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Original Article

Comparative research on creativity in juniors' motivation structure

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Abstract:
The aim of this study was to perform theoretical–empirical research into the psychological parameters of creativity within the motivation structure of junior athletes and to compare the findings by gender and sport. **Methods:** The research sample consisted of 90 junior athletes (45 males, 45 females), representing both team sports (volleyball, mini-football, football, and handball) and individual sports (Greco–Roman wrestling, artistic gymnastics, weightlifting, chess, and boxing). The sample was evenly split, with 45 athletes from each group. Junior athletes were trained at sports schools for children and youth in Ukraine, represented junior teams of professional clubs, and participated in national and international tournaments, achieving success in Ukrainian, European, and World championships. The following descriptive frequency characteristics were recorded by age: M = 17.39; SD = ±3.48; Me = 17.50. Valid and reliable tools, tested in sports studies on junior samples, were applied to establish the parameters of creativity and motivation. **Results.** A statistically significant superiority of junior female athletes (Group 1) was found in two parameters of motivation: intrinsic motivation (U = 776.50; p = .049) and social status (U = 774.00; p = .046). No superiority was identified in the parameters of creativity. No statistically significant difference was found between the sample of juniors engaging in team sports (Group I) and the sample of juniors engaging in individual sports (Group II). The use of Spearman's correlation coefficient (r_s) allowed us to establish that the parameters of creativity are low-loaded with motivational intentions, and, correspondingly, juniors' motivation is low-dependent on creativity. The comparison of two groups of the levels of creativity parameters (Group A and Group B) allowed us to identify a superiority in the parameters "extrinsic positive motivation" and "general activeness", indicating the focus of creativity on the content component of competitive activity. There is a caveat that "comfort" is the most dependent parameter that can have a negative impact on the content component of competitive activity. **Discussion and conclusions.** It was substantiated that the research into the phenomenon and psychological content parameters of creativity in juniors' motivation structure is a successful attempt to establish psychological correlations and find statistical differences in their motivation. Operationalization of the obtained results is significant in the context of a local competitive situation. It is recommended that the obtained statistical results and algorithms for establishing psychological correlations and finding differences be considered by subjects in sporting activities who work with junior athletes.
Keywords: mental health, mental state, faith, imagination, risk propensity, adolescence, self-regulation.

Introduction

Creativity is an inventive and innovative activity of people, which characterizes their abilities aiming to produce something that is fundamentally new. There is always a place for creativity in any human activity. Creativity is primarily associated with implementing a fundamentally new idea in practice. Today's life is characterized by the rapid development of sporting activities and the implementation of new ideas, approaches, and programs for athletes' training and recovery, which require well-formed creative competencies. Junior sports, being an important stage between children's and professional sports, have many latent resources that should be studied for rational and timely comprehension of processes, regularities, and principles of performing sporting activities. Athletes' creativity is oriented towards the future. It focuses on producing new things and building a model of the expected sports outcomes (Popovych et al., 2021; 2023c).

The research by A. Bollimbala et al. (2023) finds out that, compared to usual classes, physical activities improve the components of the originality and flexibility of divergent thinking and, at the same time, do not

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reduce the level of perseverance as much as typical classes. The study on the Dual Pathway to Creativity model (Nijstad et al., 2010) underscores that creativity is the generation of original ideas, which is a function of cognitive flexibility and cognitive perseverance. Accordingly, dispositional or situational changes are factors of creativity, affecting flexibility or perseverance, or simultaneously both parameters. Studies demonstrate that activation of respondents' positive mental states increases creativity. It is explained by the fact that they stimulate flexibility. It was also proved that activation of negative mental states can increase creativity because they stimulate perseverance (Bollimbala et al., 2023; Nijstad et al., 2010). This argumentation explains the study of the Dual Pathway to Creativity model. Apparently the individual can achieve creativity along both pathways. Therefore, we acknowledge that moderate physical activeness can contribute to developing creativity along both pathways. Systematic, non-exhausting physical education and sports classes promote the development of curiosity, creative imagination, and divergent and original thinking of the individual. Physical activeness has a positive effect on the brain, "rebooting" it. Apparently it helps to renew it and create favorable conditions for active work.

According to our research hypothesis and aim, the scientific interest lies in the study of the phenomenon of creativity as a psychological correlate in junior athletes' motivation structure. We have to empirically study and theoretically substantiate the obtained regular dependencies. Will the obtained levels of creativity correlate with the relevant dimensions of juniors' motivation? Will there be significant differences between the examined motivation parameters in the levels of curiosity, imagination, task complexity, and risk propensity? Scientists studying creativity in different human activities tend to believe that physical exercises allow the brain to distract from everyday problems and worries, claiming that the blood is supplied with an additional amount of blood, which provides it with nutrients through the transport function. In scientific literature, there are many recommendations on the necessity of engaging in physical activities to avoid a creative crisis and gain new creative inspiration. Through flexible thinking, creativity allows generating original ideas, developing tactics, and predicting probable scenarios of events, which contributes to adaptation and flexibility in decision-making.

Professional sports are overly conservative. There is little room for creativity, which often comes to the fore in achieving a competitive result. Scientific problems of junior sports gain new meaning and are examined in the context of age-related and psychophysiological principles and regularities in some studies on psychology and pedagogy of sporting activities (Galan et al., 2018; Kozin et al., 2023), physical culture and sports (Popovych et al., 2022b; 2022c), and physical rehabilitation (Cretu et al., 2021; Shcherbak et al., 2023). Physical activeness stimulates the brain, preventing mental disorders. Researchers J. van der Zanden et al. (2020) identified several supporting and inhibiting factors in developing adolescents' creativity. All the factors are divided into four groups: individual, parental, educational, and social. Individual factors are dependent most on respondents' motivation, self-efficacy, and openness to new experiences. Another research conducted by O. Chebykin et al. (2024) found a complex of emotional-gnostic and personal characteristics of creativity in a sample of adolescents. It was established that a high level of psycho-emotional tension, openness in interpersonal relationships, variability in relationships, activeness, flexibility, and uncertainty in decision-making are dominant. Dominant characteristics, which determine the psycho-complexes of adolescents' creativity, result in stable formations, affecting the individual's activities. Studies on respondents' dominant mental states in different activities, namely in learning and training (Kurova et al., 2023), competitive (Popovych et al., 2022d; 2023d), pedagogical (Popovych et al., 2023a), and risky-extreme (Nosov et al., 2021; Tavrovetska et al., 2023; Zinchenko et al., 2022; 2023) activities, demonstrated their dependence on the levels of respondents' characteristics. Researchers E. Zoljanahi et al. (2018) established a correlation between sports self-efficacy, attribution styles, and creativity of elite athletes and found that sports self-efficacy plays a mediating role between sports attribution styles and creativity. A direct correlation was established between creativity and attribution styles after success or failure. This may indicate the Dual Pathway to Creativity model through the mechanisms of cognitive flexibility and cognitive perseverance. An interesting scientific fact is highlighted in the research by I. Popovych et al. (2023b) on the focus of athletes in individual sports on their "Ego", which causes weakness and a closed position in relationships with others. Teamwork in team sports contributes to open positions, and interpersonal and informative constructive relationships.

Examining the phenomenon of creativity in adolescents and empirical measurement of psychological content parameters of creativity in junior athletes' motivation structure is a confirmative research strategy aiming to establish psychological correlations and identify statistically significant differences in junior athletes' motivation with high and low levels of curiosity, imagination, task complexity, and risk propensity. High and low levels can either contribute to achieving sports results, or have a negative impact on personal and competitive discipline and on the implementation of a pre-competition mindset.

Hypothesis: 1) the comparison of the examined parameters by gender will demonstrate no significant differences; 2) the comparison of the examined parameters by sports (team and individual) will show no significant differences; 3) the parameters of junior athletes' creativity will correlate with the parameters of respondents' motivation in sporting activities; 4) the levels of creativity parameters will have statistically significant differences in some parameters of respondents' motivation.

Aim. To conduct theoretical-empirical research into the phenomenon and psychological content parameters of creativity in junior athletes' motivation structure and compare the findings by gender and sports.

Methods

Methodology. The tenets of the phenomenon of creativity are outlined in the fundamental studies by A. Kiv et al. (1995), V. Pavlenko (2015) and van der Zanden et al. (2020); the research on the Dual Pathway to Creativity model (Bollimbala et al., 2023; Nijstad et al., 2010); publications on creativity in sports (Wu et al., 2011; 2012; Zahno, 2024); the interpretation of personal creativity as a phenomenon combining curiosity, imagination, task complexity, and risk propensity of junior athletes (Tunik, 2013). The theoretical-methodological foundations of the research into the phenomenon of creativity comprise the studies, which allowed us to relevantly determine creativity parameters and choose the research strategy and design. Reliable theoretical and practical principles in the following areas were considered: 1) adaptive potential under changed and extreme conditions of activity (Kariyev et al., 2024; Plokhikh et al., 2024); 2) juniors' self-efficacy in relevant activities (Halian et al., 2023a; 2023b; Zavatska et al., 2024); 3) regularities of educational and training activities (Álvarez-Huerta et al., 2021; Kobets et al. 2021a; 2021b; Kremen, 2014; Popovych et al., 2023f)); 4) age-related regularities and psychophysiological characteristics of junior athletes (Bokhonkova et al., 2024; Potop & Cretu, 2015); 5) studies on creativity in related areas of human activity (Kryshtanovych et al., 2023; Pavlyk & Radzimovska, 2023; Sergeyeva et al., 2023; Xu et al., 2012; Zareie, 2014); 6) athletes' motivational potentials and mental resources (Karpenko et al., 2024; Popovych et al., 2022a; 2023e) and other modern studies (Anis & Nordin, 2024; Kremen et al., 2022; Kremen, 2023; Semenova et al., 2024; Topuzov et al., 2022).

Participants. The research sample comprised junior athletes aged 15 to 19, a total of n = 90 people. The same numbers of representatives of team and individual sports were randomly selected. The research participants represented the following sports: volleyball, mini-football, football, and handball (n = 45; 50.00%). Individual sports were represented by athletes engaging in Greco-Roman wrestling, light and artistic gymnastics, weightlifting, chess, and boxing (n = 45; 50.00%). All the respondents were educated and trained at sports schools for children and youth in Ukraine or finished schools and represented junior teams of professional clubs. The respondents systematically train and participate in national and international tournaments and win prizes in Ukrainian, European, and World championships. The following descriptive frequency characteristics were recorded by gender: M = 17.39; SD = ±3.48; Me = 17.50. Parity was maintained by gender: male athletes (n = 45; 50.00%) and female athletes (n = 45; 50.00%).

Procedures and Instruments. The respondents' creativity parameters were identified using the questionnaire "Diagnostics of Personal Creativity" (DPC) (Tunik, 2013). This psycho-diagnostic tool allowed us to determine the levels of the respondents' creativity by four dimensions: curiosity (CR), imagination (I), task complexity (TC), and risk propensity (RP). The methodology was developed for adolescents. It contained fifty statements and a four-point direct Likert Scale. The empirical data homogeneity was tested using Cronbach's alpha. According to this methodology, Cronbach's alpha coefficient was $\alpha = .739$, which is considered a medium level of empirical data homogeneity.

To determine the dimensions of motivation, we selected psycho-diagnostic tools for identifying several important dimensions, such as external and internal vectors and stable motivational trends in sporting activities. Determining intrinsic motivation in our study is legitimate since sporting activities are the main activities and the most important type of professional realization for junior athletes participating in the research. The questionnaire "Motivation of Professional Activity" (MPA) (Rean et al., 2006) was used to determine three dimensions of motivation which were in the plane of external and internal intentions of the individual: intrinsic motivation (IM), extrinsic positive motivation (EPM), and extrinsic negative motivation (ENM). The methodology "MPA" (Rean et al., 2006) contained seven statements and a five-point direct Likert Scale. According to this methodology, Cronbach's alpha coefficient was $\alpha = .919$, which is considered a high level of empirical data homogeneity. To identify stable motivational trends, the methodology "Diagnostics of the Individual's Motivation Structure" (DIMS) (Milman, 1990) was applied. The list of the main motivational trends comprised the following dimensions: life sustenance (LS), comfort (C), social status (SS), communication (CO), general activeness (GA), creative activeness (CA), and social usefulness (SUS). The predominance of any dimension allows us to determine the level of a particular trend that is related to sports or general life orientations of junior athletes. The sum of the mean values (M) on the LS, C, SS, and CO scales characterizes the general life orientation, whereas the sum of the mean values on the GA, CA, and SUS scales characterizes the sports orientation of the individual. According to the methodology "DIMS" (Milman, 1990), Cronbach's alpha coefficient was $\alpha = .744$, which is considered a medium level of empirical data homogeneity.

Organization of Research. In September–October 2024, we developed a theoretical research model, studied the concepts of creativity, formulated the research hypothesis, and approved the confirmative research strategy with a comparison of the gender and content components. In November 2024, we collected empirical data using Google Forms. The respondents voluntarily agreed to participate in the research. They answered questions by filling out standard questionnaire forms. In December 2024, we processed the empirical data and performed statistical operations. The study was approved by all the subjects of the management process – the

administrations of the universities where the researchers worked and the administrations of sports schools for children and youth and educational-training academies of professional clubs. The research organizers ensured the participants' confidentiality and awareness, which contributed to obtaining quality empirical data.

Statistical Analysis. The empirical data obtained from Google Forms were transformed into a tabular matrix using the computer program "MS Excel". All the main operations were performed by applying the program "IBM SPSS Statistics" version 29.0.0.0 (241). The following statistical parameters were used: Cronbach's coefficient of homogeneity (α), the Kolmogorov consistency criterion (λ), Spearman's correlation coefficient (r_s), Student's test for equality of means (t), and the Mann-Whitney test (U) to compare two samples. The levels of significance $p \leq .050$; $p \leq .010$ and $p < .001$ were statistically determined and substantiated.

Results

The descriptive frequency characteristics are given according to the three methodologies: "DPC" (Tunik, 2013), "MPA" (Rean et al., 2006), and "DIMS: (Milman, 1990). According to the research design, the identified statistical differences were found between two independent groups of the sample population united by gender: Group 1 – junior female athletes (n = 45; 50.00%) and Group 2 – junior male athletes (n = 45; 50.00%) (Tabl. 1).

Table 1. Comparison of descriptive frequency characteristics of the examined parameters by gender (Group 1 and Group 2)

Groups	DFC	Parameters										
		CR	**I**	**TC**	**RP**	**IM**	**EPM**	**ENM**	**SS**	**GA**	**CA**	**SUS**
Group 1	M	6.31	8.53	8.33	8.31	4.29	2.17	3.76	3.73	3.78	4.02	3.64
	Me	6.00	9.00	9.00	9.00	4.50	2.33	4.00	3.00	3.00	4.00	3.00
	Mo	3.00	3.00[a]	3.00[a]	4.00[a]	5.00	2.33	3.00	3.00	3.00	2.00	3.00
	SD	3.78	4.76	4.68	4.32	.77	.67	1.07	1.56	1.71	1.83	1.63
	SD^2	14.27	22.62	21.91	18.63	.59	.46	1.16	2.43	2.95	3.34	2.64
	min	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00	2.00	2.00
	max	15.00	16.00	15.00	16.00	5.00	3.33	5.00	7.00	7.00	7.00	7.00
Group 2	M	6.96	8.40	7.69	8.13	3.81	2.01	3.76	3.22	3.33	3.76	3.31
	Me	6.00	8.00	7.00	8.00	4.00	2.00	4.00	2.00	3.00	3.00	2.00
	Mo	3.00	3.00	3.00[a]	3.00	5.00	2.00[a]	5.00	2.00	2.00	2.00[a]	2.00
	SD	4.43	5.02	4.73	4.32	1.19	.77	1.26	1.61	1.64	1.69	1.77
	SD^2	19.59	25.25	22.36	18.66	1.42	.59	1.59	2.59	2.68	2.87	3.13
	min	1.00	1.00	1.00	1.00	1.00	.33	1.00	1.00	1.00	2.00	1.00
	max	16.00	16.00	16.00	16.00	5.00	3.33	5.00	7.00	7.00	7.00	7.00
Mann-Whitney U-test	*U*	869.50	1012.00	960.50	920.50	**776.50**	960.50	980.00	**774.00**	834.50	956.00	826.50
	p	.246	.997	.674	.456	.049	.671	.787	.046	.138	.640	.119

Note: Group 1 – junior female athletes; Group 2 – junior male athletes; DFC – descriptive frequency characteristics; M – the mean; *Me* – the median (given *in italics*); Mo – the mode of distribution; SD – the squared deviation; d^2 – the variance of distribution; min – the minimum value of the scale; max – the maximum value of the scale; U – the value of the Mann-Whitney U-test for the difference between two samples; p – level of significance; [a] – the smallest value of several modal values; CR – curiosity; I – imagination; TC – task complexity; RP – risk propensity; IM – intrinsic motivation; EPM – extrinsic positive motivation; ENM – extrinsic negative motivation; SS – social status; GA – general activeness; CA – creative activeness; SUS – social usefulness.

The research context and algorithm determined the identification of the following descriptive frequency characteristics: the mean of distribution (*M*); the median of distribution (*Me*); the mode (*Mo*); the squared deviation (*SD*); the variance (SD^2); the minimum value of the scale (*min*) and the maximum value of the scale (*max*). The non-parametrical Mann-Whitney U-test (U) was used to determine the significance of differences. Significant differences were found in two parameters: IM (U = 776.50; p = .049) and SS (U = 774.00; p = .046). The superiority of junior female athletes (Group 1) is significant in intrinsic motivation and social status. The predominance of social status is more likely to indicate the level of junior female athletes' general life orientation, whereas intrinsic motivation is directly related to competitive achievements and focus on a winning outcome. We have to acknowledge that the first hypothesis is disproved.

The next objective of our task was to identify statistical differences between two independent groups of the sample population united by sports: Group I – the research participants engaging in team sports (n = 45; 50.00%) and Group II – the research participants engaging in individual sports (n = 45; 50.00%) (Tabl. 2).

Table 2. Comparison of descriptive frequency characteristics of the examined parameters by sports (Group I and Group II)

Groups	DFC	Parameters										
		CR	**I**	**TC**	**RP**	**IM**	**EPM**	**ENM**	**SS**	**GA**	**CA**	**SUS**
Group I	M	6.13	8.29	8.00	7.82	4.02	2.36	3.63	3.47	3.62	3.84	3.38
	Me	*5.00*	*9.00*	*8.00*	*8.00*	*4.00*	*2.33*	*3.50*	*3.00*	*3.00*	*3.00*	*3.00*
	Mo	3.00	3.00	4.00	3.00[a]	5.00	2.00	5.00	2.00[a]	2.00	2.00	2.00
	SD	3.63	4.69	4.58	4.36	1.04	1.13	1.17	1.55	1.72	1.74	1.57
	SD^2	13.16	22.03	20.96	18.97	1.08	1.27	1.38	2.39	2.97	3.04	2.47
	min	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00
	max	15.00	16.00	16.00	15.00	5.00	6.70	5.00	7.00	7.00	7.00	7.00
Group II	M	7.51	8.78	8.20	8.20	4.03	2.18	3.87	3.49	3.49	3.93	3.58
	Me	*7.00*	*10.00*	*7.00*	*8.00*	*4.00*	*2.33*	*4.00*	*3.00*	*3.00*	*3.00*	*3.00*
	Mo	3.00[a]	3.00[a]	4.00	3.00	5.00	2.00[a]	5.00	2.00	2.00	2.00	2.00
	SD	4.58	5.33	4.83	4.60	1.02	.70	1.15	1.66	1.66	1.79	1.83
	SD^2	20.94	28.36	23.35	21.16	1.050	.488	1.31	2.76	2.76	3.20	3.34
	min	1.00	1.00	2.00	2.00	1.50	1.00	1.00	1.00	2.00	2.00	1.00
	max	16.00	16.00	16.00	16.00	5.00	3.33	5.00	7.00	7.00	7.00	7.00
Mann-Whitney U-test	*U*	853.50	957.00	978.50	971.00	1003.50	989.00	885.50	996.50	963.00	991.50	977.50
	p	.197	.653	.783	.737	.940	.848	.292	.894	.680	.862	.769

Note: Group I – the sample of juniors engaging in team sports; Group II – the sample of juniors engaging in individual sports; DFC – descriptive frequency characteristics; M – the mean; *Me* – median (given *in italics*); Mo – the mode of distribution; SD – the squared deviation; SD^2 – the variance of distribution; min – the minimum value of the scale; max – the maximum value of the scale; U – the value of the Mann-Whitney U-test for the difference between two samples; p – level of significance; [a] – the smallest value of several modal values; CR – curiosity; I – imagination; TC – task complexity; RP – risk propensity; IM – intrinsic motivation; EPM – extrinsic positive motivation; ENM – extrinsic negative motivation; SS – social status; GA – general activeness; CA – creative activeness; SUS – social usefulness. No statistically significant differences were found in the compared pairs of parameters. The only tendency for superiority is observed in the representatives of individual sports (Group II) in the parameter of creativity – "curiosity" (M = 7.51; SD = 4.58; *Me = 7.00*). We can state that the second hypothesis is confirmed. The next objective of the study was to establish psychological correlations between creativity and the parameters of motivation. Kolmogorov's criterion of consistency (λ) did not confirm the normal distribution of the empirical data, hence Spearman's correlation coefficient (r_s) was used. The established psychological correlations between the parameters of junior athletes' creativity and motivation are presented in the correlation matrix (Tabl. 3).

Table 3. Psychological correlations between the parameters of junior athletes' creativity and motivation (n = 90)

Parameters of motivation	Statistical parameter	Parameters of creativity			
		CR	**I**	**TC**	**RP**
IM	r_s	.029	.127	-.019	-.025
	p	.786	.232	.859	.813
EPM	r_s	**.209***	-.020	-.066	.080
	p	.048	.852	.534	.451
ENM	r_s	.022	.071	**-.210***	.097
	p	.839	.504	.047	.363
LS	r_s	-.127	.018	.020	-.072
	p	.232	.864	.855	.502
C	r_s	**.217***	-.149	-.031	**.211***
	p	.040	.162	.771	.045
SS	r_s	-.121	.046	.010	-.064
	p	.255	.668	.922	.546
CO	r_s	.050	.029	-.099	.037
	p	.640	.785	.355	.729
GA	r_s	-.184	.086	-.093	.031
	p	.083	.421	.382	.775
CA	r_s	.036	.028	-.173	.064
	p	.733	.793	.102	.551
SUS	r_s	-.011	-.072	-.075	.047
	p	.920	.500	.484	.661

Note: CR – curiosity; I – imagination; TC – task complexity; RP – risk propensity; IM – intrinsic motivation; EPM – extrinsic positive motivation; ENM – extrinsic negative motivation; LS – life sustenance; C – comfort; SS – social status; CO – communication; GA – general activeness; CA – creative activeness; SUS – social usefulness; r_s – Spearman's correlation coefficient; *p* – level of significance; * – p < .050, the data is given **in bold type**.

Four significant correlations ($p \leq .050$) were established, three of them being direct: between "curiosity" and "extrinsic positive motivation" ($r_s = .209$; $p = .048$), between "curiosity" and "comfort" ($r_s = .209$; $p = .048$), and between "risk propensity" and "comfort" ($r_s = .209$; $p = .048$); and one correlation being inverse – between "task complexity" and "extrinsic negative motivation" ($r_s = .209$; $p = .048$). The correlation matrix suggests that creativity parameters are low-loaded with motivational intentions. Correspondingly, juniors' motivation is low-dependent on creativity. "Curiosity" and "comfort" are the most loaded parameters that may indicate the function of general life orientation, which is inherent in junior athletes. Creativity parameters are primarily positioned in sports as latent mental resources, though they may pose a latent danger. "Imagination" is an autonomous parameter, hence it can either help to achieve success or prevent an effective performance in difficult extreme situations of competitive activity. This issue requires further research. Apparently extrinsic negative motivation prevents athletes from performing complex tasks in sporting activities. Negative emotions, which accompany complex tasks, can block creative ideas, insights, and constructive images. Nevertheless, we can state that the third hypothesis is confirmed since the parameters of the respondents' creativity correlate with the parameters of motivation in sporting activities.

The final objective was to identify significant superiorities in the examined parameters by the levels of motivation dimensions. Four comparisons were performed by all the creativity parameters using the Mann-Whitney U-test (*U*). The groups for comparison were combined by the median: Group A and Group B. Group A – a high level of creativity parameters, and Group B – a low level of creativity parameters. Tabl. 4 shows the empirical results of comparing motivation by the levels of junior athletes' creativity.

Table 4. Results of the comparison of the parameters of junior athletes' motivation by the levels of creativity in Group A and Group B

Parameters of motivation	C M-W	**Parameters of creativity**			
		CR	**I**	**TC**	**RP**
Intrinsic motivation (IM)	*U*	905.500	985.000	993.500	1004.500
	p	.407	.936	.874	.960
Extrinsic positive motivation (EPM)	*U*	**745.000**	977.500	966.000	913.500
	p	.034	.889	.704	.428
Extrinsic negative motivation (ENM)	*U*	970.500	852.000	927.000	883.500
	p	.777	.233	.478	.291
Life sustenance (LS)	*U*	920.000	965.000	969.500	985.000
	p	.479	.804	.720	.831
Comfort (C)	*U*	**693.000**	966.500	945.000	**748.000**
	p	.009	.814	.575	.039
Social status (SS)	*U*	991.500	988.500	843.000	897.500
	p	.913	.960	.156	.344
Communication (CO)	*U*	948.000	819.000	852.000	994.000
	p	.635	.138	.179	.890
General activeness (GA)	*U*	826.500	**752.000**	948.500	941.500
	p	.136	.041	.594	.565
Creative activeness (CA)	*U*	991.000	918.500	895.500	1006.000
	p	.911	.526	.333	.970
Social usefulness (SUS)	*U*	921.500	937.500	990.000	950.500
	p	.485	.630	.850	.615

Note: C M-W – coefficients U-test Mann-Whitney; CR – curiosity; I – imagination; TC – task complexity; RP – risk propensity; *U* – the value of the Mann-Whitney parameter; *p* – level of significance; * – $p \leq .050$; ** – $p \leq .010$, the data is given **in bold type**.

It was found that Group A has four superiorities: two in "curiosity", one in "imagination", and one in "risk propensity". No superiority of creativity parameters was recorded in "task complexity". The parameters of motivation are divided into two by their impact on the content component of competitive activity – "EPM" (U = 745.000, p = .034), "GA" (U = 752.000; p = .041), and general life orientation – "comfort" with "curiosity" (U = 693.000; p = .009) and "risk propensity" (U = 748.000; p = .039). The established statistical superiorities allow us to state that the fourth hypothesis is confirmed since the levels of creativity parameters have significant differences in three parameters of the respondents' motivation.

Discussion

In scientific sports literature, there are many studies elucidating the problem of creativity in the context of competitive achievements and sports motivation (Gralewski et al., 2016; Hao et al., 2020). It was proved that creativity in sports, self-belief, and making extraordinary decisions in difficult situations of competitive activity can bring success and ensure a positive result in the contest (Oboeuf et al., 2023). At the same time, creativity requires athletes to permanently go beyond the frame of the game and competition discipline, search for original

ways, and have high risk propensity. The above competencies can weaken the game and personal sports discipline and pre-game mindset and have a negative effect on tactical game schemes and prepared game variations. The conservatism of professional sports is not favorable for manifesting junior athletes' creativity. We assume that manifestations of creativity can act as defensive reactions, which occur under difficult competitive conditions. In this case, the creative potential of individual performers can come to the fore and determine the result of a competition or individual performance. We cannot deny the value of a junior athlete's creative development since searching for new ideas and approaches to the learning-training process can be the most effective if subjects possess well-developed creativity. Apparently, it is important not only to develop creative potential and form creative competencies but also to learn how to operationalize them in sporting activities and implement creative ideas in different scenarios of events in a thoughtful manner. It concerns both team sports and individual performances.

When performing theoretical analysis, we found that activation of negative mental states can increase creativity since they stimulate perseverance (Bollimbala et al., 2023; Nijstad et al., 2010), however, the inverse correlation between the creativity parameter "task complexity" and "extrinsic negative motivation" (r_s = .209; p = .048) indicates the opposite (see Tabl. 3). It is obvious that negative mental states can stimulate perseverance and lead to the search of creativity, whereas extrinsic negative motivation is a stimulus which has inverse psychological correlations and does not foster creativity. The work of the Dual Pathway to Creativity model (Nijstad et al., 2010) on the two contours of flexibility and perseverance has a number of combinations, which should be identified in practice, and their functioning in the context of motivation should be proved or refuted. It was found that the parameter of general life motivation "comfort" contributes to the realization and operationalization of creative potential most of all (see Tabl. 3). It is noteworthy that risk propensity as a creativity parameter may cause a loss of the game structure, pre-game mindset, and personal pre-competition attitude that can have a negative effect on both team and individual competitive results. Probable risk scenarios should be outlined in advance, cognitively operationalized, and largely controlled, and then it will have a positive result. It is notable that juniors' competitive activities are related to creativity only through the motives "general activeness" and "extrinsic positive motivation". Extrinsic positive motivation directly impacts winning outcomes and overall sports achievements. It acts as a stimulus for junior athletes through external intentions such as praise, reward, recognition, public display of sports achievements, demonstrations or public presentations. Unlike intrinsic motivation, extrinsic positive motivation does not always ensure stable sports success and is moderately associated with an athlete's long-term progress in sporting activities. Obviously, under such conditions, creativity works through the contour of flexibility. It was proved that creativity contributes to adaptation (Richard et al., 2018). It was explained by the fact that the ability to make many flexible and original decisions gives respondents an advantage in adaptation. The obtained result does not contradict our findings but rather additionally focuses attention on the study "Dual Pathway to Creativity model" (Nijstad et al., 2010).

A comparison of two groups of the levels of creativity parameters (Group A and Group B) allowed us to observe several significant superiorities of the respondents' motivation (see Tabl. 4). The superiority in the parameters "extrinsic positive motivation" (U = 745.000, p = .034) and "general activeness" (U = 752.000; p = .041) testifies that well-developed creativity has a significant statistical superiority in the content component of competitive activity. Moreover, it should not be ignored that the superiority of the motivation parameter "comfort" was recorded twice in general life orientation. Comfort is the most dependent parameter and can have a negative impact on the content component of competitive activity. The research into creativity in the motivation structure does not exhaust the above scientific problems but rather draws attention to the complex phenomenon of creativity which requires the development of innovative methods for the research and empirical verification of some obtained results. In particular, the established superiority by gender (see Tabl. 1) and the lack of superiority by sports require verification (see Tabl. 2). The obtained statistical results allowed us to disprove the first hypothesis, confirm the other hypotheses, and achieve the research aim. It is recommended that the obtained results be considered by all subjects of sporting activities who work with junior athletes.

Conclusions

It was substantiated that the research into the phenomenon and psychological content parameters of creativity in the motivation structure of juniors is a successful attempt to establish psychological correlations and identify statistical differences in their motivation. It was explained that high and low levels of creativity can either contribute to or have a negative effect on sports results. Operationalization of the obtained results in the context of a local competitive situation is significant. The junior female athletes' (Group 1) statistically significant superiority was established in two parameters of motivation: intrinsic motivation (U = 776.50; p = .049) and social status (U = 774.00; p = .046). There was no superiority in the parameters of creativity. No statistically significant differences were found between the sample of juniors engaging in team sports (Group I) and the sample of juniors engaging in individual sports (Group II). Using Spearman's correlation coefficient (r_s) allowed us to find out that creativity parameters are low-loaded motivational intentions; correspondingly, juniors' motivation is low-dependent on creativity. The comparison of the two groups by the parameters of creativity (Group A and Group B) revealed a superiority in the parameters "extrinsic positive motivation" and

"general activeness", which indicates the focus of creativity on the content component of competitive activity. There is a caveat that "comfort" is the most dependent parameter, which can have a negative impact on the content component of competitive activity. It is recommended that the obtained statistical results and algorithm for establishing psychological correlations and identifying differences be considered by subjects of sporting activities who work with junior athletes.

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