

Regression models of creative thinking in young athletes under difficult conditions of sports activity: A gender perspective

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Abstract:

The aim of the study is to examine regression models of creative thinking in young athletes under challenging conditions of sports activity. **Methods:** The total study sample comprised 100 young athletes. The sample was heterogeneous, including 37 male athletes and 63 female athletes aged 16–23 who intend to connect their lives with professional sports. A valid and reliable psychodiagnostic toolkit was used: the "Bem Sex-Role Inventory" (Bem, 1974), the "Creativity Test" (Vishnyakova & Tkach, 1998), the modified version of the "Creativity Assessment Packet" methodology (Williams, 1980), used as the "Creative Characteristics Subtest-Questionnaire" (Belska et al., 2021), as well as standard coefficients and statistical analysis procedures. **Results:** Multiple regression analysis was performed using the stepwise introduction of independent variables. It resulted in four models, with each subsequent model being an improved version of the previous model. The most complete fourth model combined creative thinking (the Real Self), a creative attitude towards the profession (the Real Self), creative thinking (the Ideal Self), and a creative attitude towards the profession (the Ideal Self). The Kruskal-Wallis H-Test was used to diagnose statistically significant differences for the variable "personal inclination toward creative behaviour" (PICB) in respondents with masculine, feminine, and androgynous identities. Feminine young female athletes were found to demonstrate above-medium, high, and very high levels of a personal inclination toward creative behaviour. Masculine young male athletes were diagnosed with medium and below-medium levels of the PICB. Androgynous young female athletes and young male athletes reported medium levels of the PICB. **Discussion and Conclusions.** It was empirically clarified and explained that gender identity as a component of the athlete's self-consciousness structure, as part of their "Self-concept", is a consequence of the self-determination of a young person in their relationships with the social environment, a specific sports group, or a competitive situation.

Keywords: athlete's creative attitude towards sports, creative thinking, divergent thinking, athlete's self-determination, masculine type of athlete, feminine type of athlete, androgynous type of athlete.

Introduction

Over the past decades, there have been significant transformations in the structure of gender roles, norms, and gender statuses, who did not ignore professional and amateur sports. Comparing positions, statuses, rights, opportunities, and requirements regarding men and women in the 20th century (Chodorow, 1978; Pleck, 1981) and nowadays (Helgeson, 2012; Fine et al., 2019; Roselli, 2018; Sweeting et al., 2014) shows that patterns of demands and behavior are constantly changing in sports activities, training, competition, and rehabilitation work. Thus, it seems important to expand the content of the structural components of gender identity and the reflection of roles and stereotypes regarding male and female athletes in the context of creative activity.

Research into the individual's creative thinking as a factor in making decisions in difficult conditions of sports activities. Creativity functions due to the complex dynamics of various cognitive processes, including cognitive control, risk propensity, malleable intelligence, imagination, and memory (Benedek et al., 2014; Zhelezniak et al., 2024). It also involves creative thinking as a cognitive process of creating new and effective ideas (Green et al., 2023; Runco & Jaeger, 2012). The generation of creative ideas is commonly studied using tasks of divergent thinking (DT), specifically those related to creative modelling (Acar & Runco, 2019; Said-Metwaly et al., 2022).

Creativity is a special strategy for adapting to new circumstances, which has been highlighted by some

researchers (Ershadi & Winner, 2020; Popovych et al., 2026; Sternberg, 2007). Gender differences in the manifestations of effective behaviour were identified in stressful situations of sports activity (Kurova et al., 2023; Popovych et al., 2025). At the same time, creativity is considered an essential personal characteristic (Amponsah et al., 2019; Kupers et al., 2019; Piirto, 2011). Creative individuals have always used various methods to enhance their living conditions. Currently, this manifests in the application of digital technologies (Kumpulainen et al., 2021) and the use of artificial intelligence options. However, the latter can have an adverse effect, reducing the individual's intellectual efforts and hindering creative skills.

A reduction in the overall creativity indicator, as recorded in various studies, has sparked a scientific interest in the athlete's creative thinking. The study by K. Kim⁽²⁰¹¹⁾ emphasises that respondents' indicators of creative thinking, assessed using the "Torrance Tests of Creative Thinking" (TTCT) (Torrance, 1962), remained unchanged or declined.

Another study focuses on respondents' creative thinking and social skills in the Finnish education system. It examines how creative thinking, speech tempo, originality, and imagination correlate with preschool children's social orientation. The results obtained using the "Thinking Creatively in Action and Movement" (TCAM) test (Torrance, 1981) indicated that a participative orientation was closely related to creative thinking skills. However, it occurred rarely in social situations involving adults. A participative orientation was determined by the concern about the situation and the desire to change it (Nikkola et al, 2020).

The decline in creative thinking and methods for improving it in students, based on an authentic assessment task, are described in the research by W. Karunaratne and A. Calma (2023). The results obtained indicated the importance of creating opportunities for developing creative thinking, mainly through their knowledge. The specificity of semantic memory in high-order cognitive thinking is a research subject of other scientists. Focusing on creativity and associative thinking, Y. Kenett (2024) combines the computational tools of network science, machine learning, and empirical cognitive and neural research to study them. He believes this approach allows for a transition from a subjective to an objective assessment of creativity, which is related to the remoteness of ideas, associative thinking, semantic memory flexibility, etc. The importance of divergent-convergent interactions in conceptualising creativity was underscored in a study by X. Jia et al. (2019). The research into the interrelation between identity and creativity also evokes scientific interest in the context of our study. The research by S. Dollinger et al. (2005) asserts that respondents who select information based on their style and highlight their personal and professional identity have considerable creative potential and many creative achievements, whereas subjects with pronounced normative or collective identity report fewer achievements. Despite multifaceted research into creativity and identity, identifying predictors of creative thinking in young athletes with different gender identities remains relevant.

Hypothesis. We hypothesise that mental dispositions may differently determine the creativity (creative thinking) of subjects with different gender identities.

Aim. The study aims to examine creative thinking in young people with different gender identities.

Methods

Methodology. The methodological foundations of the research include the ideas and approaches of scientists studying identity (Chodorow, 1978; Pleck, 1981; Helgeson, 2012; Fine et al., 2019; Roselli, 2018; Sweeting et al., 2014) and creativity (Byman et al., 2022; Ershadi & Winner, 2020; Kiv et al., 1995; Sternberg, 2007; Ahmadi & Besancon, 2017; Amponsah et al., 2019; Kumpulainen et al., 2020) as psychological phenomena. In particular, the criteria of creativity known today are classified into ten categories: tests for divergent thinking; tests for attitudes and interests; tests for personality; biographical tests; teachers' nominations; colleagues' nominations; managers' assessments; product assessments; extraordinary and self-assessed creative actions and achievements. Scientific literature shows that self-assessment of creative actions and achievements is the most substantiated method for selecting creative individuals (Hocevar, 1981; Kiv et al., 1995; Skager et al., 1965). Attention is paid to the psychophysiological patterns of sports activity (Kozin et al., 2023; 2026) and the thought processes of young athletes (Perepelytsia et al., 2026).

Participants. The total research sample comprised 100 young athletes. The heterogeneous sample, including 37 (37.0%) male athletes and 63 (63.0%) female athletes aged 16 to 23 ($M = 19.05$; $SD = 1.219$), was selected using random sampling. All athletes linked their lives with professional sports and were prizewinners of all-Ukrainian and International sports championships. All respondents gave informed written consent to participate in the research.

Procedures and Instruments. The "Bem Sex-Role Inventory" (BSRI) by S. Bem (1974) was used to diagnose gender identity. It is designed to assess the individual's self-identification with traditional masculine, feminine, or androgynous traits. The classic version included sixty traits (adjectives or descriptive personal qualities) differentiated as follows: twenty feminine traits, twenty masculine traits, and twenty neutral (unidentified) traits. The tool allows for determining the gender role: a masculine type (M) – a high score for masculine traits and a low score for feminine traits; the feminine type (F) – a high score for feminine traits and a low score for masculine traits; the androgynous type (A) – a high score on both scales; the undifferentiated type (U) – a low score on both scales. The individualism score (IS) was determined using the formula $IS = (F - M) \times 2.322$. The

IS value, ranging from -1 to +1, indicates androgyny; the value below -1 ($IS < -1$) testifies to masculinity, and the value above +1 ($IS > 1$) signifies femininity. The data recorded at a level of $IS < -2.025$ indicates pronounced masculinity, while the data at a level of $IS > +2.025$ means pronounced femininity. The “BSRI” by Sandra Bem (1974) was one of the first tools to introduce the concept of **androgyny** as a separate positive characteristic.

The psychodiagnostic tool “Creativity Test” (CT) (Vishnyakova & Tkach, 1998) is designed to assess the individual’s creative skills and generate their personal creative profiles. The possibility to **compare the Real “Self” and the Ideal “Self”** in the context of creativity is a characteristic feature of the methodology. This allows for measuring the current level of creative skills and revealing internal **creative reserves** and potential areas of development. The questionnaire includes eighty statements, answers to which allowed for assessing the following creativity components: creative thinking, curiosity, originality, imagination, intuition, emotional sensitivity and empathy, a sense of humour, and a creative attitude towards professional activity.

The “Creativity Assessment Packet” (CAP) test is a comprehensive diagnostic system developed by F. Williams (1980) to assess creativity levels. The adapted questionnaire version, tailored to the Ukrainian cultural context, is used to study the creative potential of respondents. The modified version “Creative Characteristics Subtest-Questionnaire” (CPC) edited by N. Belska et al. (2021) was employed. This methodology is designed to measure the level of a personal inclination toward creative behaviour (PICB). It includes thirty-three statements and a four-point bipolar Likert scale.

Variables. In regression analysis, a personal inclination toward creative behaviour was considered a dependent variable for the “CPC” methodology (Belska et al., 2021). Creative thinking, curiosity, originality, imagination, intuition, emotional sensitivity and empathy, a sense of humour, and a creative attitude towards professional activity were regarded as independent variables for the “CT” (Vishnyakova & Tkach, 1998). The types of gender roles, namely masculine, feminine, and androgynous, were considered grouping variables.

Statistical Analysis. The research was conducted employing a confirmatory strategy to predict correlations between independent and dependent variables. The statistical analysis of the results was performed using descriptive statistics and multiple regression analysis. Dispersion analysis was performed with a focus on $p \leq .05$. The effect size was calculated using the η^2 (Eta-squared) criterion. The statistical software “IBM SPSS Statistics”, version 29.0.0.0 (241), was used for statistical operations.

Results

Tabl. 1 presents the descriptive statistics of the studied variables. The Shapiro–Wilk Test (Sh–W) values indicate that there is no normal distribution for almost all variables. A normal distribution was recorded only for the “creativity” variable. Given the results obtained, non-parametric methods were applied for further empirical data processing.

Table 1. Descriptive characteristics of the diagnosed variables (n = 100)

Variables	N	X	SE _x	SD	A	K	Sh–W (p)
Femininity (F)	26	1.1342	.037	.135	1.271	.151	.006
Masculinity (M)	38	-1.3077	.052	.228	-.470	-.688	.007
Androgyny (A)	36	.0194	.146	.623	-.547	-1.372	.005
Individualism score (IS)	100	-0.19	.149	1.060	.080	-1.662	.001
PICB	100	25.92	1.949	13.781	.262	-.845	.133
Creative thinking (the Real Self)	100	7.02	.195	1.378	-.330	.344	.023
Creative thinking (the Ideal Self)	100	8.98	.119	.845	-.384	-.565	.000
Curiosity (the Real Self)	100	7.20	.159	1.125	-.143	-.819	.001
Curiosity (the Ideal Self)	100	8.80	.111	.782	-.160	-.372	.000
Originality (the real Self)	100	6.72	.140	.991	-.186	-.425	.000
Originality (the Ideal Self)	100	8.80	.125	.881	-.710	.971	.000
Imagination (the Real Self)	100	7.44	.167	1.181	-.316	-.727	.001
Imagination (the Ideal Self)	100	9.04	.121	.856	-.485	-.534	.000
Intuition (the Real Self)	100	7.26	.193	1.367	-.444	.166	.007
Intuition (the Ideal Self)	100	9.12	.133	.940	-.709	-.546	.000
Emotional empathy (the Real Self)	100	6.96	.176	1.245	-.385	-.563	.002
Emotional empathy (the Ideal Self)	100	9.00	.134	.948	-1.949	5.962	.000
Sense of Humour (the Real Self)	100	6.76	.144	1.021	-.090	.280	.002
Sense of Humour (the Ideal Self)	100	8.72	.107	.757	-.358	.059	.000
Creative attitude towards the profession (the Real Self)	100	6.96	.183	1.293	-.454	-.306	.003
Creative attitude towards the profession (the Ideal Self)	100	8.88	.127	.895	-.467	-.428	.000

Note: PICB – a personal inclination toward creative behaviour; p – statistical significance; X – the mean; SD – the standard deviation; SE_x – the standard error of the mean; A – asymmetry; E – excess; Sh–W – Shapiro–Wilk’s Test (the lower significance level – $p > .05$). Source: Own research.

Multiple regression analysis with the stepwise introduction of independent variables was performed to identify the predictors affecting the creativity indicator for the “CPC” (Belska et al., 2021). The scales of the “CT” (Vishnyakova & Tkach, 1998) were considered independent variables, which made it possible to assess the level of the young athletes’ creative skills. The coefficient of determination (R^2) given in Tabl. 2 shows the percentage of dispersion explained by the regression model, which is sufficient for psychological studies. Each subsequent model is an improved version of the previous one. All models have statistically significant correlation values. However, Model 4 is the best one in terms of R^2 and adjusted R^2 .

Table 2. Generalised data for the model of regression analysis

Model	R	R^2	Adjusted R^2	SE	Statistics of changes				
					R^2	F	df (1)	df (2)	p (for F)
1	.372 ^a	.138	.120	12.924	.138	7.712	1	48	.008
2	.491 ^b	.241	.209	12.256	.103	6.372	1	47	.015
3	.558 ^c	.311	.266	11.806	.070	4.653	1	46	.036
4	.611 ^d	.373	.318	11.384	.062	4.478	1	45	.040

Note: 1, 2, 3, – models of multiple regression (Model: 1 (a) – predictors: creative thinking (the Real Self); 2 (b) – predictors: creative thinking (the Real Self), creative attitude towards the profession (the Real Self); 3 (c) – predictors: creative thinking (the Real Self); creative attitude towards the profession (the Real Self), creative thinking (the Ideal Self); 4 (d) – predictors: creative thinking (the Real Self); creative attitude towards the profession (the Real Self), creative thinking (the Ideal Self); creative attitude towards the profession (the Ideal Self); R – correlation coefficient of the predictor with the model; R^2 – coefficient of determination; SE – standard error; F – Fisher’s test; p – statistical significance; df (1, 2) – degrees of freedom; Dependent variable: “creativity” (CAP).

Source: Own research.

The differences between the models are statistically significant. The values presented in Tabl. 3 indicate the difference: $R^2 \neq 0$.

Table 3. Indicators of differences in the empirical distribution

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	P
1	Regression	1288.141	1	1288.141	7.712	.008 ^b
	Remainder	8017.539	48	167.032		
	Total	9305.680	49			
2	Regression	2245.377	2	1122.689	7.474	.002 ^c
	Remainder	7060.303	47	150.219		
	Total	9305.680	49			
3	Regression	2893.922	3	964.641	6.921	.001 ^d
	Remainder	6411.758	46	139.386		
	Total	9305.680	49			
4	Regression	3474.238	4	868.559	6.702	.000 ^e
	Remainder	5831.442	45	129.588		
	Total	9305.680	49			

Note: ^a – dependent variable: “creativity” (CAP); 1, 2, 3, 4 – models of multiple regression (see note in Tabl. 2); df (1, 2) – degrees of freedom; F – Fisher’s test; p – statistical significance.

Source: Own research.

The CAP test (Tabl. 4) was used to find the shares of the predictors affecting the indicator of young people’s creativity.

Table 4. Beta coefficients of the independent variables in the model of regression analysis

Coefficients ^a									
Model	Not standardised		Standardised		T	p	VIF	Correlations	
	β	SE	β					Zero-order	Partial
(Constant)	-.209	9.585			-.022	.983			
1 Creative thinking (the Real Self)	.722	1.340	.372		2.777	.008	1.000	.372	.372
(Constant)	-22.495	12.671			-1.775	.082			
2 Creative thinking (the Ideal Self)	3.500	1.274	.350		2.747	.009	1.005	.372	.372
2 Creative attitude towards the profession (the Real Self)	3.427	1.357	.321		2.524	.015	1.005	.346	.346
(Constant)	9.926	19.362			.513	.611			
3 Creative thinking (the Real Self)	5.870	1.647	.587		3.563	.001	1.810	.372	.465

4	Creative attitude towards the profession (the Real Self)	3.967	1.331	.372	2.980	.005	1.042	.346	.402	.365
	Creative thinking (the Ideal Self)	-5.882	2.727	-.361	-2.157	.036	1.866	.100	-.303	-.264
	(Constant)	41.141	23.793		1.729	.091				
	Creative thinking (the Real Self)	5.685	1.591	.568	3.574	.001	1.816	.372	.470	.422
	Creative attitude towards the profession (the Real Self)	5.571	1.491	.523	3.737	.001	1.405	.346	.487	.441
	Creative thinking (the Ideal Self)	-6.026	2.630	-.369	-2.291	.027	1.867	.100	-.323	-.270
	Creative attitude towards the profession (the Ideal Self)	-4.482	2.118	-.291	-2.116	.040	1.359	-.062	-.301	-.250

Note: ^a – dependent variable: “creativity” (CAP); constant – intercept; 1, 2, 3, 4 – multiple regression models (see note in Tabl. 2); β – beta coefficient; SE – standard error; p – statistical significance; t – Student’s criterion; VIF – collinearity index. Source: Own research.

The dominance of feminine, masculine, and androgynous traits in the subjects was identified based on the IS for the “BSRI” (Bem, 1974). Given the absence of a normal distribution, the non-parametric Kruskal-Wallis’s test (*H*) for several independent groups was employed to find differences between the research participants’ gender groups. The Kruskal-Wallis’s test (*H*) was also used to **identify statistically significant differences between some variables in the subjects with feminine, masculine, and androgynous gender identities. The quantified differences and the effect size, η^2 (Eta-squared), are given in Tabl. 5.**

Table 5. Indicators of the comparative analysis of dispersions^a based on the grouping variable “gender”^b

Variables	Femin (n = 13)			Maskul (n = 19)			Androg (n = 18)			P for (H)	Effect size η^2
	X	SE	SD	X	SE	SD	X	SE	SD		
Individualism score (IS)	40.46	2.588	9.333	15.53	2.085	9.088	26.39	2.536	10.760	.000	.516
Creative thinking (the Real Self)	7.92	.309	1.115	6.58	.345	1.502	6.83	.271	1.150	.022	.161
Creative thinking (the Ideal Self)	9.31	.175	.630	8.84	.245	1.068	8.89	.159	0.676	.287	.055
Curiosity (the Real Self)	8.15	.249	.899	6.84	.206	.898	6.89	.267	1.132	.002	.258
Curiosity (the Ideal Self)	9.08	.239	.862	8.68	.154	.671	8.72	.195	.826	.234	.045
Originality (the Real Self)	7.31	.133	.480	6.58	.192	.838	6.44	.294	1.247	.027	.130
Originality (the Ideal Self)	8.85	.154	.555	8.47	.246	1.073	9.11	.179	.758	.136	.100
Imagination (the Real Self)	7.69	.263	.947	7.26	.295	1.284	7.44	.294	1.247	.633	.021
Imagination (the Ideal Self)	8.85	.249	.899	9.00	.202	.882	9.22	.191	.808	.498	.031
Intuition (the Real Self)	7.31	.328	1.182	7.00	.342	1.491	7.50	.326	1.383	.264	.026
Intuition (the Ideal Self)	9.23	.323	1.166	9.16	.191	.834	9.00	.214	.907	.583	.010
Emotional Empathy (the Real Self)	7.23	.257	.927	6.79	.338	1.475	6.94	.286	1.211	.760	.020
Emotional empathy (the Ideal Self)	9.00	.113	.408	8.79	.292	1.273	9.22	.191	.808	.364	.039
Sense of humour (the Real Self)	7.23	.201	.725	6.74	.304	1.327	6.44	.166	.705	.055	.092
Sense of humour (the Ideal Self)	8.69	.175	.630	8.84	.191	.834	8.61	.183	.778	.465	.018
Creative attitude towards the profession (the Real Self)	7.54	.332	1.198	6.42	.318	1.387	7.11	.254	1.079	.078	.125
Creative attitude towards the profession (the Ideal Self)	8.92	.178	.641	8.89	.228	.994	8.83	.232	.985	.975	.002

Note: ^a – the grouping variable – gender; ^b – Kruskal-Wallis H-Test. Source: Own research.

Discriminant analysis was performed to identify the variables that have the greatest impact on the subjects' differentiation based on the "gender" criterion. The calculations indicate the significance of the discriminant model: λ -Wilks': .17814 approx. $F(18,78) = 5.9335$, $p < .000$. The discriminant model included nine variables with λ -Wilks $> .17814$. However, only five variables were statistically significant ($p < .05$).

Table 6. Discriminant Function Analysis Summary

Variables	Wilks (λ)	Partial (λ)	F-remove (1,3)	p-value	Toler.	1-Toler. (R-Sgr.)
PICB	.409	.435	25.279	.000	.758	.241
Curiosity (the Real Self)	.260	.684	8.980	.000	.616	.383
Originality (the Ideal Self)	.231	.770	5.793	.006	.648	.351
Emotional empathy (the Real Self)	.212	.840	3.711	.033	.663	.336
Intuition (the Real Self)	.221	.803	4.756	.014	.650	.349
Originality (the Ideal Self)	.202	.881	2.619	.085	.737	.262
Intuition (the Ideal Self)	.202	.877	2.717	.078	.753	.246
Imagination (the Ideal Self)	.196	.906	2.021	.146	.777	.222
Creative attitude towards the profession (the Real Self)	.195	.912	1.874	.167	.688	.311

Source: Own research.

Tabl. 7 shows the predictors that differentiate the subjects most by the "gender" criterion.

Table 7. Summary of Stepwise Analysis

Variable Enter / Remove	Step	f to ent/rem	df1	df2	p-value	No. of vars.in	Lambda	F-value	df1	df2	p-value
PICB	1	25.093	2	47	.000	1.000	.483	25.093	2	47	.000
Curiosity (the Real Self)	2	7.752	2	46	.001	2.000	.361	15.243	4	92	.000
originality (the Ideal Self)	3	4.088	2	45	.023	3.000	.306	12.112	6	90	.000
Emotional Empathy (the Real Self)	4	1.770	2	44	.182	4.000	.283	9.667	8	88	.000
Intuition (the Real Self)	5	1.728	2	43	.189	5.000	.262	8.195	10	86	.000
Originality (the Real Self)	6	2.560	2	42	.089	6.000	.233	7.480	12	84	.000
Intuition (the Ideal Self)	7	1.976	2	41	.151	7.000	.213	6.829	14	82	.000
Imagination (the Ideal Self)	8	1.831	2	40	.173	8.000	.195	6.315	16	80	.000
Creative attitude towards the profession (the Real Self)	9	1.874	2	39	.167	9.000	.178	5.933	18	78	.000

Source: Own research.

Discussions

Gender identity of young athletes should be considered in the context of the general concept of identity. Being a component of the athlete's self-consciousness and a part of the individual's Self-Concept, identity is a consequence of self-identification in relationships with a social environment or a particular social group. Identity is also a part of the athlete's Self-concept, which is formed through their belonging to society.

We assume that gender identity may affect the individual's creative manifestations expressed in measurable indicators of creativity (creative thinking). The process of theoretical research enabled us to understand that the context of social interactions, where gender identity manifests distinctly, can block creativity through various effects, including social, cognitive, group effects, among others. At the same time, gender differences in creativity are more evident in the style and types of task performance and the levels of self-assessment of creativity than in the level of creative potential in a competitive sports field.

At the empirical stage, masculine ($X = -1.3077 \pm 0.052$; $SD = 0.228$), feminine ($X = 1.1342 \pm 0.037$; $SD = 0.135$), and androgynous ($X = -0.0194 \pm 0.146$; $SD = 0.623$) traits were found in the surveyed young female athletes and young male athletes (see Tabl. 1). Interviewing the respondents revealed that feminine female athletes more often indicated their gender and used feminine nouns to denote their occupation (profession, hobby, or other activity), whereas androgynous female athletes mainly did not indicate their gender.

Masculine men mostly highlighted their gender when characterising themselves. Androgynous male athletes also emphasised their gender, and only a third of them did not mention it.

The non-parametric Kruskal-Wallis's test (H) for several independent groups was employed to identify statistically significant differences in the variable "personal inclination toward creative behaviour" based on the "CPC" (Belska et al., 2021). ($H = 24.302, p \leq .01, \eta^2 = .516$) were characteristics of the subjects with masculine, feminine, and androgynous identities. Feminine female athletes were found to demonstrate above-medium, high, and very high levels of a personal inclination toward creative behaviour. Masculine male athletes reported medium and below-medium levels of the PICB. A medium level of the PICB was recorded in androgynous female athletes and masculine male athletes.

Gender differences in creative manifestations were diagnosed on the following scales of the "CT" (Vishnyakova & Tkach, 1998): creative thinking (the Real Self) ($H = 7.625, p < .05, \eta^2 = .161$), curiosity (the Real Self) ($H = 12.865, p < .01, \eta^2 = .258$), and originality (the Real Self) ($H = 7.233, p < .05, \eta^2 = .130$). Such variables as a sense of humour (the Real Self) ($p = .055, \eta^2 = .092$) and a creative attitude towards the **profession** ($p = .078, \eta^2 = .125$) **approach the zone of uncertainty** (see Tabl. 5).

Regression analysis allowed for identifying the share of predictors accounting for the indicator of young athletes' creativity according to the "CPC" (Belska et al., 2021). The fourth model is considered the most complete. It contains such predictors as creative thinking (the Real Self) ($\beta = .568, p < .01$), a creative attitude towards the profession (the Real Self) ($\beta = .523, p < .01$), creative thinking (the Ideal Self) ($\beta = -.369, p < .05$), and a creative attitude towards the profession (the Ideal Self) ($\beta = -.291, p < .05$) (see Tabl. 4). Not all the above predictors are differentiated by gender identity and significantly manifested in the subjects.

Discriminant analysis showed that such variables as "creativity" "CPC" (Belska et al., 2021), "curiosity (the Real Self)", "originality (the Ideal Self)", "emotional empathy (the Real Self)" and "intuition (the Real Self)" are the most differentiated by the "gender" criterion. Their individual λ -Wilks coefficients are higher than for the entire discriminant model (λ -Wilks $> .17814$) (see Tabl. 6). Stepwise analysis testified that the variable "personal inclination toward creative behaviour" "CPC" (Belska et al., 2021), showing the highest coefficient when introduced into the model ($f = 25.09368, p < .01$), is the most significant one. It is followed by "curiosity" ($f = 7.75220, p < .01$) and "originality" ($f = 4.088, p < .05$) (see Tabl. 7).

The results obtained are consistent with the studies of other researchers. Examining the manifestations of gender differences in the structure creativity, O. Chorna (2024) found differences and similarities in the development of respondents' creative imagination. The identified significant differences in verbal fantasies proved to be bigger in male representatives, as measured by the criteria of productivity and flexibility. At the same time, women respondents significantly surpassed boys in terms of the indicators of non-verbal fantasies. Undoubtedly, this concerns not gender differences in the literal sense of the word but gender differentiation, since our research diagnosed feminine traits in female athletes and masculine traits in male athletes. Therefore, we dared to make such a comparison.

The study by M. Tkalych et al. (2020) asserts that identity, regardless of gender, encompasses stereotypical and individual traits. In particular, the gender component of the Self-concept, which is characteristic of both male and female athletes, is filled with personal characteristics and stereotypical notions of the masculine and feminine, the norms of typical gender-related behaviours (mainly in relationships with the opposite sex, maternal and paternal roles, emotional (female athletes) and instrumental (male athletes) functions) at personal and interpersonal levels. Research shows that gender norms and stereotypes are inherent in social, professional, family, and sexual spheres. They are involved in perceiving external and internal gender-based personality traits. Researchers conclude that female athletes' gender identity has a relational type, whereas male athletes' gender identity is instrumental and less emotional and communicative (Tkalych et al. (2020).

Conclusions

The study analysed and substantiated the specificity of young athletes' creative thinking and gender identity. It showed that gender identity, as a component of the athlete's self-consciousness and a part of the individual's Self-concept, is a consequence of self-identification in relationships with a social environment or a particular social group.

The research empirically diagnosed the subjects with feminine, masculine and androgynous traits, as well as the specificity of manifesting creative thinking components. Female athletes with feminine traits were found to show medium, high, and very high levels of a personal inclination toward creative behaviour. Men with masculine traits demonstrated medium or below-medium levels of creative inclinations. Female athletes and male athletes with androgynous traits exhibited medium levels of creative inclinations.

Multiple regression with the stepwise introduction of independent variables was performed to identify the predictors affecting the variable "personal inclination toward creative behaviour". Regression analysis results allowed for identifying the contribution of certain predictors in accounting for young athletes' creativity levels, which were measured using the "CPC" (Belska et al., 2021). The most complete model includes the following predictors: creative thinking (the Real Self), a creative attitude towards the profession (the Real Self), creative thinking (the Ideal Self), and a creative attitude towards the profession (the Ideal Self).

Discriminant analysis revealed that the variables “personal inclination toward the creative behavior”, “curiosity” (the Real Self), “originality” (the Ideal Self), “emotional empathy” (the Real Self), and “intuition” (the Real Self) differentiate the respondents most clearly by gender in the context of difficult conditions of sports activities.

Declaration of generative AI and AI-assisted technologies in the writing process

No AI-assisted technologies were used in the writing, editing, or data analysis for this manuscript. All work is original and completed solely by the listed authors.

Data availability statement

The datasets generated during and/or analysed during the current are available from the corresponding author on reasonable request.

Ethics Statement

This research was conducted in accordance with the principles of the Declaration of Helsinki. Respondents provided personal written consent to participate in the study, after which they received access to the questionnaires.

Conflict of Interests

The authors report there are no competing interests to declare. Authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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