



## ORIGINAL ARTICLES. SPORT

# Emotional intelligence in shaping junior athletes' productive coping strategies

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## Abstract

### Background and purpose

The aim is to study the role and function of junior athletes' emotional intelligence in shaping productive strategies, including self-control, accepting responsibility, problem-solving planning, positive reappraisal, and social support. Material and methods

The sample (n = 120) consisted of randomly selected junior male (n = 55; 45.83%) and female (n = 65; 54.17%) athletes with different qualifications, who were educated and trained at the academies of professional clubs and sports schools for children and youth, belonged to the country's Olympic Reserve, had experience in participating in All-Ukrainian and international sports competitions, and were prize-winners in European and World championships. The respondents' ages ranged from 15 to 19 years (M = 16.45; SD = ±2.97).

### Results

The profile of emotional self-regulation was designed to control changes in these parameters. Based on the grouping variables of emotional intelligence, differences were found in two productive coping strategies: "self-control" – for the grouping variable "managing emotions" (t = -2.183; p = 0.031; d = -0.401) and "accepting responsibility" – for the grouping variable "self-motivation" (t = 2.382; p = 0.019; d = 0.436). It was substantiated that the parameters of emotional intelligence, "managing emotions" and "self-motivation", are the most sensitive to shaping productive coping strategies. It was emphasised that the three factors resulting from dimensionality reduction, "self-motivational regulation", "positive construction", and "conscious control", relevantly reflected the psychological content features of emotional self-regulation.

### Conclusions

It was substantiated that research into junior athletes' emotional intelligence in shaping productive coping strategies is a confirmatory empirical study, which allowed for establishing correlations, identifying significant advantages in productive coping strategies of self-control, accepting responsibility, problem-solving planning, positive reappraisal, and social support based on the grouping variables of emotional intelligence. It was summarised that the established scientific facts complement the theoretical knowledge of the formation of emotional self-regulation, the development of the emotional and volitional sphere, and the construction of worldviews in junior sports representatives.

**Key words:** self-control, accepting responsibility, problem-solving planning, positive reappraisal, emotional self-regulation, self-motivation



## Анотація

**Ігор Попович, Євген Карпенко, Галина Матусяк, Наталія Добровольська, Едуард Сколота, Валентина Каленчук, Ігор Гоян. Емоційний інтелект в організації продуктивних копінг-стратегій юних атлетів**

### Обґрунтування і мета

Метою є дослідження ролі і місця емоційного інтелекту юних атлетів у організації продуктивних копінг-стратегій: самоконтролю, прийняття відповідальності, планування вирішення проблеми, позитивної переоцінки і соціальної підтримки.

### Матеріал і методи

Вибіркову сукупність ( $n = 120$ ) склали рандомно відібрані юні спортсмени ( $n = 55$ ; 45.83%) і юні спортсменки ( $n = 65$ ; 54.17%) різних кваліфікаційних рівнів, що навчалися і тренувалися в академіях професійних клубів, дитячо-юнацьких спортивних школах, належали до олімпійського резерву країни, мали досвід виступів на усеукраїнських і міжнародних спортивних форумах, були призерами першості Європи і Світу. Вік респондентів знаходився у межах від 15 років до 19 років ( $M = 16.45$ ;  $SD = \pm 2.97$ ).

### Результати

Запропоновано засобами профілю емоційної саморегуляції контролювати зміни у цих параметрах. За групуючими змінними емоційного інтелекту з'ясовано відмінності у двох продуктивних копінг-стратегіях: "самоконтролі" за групуючою змінною "управління емоціями" ( $t = -2.183$ ;  $p = 0.031$ ;  $d = -0.401$ ) і у "прийнятті відповідальності" за групуючою змінною "самомотивація" ( $t = 2.382$ ;  $p = 0.019$ ;  $d = 0.436$ ). Констатовано і обґрунтовано, що параметри емоційного інтелекту – "управління емоціями" і "самомотивація" є найбільш чутливими до організації продуктивних копінг-стратегій. Зазначено, що встановлені зменшенням співрозмірності три фактори: "самомотиваційна регуляція", "позитивне конструювання" і "усвідомлене контролювання", якісно відобразили психологічні змістові особовості феномену емоційної саморегуляції.

### Висновки

Обґрунтовано, що дослідження емоційного інтелекту юних атлетів у організації продуктивних копінг-стратегій є констатувальним емпіричним дослідженням, дизайн якого дозволив встановити кореляційні зв'язки, достовірні переваги в продуктивних копінг-стратегіях самоконтролю, прийняття відповідальності, планування вирішення проблеми, позитивної переоцінки і соціальної підтримки за групуючими змінними емоційного інтелекту. Узагальнено, що отримані наукові факти доповнюють теоретичні знання з формування емоційної саморегуляції, розвитку емоційно-вольової сфери, становлення світоглядних настановлень представників юнацького спорту.

**Ключові слова:** самоконтроль, прийняття відповідальності, планування вирішення проблеми, позитивна переоцінка, емоційна саморегуляція, самомотивація

## Аннотация

**Игорь Попович, Евгений Карпенко, Галина Матусяк, Наталья Добровольская, Эдуард Сколота, Валентина Каленчук, Игорь Гоян. Эмоциональный интеллект в организации продуктивных копинг-стратегий юных атлетов**

### Обоснование и цель

Целью является исследование роли и места эмоционального интеллекта юных атлетов в организации продуктивных копинг-стратегий: самоконтроля, принятия ответственности, планирования решения проблемы, положительной переоценки и социальной поддержки.

### Материал и методы

Выборочную совокупность ( $n = 120$ ) составили рандомно отобранные юные спортсмены ( $n = 55$ ; 45.83%) и юные спортсменки ( $n = 65$ ; 54.17%) различных квалификационных уровней, обучавшихся и тренировавшихся в академиях профессиональных клубов, детско-юношеских спортивных школах, принадлежащих к олимпийскому резерву страны, имели опыт выступлений на всеукраинских и международных спортивных форумах, были призерами первенства Европы и Мира. Возраст респондентов находился в пределах от 15 до 19 лет ( $M = 16.45$ ;  $SD = \pm 2.97$ ).

### Результаты

Предложено средствами профиля эмоциональной саморегуляции контролировать изменения этих параметров. С помощью группирующих переменных эмоционального интеллекта выяснены различия в двух продуктивных копинг-стратегиях: "самоконтроле" по группирующей переменной "управление эмоциями" ( $t = -2.183$ ;  $p = 0.031$ ;  $d = -0.401$ ) и в "принятии ответственности" по группирующей переменной "самомотивация" ( $t = 2.382$ ;  $p = 0.019$ ;  $d = 0.436$ ). Констатировано и обосновано, что параметры эмоционального интеллекта – "управление эмоциями" и "самомотивация" наиболее чувствительны к организации продуктивных копинг-стратегий. Отмечено, что установленные уменьшением соразмерности три фактора: самомотивационная регуляция, положительное конструирование и осознанное контролирование, качественно отразили психологические содержательные особенности феномена эмоциональной саморегуляции.

### Выводы

Обосновано, что исследование эмоционального интеллекта юных атлетов в организации продуктивных копинг-стратегий является констатирующим эмпирическим исследованием, дизайн которого позволил установить корреляционные связи, достоверные преимущества в продуктивных копинг-стратегиях самоконтроля, принятие ответственности, планирование решения проблемы, положительной переоценки и социальной переоценки. Обобщено, что полученные научные факты дополняют теоретические знания по формированию эмоциональной саморегуляции, развитию эмоционально-волевой сферы, становлению мировоззренческих установок представителей юношеского спорта.

**Ключевые слова:** самоконтроль, принятие ответственности, планирование решения проблемы, положительная переоценка, эмоциональная саморегуляция, самомотивация



## Introductions

Junior athletes' emotional self-regulation is an integral personal characteristic that combines the athlete's abilities to manage their emotions, feelings, thoughts, and actions, remain calm, control themselves in adverse situations, and perform the managerial function of their psycho-emotional states through developed volitional, cognitive, and emotional mechanisms. The fundamental studies by Boryshevsky [1] highlight the importance of considering the current needs, personally meaningful goals, social expectations, life relationships, and social attitudes in developing the individual's self-regulation. The athlete's emotional self-regulation is based on their emotional intelligence, i.e., their ability to recognise and control their emotions and those of other participants in sports activities, which is achieved through self-knowledge, self-education, self-development, auto-training, and educational technologies. Effective emotional self-regulation undoubtedly testifies to the athlete's self-control and emotional maturity [2]. Emotional maturity can ensure the junior athlete's effective social adaptation and ability to realise their potential in time. There are numerous examples in junior sports where beginner athletes showed great promise but did not manage to realise their potential in professional sports. To some extent, the problem of beginner athletes lies with weak operational capability that causes severe psychological disorders and problems at the stages of professional sports. Emotional self-regulation allows athletes to maintain psychological balance. A lack of or instability in this balance causes them lower their standards, take breaks during the learning and training process, and surrender to emotionally stable opponents in sports competitions. It is noteworthy that emotional self-regulation can integrate the work of emotional, volitional, and cognitive spheres of the psyche and also considerably affect the motivational and cognitive aspects of sports activities. The aforementioned psychological tenets actualise the research into the role and function of junior athletes' emotional intelligence in shaping productive coping strategies.

Emotional intelligence is closely related to shaping coping strategies, as demonstrated in numerous studies on various spheres of human activity [3; 4]. Emotional intelligence, along with sports experience, positively affects the athlete's decision-making [5]. Since productive coping

strategies are conscious actions to deal with stress and maintain psychological well-being, developing them enables individuals to regulate their emotional states more effectively during sports competitions [6; 7]. Obviously, high emotional intelligence contributes to selecting productive coping to handle pressure, cope with failures, and achieve better sports outcomes. Researchers Cunha et al. [8] defined the role of self-control and emotional regulation in young athletes' psychological well-being, employing a sample of  $n = 145$  athletes aged 15 to 21, and concluded that awareness of emotions plays a crucial role in facilitating young athletes' psychological adaptation and well-being. The results obtained by researchers Lepers et al. [9] align with the data on self-control and stress. Some scientists focus on the empathic component of emotional intelligence, believing that empathy, compassion, and the understanding of competitors' and coaches' emotions improve interaction in the team and serves as the athlete's psychological resource [10].

The research into coping strategies in adverse life events, particularly those of displaced people, conducted by Plokhikh et al. [11], shows the effectiveness of the individual's defence mechanisms in actual conditions. The processes of mobilising efforts largely have much in common with the athlete's competitive activities. The findings of the study reveal the consistency of psychological correlations and significant differences. In the context of research on emotional intelligence and coping strategies, the problems of improving psychological well-being, maintaining stability, adapting to adverse conditions, and preventing psychological burnout often come to the fore. The studies by Mei et al. [12], and Yu et al. [13] on psychological burnout show that it can be prevented through the intermediary role of emotional intelligence and resilience. Jordalen et al. [14] focused on the significance of motivation and self-control in preventing burnout. Researchers underscore that the time interval between measurement points in such studies plays a crucial role. Another study by Zuo and Bai [15] used mixed methods to examine emotional regulation, coping strategies, and burnout among Chinese athletes. Applying mediation analysis, the researchers found that coping strategies such as positive reappraisal and denial partially mediated the relationship between emotional regulation and burnout. Their findings suggest that emotional



intelligence is a complex phenomenon, and that emotional regulation and productive strategies, particularly social support, can mitigate burnout.

It was found that physical activity in leisure time improves happiness, health, and mood more effectively than activity in physical work. Therefore, it is important that junior athletes view the learning and training process not as exhausting work requiring excessive self-control, but rather as alternating difficult tasks with pleasant and exciting moments [16].

Attention should be paid to research into psychophysiological regulation, which is considered a process of conscious or unconscious control over one's emotional states, reactions, and behavior through the impact on physiological processes in the body, including breathing, muscle tone, and visual thinking in the studies by Kozina et al. [17; 18], Kozin et al. [19]. It is believed that physiological processes, along with high emotional intelligence, help junior athletes not only select but also effectively employ productive coping strategies, which result in better adaptation, resilience, and high sports results.

The confirmatory empirical research into

junior athletes' emotional intelligence in shaping productive coping strategies allowed for establishing correlations and identifying significant advantages in the productive coping strategies of self-control, accepting responsibility, problem-solving planning, and positive reappraisal based on the grouping variables of emotional intelligence. In the context of the formation of emotional self-regulation, the development of the emotional and volitional sphere, and the construction of worldviews, the established empirical facts possess scientific novelty and cognitive value.

Hypothesis. It is hypothesised that: 1) juniors' productive coping strategies will have significant correlations with emotional intelligence parameters; 2) junior athletes' productive coping strategies will have significant differences for the grouping variables of emotional intelligence.

Aim. To examine the role and function of junior athletes' emotional intelligence in shaping productive coping strategies, including self-control, accepting responsibility, problem-solving planning, positive reappraisal, and social support.

## Material and methods

### Participants

The sample  $n = 120$  consisted of randomly selected junior athletes. The gender ratio was as follows: junior male athletes ( $n = 55$ ; 45.83%) and junior female athletes ( $n = 65$ ; 54.17%). Juniors represented team and individual sports, including football, handball, volleyball, freestyle wrestling, classic wrestling, boxing, track and field, artistic gymnastics, weightlifting, sambo, and judo. The sample included athletes with different qualification levels who were educated and trained at the academies of professional clubs and sports schools for children and youth. They belonged to the country's Olympic reserve, had experience in participating in All-Ukrainian and international sports competitions, and had won prizes at European and World championships. The respondents' ages ranged from 15 to 19 years ( $M = 16.45$ ;  $SD = \pm 2.97$ ). At the time of the empirical cross-section, all respondents were healthy. They trained and regularly participated in sports championships.

### Organization of Research

The comparative research involved comparing coping strategies based on the grouping variables of emotional intelligence. This research strategy is characteristic of a confirmatory study. The research participants' data were collected between September and November, 2025. The research employed a combined approach, utilising Google Forms for a remote survey and paper questionnaire forms in a face-to-face format. All respondents provided written informed consent or completed Google Forms regarding the subject, procedure, timing, and voluntary participation in the survey. The age in years was also written on application forms. After the confirmation of the researcher responsible for data collection, questionnaires were sent via Google Forms (remotely) or paper questionnaire forms were distributed (in person) for participation in the research. Further procedure was anonymous and confidential. The study, conducted within the framework of the initiative research topics of the



researchers' departments, was approved by the Ethics Committees and the Educational and Methodological Councils of universities. The research organisers received permission from the administrations of the academies of professional clubs and sports schools for children and youth. Consent was also obtained from coaches training athletes in individual sports. The approval took two months, from September to October, 2025. This research into emotional intelligence in shaping productive coping strategies among young athletes was conducted in accordance with the principles of the Declaration of Helsinki. The outlined tenets, principles, and content features of the survey preparation ensured reliability, validity, and representativeness of the empirical dataset.

### Procedures and Instruments

To identify a set of parameters relevantly reflecting the phenomenon of emotional self-regulation, valid and reliable questionnaires numerous tested on junior sports samples, "Hall Emotional Intelligence Test" (HEIT) [20] and "Way of Coping Questionnaire" (WCQ) [21], were employed. The psychodiagnostic instrument "HEIT" [20] was used to measure the levels of emotional intelligence parameters on the main scales: emotional awareness (EA), managing emotions (ME), self-motivation (SM), empathy (E), and emotion recognition (ER). The methodology effectively combined intrapsychic (EA; ME; SM) and interpsychic dimensions (E; ER). The application of this methodology is justified by the fact that the set of emotional intelligence dimensions based on identifying the individual's capacity for self-reflection, interpretation of their life experiences, empathy, compassion, and the ability to understand others' psycho-emotional states, relevantly reflected the content of respondents' emotional self-regulation. The operational component of assessing emotional self-regulation comprised productive coping

strategies identified using the methodology "WCQ" [21]. The productive coping strategies included self-control (SC), accepting responsibility (AR), problem-solving planning (PSP), positive reappraisal (PR), and social support (SS). Since the other three coping strategies, confrontation (C), distancing (D), and escape-avoidance (E-A), are not considered productive, they were not studied in the empirical research. The statistical reliability of empirical data for the research methodologies is given in Table 1.

### Statistical analysis

The main statistical operations were performed using the computer software "IBM SPSS Statistics", version 29.0.0.0 (241). The empirical data obtained through Google Forms were automatically integrated into the empirical matrix generated in the "MS Excel" program. The empirical data obtained in a face-to-face format were processed manually and entered into the empirical matrix in "MS Excel". Statistical operations were performed using standard statistical coefficients: statistical reliability – Cronbach's ( $\alpha$ ); descriptive frequency characteristics – the mean of a distribution ( $M$ ), the median ( $Me$ ), the squared deviation ( $SD$ ); the normal distribution – asymmetry ( $A$ ) and excess ( $E$ ); psychological correlations – Pearson's correlation coefficient ( $r$ ); differences between two independent groups – Student's t-test ( $t$ ); dimensionality reduction – to find factor loadings ( $F$ ). The research also employed Levene's Test ( $F$ ) with Welch's correction ( $t$ ), which allowed for clarifying differences between the studied groups based on the grouping variable, and Cohen's  $d$  to measure the effect size. Only bivariate significant correlations at a level of  $p \leq 0.050$ ,  $p \leq 0.010$  and  $p < 0.001$  were interpreted.

## Results

The sample was tested for internal consistency based on the analysis of reliability using Cronbach's ( $\alpha$ ). The sample was tested for individual methodologies and the empirical dataset obtained (Table 1).

The results confirmed a high level of statistical reliability (0.878–0.911). Table 2 presents the descriptive frequency characteristics of junior athletes' emotional intelligence parameters and productive coping strategies based on the psychodiagnostic instruments, "Hall Emotional

Intelligence Test" (HEIT) [20] and "Way of Coping Questionnaire" (WCQ) [21]. The parameters of the descriptive characteristics, the mean ( $M$ ) and the squared deviation ( $SD$ ), are given. The application of these two parameters ensures the reproducibility of the main dataset. The median ( $Me$ ) was used to divide emotional intelligence parameters into two groups: Group 1 with low levels of the parameters ( $\geq Me$ ) and Group 2 with high levels of the parameters ( $< Me$ ). Asymmetry ( $A$ ) and excess ( $E$ ) were used to test data for a normal distribution on all scales.



**Table 1**  
Statistical reliability of psychodiagnostic research instruments

Psychodiagnostic research instruments	Statistical reliability (Cronbach's alpha), $\alpha$
"HEIT" [20] (conditional unit)	0.878
"WCQ" [21] (conditional unit)	0.911
Total sample (conditional unit)	0.892

**Table 2**  
Descriptive frequency characteristics of junior athletes' emotional intelligence parameters and productive coping strategies (n = 120)

Scale	M	Me	SD	A	E
<b>"HEIT" [20]</b>					
Emotional awareness (EA) (scores)	9.02	9.00	$\pm 3.94$	0.211	-0.366
Managing emotions (ME) (scores)	7.26	7.00	$\pm 3.94$	0.249	-0.418
Self-motivation (SM) (scores)	7.98	8.00	$\pm 3.70$	0.204	0.462
Empathy (E) (scores)	9.90	10.00	$\pm 3.99$	-0.056	-0.335
Emotion recognition (ER) (scores)	8.69	9.00	$\pm 4.02$	0.333	0.064
<b>"WCQ" [21]</b>					
Self-control (SC) (scores)	11.64	11.00	$\pm 2.76$	0.305	-0.675
Accepting responsibility (AR) (scores)	10.01	10.00	$\pm 2.91$	0.149	-0.651
Problem-solving planning (PSP) (scores)	11.27	11.00	$\pm 2.73$	0.193	-0.434
Positive reappraisal (PR) (scores)	11.22	11.00	$\pm 2.73$	0.334	-0.260
Social support (CPI) (scores)	10.96	10.50	$\pm 3.08$	0.040	-0.720

Notes: M – the mean of the sample; Me – the median of the sample's parameters (given *in italics*); SD – the squared deviation of the sample; A – asymmetry; E – excess.

It is noteworthy that the values of asymmetry ( $A$ ) and excess ( $E$ ) do not exceed unity, which confirms the normal distribution of the empirical data and allows using parametric statistics. Among emotional intelligence parameters, "empathy" had the highest values ( $M = 9.90$ ;  $SD = \pm 3.99$ ); the lowest values were recorded in the parameter "managing emotions" ( $M = 7.26$ ;  $SD = \pm 3.94$ ). Productive coping strategies, which had no significant values, were recorded at relatively similar empirical levels. The comparison of these data with the empirical dataset in studies by other authors conducting research on junior samples [3; 22] shows no significant differences, providing reason to consider the results representative and reflective of the general population.

The methodological substantiation of junior athletes' emotional regulation allowed for creating a generalised profile of junior athletes' emotional regulation. The profile is presented as a

petal diagram that allows for a visual comparison of the measurements with each other and between individual respondents. A closed black line created the contour of emotional regulation. The outlined area is considered emotional self-regulation potential. Obviously, an increase in the area from one measurement to another will be considered an improvement in emotional self-regulation, whereas a reduction will be regarded as destabilisation. The levels of the parameters forming the area are important. For example, a high level of problem-solving planning combined with low empathy will exhibit the content features of emotional regulation that are distinct from those of a high level of social support with low self-motivation. In any variant, the larger the area, the higher the emotional regulation capacity is, and vice versa. Small areas negatively affect not only competitive activities but also learning, training, and rehabilitative processes (Figure 1).

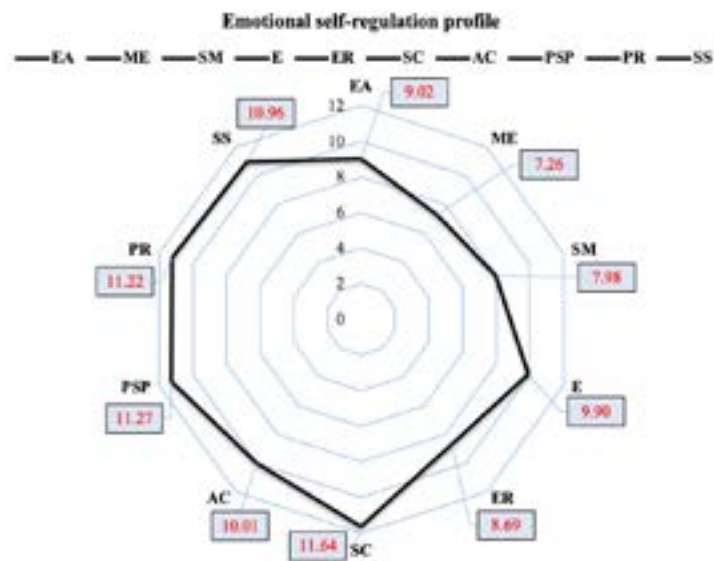


Figure 1. Profile of junior athletes' emotional self-regulation

Notes: EA – emotional awareness (scores); ME – managing emotions (scores); SM – self-motivation (scores); E – empathy (scores); ER – emotion recognition (scores); SC – self-control (scores); AC – accepting responsibility (scores); PSP – problem-solving planning (scores); PR – positive reappraisal (scores); SS – social support (scores).

The dominant parameters of the petal diagram are “self-control” ( $M = 11.64$ ;  $SD = \pm 2.76$ ), “problem-solving planning” ( $M = 11.27$ ;  $SD = \pm 2.73$ ), and “positive reappraisal” ( $M = 11.22$ ;  $SD = \pm 2.73$ ). It is important that the parameters were weighed before creating the diagram. The results demonstrate the values of the three productive coping strategies, suggesting the advantage of the operational component over the content component. This characteristic is often observed in junior athletes.

According to the comparative design of the confirmatory research strategy, establishing psychological correlations was an important research step. Since the data followed a normal distribution, Pearson's correlation coefficient was used ( $r$ ). Table 3 presents the correlation matrix data on emotional intelligence parameters and productive coping strategies.

Table 3

Correlation matrix of emotional intelligence parameters and productive coping strategies across the sample ( $n = 120$ )

Scale	Statistical parameter	Productive coping strategies				
		SC	AC	PSP	PR	SS
Emotional awareness (EA) (conditional unit)	$r$	0.062	-0.133	0.230*	0.185*	0.129
	$p$	0.499	0.149	0.011	0.043	0.160
Managing emotions (ME) (conditional unit)	$r$	0.233*	-0.092	0.062	0.060	-0.075
	$p$	0.010	0.320	0.504	0.512	0.413
Self-motivation (SM) (conditional unit)	$r$	0.171	-0.207*	0.000	-0.023	-0.111
	$p$	0.061	0.023	0.996	0.801	0.229
Empathy (E) (conditional unit)	$r$	0.151	0.031	0.065	0.095	-0.076
	$p$	0.100	0.738	0.481	0.301	0.411
Emotion recognition (ER) (conditional unit)	$r$	0.234*	-0.024	0.148	0.153	0.017
	$p$	0.010	0.791	0.108	0.095	0.851

Notes:  $r$  – Karl Pearson's correlation coefficient;  $p$  – level of significance; \* –  $p \leq 0.050$ ; \*\* –  $p \leq 0.010$ ; \*\*\* –  $p < 0.001$ ; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social support.



Four direct correlations and one inverse correlation were recorded between emotional intelligence parameters and productive coping strategies ( $p \leq 0.010$ ): between “self-control” and “managing emotions” ( $r = 0.233$ ;  $p = 0.010$ ), “self-control” and “emotion recognition” ( $r = 0.234$ ;  $p = 0.010$ ), “accepting responsibility” and “self-motivation” ( $r = -0.207$ ;  $p = 0.023$ ), “problem-solving planning” and “emotional awareness” ( $r = 0.230$ ;  $p = 0.011$ ), “positive reappraisal” and “emotional awareness” ( $r = 0.185$ ;  $p = 0.043$ ). It was found that “emotional awareness” is the most dependent emotional intelligence parameter (two significant correlations), and “self-control”, with

two significant correlations, was found to be the most dependent coping strategy. The strongest direct correlation was established between “self-control” and “emotion recognition” ( $r = 0.234$ ;  $p = 0.010$ ). It suggests that this correlation is the most trained in sports activities. Table 4 presents the results of comparison based on the grouping variable “emotional awareness” between Group 1 ( $n = 68$ ; 56.67%) with a low level of this parameter ( $< Me$ ) and Group 2 ( $n = 52$ ; 43.33%) with a high level of this parameter ( $\geq Me$ ). Student’s t-test was used to compare two independent samples (Group 1 and Group 2), measuring the effect size (Cohen’s  $d$ ).

**Table 4**

Comparison of productive coping strategies based on the grouping variable “emotional awareness” between Group 1 and Group 2

Scale	Levene’s test		Student’s t-test for the equality of variances				Cohen’s d
	F	p	t	p	95 CI		
					Lower	Upper	
SC (conditional unit)	3.363	0.069	-0.842	0.402	-1.437	0.579	-0.155
AC (conditional unit)	0.329	0.568	0.451	0.653	-0.823	1.308	0.083
PSP (conditional unit)	0.941	0.334	-1.570	0.119	-1.775	0.205	-0.289
PR (conditional unit)	0.188	0.665	-0.547	0.586	-1.275	0.723	-0.101
SS (conditional unit)	0.017	0.896	-0.907	0.366	-1.638	0.608	-0.167

Notes: Group 1 – a low level of emotional awareness; Group 2 – a high level of emotional awareness; F – Levene’s test для двосторонньої дисперсій; p – level of significance; t – Student’s t-test (significant differences are given in **bold type**); 95 CI – confidence interval; Cohen’s d – effect size; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social support.

No significant differences were identified based on the grouping variable “emotional awareness” in productive coping strategies. Thus, different levels of emotional awareness do not affect the work of productive coping strategies. Table 5 presents the results of the comparison based on the

grouping variable “managing emotions” between Group 1 ( $n = 66$ ; 23.85%) with a low level of the parameter ( $< Me$ ) and Group 2 ( $n = 54$ ; 76.15%) with a high level of the parameter ( $\geq Me$ ). Student’s t-test was used to compare the two groups.



**Table 5**

Comparison of productive coping strategies based on the grouping variable “managing emotions” between Group 1 and Group 2

Scale	Levene’s test		Student’s t-test for the equality of variances				Cohen’s d
	F	p	t	p	95 CI		
					Lower	Upper	
SC (conditional unit)	0.085	0.771	<b>-2.183</b>	0.031	-2.07722	-0.10124	-0.401
AC (conditional unit)	3.852	0.052	0.829	0.409	-0.61626	1.50346	0.152
PSP (conditional unit)	0.307	0.581	-0.241	0.810	-1.11748	0.87505	-0.044
PR (conditional unit)	2.206	0.140	-0.267	0.790	-1.13088	0.86253	-0.049
SS (conditional unit)	0.085	0.772	-0.312	0.756	-1.29917	0.94563	-0.057

Notes: Group 1 – a low level of managing emotions; Group 2 – a high level of managing emotions; F – Levene’s test for homogeneity of variances; p – level of significance; t – Student’s t-test (significant differences are given in **bold type**); 95 CI – confidence interval; Cohen’s d – effect size; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social support.

The only significant difference was recorded in the productive coping strategy “self-control” ( $t = -2.183$ ;  $p = 0.031$ ;  $d = -0.401$ ) based on the grouping variable “managing emotions”. It is largely an expected difference, as the readiness and ability to manage emotions is associated with the athlete’s self-control. The effect size (Cohen’s  $d$ ) was found to be at a medium level. Critical values were not recorded based on Levene’s test. Thus, a significant

advantage of Group 2 was found based on the grouping variable “managing emotions”. Table 6 shows the comparison of data based on the grouping variable “self-motivation” between Group 1 ( $n = 64$ ; 21.54%) with a low level of the parameter ( $< Me$ ) and Group 2 ( $n = 56$ ; 78.46%) with a high level of the parameter ( $\geq Me$ ). The groups were compared using Student’s t-test.

**Table 6**

Comparison of productive coping strategies based on the grouping variable “self-motivation” between Group 1 and Group 2

Scale	Levene’s test		Student’s t-test for the equality of variances				Cohen’s d
	F	p	t	p	95 CI		
					Lower	Upper	
SC (conditional unit)	3.752	0.055	-0.932	0.353	-1.47224	0.53027	-0.170
AC (conditional unit)	2.711	0.102	<b>2.382</b>	0.019	0.21017	2.28090	0.436
PSP (conditional unit)	1.681	0.197	-0.205	0.838	-1.09623	0.89087	-0.037
PR (conditional unit)	2.649	0.106	-0.570	0.570	-1.27879	0.70691	-0.104
SS (conditional unit)	0.257	0.613	1.719	0.088	-0.14615	2.06579	0.314

Notes: Group 1 – a low level of self-motivation; Group 2 – a high level of self-motivation; F – Levene’s test for homogeneity of variances; p – level of significance; t – Student’s t-test (significant differences are given in **bold type**); 95 CI – confidence interval; Cohen’s d – effect size; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social research.

The only significant difference was identified in the productive coping strategy “accepting responsibility” ( $t = 2.382$ ;  $p = 0.019$ ;  $d = 0.436$ ) based on the grouping variable “self-motivation”. This is an unexpected advantage, as a low level of self-motivation leads to a high level of accepting responsibility. The effect size (Cohen’s  $d$ ) was recorded at a medium level. No critical values were recorded using Levene’s test. Thus, the only

significant advantage of Group 1 was found based on the grouping variable “self-motivation”. Table 7 presents the results of comparison based on the grouping variable “empathy” between Group 1 ( $n = 66$ ; 21.54%) with a low level of the parameter ( $< Me$ ) and Group 2 ( $n = 54$ ; 78.46%) with a high level of the parameter ( $\geq Me$ ). The groups were compared using Student’s t-test.



**Table 7**

Comparison of productive coping strategies based on the grouping variable “empathy” between Group 1 and Group 2

Scale	Levene’s test		Student’s t-test for the equality of variances				Cohen’s d
	F	p	t	p	95 CI		
					Lower	Upper	
SC (conditional unit)	0.035	0.853	-1.425	0.157	-1.71804	0.28033	-0.261
AC* (conditional unit)	5.657	0.019	-0.568	0.571	-1.33344	0.73916	-0.102
PSP (conditional unit)	0.028	0.868	-0.174	0.862	-1.08392	0.90884	-0.032
PR (conditional unit)	3.495	0.064	-0.582	0.562	-1.28800	0.70316	-0.107
SS (conditional unit)	0.007	0.936	0.163	0.871	-1.03015	1.21533	0.030

Notes: \* – the data are given using Welch’s t-test; Group 1 – a low level of empathy; Group 2 – a high level of empathy; F – Levene’s test for homogeneity of variances; p – level of significance; t – Student’s t-test (significant differences are given in **bold type**); 95 CI – confidence interval; Cohen’s d – effect size; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social support.

No significant difference was found in productive coping strategies based on the grouping variable “empathy”. Thus, different levels of empathy do not affect the work of productive coping strategies. Critical values were recorded in “accepting responsibility” using Levene’s test. The data presented in Table 7 were corrected

using Welch’s t-test. Table 8 presents the results of comparison based on the grouping variable “emotion recognition” between Group 1 (n = 73; 21.54%) with a low level of the parameter (< *Me*) and Group 2 (n = 47; 78.46%) with a high level of the parameter ( $\geq$  *Me*). The groups were compared using Student’s t-test.

**Table 8**

Comparison of productive coping strategies based on the grouping variable “emotion recognition” between Group 1 and Group 2

Scale	Levene’s test		Student’s t-test for the equality of variances				Cohen’s d
	F	p	t	p	95 CI		
					Lower	Upper	
SC* (conditional unit)	7.292	0.008	-1.493	0.138	-1.69606	0.23817	-0.265
AC (conditional unit)	2.556	0.113	-0.090	0.928	-1.13271	1.03391	-0.017
PSP (conditional unit)	0.007	0.936	-1.618	0.108	-1.82531	0.18381	-0.303
PR* (conditional unit)	6.550	0.012	-1.117	0.267	-1.67741	0.47129	-0.221
SS (conditional unit)	0.049	0.825	0.305	0.761	-0.96764	1.32030	0.057

Notes: \* – the data are given using Welch’s t-test; Group 1 – a low level of emotion recognition; Group 2 – a high level of emotion recognition; F – Levene’s test for homogeneity of variances; p – level of significance; t – Student’s t-test (significant differences are given in **bold type**); 95 CI – confidence interval; Cohen’s d – effect size; SC – self-control; AC – accepting responsibility; PSP – problem-solving planning; PR – positive reappraisal; SS – social support.

No significant difference was found in productive coping strategies based on the grouping variable “emotion recognition”. Thus, different levels of emotion recognition do not affect the work

of productive coping strategies. Critical values were recorded in “self-control” and “positive revaluation” using Levene’s test. The data presented in Table 8 were corrected using Welch’s t-test. Substantiating



emotional self-regulation, identifying the role and function of emotional intelligence parameters in the work of productive coping strategies logically led to the statistical operation of reducing the dimensionality of the ten studied factors. The principal component method, Varimax rotation,

and the Kaiser normalisation were employed. The requirements for applying factor analysis were met. Table 9 presents the rotated matrix of factor loadings for emotional self-regulation, or the combination of emotional intelligence parameters and productive coping strategies.

**Table 9**

Rotated component matrix<sup>a</sup> of factor loadings for emotional self-regulation across the sample (n = 120)

Scale	Components of factor loadings		
	Factor 1	Factor 2	Factor 3
Emotional awareness (EA) (conditional unit)	0.577	0.479	-0.394
Managing emotions (ME) (conditional unit)	0.677	-0.165	0.240
Self-motivation (SM) (conditional unit)	0.775	-0.163	-0.029
Empathy (E) (conditional unit)	0.739	0.080	-0.020
Emotion recognition (ER) (conditional unit)	0.769	0.237	-0.052
Self-control (SC) (conditional unit)	0.305	0.258	0.728
Accepting responsibility (AR) (conditional unit)	-0.170	0.118	0.652
Problem-solving planning (PSP) (conditional unit)	0.106	0.650	0.247
Positive reappraisal (PR) (conditional unit)	0.087	0.703	0.303
Social support (SS) (conditional unit)	-0.171	0.683	-0.048

Notes: <sup>a</sup> – factor analysis; the principal component method; Varimax rotation with the Kaiser normalisation; significant factor loadings greater than 0.600 are given in **bold type**.

**Table 10**

Matrix of the total variance of factor analysis of emotional intelligence parameters and productive coping strategies across the sample (n = 120)

Initial eigenvalues			Sum of squared loadings		
V, in total (conditional unit)	D (%)	Σ (%)	V, in total (conditional unit)	d (%)	Σ (%)
2.836	28.357	28.357	2.836	28.357	28.357
1.884	18.838	47.195	1.884	18.838	47.195
1.114	11.142	58.337	1.114	11.142	58.337
0.959	9.595	67.931			
0.789	7.885	75.817			
0.612	6.120	81.936			
0.531	5.307	87.243			
0.469	4.691	91.935			
0.440	4.395	96.330			
0.367	3.670	100.000			

Notes: D – dispersion; Σ – sum of variances.

Furthermore, the matrix of the total variance in dimensionality reduction of emotional intelligence and productive coping strategies in the sample of juniors was added. Three factors with loadings

greater than unity were recorded. The total variance was consistent, being  $V = 5.834$ ;  $\Sigma = 58.337$ . Factor 1 included only emotional intelligence variables, with “self-motivation” prevailing (0.775), followed



by the parameters “emotion recognition” (0.775), “empathy” (0.775), and “managing emotions” (0.775). This factor is the most loaded. It was defined as “self-motivational regulation” in junior athletes’ sports activities. It is challenging to manage this factor; junior athletes’ behaviours are often accompanied by creativity, original ideas, and a reluctance to accept responsibility. In team sports, such athletes are unstable. The following two factors include only productive coping strategies. Factor 2 is represented by three positively loaded coping strategies, including “problem-solving planning” (0.650), “positive reappraisal” (0.703), and “social

support” (0.683). This factor is interpreted as “positive construction” in junior athletes’ sports activities. Factor 3 is represented by positively loaded coping strategies, including “self-control” (0.728) and “accepting responsibility” (0.652). This factor is interpreted as “conscious control”. This factor is the least loaded. It reflects respondents’ ability to exercise self-control to attain vital goals. It is noteworthy that respondents with excessive desire to control everything and high responsibility are prone to emotional exhaustion, which may cause poor sports outcomes.

## Discussion

The analysed scientific literature on emotional intelligence and coping strategies reveals autonomously outlined scientific problems and explores important aspects in the context of sports activities of athletes with different qualification levels [7; 12]. A number of studies have shown the impact of emotional intelligence on respondents’ selection of coping strategies [3], established and interpreted psychological correlations [22], and investigated the psychological resource of athletes’ emotional intelligence [10]. Our research into the role and function of junior athletes’ emotional intelligence in shaping productive coping strategies focuses on studying the aforementioned scientific issue on a representative sample of juniors (see Table 2). The established psychological patterns (see Figure 1) and correlations (see Table 3), the identified significant differences (see Table 4–8), and consolidated factors (see Table 9–10) of the studied parameters in the context of the formation and development of the junior athlete’s emotional self-regulation testify to the scientific value of the research. The aim was achieved, and two alternative hypotheses were tested. Let us dwell on some controversial aspects.

In our research, we focused on emotional intelligence parameters in the junior sample (see Table 2). Scientific studies do not show significant differences in the studied parameters compared to other samples. However, some emotional intelligence parameters indicate their underdevelopment. These parameters include “managing emotions” ( $M = 7.26$ ;  $SD = \pm 3.94$ ) and “emotion recognition” ( $M = 8.69$ ;  $SD = \pm 4.02$ ). At the same time, though the prevalence of “empathy” ( $M = 9.90$ ;  $SD = \pm 3.99$ ) indicates respondents’ readiness to empathise and

sympathise, the highest level of empathy, along with other emotional intelligence parameters, suggests rather that the junior athlete’s emotional immaturity is a disadvantage than an advantage. Adolescence is a sensitive period of readiness for personal changes, the search for meaning in life, the shaping of the value and meaning sphere, self-identification, the development of creative thinking, and the formation of certain physical qualities. All these can significantly change the attitude towards sports activities and life in general. Though the junior athlete’s psyche is the most receptive to education during this age period, the initiative should come from them, driven by their desire for self-improvement, development, and growth [23; 24]. Thus, the problem of the formation of juniors’ emotional self-regulation is highly relevant, changeable, and warrants thorough research. This scientific problem requires comprehensive research that considers not only psychological and social factors, but also biological, physiological, and even genetic factors. Social transformations and cataclysms that have affected the few past decades, particularly pandemics, armed conflicts, the total digitalisation of the learning and training space, the rapid growth of artificial intelligence technologies, and many others, have brought about significant changes to the social field of the studied problem. The junior athlete’s immature emotional and volitional sphere can become the root cause of difficulties in the athlete’s growth and increase fatigue, exhaustion, and traumatism. Everything begins with a thought, emotion, and action. Thus, young people’s lack of knowledge about the emotional sphere, their feelings and emotions, inability to manage their psycho-emotional states, insufficient social experience, and a low level of emotional intelligence competencies do



not enable them to properly select or shape productive coping strategies. Therefore, the proposed research design involving a number of statistical operations allowed for revealing the content aspects of this scientific problem.

The profile of junior athletes' emotional self-regulation (see Figure 1) is a successful attempt to operationalise the current state of emotional intelligence and productive coping strategies. It is important to automate data collection and cross-sectional comparison through the analytical services provided by the academies of professional clubs and sports schools for children and youth. It is necessary to consider significant changes in the area, the contour length, and the values of some parameters. It is noteworthy that the longer the contour, the less stable emotional self-regulation is. Excessive length indicates destabilising processes that should be considered by the team psychologist or a psychologist in a sports institution. Such individuals need psychological support, psychotherapeutic work, and psycho-correction. The correlation matrix expectedly demonstrated direct correlations between the studied parameters (see Table 3). To a large extent, the inverse correlation between "accepting responsibility" and "self-motivation" ( $R = -0.207$ ;  $p = 0.023$ ) is unexpected. This inverse correlation can be explained by the fact that self-motivation is associated with junior athletes' creativity and originality, which partially contradicts the coping strategy "accepting responsibility". Special attention should be paid to empathy and social support since these parameters are the most autonomous and pose a latent danger if their values are excessively high or low. Therefore, the profile of emotional self-regulation (see Figure 1) can be used to control changes in these parameters.

Let us proceed to the statistical operations of comparison (see Table 4-8). Undoubtedly, the identification of significant differences in coping strategies depending on low and high values of emotional intelligence parameters was of scientific interest. The results showed differences only in two dimensions, namely in the productive coping strategy "self-control" ( $t = -2.183$ ;  $p = 0.031$ ;  $d = -0.401$ ) based on the grouping variable "managing

emotions" and in the productive coping strategy "accepting responsibility" ( $t = 2.382$ ;  $p = 0.019$ ;  $d = 0.436$ ) based on the grouping variable "self-motivation". These changes have a medium effect size (Cohen's  $d$ ). Interestingly, in the first variant, the advantage was recorded in the group with high values of "managing emotions". In contrast, in the second variant, the advantage was observed in the group with low values of "self-motivation". Thus, it was statistically established that the emotional intelligence parameters, "managing emotions" and "self-motivation", are the most sensitive to shaping productive coping strategies.

The psychodiagnostic set of ten variables relevantly reflected the research subject, and through dimensionality reduction, allowed for the identification of three factors. The three factors, "self-motivational regulation", "positive construction", and "conscious control", qualitatively complemented the research into emotional self-regulation. It is noteworthy that positive reappraisal in emotional self-regulation is a psychological technique of cognitive reconstruction. The athlete consciously changes their perception of a competitive stressful or negative situation to a more positive and constructive attitude towards it. Each difficult situation offers an opportunity for development and poses a challenge for new accomplishments. Well-developed emotional self-regulation enables athletes to manage emotions and restore an internal balance. "Positive construction" is a key component in the emotional self-regulation of junior athletes.

To summarise, the established scientific facts complement the theoretical knowledge of the formation of emotional self-regulation, the development of the emotional and volitional sphere, and the construction of worldviews in junior athletes. This research represents another successful stage in establishing important scientific facts related to the phenomenon of junior athletes' emotional self-regulation. Creating and examining the structural-functional model of the junior athlete's emotional self-regulation are considered the prospects for further research.

## Conclusions

It was substantiated that the research into junior athletes' emotional intelligence in shaping productive coping strategies is a confirmatory

empirical study which allowed for establishing correlations and identifying significant advantages in productive coping strategies based on the



grouping variables of emotional intelligence. It was theoretically substantiated that the junior athlete's immature emotional and volitional sphere can become the root cause of difficulties in the athlete's growth, increasing fatigue, exhaustion, and traumatism. The profile of junior athletes' emotional self-regulation was created. It was highlighted that this profile is a successful attempt to graphically present the operationalisation of the current state of respondents' emotional intelligence and productive coping strategies. Psychological correlations were established between the studied parameters. The only inverse correlation was unexpectedly recorded between "accepting responsibility" and "self-motivation", which was explained by respondents' creativity and originality, which partially contradicts the coping strategy "accepting responsibility". There was a caveat that empathy and social support are the most autonomous parameters that can pose a latent danger if their values are excessively low or high. It was proposed that the profile of emotional self-regulation should be used to control changes in these parameters. Based on the grouping variables

of emotional intelligence, differences were found in two productive coping strategies: in "self-control" ( $t = -2.183$ ;  $p = 0.031$ ;  $d = -0.401$ ) for the grouping variable "managing emotions" and in "accepting responsibility" ( $t = 2.382$ ;  $p = 0.019$ ;  $d = 0.436$ ) for the grouping variable "self-motivation". It was found and substantiated that the emotional intelligence parameters, "managing emotions" and "self-motivation", are the most sensitive to shaping productive coping strategies. It was highlighted that three factors were established using dimensionality reduction: "self-motivational regulation", "positive construction", and "conscious control", which relevantly reflected the psychological content features of emotional self-regulation. The aim was achieved, and the hypotheses were tested. It was summarised that the established scientific facts complement the theoretical knowledge of the formation of emotional self-regulation, the development of the emotional and volitional sphere, and the construction of worldviews in junior athletes.

## Conflict of interest

The authors declare that there is no conflict of interest in this study.

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