

Dominant mental states in juniors' coping behavior

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Abstract:

This study **aims** to identify the psychological correlations of defensive behavior and develop a factor structure of dominant mental states related to coping behavior in junior athletes. **Methods:** The sample included junior athletes aged 15–19 ($M = 17.23$; $SD = \pm 3.43$), participating in All-Ukrainian, European, and World championships ($n = 119$). Two validated psycho-diagnostic tools, previously tested on Ukrainian populations, were used to accurately capture the key research variables. Theoretical methods included retrospective analysis, generalization, comparative analysis, and interpretation. Empirical methods involved targeted observation and testing. Factorial ANOVA was applied to reduce the proportionality among research variables. Standard statistical procedures were also performed. **Results:** The methodological foundations were based on the concept of the athlete's personality as an open and dynamic system, taking into account psychophysiological and age-related growth patterns. The strongest direct correlation was found between “planning” and “emotional stability” ($R = .841$; $p < .001$), while the strongest inverse correlation was between “refusal” and “emotional stability” ($R = -.838$; $p < .001$). It was summarized that emotional stability is the most loaded and actualized characteristic in the research conditions. The factor structure of dominant mental states of junior athletes' coping behavior was created. Eight factors were established ($\Sigma d = 86.293\%$): F1 “Self-blame coping behavior”, F2 “Sensitive coping behavior”, F3 “Dependent coping behavior”, F4 “Conscious coping behavior”, F5 “Tense coping behavior”, F6 “Confident coping behavior”, F7 “Safe coping behavior”, and F8 “Dreamy coping behavior”. It was summarized that diagnosing and interpreting dominant mental states of junior athletes' coping behavior gave us a deeper insight into junior athletes' psychology in crisis and extreme situations of life activities. **Discussion and conclusions:** It was empirically established and theoretically substantiated that dominant mental states of junior athletes' coping behavior are active strategies of defensive behavior in critical situations of sporting activities. It was underscored that dominant mental states of coping behavior reflect the prevalent type of behavior in combination with the most pronounced personality traits that are actualized in the dimensions of defensive behavior. The research findings should be operationalized in the activities of sports subjects working in junior sports.

Keywords: mental state, mental health, coping strategies, defense mechanisms, reframing, confrontation, psycho-emotional resource.

Introduction

The problem of applying psychological knowledge aimed at solving specific tasks of learning and training, competitive or restorative and rehabilitative areas of juniors' sporting activities is associated with a number of aspects: 1) the timeliness of request; 2) the ability to operationalize the task to identify a solution algorithm; 3) developed competencies for implementing the results obtained in a particular area of sporting activities. Despite the aforementioned aspects, establishing psychological correlations, dominants, factors, and factor structures in any relevant problem has always been a research focus for interested subjects of sporting activities. Possessing knowledge about the identified patterns, dependencies or significant differences, even without implementing it, gives athletes, coaching staff, and organizers a significant advantage in psychological literacy over their opponents. This knowledge immediately affects tactical training.

Dominant mental states of juniors' coping behavior are within the scope of those scientific problems, which attract scientists' attention periodically. This is associated with different factors, which can create a factor

structure of defense mechanisms and actualize their properties in stressful situations of sporting activities. Permanent significant changes sweeping our society are considered by representatives of junior sports. Permanent changes set benchmarks for new expectations, new social norms, and standards. All this leads to higher requirements for athletes of all categories, including junior athletes. Such a social transformation as the lockdown caused by the COVID-19 pandemic significantly affected all areas of human life, including sports. During the lockdown, adolescents who tended to use social media were immersed in the virtual world to a larger extent. It is known that excessive use of social media reduces the individual's physical activity.

Military conflicts (Kremen, 2023; Popovych et al., 2023d), sanctions, doping scandals, and innovations are potent stressors that significantly impact the psyche of a junior athlete (Shcherbak et al., 2023). The new social reality encourages scientists to reconsider the formation of essential competencies and personality traits of individuals who engage in sports on a systematic basis. Adverse and extreme conditions actualize mental states and internalize some personality traits (Popovych et al., 2022c). The research by I. Halian et al. (2024) explores coping strategies in youth's behavioral patterns under martial law. Researchers revealed a relationship between respondents' traits and situational anxiety, and emotion-focused coping.

Discriminant analysis revealed the dominance of emotional coping, which negatively affects performance, causes physiological problems, and diminishes quality of life and psychological well-being. Another study found that high requirements dictated by social requests incentivize juniors to internalize personal development (Popovych et al., 2023f). It was established that the high physical performance of junior athletes does not lead to psychological well-being. On the contrary, it can cause overtraining and demotivation. Time competence is critical to any activity in times of permanent changes. Studies on time competencies found that the formation of an optimal profile of time perspective affects motivation and defensive behavior (Plokhikh et al., 2024; Popovych et al., 2022a; 2023b).

Difficult situations cause higher levels of anxiety and internalization of anxiety states. The research by H. Broos et al. (2023) shows that emotional intolerance increases the impact on anticipatory anxiety in situations of deep uncertainty. The identified patterns of the mechanism of pre-game expectations (Popovych et al., 2023c), the outlined contours of expected behavior (Popovych et al., 2022b), and the creation of a probable behavioral model (Kremen & Ilyin, 2022) suggest that expectations have a pronounced constructive vector since they are oriented toward the future. Uncertainty and the level of emotional stability/emotional instability affect the choice of coping strategies (Khraban & Silko, 2022). It was proved that difficult life situations actualize dominant mental states in which the meaning-value component comes to the fore (Kurova et al., 2023; Popovych et al., 2023a). The research by I. Popovych et al. (2022d) into mental psycho-complexes shows that internality and coping strategies occupy an important place and determine the content.

When performing a retrospective analysis of the outlined research subject, it seems appropriate to pay attention to age-related and psychophysiological patterns of adolescence (Cretu et al., 2021; Kozin et al., 2023; Potop & Cretu, 2015). Junior athletes are characterized by the formation of worldviews, self-identification, and professional identification (Tavrovetska et al., 2023). This identification is accompanied by the mechanism of social comparison. The studies by Y. Raievska et al. (2024) and N. Zavatska et al. (2024) found the dependence of social comparison in the dimensions of interpersonal and subject self-efficacy. The desire to be effective based on the maximalist manifestations of young respondents (Koval et al., 2024) does not always have positive consequences. The timely formation of junior athletes' self-regulation (Krasnik et al., 2024) allows them to grow professionally (Di Corrado et al., 2025; Halian et al., 2023).

Notably, in the context of our research, it is important to consider not only the established scientific facts but also the implementation of knowledge about constructive coping strategies aimed at maintaining mental health, a sense of dignity, self-esteem, and self-worth, as underscored by L. Adamehko (2020). The lack of constructive defense mechanisms (Chebykin et al., 2024), coping strategies (Lazarus & Folkman, 1984), and self-healing practices (Tytarenko, 2024) can provoke the onset of psychosomatic diseases, the fixation of negative reactions that have been formed spontaneously.

Dominant mental states of junior athletes' coping behavior are considered to be active states of sporting activities experienced by junior athletes. Dominant mental states of coping behavior reflect the prevalent type of behavior in combination with the most pronounced personality traits, which, in turn, are actualized in the dimensions of coping behavior.

Hypothesis. We hypothesize that: 1) the factor structure of dominant mental states of junior athletes' coping behavior will allow us to establish important psychological facts, which will have a latent resource for adolescents' successful sporting activities; 2) all components of the factor structure will have loadings of coping behavior parameters.

Aim. To reveal psychological correlations of defensive behavior and create the factor structure of dominant mental states of junior athletes' coping behavior.

Material and methods

Methodology. The methodological foundation of the research into dominant mental states of junior athletes' coping behavior is the concept of assessing stressful situations and coping with them developed by R. Lazarus and S. Folkman (1984), which regards coping behavior as the individual's efforts aimed at solving these problems. As a rule, these efforts are based on a comfortable state of mind. This applies to both situations related to a great danger and situations in which the individual seeks great success. In both situations, the individual's adaptive capabilities are activated. We also considered the concept by G. Vaillant, (2000), who expressed a different viewpoint and identified three classes of coping strategies: 1) strategies aimed at seeking social support; 2) conscious cognitive strategies used in difficult situations (coping strategies in their traditional meaning); 3) involuntary mental mechanisms that change our perception of internal or external reality to reduce stress. We applied the principle of complexity and systematicity, which implies that the combination of connections between dimensions ensures the transition from certain components through the formation of symptom complexes to the basic components. We analyzed experimental studies on human behavior in extreme situations and other activities (Dovgyi et al., 2022; Zinchenko et al., 2023), implementing the technologies of digital educational space (Kobets et al., 2021a; 2021b; Kremen et al., 2022; Topuzov et al., 2023) and other publications covering human behavior in specific conditions (Fasanelli et al., 2024; Hoi et al., 2025; Hrys et al., 2024).

Participants. The research involved junior athletes aged 15 to 19 ($M = 17.23$; $SD = \pm 3.43$), including the participants in All-Ukrainian, European, and World championships ($n = 119$). We had the following distribution by gender: male junior athletes ($n = 51$; 42.86%) and female junior athletes ($n = 68$; 57.14%). A considerable portion of respondents were affected by martial law since their professional clubs changed their training schedules and had to relocate to safer Ukrainian cities. Among the respondents, there were champions and prizewinners of the Ukrainian Championship, the European Championship, and All-Ukrainian and International tournaments.

Organization of research. The research was conducted employing a confirmative strategy and applying 1) the methods of descriptive statistics to identify the main frequency parameters, 2) the methods of statistical inference to establish psychological correlations, and 3) the methods of data transformation – factor analysis. We used standard forms tested on a Ukrainian sample. The forms were designed in Google Forms. Only the remote format was used in the survey. The participants filled out a consent form in advance for collecting empirical data and personal data processing. Confidentiality of the respondents' personal data was maintained. All participants were informed in advance about the purpose of the survey and the time allocated to complete the forms. They were also informed that they could terminate participation in the survey at any time without explanation. The empirical data collection lasted three months – between September and November 2024. Consent to conduct the survey was received from the administrations of professional clubs and educational institutions attended by junior athletes. This collection of empirical materials allowed us to obtain valid and reliable results.

Procedures and instruments. The research employed two psycho-diagnostic tools that are valid, reliable, and representative. They differentiate the research phenomena well enough. To assess coping behavior, we used the "Brief-COPE" (Carver, 1997), adapted to the Ukrainian sample by researchers T. Yablonska et al. (2023), and a short scale proposed by Ukrainian scientists (Aleksina et al., 2024). This methodology (Yablonska et al., 2023) allowed us to identify the following types of coping behavior: active coping (AC) – problem-focused coping; using information support (UIS) – problem-focused coping; positive reframing (PR) – problem-focused coping; planning (PL) – problem-focused coping; emotional support (ES) – emotion-focused coping; expressing emotions (EE) – emotion-focused coping; humor (H) – emotion-focused coping; acceptance (A) – emotion-focused coping; religion (R) – emotion-focused coping; self-blame (SB) – emotion-focused coping; self-distraction (SD) – avoidance coping; refusal (RF) – avoidance coping; taking psychoactive substances (TPS) – avoidance coping; behavioral differentiation (BD) – avoidance coping. The methodology consists of twenty-eight statements and a four-point direct Stapel scale with multiple-choice options: "1" – I did not usually do it; "2" – I seldom did it; "3" – I did it from time to time; "4" – This is exactly what I usually did. The range of measurement scales was from 2.00 to 8.00 points. Cronbach's alpha (α) by "Brief-COPE" (Carver, 1997), adapted by T. Yablonska et al. (2023), indicated homogeneity at a medium level ($\alpha = .746$). The "Sixteen Personality Factor Questionnaire" (16PF) by H. Cattell, A. Mead (2008), presented by O. Kokun et al. (2012), was used to identify a list of respondents' personality traits that are actualized in difficult conditions of sporting activities. The questionnaire scales have a binary combination. Below, we give a list of scales: openness (A+) and closedness (A-); developed thinking (B+) and limited thinking (B-); emotional stability (C+) and emotional instability (C-); independence (E+) and malleability (E-); safety (F+) and anxiousness (F-); consciousness (G+) and unscrupulousness (G-); courage (H+) and shyness (H-); sensitivity (I+) and firmness (I-); suspiciousness (L+) and trustfulness (L-); dreaminess (M+) and practicality (M-); sophistication (N+) and simplicity (N-); guilt proneness (O+) and calm confidence (O-); radicalism (Q1+) and conservatism (Q1-); independence from the group (Q2+) and dependence on the group (Q2-); self-control, strong will (Q3+) and lack of self-control, indifference (Q3-); internal tension (Q4+) and internal relaxation (Q4-). The range of measurement scales was

from 1.00 to 10.00 points. Cronbach's alpha (α) by "16PF" (Cattell & Mead, 2008), tested by O. Kokun et al. (2012), indicated a medium level of homogeneity ($\alpha = .789$).

Statistical analysis. In the first stage, we applied the methods of descriptive statistics to identify the main frequency characteristics using MS"Excel"; when employing the methods of statistical inference with Spearman's correlation coefficient (r_s), statistical operations were performed using the computer program "IBM SPSS Statistics" version 29.0.0.0 (241); this program was also employed to transform data by means of factor analysis with extracting principal components (ANOVA). Level of $p \leq .050$; $p \leq .010$; $p \leq .001$ were considered statistically significant.

Results

In the first stage, the methods of descriptive statistics were used to find the minimum empirical value (min), the maximum empirical value (max), the mean of distribution (M), the median (Me), the mode (Mo), and the mean squared deviation (SD). Tabl. 1 presents the indicators of the above descriptive statistics by the method "Brief-COPE" (Carver, 1997; adapted T. Yablonska et al. (2023).

Table 1. Descriptive statistics of the indicators according to the methodology "Brief-COPE" (Carver, 1997; adapted by T. Yablonska et al. (2023)

Types of coping behavior	min	max	M	Me	Mo	SD
Active coping (AC)	3.00	8.00	5.40	5.00	5.00	1.65
Using information support (UIS)	4.00	6.00	4.83	5.00	4.00	.83
Positive reframing (PR)	3.00	5.00	3.77	4.00	3.00	.81
Planning (PL)	2.00	6.00	3.77	4.00	5.00	1.21
Emotional support (ES)	3.00	8.00	4.95	4.00	4.00	1.36
Expressing emotions (EE)	2.00	5.00	3.90	4.00	4.00	.82
Humor (H)	1.00	4.00	2.82	3.00	2.00	.81
Acceptance (A)	2.00	8.00	5.05	4.00	4.00	2.34
Religion (R)	3.00	7.00	5.48	6.00	6.00	1.26
Self-blame (SB)	1.00	6.00	3.30	3.00	2.00	1.61
Self-distraction (SD)	1.00	8.00	5.55	6.00	6.00	2.35
Refusal (RF)	1.00	8.00	3.47	3.00	3.00	2.14
Taking psychoactive substances (TPS)	3.00	8.00	6.18	7.00	7.00	1.79
Behavioral differentiation (BD)	1.00	4.00	2.65	3.00	3.00	.99

Note: min – the minimum empirical value; max – the maximum empirical value; M – the mean of distribution; Me – the median; Mo – the mode; SD – the squared deviation.

We found that a considerable portion of the minimum values was in the range min = 1.00 – 3.00. However, different values were recorded in the UIS parameter (min = 4.00). A considerable portion of the maximum values was recorded in the range min = 5.00 – 8.00. The following parameters had different values: H (max = 4.00) and BD (max = 4.00). The mean values and the squared deviation had trends that only reflected the complexity of the current situation. The randomly created sample did not allow us to identify significant differences in the invariance of coping behavior. Tabl. 2 presents the indicators of the aforementioned descriptive statistics by the "Sixteen Personality Factor Questionnaire" (16PF) H. Cattell, A. Mead (2008), given by O. Kokun et al. (2012).

Table 2. Descriptive statistics of the indicators by the "Sixteen Personality Factor Questionnaire" (16PF) H. Cattell, A. Mead (2008), given by O. Kokun (2012)

Respondent characteristics	min	max	M	Me	Mo	SD
Openness (A+) / Closeness (A-)	1.00	10.00	4.98	5.00	2.00	2.88
Developed thinking (B+) / Limited thinking (B-)	1.00	10.00	5.35	5.00	5.00	2.44
Emotional stability (C+) / Emotional instability (C-)	1.00	9.00	4.97	5.00	6.00	2.27
Independence (E+) / Malleability (E-)	1.00	7.00	4.98	5.00	8.00	2.30
Safety (F+) / Anxiousness (F-)	2.00	10.00	6.32	7.00	4.00	2.20
Consciousness (G+) / Unscrupulousness (G-)	2.00	9.00	5.52	6.00	7.00	2.25
Courage (H+) / Shyness (H-)	1.00	10.00	5.08	6.00	1.00	2.80
Sensitivity (I+) / Firmness (I-)	1.00	10.00	4.66	5.00	5.00	2.29
Suspiciousness (L+) / Trustfulness (L-)	2.00	10.00	5.08	5.00	3.00	2.30
Dreaminess (M+) / Practicality (M-)	1.00	9.00	4.96	4.00	2.00	2.67
Sophistication (N+) / Simplicity (N-)	1.00	10.00	4.76	5.00	5.00	2.38
Guilt proneness (O+) / Calm confidence (O-)	2.00	10.00	5.94	7.00	7.00	2.26
Radicalism (Q1+) / Conservatism (Q1-)	1.00	9.00	5.45	6.00	6.00	2.25
Independence from the group (Q2+) / Dependence on the group (Q2-)	1.00	7.00	5.74	5.00	5.00	2.56
Self-control, strong will (Q3+) / Lack of self-control, indifference (Q3-);	1.00	10.00	6.38	7.00	8.00	2.51
Internal tension (Q4+) / Internal relaxation (Q4-)	2.00	10.00	6.66	7.00	8.00 ^a	2.52

Note: min – the minimum empirical value; max – the maximum empirical value; M – the mean of distribution; Me – the median; Mo – the mode; SD – the squared deviation; ^a – there are several modal values, the smallest value is presented.

We established that all minimum values were in the range min = 1.00 – 2.00. No differences were identified. A considerable portion of the maximum values was recorded in the range min = 9.00 – 10.00. Two parameters had noticeably different maximum values: E+/E- (max = 7.00) and Q2+/Q2- (max = 7.00). Notably, the mean of distribution and the squared deviation had differences at the level of trends. No significant differences were identified in the respondents' personality traits compared to similar samples.

In the second stage, the methods of statistical inference were applied to establish psychological correlations using Pearson's coefficient (R). We found significant direct and inverse correlations between the respondents' actualized personality traits and types of coping behavior. Tabl. 3 presents a matrix of correlations between the research parameters by Pearson's coefficient (R).

Table 3. Matrix of correlations between the research parameters by Pearson's coefficient (R) (n = 119)

Scale	SP	AC	UIS	PR	PL	ES	EE	H	A	R	SB	SD	RF	TPS	BD
A+/A-	R	.058	-.184*	-.207*	.126	-.087	-.005	-.071	.033	-.032	-.106	.097	-.120	.060	-.036
	p	.534	.046	.024	.174	.346	.960	.444	.723	.732	.249	.292	.192	.516	.700
B+/B-	R	.330**	-.416**	-.325**	.403**	-.440**	-.382**	-.343**	.324**	-.229*	-.347**	.438**	-.420**	-.053	-.339**
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.012	<.001	<.001	<.001	.565	<.001
C+/C-	R	.821**	-.775**	-.545**	.841**	-.834**	-.811**	-.826**	.804**	-.256**	-.832**	.798**	-.838**	.076	-.799**
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.005	<.001	<.001	<.001	.409	<.001
E+/E-	R	.585**	-.612**	-.468**	.586**	-.543**	-.619**	-.578**	.539**	-.140	-.592**	.629**	-.621**	.112	-.605**
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.128	<.001	<.001	<.001	.225	<.001
F+/F-	R	.100	-.170	-.011	.088	.000	-.090	-.133	.128	.067	-.164	.125	-.095	.138	-.037
	p	.277	.064	.903	.339	.998	.329	.151	.165	.472	.075	.176	.304	.133	.689
G+/G-	R	-.083	.147	.075	-.066	.125	.075	.099	-.092	.078	.059	-.096	.103	-.012	.052
	p	.368	.110	.419	.477	.176	.419	.283	.322	.397	.524	.300	.264	.893	.572
H+/H-	R	-.115	.229*	.015	-.082	.179	.096	.144	-.118	-.051	.102	-.133	.120	-.143	.101
	p	.213	.012	.870	.374	.051	.299	.118	.201	.581	.269	.150	.194	.120	.275
I+/I-	R	-.101	.225*	.091	-.043	.033	.086	.126	-.112	-.026	.081	-.137	.127	-.033	.174
	p	.273	.014	.324	.644	.725	.354	.174	.226	.780	.383	.137	.168	.722	.059
L+/L-	R	.206*	-.122	.093	.193*	-.189*	-.289**	-.150	.182*	.012	-.142	.236**	-.101	.143	-.087
	p	.025	.187	.316	.036	.040	.001	.102	.048	.894	.123	.010	.274	.121	.348
M+/M-	R	-.066	.062	.224*	-.017	-.040	.002	.063	.017	.119	.108	-.027	.121	.183*	.166
	p	.479	.503	.014	.851	.663	.983	.497	.858	.196	.244	.767	.192	.047	.070
N+/N-	R	-.066	.009	.139	-.070	-.020	-.008	.051	.004	.048	.132	-.024	.088	.042	.053
	p	.476	.921	.133	.452	.833	.928	.582	.968	.606	.151	.791	.344	.650	.569
O+/O-	R	-.100	.160	.318**	-.138	.218*	.043	.050	.015	.309**	.180*	-.206*	.159	.299**	.113
	p	.280	.081	<.001	.135	.017	.640	.588	.870	<.001	.050	.025	.085	<.001	.222
Q1+/Q1-	R	-.082	.003	.082	-.189*	.201*	.142	.066	-.060	.142	.081	-.124	.066	.012	-.043
	p	.375	.973	.375	.040	.028	.125	.473	.517	.125	.380	.178	.476	.897	.642
Q2+/Q2-	R	.072	-.063	-.162	.021	.055	-.081	-.107	.047	-.059	-.097	.071	-.120	-.050	-.117
	p	.434	.493	.078	.819	.555	.382	.248	.612	.522	.295	.441	.193	.592	.205
Q3+/Q3-	R	-.301*	.317**	-.012	-.299*	.227*	.291**	.342**	-.369*	-.167	.278**	-.274*	.269**	-.309*	.223*
	p	<.001	<.001	.900	<.001	.013	.001	<.001	<.001	.069	.002	.003	.003	<.001	.015
Q4+/Q4-	R	-.078	.132	-.155	-.006	-.045	.070	.090	-.108	-.181*	.040	-.095	.039	-.237*	.013
	p	.398	.154	.093	.951	.629	.450	.333	.244	.049	.666	.305	.673	.009	.887

Note: SP – statistical parameter; R – the value of Pearson's coefficient; p – the level of significance; * – correlation at $p \leq .050$; ** – correlation at $p \leq .010$; $p < .001$; significant values are given in bold type; A+ – openness; A- – closedness; B+ – developed thinking; B- – limited thinking; C+ – emotional stability; C- – emotional instability; E+ – independence; E- – malleability; F+ – safety; F- – anxiousness; G+ – consciousness; G- – unscrupulousness; H+ – courage; H- – shyness; I+ – sensitivity; I- – hardness; L+ – suspiciousness; L- – trustfulness; M+ – dreaminess; M- – practicality; N+ – sophistication; N- – simplicity; O+ – guilt proneness; O- – calm confidence; Q1+ – radicalism; Q1- – conservatism; Q2+ – independence from the group; Q2- – dependence on the group; Q3+ – self-control, strong will; Q3- – lack of self-control, indifference; Q4+ – internal tension; Q4- – internal relaxation; AC – active coping; UIS – using information support; PR – positive reframing; PL – planning; ES – emotional support; EE – expressing emotions; H – humor; A – acceptance; R – religion; SB – self-blame; SD – self-distraction; RF – refusal; TPS – taking psychoactive substances; BD – behavioral differentiation.

The matrix of correlations showed seventy-one significant correlations between the research parameters, thirty-two being direct ($\leq .050$; $p \leq .010$; $p < .001$) and thirty-nine being inverse ($\leq .050$; $p \leq .010$; $p < .001$). The following types of coping behavior are the most dependent: emotional support – seven psychological correlations; using information support – six correlations; positive reframing – six correlations; planning – six correlations; and self-distraction – six correlations. The following respondents' characteristics are the most dependent: developed thinking/limited thinking – thirteen psychological correlations; emotional stability/emotional instability – thirteen correlations; independence/malleability – twelve correlations; self-control, strong will/lack of self-control, indifference – twelve correlations. The strongest direct correlation was established between planning and emotional stability ($R = .841$; $p < .001$). The strongest inverse correlation was found between refusal and emotional stability ($R = -.838$; $p < .001$).

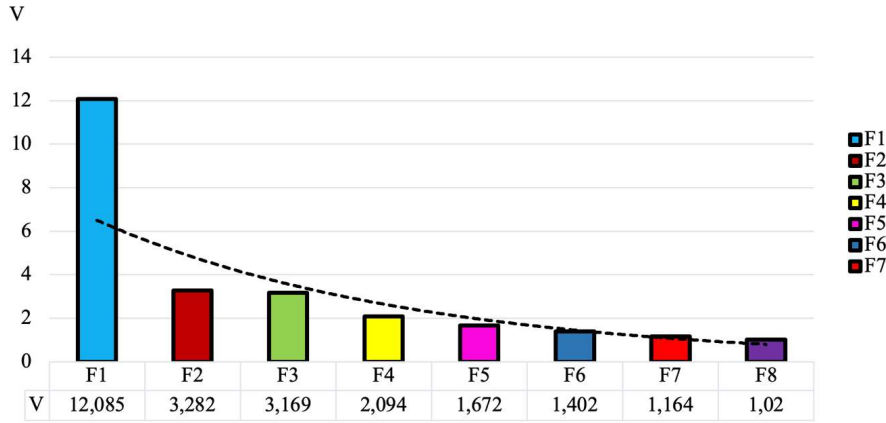
In the third stage of working with the results, we applied the methods of data transformation, namely a factorial ANOVA with principal component extraction, using Varimax rotation. Thirty measurements relevantly reflected the subject of the research into dominant mental states of junior athletes' behavior. Tabl. 4 presents the matrix of factor loadings.

Table 4. Matrix of factor loadings (n = 119)

Factor	Initial eigenvalues			Extracted sums of squares		
	In total	% of variance	Sum %	In total (V)	% of variance	Sum %
1	12.085	40.284	40.284	12.085	40.284	40.284
2	3.282	10.940	51.225	3.282	10.940	51.225
3	3.169	10.564	61.789	3.169	10.564	61.789
4	2.094	6.981	68.770	2.094	6.981	68.770
5	1.672	5.573	74.344	1.672	5.573	74.344
6	1.402	4.673	79.016	1.402	4.673	79.016
7	1.164	3.878	82.895	1.164	3.878	82.895
8	1.020	3.398	86.293	1.020	3.398	86.293

Note: factor extraction method: principal component method.

The matrix of factor loadings showed that the array of empirical variables was transformed into eight components with loadings greater than one. The total variance of all components was $\Sigma d = 86.293\%$. Fig. 1 presents the factor structure of dominant mental states of the respondents' coping behavior.



Note: ----- – trend line; F1 – Self-blame coping behavior; F2 – Sensitive coping behavior; F3 – Dependent coping behavior; F4 – Conscious coping behavior; F5 – Tense coping behavior; F6 – Confident coping behavior; F7 – Safe coping behavior; F8 – Dreamy coping behavior.

Figure 1. Factor structure of dominant mental states of junior athletes' coping behavior

Tabl. 5 presents the expanded matrix of factor components demonstrating loadings of all thirty variables.

Table 5. Matrix of factor components (n = 119)

Scale	F1	F2	F3	F4	F5	F6	F7	F8
A+/A-	-.108	-.104	-.043	-.504	.424	.519	-.004	-.364
B+/B-	-.463	-.020	-.067	-.337	-.162	.516	.121	.368
C+/C-	-.882	.113	-.023	.021	-.229	.028	-.014	.246
E+/E-	-.670	-.177	.159	.074	-.309	.144	-.189	.103
F+/F-	-.110	-.240	.228	.084	.402	.212	.751	.175
G+/G-	.090	-.300	.070	.740	-.138	.339	.099	.089
H+/H-	.165	.200	-.400	.631	.072	-.046	-.144	.080
I+/I-	.134	.519	-.410	.481	.009	-.111	.332	.091
L+/L-	-.136	.620	-.278	.020	.431	-.155	.137	-.123
N+/N-	.062	.740	-.093	-.285	-.146	.041	.080	-.218
M+/M-	.029	.481	-.074	-.446	-.179	.053	.038	.561
O+/O-	.139	.169	.525	-.308	-.262	-.533	.124	.061
Q1+/Q1-	-.079	-.617	.401	-.116	-.014	-.433	.309	-.070
Q2+/Q2-	.105	-.690	.417	.041	.197	-.041	-.116	.175
Q3+/Q3-	.317	-.314	-.403	-.093	.469	-.089	-.407	.230
Q4+/Q4-	.075	-.072	-.429	-.194	.569	-.292	.019	.332
AC	-.962	.089	.121	.097	.125	-.072	-.063	-.020
UIS	.943	-.020	-.149	.044	-.112	-.084	.044	.032
PR	.658	.407	.530	.108	.132	.049	-.062	.106

PL	-.971	.079	-.029	.061	.079	-.022	-.008	-.042
ES	.924	-.035	.231	.069	.038	.018	-.001	.016
EE	.916	-.142	-.100	-.072	-.071	.087	.024	-.054
H	.959	-.069	-.150	-.059	-.093	.076	.018	.019
A	-.922	.173	.239	.082	.116	-.072	-.048	.031
R	.304	.379	.764	.160	.255	.110	-.165	.082
SB	.972	.064	.076	-.070	-.051	.056	-.061	.085
SD	-.948	-.024	-.122	-.019	-.021	.000	.064	-.063
RF	.975	.108	.118	.008	.023	.062	-.026	.055
TPS	-.091	.470	.781	.123	.284	.116	-.109	.011
BD	.924	.030	-.117	-.089	-.110	.090	.175	-.089

Note: factor extraction method: principal component method; generated components – 8; significant loadings are given in bold type; A+ – openness; A- – closedness; B+ – developed thinking; B- – limited thinking; C+ – emotional stability; C- – emotional instability; E+ – independence; E- – malleability; F+ – safety; F- – anxiousness; G+ – consciousness; G- – unscrupulousness; H+ – courage; H- – shyness; I+ – sensitivity; I- – hardness; L+ – suspiciousness; L- – trustfulness; M+ – dreaminess; M- – practicality; N+ – sophistication; N- – simplicity; O+ – guilt proneness; O- – calm confidence; Q1+ – radicalism; Q1- – conservatism; Q2+ – independence from the group; Q2- – dependence on the group; Q3+ – self-control, strong will; Q3- – lack of self-control, indifference; Q4+ – internal tension; Q4- – internal relaxation; AC – active coping; UIS – using information support; PR – positive reframing; PL – planning; ES – emotional support; EE – expressing emotions; H – humor; A – acceptance; R – religion; SB – self-blame; SD – self-distraction; RF – refusal; TPS – taking psychoactive substances; BD – behavioral differentiation.

For convenience, the loadings greater than $< .500$ are given in bold type. F1 is loaded with fourteen parameters: C+/C- (-.882), E+/E- (-.670), AC (-.962), UIS (-.943), PR (.658), PL (-.971), ES (.924), EE (.916), H (.959), A (-.922), SB (.972), SD (-.948), RF (.975), BD (.924). F2 is loaded with five parameters: I+/I- (.519), L+/L- (.620), N+/N- (.740), Q1+/Q1- (-.617), Q2+/Q2- (-.690). F3 is loaded with four parameters: O+/O- (.525), PR (.530), R (.764), TPS (.781). F4 has three loadings: A+/A- (-.504), G+/G- (.740), H+/H- (.631). F5 has one loading Q4+/Q4- (.569). F6 has three loadings: A+/A- (.519), B+/B- (.516), O+/O- (-.533). F7 has one loading: F+/F- (.751). F8 also has one loading: M+/M- (.561).

Discussions

Over the past years, research into dominant mental states of junior athletes' coping behavior has been relevant for various objective and subjective reasons. Constant social changes occurring in all areas of human life also affect sporting activities. Adolescents are active subjects and agents of social changes. On the one hand, they have high readiness and tolerance of change (Bokhonkova et al., 2025; Hoian et al., 2025; Kariyev et al., 2025); on the other hand, they are characterized by high resistance to imposed standards and innovations. Philosophical studies and research into the individual's dialectical development (Kremen, 2014; Kremen & Ilyin, 2020) do not provide answers to a number of questions related to adolescents' worldviews, sociogenic challenges, and social transformations. Modern research into dominant mental states has demonstrated the legitimacy of this methodology (Popovych et al., 2023d; 2023e). Identifying three coping strategies – problem-focused coping; emotion-focused coping; avoidance coping, and fourteen types of coping behavior “Brief-COPE” (Carver, 1997) allowed for qualitative disentanglement of the research subject (see Tabl. 1). In the context of the research design, using sixteen dichotomous scales of the methodology “16PF” (Cattell, & Mead, 2008) is a successful attempt to capture personality traits actualized by social situations (see Tabl. 2).

The established psychological correlations (see Tabl. 3) demonstrated a complex pattern of relationships. However, the established correlations do not allow us to state causality. They enable us to state only the significance of correlations and their dynamics (direct or inverse). Since our research deals with a large number of variables, it was imperative to use the method of data transformation. Using a factorial ANOVA with extracting principal components allowed us to efficiently solve this problem. The identified eight principal components determined the total level of variance that amounted to $\Sigma d = 86.293\%$ (see Tabl. 4). The trend line demonstrated a relatively moderate decline from F1 to F8 (see Fig. I). The presented matrix of factor components allowed us to reveal the content features of each qualitatively (see Tabl. 5). F1 is loaded with eight direct significant measurements: “using information support”, “positive reframing”, “emotional support”, “expressing emotions”, “humor” “self-blame”, “refusal”, “behavioral differentiation” and six inverse measurements: “emotional stability”, “independence”, “active coping”, “planning”, “acceptance”, and “self-distraction”. The highest value of “self-blame” (.972) gave a reason for naming F1 “Self-blame coping behavior”. This behavior is accompanied by a lack of planning, emotional instability, and malleability. It has significant factor loadings ($V = 12.085$; $d = 40.284\%$) (see Tabl. 4). F2 is loaded with three direct measurements: “sensitivity”, “suspiciousness”, and “sophistication” and two inverse measurements – “radicalism” and “independence from the group”. The indicator “sophistication” has the highest value (.740). F2 was called “Sensitive coping behavior”. This behavior entails high sensitivity and dependence on the surrounding. It has the second highest factor loadings ($V = 3.282$; $d = 10.940\%$) (see Tabl. 4). F3 is loaded only with direct measurements: “guilt proneness”, “positive reframing”, “religion”, and “taking psychoactive substances”. The

direct indicator “taking psychoactive substances” has the highest value (.781). Since taking psychoactive substances usually causes physical or mental dependence, F3 was named “Dependent coping behavior”. This defensive behavior is accompanied by profound religiosity and a desire for reevaluation. It has the following factor loadings ($V = 3.169$; $d = 10.564\%$) (see Tabl. 4). F4 is loaded with two direct measurements: “consciousness” and “courage” and one inverse measurement – “openness”. Since the parameter “consciousness” has the highest value (.740), F4 was named “Conscious coping behavior”. This defensive behavior entails high levels of courage and closedness. It has the following factor loadings ($V = 2.094$; $d = 6.981\%$) (see Tabl. 4). F5 is loaded with one direct measurement – “internal tension”. F5 was named “Tense coping behavior” ($V = 1.672$; $d = 5.573\%$) (see Tabl. 4). F6 is loaded with two direct measurements: “openness” and “developed thinking” and one inverse measurement – “guilt proneness”. Since the parameter “guilt proneness” with the highest value (-.533) is inverse and characterizes calm confidence, this gives a reason for naming F6 “Confident coping behavior”. It implies open and thoughtful attitude of the individual. It has the following factor loadings ($V = 1.402$; $d = 4.673$) (see Tabl. 4). F7 and F8 were named after their most pronounced parameters: “safety” and “dreaminess”. Accordingly, F7 was named “Safe coping behavior” and F8 was named “Dreamy coping behavior”. F7 is characterized by high assertiveness and volitional control, whereas F8 is considered immature behavior. Diagnosing and interpreting dominant mental states of junior athletes’ coping behavior gave us a deeper insight into junior athletes’ psychology in crisis and extreme situations of life activities.

The aim was achieved. The first hypothesis was largely obvious and needed testing. It was confirmed since the factor structure of dominant mental states of junior athletes’ coping behavior allowed us to establish important psychological facts, which comprise a latent resource for juniors. The second hypothesis was refuted since only F1 and F3 were loaded with the parameters of coping behavior. It is noteworthy that the individual’s actualized traits come to the fore in critical situations of sports interactions. This was recorded in F2, F4, F5, F6, F7, and F8. Obviously, they have higher levels of assimilative capacities than the patterns of defensive behavior.

Conclusions

Dominant mental states of junior athletes’ coping behavior are active states of junior subjects’ sporting activities, which reflect the prevalent type of defensive behavior in combination with the most pronounced personality traits. Crisis situations of sporting activities create conditions for actualizing juniors’ personality traits in the dimensions of coping behavior. We established direct and inverse psychological correlations between coping behavior and junior athletes’ traits actualized in sporting activities. The strongest direct correlation was established between planning and emotional stability ($R = .841$; $p < .001$). The strongest inverse correlation was recorded between refusal and emotional stability ($R = -.838$; $p < .001$). It was summarized that emotional stability is the most loaded and actualized trait in the research conditions. We created the factor structure of dominant mental states of junior athletes’ coping behavior. Eight factors were identified ($\Sigma d = 86.293\%$): F1 “Self-blame coping behavior”, F2 “Sensitive coping behavior”, F3 “Dependent coping behavior”, F4 “Conscious coping behavior”, F5 “Tense coping behavior”, F6 “Confident coping behavior”, F7 “Safe coping behavior”, and F8 “Dreamy coping behavior”. It was summarized that diagnosing and interpreting dominant mental states of junior athletes’ coping behavior provided us with a deeper insight into junior athletes’ psychology in crisis and extreme situations of life activities.

The aim was achieved, the first hypothesis was confirmed, and the second hypothesis was refuted. It was found that the individual’s actualized traits rather than coping behavior patterns come to the fore in critical situations of sports interactions. The research findings should be operationalized in the activities of sports subjects working in junior sports.

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