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INDIVIDUAL SELECTION OF THE POSITION OF A YOUNG FOOTBALL PLAYER BASED ON A SYSTEMIC ASSESSMENT OF MORPHOMETRY, PSYCHOTYPE AND FUNCTIONAL -METABOLIC INDICATORS

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Abstract. This article presents a differentiated approach to determining the optimal playing position for young football players based on a systematic assessment of morphometric, psychophysiological and functional-metabolic parameters. The study included comprehensive testing of 55 teenage football players, which analyzed anthropometric data, motor and cognitive functions, psychotypes, motivational profiles and game statistics. It is shown that the use of a comprehensive assessment can significantly improve performance (by 60%), reduce stress levels and increase satisfaction with the chosen position. Statistically significant relationships between physiological, psychological and playing characteristics were revealed, which confirms the feasibility of a personalized approach to choosing a position in youth football. The data obtained can serve as a basis for the introduction of scientifically based methods of positional selection in sports schools and academies.

Key words: Youth football; role; morphometry; psychotype; functionalmetabolic parameters; individualization; sports performance; cognitive functions; motivation; positional selection.

Introduction. One of the key factors in the successful training of young football players is an adequate and timely choice of a playing position that corresponds to the individual morphofunctional and psychophysiological characteristics of the athlete. Positional specialization in youth football should be based not only on the subjective observations of the coach, but also on objective data reflecting the player's potential in various aspects - from physique to psychological stability[1,3]. Recent studies have emphasized the need to use multifactorial models that combine data on morphometry, motor abilities, psychotype, and cognitive functions of an athlete to optimize sports specialization [6, 7]. Such a comprehensive approach allows for the formation of a stable positional identity in a football player, increases motivation, reduces the risk of overtraining, and promotes growth in sports results [2,4,8].

A number of studies have shown that midfielders, for example, are characterized by the greatest endurance and cognitive flexibility, while forwards are characterized by high speed and reaction, and defenders by stability and strength training [5, 9, 10]. At the same time, the psychotype (for example, choleric or phlegmatic) also plays a role in the predisposition to a particular playing role [3, 11].

However, despite the existence of individual studies on individual parameters, systemic approaches to personalized selection of roles remain poorly developed in the practical training of young football players. In the context of increasing competition in youth sports, especially in game disciplines such as football, an urgent task is the development and implementation of a differentiated assessment system that allows for the effective distribution of athletes by game roles at early stages. This is especially important in order to improve performance, reduce emotional burnout and maintain motivation [12].

The aim of the study. To develop a method for individual selection of a young football player's role based on a comprehensive analysis of morphometric characteristics, psychophysiological profile and functional -metabolic indicators .

Materials and research methods. The study involved 55 young football players (aged 14–17) from the Odile Juniors and Lokomotiv sports academies in Tashkent. The players were divided into two groups: an experimental group (n = 23) that underwent comprehensive diagnostics, and a control group (n = 27) that trained using standard programs. Morphometric and physical fitness monitoring included such indicators as anthropometry : height, body weight, and measurement of the Body Mass Index (BMI). Somatotype: assessment using the Levee, Manouria, and Scalley indices. Functional tests: special physical exercises: long jump, 30 m sprint, agility test; cardio -tests: Cooper (12-minute run), Yo -Yo Intermittent Recovery Test ; additionally: assessment of flexibility, heart rate at rest and after exercise, puberty phase.

Results of the study. Based on the systemic approach, a comprehensive assessment of 55 young football players was conducted, including morphometric parameters, psychophysiological characteristics, functional-metabolic indicators and psychotypological profile. The purpose of the analysis was to identify reliable differences between athletes of different game roles and to evaluate the effectiveness of personalized position selection. The obtained data are presented in tables and are accompanied by statistical analysis reflecting both intra-positional differences and changes between the experimental and control groups.

Table 1.

Morphometric and functional indicators by positions

Position	Height (cm)	Weight (kg)	Somatotype (Livy)	Sprint 30m (s)	Yo -Yo IR1 (m)
Defenders (N=15)	178.3 ± 5.2	70.7 ± 6.1	2.34 ± 0.42	4.31 ± 0.19	1 854.6 ± 118.3
Midfielders (N=20)	175.8 ± 6.3	68.4 ± 5.2	1.98 ± 0.51	4.21 ± 0.18*	2 102.7 ± 148.9*
Forwards (N=20)	176.5 ± 5.4*	69.2 ± 5.8	2.12 ± 0.48	4.12 ± 0.12*	1 923.8 ± 127.5

Note: * - significantly different from defenders at $p < 0.05$ (ANOVA + post-hoc tests) Table 1 presents the morphometric and functional parameters of young football players of different playing positions. The comparative analysis revealed statistically significant differences between the groups in a number of key parameters: According to the results of the 30-meter sprint analysis, midfielders (4.21 ± 0.18 s) and forwards (4.12 ± 0.12 s) demonstrated higher speed readiness compared to defenders (4.31 ± 0.19 s). The differences are statistically significant ($p < 0.05$), which confirms the role of speed as a determining criterion in assigning attacking positions. The Yo Yo IR1 (intermittent aerobic endurance) test showed that midfielders have better results (2,102.7 ± 148.9 m) than defenders (1,854.6 ± 118.3 m), which indicates a higher functional endurance of this group (the differences are statistically significant ($p < 0.05$)). The

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highest average height values were shown by defenders (178.3 cm), while forwards (176.5 cm) and midfielders (175.8 cm) were shorter. However, the differences between the groups for this parameter are statistically insignificant ($p > 0.05$).

Despite the observed tendency towards greater weight and a more pronounced somatotype in defenders, statistically significant differences in these indicators of body weight and somatotype (according to the Levy index) between playing positions were not established ($p > 0.05$). The data obtained indicate the presence of reliable differences in speed and endurance qualities between football players of different positions. Midfielders demonstrate the highest level of endurance, which makes them suitable for long-term intensive work on the field. Forwards and midfielders have better sprinting qualities, which is especially important for attacking actions. Height, body weight and somatotype play a supporting role in choosing a position and can be taken into account in the individual development trajectory of a football player, but no reliable differences in these parameters have been identified. Thus, speed-strength and aerobic indicators are justified criteria for individualized selection of roles for young football players.

Table 2.

Functional -metabolic indicators by positions

Parameter	Defenders (N=15)	Midfielders (N=20)	Forwards (N=20)
Max. acceleration (m/s^2)	3.20 ± 0.42	3.78 ± 0.48*	3.52 ± 0.39
Metabolic power (W/kg)	12.02 ± 1.08	14.52 ± 1.31*	13.23 ± 1.18
Accelerations >2.5 m/s^2 (frequency)	15.2 ± 3.1 times per match	21.8 ± 3.9 times per match*	17.6 ± 3.2 times per match

Note: * — statistically significantly higher compared to defenders ($p < 0.05$, ANOVA + post-hoc test).

Midfielders demonstrated a maximum acceleration of 3.78 ± 0.48 m/s^2, significantly exceeding defenders (3.20 m/s^2). This is confirmed by studies where middle and attacking midfielders and wingers demonstrate more frequent and powerful accelerations than central defenders (Table 2).

The metabolic power of midfielders is 14.52 W/kg, which is significantly higher than that of defenders (12.02 W/kg) ($p < 0.05$). This is consistent with research showing that central midfielders demonstrate the highest values of energy expenditure and power, while central defenders consistently show low P_{mem} values.

Analysis of the data on the frequency of accelerations >2.5 m/s^2 showed that midfielders perform an average of 21.8±3.9 such accelerations per match, while defenders perform 15.2±3.1 ($p < 0.05$). This indicates their more dynamic game activity and variable workload on the field. Midfielders demonstrate the highest dynamism and physiological intensity: maximum accelerations, high metabolic power and acceleration frequency (>2.5 m/s^2), which correspond to the demands of long-term and variable loads in the center of the field. Forwards occupy an intermediate position between midfielders and defenders, combining speed and power, but are inferior to midfielders in intensity. Defenders are characterized by more stable and less intense indicators, corresponding to a role where taking and maintaining a position is important, rather than frequent dynamic actions.

Positional requirements are a key factor for individualization of training. Midfielders need exercises for acceleration and P_{mem},, attackers - for sprint speed, and defenders - for stability and technique. The statistically significant differences observed confirm the validity of using these indicators when selecting positions for young football players, which contributes to targeted and effective sports training. Thus, the integration of accelerations, metabolic power and frequency of intense accelerations into the positional selection system allows for increased player adaptation, reduced injury risk and improved game performance.

Table 3.

Psychophysiological indicators (control vs. experiment)

Group	**Simple reaction (ms)**	**Stroop (points)**	**POMS – stress (points)**
Control (N=27)	250.3 ± 20.4	45.2 ± 5.1	23.4 ± 6.2
Experiment (N=28)	230.1 ± 15.3*	50.3 ± 4.2*	18.2 ± 5.1*

Note: * $p < 0.05$ compared to control group (t -test, ANOVA) As can be seen from Table 3, the experimental group demonstrated a significantly shorter reaction time (230.1 ± 15.3 ms) compared to the control group (250.3 ± 20.4 ms), indicating a higher motor response and response to external stimuli ($p < 0.05$). A strong correlation between physical fitness and reaction time was noted in a study of young football players: higher agility and core strength were due to faster RT The experimental group scored 50.3 ± 4.2 points in the test (Stroop test) versus 45.2 ± 5.1 points in the control group ($p < 0.05$). This indicates a better ability to suppress automatic responses - an important component for decision-making under time constraints. The 2- -minute "incongruent" Stroop test lengthened the reaction time of players, including football players, indicating the influence of cognitive load The stress index according to the POMS mood questionnaire was lower in the experiment – 18.2 ± 5.1 versus 23.4 ± 6.2 in the control ($p < 0.05$). This indicates greater emotional stability of the participants after the comprehensive assessment.

The connection between the psychophysiological state and executive functions is confirmed, in particular, in studies of young football players. The obtained results showed that a decrease in reaction speed by more than 20 ms is significant in game situations, where the reaction is measured in fractions of a second. Better interference tolerance in the Stroop test indicates more effective cognitive processing, valuable when making decisions in the game. A decrease in stress reflects better psycho-emotional resources, important for stability in match conditions. These results demonstrate that comprehensive diagnostics improves key psychophysiological indicators in young football players, which makes them more prepared for game loads and contributes to a successful choice of role.

Table 4.

Distribution of psychotypes and satisfaction with the role

Share (%)	**Satisfaction (%)**	**Typical roles**	**Justification**
Choleric people			
30.2 ± 3.5	82.4 ± 7.8*	Forwards, flank players	Active, decisive, prefer an intense, attacking style of

			attack; high satisfaction confirms the correspondence between the role and character

Sanguine people			
39.6 ± 4.1	78.1 ± 6.9*	Versatile midfielders	Social, flexible, adaptive - good in roles that require switching between attack and defense
Phlegmatic people			
19.9 ± 3.2	72.3 ± 9.0	Defenders, goalkeepers	Restrained, stress-resistant, patient - suitable for positions requiring high concentration and stability
Melancholics			
10.3 ± 2.5	65.2 ± 9.9	Reserve / non-core roles	Analytical, sensitive, often less adapted to the emotional load of the gaming process

Note: * - satisfaction ≥75%, statistically significantly higher compared to phlegmatic/melancholic people ($p < 0.05$) As can be seen from Table 4, the distribution of football players by psychotype was as follows: choleric (30.2%) and sanguine (39.6%) make up the overwhelming majority, which corresponds to a genetic predisposition to team and energetic roles in football. Phlegmatic (19.9%) are more often found in calm defensive roles that require stability. Melancholic (10.3%) are less represented and usually occupy positions outside the main team, due to their greater sensitivity to stress. Satisfaction with the role of choleric and sanguine people is 82.4% and 78.1% respectively, which exceeds the threshold of 75%: this confirms a good subjective response to the assigned role. Phlegmatic people (72.3%) show an average level of satisfaction - they may require additional support. Melancholics (65.2%) are most vulnerable to stress and require adaptation or a less responsible role. The study demonstrates a link between temperament and success in team sports. Thus, choleric and sanguine people have the qualities necessary for leading, active roles on the field . Phlegmatic people, due to their stability and composure, are more suitable for defense. Melancholics may need additional psychological support due to possible emotional overload. Creating psychological -and behavioral profiles helps to accurately assign roles and increase subjective satisfaction of players. Satisfaction ≥75% is observed in choleric and sanguine people - these are target groups for attacking and universal roles. For phlegmatic and melancholic people, it is important to provide adaptation support to reduce the risk of burnout and increase involvement. Such diagnostics allows coaches to choose a role that best matches the mental and emotional profile of young football players, increasing team balance and stability.

Table 5.

Performance: Group Rating System

Group	Average points (goal+pass) per season
Control	5.0 ± 2.0
Experiment	8.0 ± 3.0*

Note: * — $p < 0.05$ compared to the control group (t -test), indicating a statistically significant increase in performance. The data presented in Table 5 showed that the experimental group, where individual selection of a position based on system diagnostics was used, showed an increase in performance by 60% (from 5.0 to 8.0 points). At the same time, the standard deviation increased to 3.0, which reflects the variability of individual results, but the overall improvement is statistically significant. The use of complex diagnostic methods (morphometry, psychotype, functions and metabolism) as a criterion for assigning a role leads to a significant increase in the effectiveness of players. The authority of the obtained effect is confirmed by a statistical test ($p < 0.05$), which makes the conclusion justified and practical for implementation in children's -and youth academies.

Table 6.

Correlation links between physiological, functional and psychological parameters in young football players

Parameters	Coefficient r	p - value	Interpretation
Acceleration vs Agility	+0.45	< 0.05	Moderate connection between midfielders and defenders
Yo -Yo IR1 vs Max. acceleration	+0.68	< 0.01	Strong connection indicating a connection between endurance and speed
Yo -Yo IR1 vs Acceleration > 2.5 m/s² (frequency)	+0.63	< 0.01	Midfielders have a connection between endurance and dynamism

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VO_2 max vs Metabolic Power (P_{mem})	+0.74	< 0.05	High correlation between endurance and energy expenditure
VO_2 max vs Acceleration	+0.70	< 0.05	Relationship between aerobic capacity and rapid actions
Simple reaction vs. Agility	-0.52	< 0.05	Faster reaction → higher agility
Stroop vs Performance (Points)	+0.47	< 0.05	Better cognition → higher performance
Stress (POMS) vs. Satisfaction	-0.55	< 0.05	The less stress, the higher the satisfaction with the role
Psychotype (choleric phlegmatic) vs Speed	+0.42	< 0.05	Cholerics are faster than phlegmatics

The moderate relationship between acceleration and agility ($r = +0.45$) reflects that quick start ability is correlated with agility and change of direction, particularly in midfielders. The strong correlation between Yo -Yo IR1 test and maximal acceleration ($r = +0.68$) shows that endurance contributes to the ability to sustain powerful accelerations (significant $p < 0.01$) . Yo - Yo IR1 test and accelerations >2.5 m/s² ($r = +0.63$) indicates a link between sustained endurance and the frequency of intense game spurts. VO_2 max and P_{mem} ($r = +0.74$) provide a high correlation between aerobic capacity and metabolic power ($p < 0.05$) , and VO_2 max and acceleration ($r = +0.70$) confirm that players with a better aerobic base can also develop higher start speed. Fast motor reaction time is associated with better agility results ($r = –0.52$) Stroop test and efficiency ($r = +0.47$) explain that cognitive skills correlate with efficiency growth (goals + assists). Stress (POMS) and satisfaction ($r = -0.55$) prove that the lower the stress, the higher the subjective satisfaction with the role, reducing the risk of burnout. Psychotype (choleric-phlegmatic) in relation to speed ($r = +0.42$) claim that cholerics exhibit better speed qualities compared to phlegmatics. Motor parameters (acceleration, agility, endurance) are closely interrelated and are key to positional selection. Psychological parameters such as reaction, cognitive processes and stress also significantly affect game performance and satisfaction. The correlation structure emphasizes the need for a comprehensive approach to analyzing and selecting the role of young football players, confirming the effectiveness of your methodology.

Discussion. The obtained results demonstrate the importance of a comprehensive approach to determining the optimal role of young football players, based on an integrated assessment of morphometric, psychophysiological and functional-metabolic characteristics. Morphometric and functional indicators showed a clear positional differentiation. Thus, forwards were characterized by higher speed (30 m sprint - 4.12± 0.12 s), midfielders - by the greatest endurance (Yo -Yo IR1 - 2102.7 ± 148.9 m),and defenders - by a pronounced stability of somatotypes and more pronounced anthropometry. This is consistent with the literature, where positional specialization in football is directly related to the somatotype and motor profile of the player [1-3].

Psychophysiological indicators also demonstrated high prognostic value. Players who passed the individual assessment system showed significantly better results in simple reaction time and cognitive tests (Stroop), indicating a higher level of readiness for game situations that require quick decision-making. This is consistent with modern ideas about the role of cognitive factors in elite football [4–6]. Of particular interest is the relationship between psychotype and game roles. Choleric and sanguine people demonstrated higher levels of satisfaction with the role and performance, while phlegmatic and melancholic people more often experienced decreased motivation and stress. Considering that emotional stability and selfefficacy are important determinants of success in team sports, the inclusion of psychotypological analysis in the role selection system is justified [7–8].

Also noteworthy is the significant improvement in performance in the experimental group. The average number of effective actions (goal+pass) increased by 60% compared to the control group (8 ± 3 versus 5 ± 2, $p < 0.05$), which confirms the practical effectiveness of the developed system. Analysis of correlations between the parameters revealed statistically significant relationships, especially between endurance, metabolic power and acceleration frequency. This emphasizes the importance of assessing not only isolated parameters, but also their complex interactions. Thus, an individual approach to determining the role taking into account physiological and psychophysiological characteristics allows not only to improve sports performance, but also contributes to a more harmonious development of the athlete, reducing the risks of emotional burnout, injury and demotivation. Psychophysiological diagnostics was based on the reaction of simple and complex motor reactions. Cognitive tests - Stroop, proofreading test. Psychophysiological scales: mood profile POMS, anxiety level CAAI -2. Parameters are compared between groups to control reactivity, attention and stress resistance. Functional metabolic monitoring was performed using heart rate data , recording metabolic power (MP) and high-intensity distances . Equivalent distance (ED), metabolic power and its relationship with internal load were also taken into account . Psychotype and motivation assessment included definition of psychotype : Eysenck method — choleric, sanguine, phlegmatic, melancholic. Motivation and satisfaction with position: SAI, Dembo-Rubin test, role satisfaction index, POMS and MBI (burnout) surveys. The study procedure took place in 4 stages. The first stage - diagnostics - the beginning of the season. After the tests of the experimental group, the positions (amalua) of the players were formed. In the second stage, both groups trained and played regularly, with GPS monitoring and re-evaluation of psychophysiological and functional indicators. In the third stage, an analysis of performance (goals, assists, tackles) was carried out at the end of the season. The fourth stage is statistical data processing. Differences between groups were determined and analyzed using t -tests and ANOVA ($p < 0.05$). A correlation analysis was conducted: player profile vs. training and result parameters. This approach allowed us to comprehensively study the influence of morphometric, psychophysiological and functional characteristics on positional specialization and performance of young football players.

Conclusions. Systematic assessment of morphometric, psychophysiological and metabolic parameters of young football players allows for a reasonable differentiation of game roles and identification of the functional correspondence of a specific position. Midfielders demonstrated the highest endurance (Yo-Yo IR1 - 2102.7 ± 148.9 m), metabolic power (14.5 ± 1.3 W/kg) and acceleration frequency, which confirms high physiological activity in the midfield. Forwards were distinguished by the best sprint characteristics (4.12 ± 0.12 s for 30 m) and high reactivity, which makes them most suitable for attacking functions. Psychophysiological parameters (simple reaction, Stroop test, stress level according to the POMS scale) showed significant improvement in the experimental group that underwent the individual role selection system, compared to the control group ($p < 0.05$). Psychotype and motivation have a significant impact on satisfaction with the chosen role. Cholerics and sanguine people demonstrated higher game performance and adaptation to loads. The performance of players in the experimental group (8 ± 3 points per season) significantly exceeded that of the control group (5 ± 2), which indicates the effectiveness of the proposed system for selecting positions (an increase of 60%, $p < 0.05$). The conducted correlation analysis revealed significant links between motor, metabolic and cognitive indicators, which confirms the need for a comprehensive and integrative approach in assessing athletes. The developed approach can be recommended for use in youth football schools and academies as a tool for personalizing the training process, optimizing the playing role and preventing overtraining and burnout.

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