leq 0.05$), pride in productivity ($t = 2.52$; $p \leq 0.05$), preference for difficult tasks ($t = 2.86$; $p \leq 0.01$), status orientation ($t = 5.10$; $p \leq 0.01$), competitiveness ($t = 9.78$; $p \leq 0.01$) and goal setting ($t = 3.80$; $p \leq 0.01$), as well as in the total achievement motivation score which is identified as the sum of all components ($t = 3.90$; $p \leq 0.01$). Except for the flow dimension, these are all dimensions found in Factor 1 in the LMI model for the general population termed ambition by the authors.

Tables 3a and 3b below present the correlation matrix of the relationships of individual dimensions in our surveyed group.

Table 3a: The correlation matrix of the relationships of individual dimensions according to the LMI questionnaire (n=32)

	Persistence	Dominance	Engagement	Confidence in success	Flexibility	Flow	Fearlessness	Internality
Persistence	1							
Dominance	0.29	1						
Engagement	0.51**	0.26	1					
Confidence in success	0.36*	0.44*	0.28	1				
Flexibility	0.52**	0.41*	0.3	0.37*	1			
Flow	0.74**	0.29	0.46*	0.11	0.26	1		
Fearlessness	0.58**	0.50**	0.25	0.43*	0.66**	0.13	1	
Internality	0.40*	0.18	0.07	-0.12	0.50**	0.1	0.36*	1
Compensatory effort	0.40*	0.36	0.65**	0.26	0.23	0.47**	-0.05	0.18
Pride in productivity	0.26	0.35**	0.50**	0.07	0.36*	0.49**	0.02	0.27
Eagerness to learn	0.22	0.55**	0.45*	0.43*	0.19	0.39*	0.29	0.06
Preference for difficult tasks	0.54**	0.31	0.38*	0.31	0.46**	0.40*	0.54**	-0.04
Independence	0.60**	0.61**	0.34	0.38*	0.69**	0.31	0.54**	0.15
Self-control	0.35	0.19	0.32	0.13	0.35	-0.13	0.40*	0.51**
Status orientation	0.16	0.40*	0.37*	0.31	0.36*	0.40*	0.18	0.13
Competitiveness	0.44*	0.47**	0.62**	0.34	0.44*	0.41*	0.37*	0.20
Goal setting	0.26	0.50**	0.47**	0.48**	0.11	0.39*	0.11	-0.17

Table 3b: The correlation matrix of the relationships of individual dimensions according to the LMI questionnaire

	Compensatory effort	Pride in productivity	Eagerness to learn	Preference for difficult tasks	Independence	Self-control	Status orientation	Competitiveness	Goal setting
Compensatory effort	1								
Pride in productivity	0.54**	1							
Eagerness to learn	0.21	0.37*	1						
Preference for difficult tasks	0.32	0.17	0.22	1					
Independence	0.18	0.27	0.17	0.60**	1				
Self-control	0.26	0.23	0.20	0.07	0.12	1			
Status orientation	0.41*	0.56**	0.45**	0.15	0.12	0.09	1		
Competitiveness	0.47**	0.63**	0.38*	0.31	0.46**	0.20	0.74**	1	
Goal setting	0.16	0.31	0.56**	0.17	0.27	-0.01	0.56**	0.56**	1

**** The correlation is significant at the significance level of 0.01 (2-tailed test)**
***The correlation is significant at the significance level of 0.05 (2-tailed test)**

Table 4 presents the result of the exploratory factor analysis of our model. It presents both the total number of factors and their % variances and cumulative variances, and also the four-factor model and its non-rotated and rotated form.

Table 4: Explained variances of the achievement motivation model in endurance athletes

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.39	37.59	37.59	6.39	37.59	37.59	3.37	19.84	19.84
2	2.30	13.56	51.14	2.30	13.56	51.14	3.26	19.17	39.01
3	1.85	10.90	62.04	1.85	10.90	62.04	3.17	18.66	57.67
4	1.39	8.19	70.24	1.39	8.19	70.24	2.14	12.57	70.24
5	1.04	6.12	76.36						
6	0.79	4.64	81.00						
7	0.65	3.85	84.85						
8	0.58	3.42	88.27						
9	0.54	3.16	91.43						
10	0.33	1.95	93.38						
11	0.29	1.72	95.09						
12	0.26	1.52	96.61						
13	0.24	1.40	98.02						
14	0.13	0.79	98.80						
15	0.13	0.77	99.57						
16	0.04	0.23	99.81						
17	0.03	0.19	100.00						

Strictly observing the Kaiser criterion an additional, the fifth factor might be included in the model. Its value, however, is only 1.04 and, moreover, the fifth factor would only account for 6.12 % of the variance. For this reason, we decided not to create this factor and generate a four-factor model (Table 4, Table 5). Table 5 displays the four-factor rotated model and individual dimensions of the LMI questionnaire in the way they score in individual factors.

Table 5: The rotated factor matrix

LMI scale	Factor 1 Independence	Factor 2 Ambition	Factor 3 Self-assertion	Factor 4 Motivation for tasks
Persistence	0.83	0.13	0.22	0.07
Dominance	0.80	0.28	0.04	-0.15
Engagement	0.73	-0.16	0.30	0.42
Confidence in success	0.71	0.39	0.05	0.27
Flexibility	0.64	0.17	0.19	0.49
Flow	0.11	0.85	-0.02	0.11
Fearlessness	-0.03	0.73	0.30	0.27
Internality	0.26	0.70	0.28	0.09
Compensatory effort	0.30	0.69	0.17	-0.19
Pride in productivity	0.22	0.58	0.58	0.21
Eagerness to learn	0.07	0.29	0.79	-0.21
Preference for difficult tasks	0.07	0.23	0.73	0.08
Independence	0.41	-0.01	0.73	0.09
Self-control	-0.08	0.50	0.65	0.16
Status orientation	0.42	-0.01	0.59	-0.05
Competitiveness	0.11	0.16	-0.14	0.85
Goal setting	0.10	0.07	0.10	0.80

Note. Coefficients higher than 0.5 are printed in bold.

The motivational structure model, in our case, consists of four factors accounting for 70.24% of the total variance (Table 4, Table 5). Three factors are, in their majority, identical by content with the model for the general population, therefore, we preserved their names, too; their significance reflecting the percentage in the overall model they account for, however, varies from the general population.

The highest percentage (19.84% of the total variance) in our model is accounted for by Factor 1 (independence), which is presented in a very similar way as in the general population by dimensions of independence, preference for difficult tasks, fearlessness, persistence and flexibility. Factor 2 (again very similarly to the general population) is saturated by the dimensions identifying the area of ambition (compensatory effort, pride in productivity, engagement, competitiveness and flow state) accounting for 19.17% of the total variance. Like in the general population model, these two factors account for the highest % of the total variance. Factor 4 in our model is by its content very similar to Factor 3 in the general population (motivation for tasks) with dimensions of self-control and internality accounting for 12.57 % of the total variance, which is less than in the general population.

Our model, however, newly presents Factor 3 (the fourth in the overall model termed self-assertion (or effort to assert oneself, a desire to assert oneself, orientation for success), which accounts for 18.66 % of the total variance and is created by dimensions: competitiveness (which also scores for Factor 2 – ambition), goal setting, dominance, confidence in success, status orientation and eagerness to learn. It, therefore, rather includes the socio-motivational component where the most socially oriented dimensions are competitiveness, status orientation and dominance.

Discussion

The result of our study confirms the conclusions made by some previous investigations (Csikszentmihalyi, 1992; Heckhausen, 1989; Schuler & Prochaska, 2003, etc.), where, together with the above authors, we claim that motivation is a heterogeneous construct. Comparing the results with the general population, we found differences both in individual scales of motivation and in the motivational structure model itself. Comparing the results of triathletes with the Czech population group (LMI), the t-test helped us to identify significant-

ly higher values for triathletes in dimensions of engagement, flexibility, preference for difficult tasks, status orientation, goal setting and in the total score of achievement motivation ($p \leq 0.01$) plus compensatory effort and pride in productivity ($p \leq 0.05$). Except for the flow dimension, these are all dimensions which are contained in Factor 1 in the LMI model for the general population termed ambition by the authors. Hence, compared to the general population, endurance athletes are more ambitious, better able to cope with new situations and tasks. They are characterised by a high level of activity, are willing to reach repeatedly high performances. The reason may be their need to repeatedly experience positive feelings associated with success. Their self-esteem highly depends on their own exerted performance for which they also seek social respect. Contrary to the general population, they seek possibilities for competing and comparing with other people. Victory is important for them, and they are able to sacrifice a lot for it. They set high demands for themselves, make long-term plans and know exactly what they want to achieve in the future.

The motivational structure model also differs from that for the general population, and it is comprised of four latent factors. Three are identical by content with the achievement structure model for the general population, while the fourth factor (Factor 3), which we termed self-assertion, most likely only applies to elite athletes being saturated by dimensions of competitiveness (which also scores for Factor 2 – ambition), goal setting, dominance, confidence in success, status orientation and eagerness to learn. A sporting environment is characterised by exerting performance and testing it in competition with the others. One's own performance is constantly socially compared (successful versus unsuccessful) with the others. Competitiveness is then represented by a tendency to experience competition as encouragement and motivation for improving performance. Status orientation indicates the pursuit of social recognition, the effort to gain respect, prestige and a leadership position. The activities are oriented to achieve the set goal - a shift within the social hierarchy, or on sports rankings. Successful performance subsequently provides reward in the form of gained prestige, respect, status, a certain social position and role.

Factor 3 is also manifested by dominance over the others, a tendency to seize the initiative, control and power. Individuals scoring high on this factor strive for self-assertion, independence, a leadership position. Goal setting is closely associated with planning one's goals. It represents an individual's orientation towards future, their resolute efforts to consistently strive for reaching the optimum performance, gaining success or a social status. The goals set or the demands needed for their achievement are often very high (this also refers to long-term goals).

Confidence in success is manifested as a belief in achieving success and the result of one's own activity. It represents the expectation of success, even when confronted with new situations, hardly predictable or challenging situations. Self-confidence (confidence in success) indicates an individual's belief that their abilities and skills will overcome a rival and all stressful situations and will lead to success.

The willingness to learn stems from an individual's desire to extend their knowledge and skills. Individuals scoring high values show interest, expend time and effort to acquire new skills and develop their personality, all on their own initiative. This gives them a better ability to adapt to new or changing conditions, try out new ways of dealing with situations. In the case of a group of athletes, however, we assume that only a limited area related to performance in sport is concerned which cannot be generalized as motivation to learn in general.

It may be claimed that elite triathletes are more motivated than the general population, which may be one of the factors influencing the reaching of their performances. Motivation itself, however, is not the only factor determining the achievement of a performance limit. The opinion that the limiting factor for the termination of long-term endurance stress (complete exhaustion) is the fatigue of the body organs involved and the loss of the ability to generate the same exercise performance despite the maximum participation of motivation and the volitional component prevailed the field of physiology of stress for many years (Edwards, 1983; Hill, Long, & Lupton, 1924). On the contrary, the physiological and neurological research of recent years greatly differs as to whether the area of physiological determinants is really the limiting factor of the termination of an activity, or whether this limiting factor is rather the peripheral or the central nervous system (e.g. Place & Kayser, 2010; Noakes, 2011; Smirmaul, Fontes, & Noakes, 2010; Marcora 2010; Amann & Secher, 2010).

Human performance is most likely a non-homogeneous construct of the above determinants, but, in addition, the reaching of its limit level is probably also determined by motivation and determination (e.g. Eckardt & Schuler, 1992; Aktinson 1978; Rudik, 1961). Thus, we may conclude that motivation and determination affect how much a real performance approaches the performance limit of an individual resulting from their acquired as well as inherited dispositions. The issue that must be addressed in the future is how to separate the above factors and thus how to measure them.

Conclusion

Comparing our results with the general population, we found differences both in individual motivation scales and in the motivational structure model itself. Comparing the results of triathletes with the Czech standardization sample (LMI), statistically significantly higher values for triathletes are identified in dimensions of engagement, flexibility, preference for difficult tasks, status orientation, competitiveness, goal setting and in the total achievement motivation score ($p \leq 0.01$) plus compensatory effort and pride in productivity ($p \leq 0.05$).

The motivational structure model also differs from that for the general population; it consists of four latent factors. Three of them are by content identical with the motivational structure model for the general population, while the fourth factor (Factor 3), which we termed self-assertion, most likely applies only to elite athletes.

The model accounts for 70.24% of the total variance with Factor 1 (independence) accounting for the greatest percentage of the variance, i.e. 19.84%, Factor 2 (ambition) for 19.17 %, Factor 3 (self-assertion) for 18.66 % and Factor 4 (motivation for tasks) for 12.57% of the total variance.

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