

установление личного контакта, положительное подкрепление. С целью развития уровня эмпатии, на основе проделанной работы, были даны рекомендации тренерам.

### Литература

1. **Алехин А. Н.** Индивидуальные отношения. Теория и практика эмпатии [Текст] : монография / А. Н. Алехин, А. В. Алехин, А. В. Курпатов. — Олма Медиа Групп, 2007. — 384с.
2. **Агватер И.** «Я вас слушаю», М. 1988.
3. **Басова А. Г.** Формирование эмпатии [Текст] / А. Г. Басова // Молодой ученый. — 2013. — №5. — С. 631–633.
4. **Баталова М. С.** Эмпатия и успешность в коммуникативной сфере [Текст] : монография / М. С. Баталова. LAP Lambert Academic Publishing, 2012. — 72 s.
5. **Бражникова А. Н.** Эмпатия как нравственное качество будущего профессионала / А. Н. Бражникова // психологическая наука и образование. — 2012. — №4. — С. 120–130.
6. **Васильюк В. Ф.** Психология переживания, М. 1989, 288с.
7. **Райгородский Д. Я.** Практическая психодиагностика, 2020, 668с.

\* \* \*

УДК 159.91 : 796

doi:10.18720/SPVPU/2/id23-231

## ПСИХОФИЗИОЛОГИЧЕСКИЕ ПОКАЗАТЕЛИ СПОРТИВНОЙ МОТИВАЦИИ СПОРТСМЕНОВ, ЗАНИМАЮЩИХСЯ ЕДИНОБОРСТВАМИ

**Степанян Лусине Самвеловна, Лалаян Гаяне Арменовна**

*ГИФКСА, Ереван, Армения*

**Аннотация.** Исследована связь между доминирующими мотивами и спортивными результатами у спортсменов, с использованием теста диагностики особенностей мотивации и показателей ЭЭГ и ЭКГ для измерения психофизиологических реакций. Показано наличие различий между доминирующими мотивами у спортсменов с разными уровнями достижений. Установлено, что у элитных спортсменов преобладают мотивы перспектив спортивного роста и желание представить страну, а также был более высокий уровень физиологической возбудимости (стресс, волнение, число сердечных сокращений). В то же время, у спортсменов с более низкими показателями уровень возбудимости был ниже.

**Ключевые слова:** психофизиология спортивной деятельности, мотивация, спортивная мотивация, спортивные достижения.

## PSYCHOPHYSIOLOGICAL INDICATORS OF SPORTS MOTIVATION OF ATHLETES ENGAGED IN MARTIAL ARTS

**Stepanyan Lusine Samvel, Lalayan Gayane Armen**

*ASIPCS, Yerevan, Georgia*

**Abstract.** The relationship between dominant motives and sports results in athletes was studied using a test for diagnosing motivational features and EEG and ECG indicators to measure psychophysiological reactions. Differences in dominant motives were found between athletes with varying levels of achievement. Elite athletes were found to be primarily motivated by prospects for sports growth and the desire to represent their country. Additionally, these athletes displayed a higher level of physiological excitability (measured by stress, excitement, and heart rate) compared to athletes with lower scores, who showed lower levels of excitability.

**Keywords:** Psychophysiology of sports activity; motivation; sports motivation; sports performance; martial arts.

### Introduction

In recent years, sports psychology and physical culture have emphasized the inclusion of psychological and psychophysiological features in sports activities. A reliable methodology for studying sports motivation is crucial, and psychophysiological measures offer promising solutions. Sports motivation is a multifaceted concept studied using different theoretical frameworks. Self-determination theory suggests an athlete's motivation quality is determined by the degree to which their basic psychological needs are met [6]. Goal orientation theory provides insights into the relationship between motivation and focus on task or ego-oriented goals [5]. Self-efficacy, an individual's belief in their ability to perform a task, is a crucial factor influencing achievement striving in sport [1].

The implementation of psychophysiological measures can provide more objective and dependable indicators of

an athlete's motivation, particularly in high-pressure contexts such as martial arts. Psychophysiological measures can help researchers understand an athlete's motivational state and its impact on performance, leading to the optimization of training strategies. Tailored interventions, such as biofeedback and neurofeedback stimulation methods, can enhance an athlete's productivity and consistency in performance [2]. Korobeynikov and colleagues found that highly motivated judo athletes activated neurodynamic and cognitive functions, while athletes motivated to avoid failure developed coping strategies to prevent psycho-emotional stress [3].

This highlights the importance of understanding an athlete's motivational state and developing tailored strategies to optimize their performance. A multidisciplinary and interdisciplinary study of sports motivation, including the implementation of psychophysiological measures,

is crucial for improving athletic performance and promoting athlete well-being.

**The study aimed** to study the hierarchical level of dominant motives and sports results in athletes based on psychophysiological indicators.

**Materials and methods**

The total sample of the study consists of 15 participants. All athletes are men, 18–25 years old (wrestling: n = 6, karate: n = 3, judo: n = 3, boxing: n = 3). The participants were divided into 3 groups according to the level of sports success. The first group includes athletes with high sports success (participants of the World and European Championships, n = 4), the second group includes athletes with middle sports success level (participants of the championships of Armenia, n = 6), and the third group includes athletes without sports success (n = 5).

**Study organization**

Based on the analysis of literary sources, the present study has identified 10 motives for engaging in sports activities. To investigate the neural and physiological correlates of these motives, participants were presented with two-dimensional animated images depicting these motives while

their brain and heart activity was recorded using an EEG and ECG device, respectively. The EEG device utilized in the study was the Emotiv EPOC+, which measured six emotional and subconscious states, namely stress, engagement, interest, excitement, focus, and relaxation. On the other hand, the ECG device used was the Varicard 2.51, which recorded heart rate variability as an indicator of physiological arousal. To assess the motivation of the participants, the V. I. Tropnikov’s “Studying the Motives for Playing Sports” test was selected. The analysis was conducted using statistical tools available in SPSS 22.0 mathematical statistic package, EmotivePro software (analyze electroencephalographic data) and ISCIM6 (electrocardiographic data).

**Results**

The results of Tropnikov’s test “Studying motives for sports” for three research groups are shown in table 1.

Below are the average heart rate scores of the three study groups while viewing motive pictures (see Table 2). Also, an analysis was made of the average heart rate in the research groups during the entire experiment (see table 3).

The study found that athletes who achieved high sports success valued the motives of representing their

Table 1

**Tropnikov’s “The study of motives for playing sports” test results**

Motive	1st group (n = 4)		2nd group (n = 6)		3rd group (n = 5)	
	M	Std,D	M	Std,D	M	Std,D
On the advice of parents	3,25	2,06	4,5	0,83	3,06	0,85
Collectivist orientation (the feeling of belonging to a team)	3,96	0,59	3,92	1,10	3,2	0,62
For self-defense	3,58	0,45	4,43	0,57	4,37	0,42
The prospect of sports growth	4,88	1,28	4,66	0,37	3,99	0,90
Desire to represent the country	5	0	4	0,40	4,25	1,5
Satisfaction of material needs	1,35	0,44	3,06	0,73	4,5	0,57
The ability to travel	4,83	0,25	4,58	0,37	3,87	1,31
Desire to be like a sports celebrity	2,99	1,12	2,38	1,62	2,99	1,46
Increase prestige, desire for glory (Glorification)	3,76	0,46	3,38	0,52	3,6	0,92
Development of character and mental qualities (Personal improvement)	4,25	0,29	4,07	0,37	3,90	1,19

Table 2

**Heart rate results for 3 research groups**

1	Motive	1st group (n=4)	2nd group (n=6)	3rd group (n=5)
2	On the advice of parents	69,8	70,6	66,2
3	The feeling of belonging to a team	69,4	70,1	60,3
4	For self-defense	65,6	67,8	63,5
5	The prospect of sports growth	72,8	67,1	61
6	Desire to represent the country	70,5	65,8	59,5
7	Satisfaction of material needs	64,375	66,8	68,2
8	The ability to travel	64,5	62,08	60,5
9	Desire to be like a sports celebrity	67,25	67,3	63,5
10	Glorification	68	70,3	65,5
11	Personal improvement	67,25	68	65

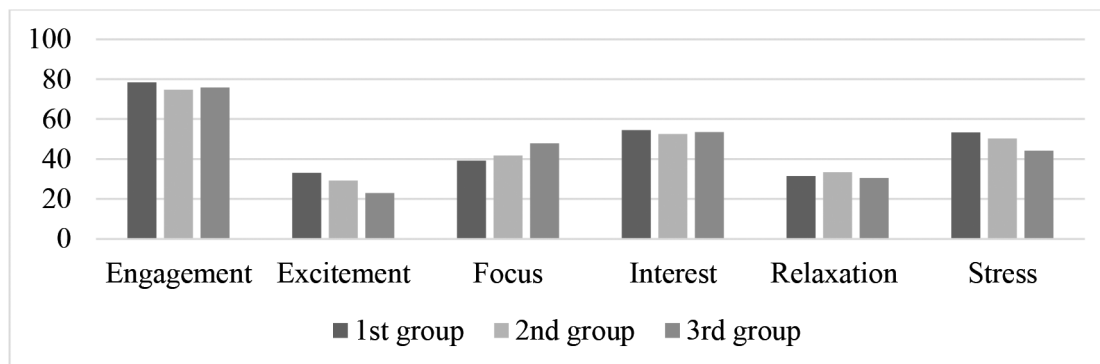


Fig. 1. Results of EEG parameters for 3 research groups

### Descriptive Statistics of heart rate data

	Mean	Std. Deviation
1st group (n = 4)	68,3442	2,742
2nd group (n = 6)	67,6171	2,530
3rd group (n = 5)	62,9494	2,926

country and the prospect of sports growth more. In contrast, middle-level athletes valued prospects of sports growth, travel, and parental advice. The desire for growth and development in their sport was a primary motivation, along with opportunities to travel and gain experience. Parental advice and guidance also played a significant role in their motivation to continue pursuing their sport. For athletes who didn't register sports success, the study found that they prioritized satisfying material needs. The results of the study align with Maslow's theory of needs [4], which suggests that people have a hierarchy of needs that motivate them. Lower-level needs such as physiological needs, safety needs, and love and belonging needs are more important for individuals with lower sports success, while higher-level needs such as esteem needs and self-actualization needs are more important for individuals with higher sports success.

The study also suggests that physiological data provides more objective results compared to self-reported tests. The glorification motive, which is the desire for recognition and praise, had high scores across all research groups, which was not detected by the test.

The study collected data using an EEG device called Emotive Epop+ on 3 research groups, focusing on 6 parameters: engagement, excitement, focus, interest, relaxation, and stress (Figure 1).

The study found that participants were engaged and interested in the experiment. Athletes with higher athletic performance had lower levels of focus during the experiment, while higher-performing athletes experienced higher levels of stress. Data on the "Relaxation" scale were below average. The study also found a strong association between sports performance and the underlying physiological and

neural correlates of excitability, with higher-performing athletes exhibiting higher levels of excitability. These findings have important implications for sports training and coaching, emphasizing the need for personalized interventions to optimize sports performance based on individual differences in excitability.

The study explored the motives of athletes and their relationship to sports success using the Tropnikov test and heart rate data. The results indicated that athletes with higher sports success prioritized representing their country and sports growth, while those with middle sports results were motivated by travel, parental advice, and glorification. Athletes who did not achieve sports success were primarily motivated by material needs. Additionally, the study found a need to consider individual differences in excitability for optimizing sports performance. These insights can be useful for coaches and athletes in goal-setting and training program design. Further research can explore athletes' awareness of their true motives for exercising.

### References

1. **Feltz D. L.** Self-efficacy beliefs of athletes, teams, and coaches / D. L. Feltz, C. D. Lirgg // Handbook of sport psychology. – 2001. Vol. 2 (2001). – P. 340–61.
2. **Fronso S. di.** Performance Optimization in Sport: A Psychophysiological Approach / S. di Fronso, C. Robazza, L. Bortoli, M. Bertollo // Motriz: Revista de Educação Física. – 2017. – Vol. 23(4). doi:10.1590/s1980-6574201700040001
3. **Korobeynikov G. V.** Relationship of psychophysiological characteristics with different levels of motivation in judo athletes of high qualification / G. V. Korobeynikov, L. G. Korobeynikova, L. V. Romanyuk, N. A. Dakal, et al // Pedagogics, psychology, medical-biological problems of physical training and sports. – 2017. – № (6). – P. 272–278.
4. **Maslow A. H.** (1943). A theory of human motivation / A. H. Maslow // Psychological Review. – 1943. – Vol. 50(4). – P. 370–396. <https://doi.org/10.1037/h0054346>
5. **Nicholls J. G.** Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance / J. G. Nicholls, // Psychological review. –1984. – Vol.91(3). – P. 328–346.
6. **Ryan R. M.** Intrinsic and extrinsic motivations: Classic definitions and new directions / R. M. Ryan, E.L. Deci // Contemporary educational psychology. 2000. – Vol. 25(1). P. 54–67.

\* \* \*