# CONCEPTUAL MODEL OF INDIVIDUALIZATION BASED ON STRENGTH, SPEED, AND COORDINATION CHARACTERISTICS

**Yevhen Pylypenko**
Independent Researcher and Coach, Ukraine
e-mail: yevhenpylypenko82@gmail.com, orcid.org/0009-0001-8152-7386

**Summary**

The study for the first time identified and classified a complete group of seven typical fighting styles in modern freestyle wrestling: "power", "game", "distance-tempo", "clincher", "hold-tempo", "high-reliability", and "even-developed". Each style is represented through a complex of model characteristics that combine five fundamental groups of parameters: morphological features (mass-height indices and body proportions), psychological qualities (creativity, discipline, psycho-emotional stability), the level of special physical and technical-tactical fitness, and kinematic characteristics of a competitive match (reliability of attack and defense, effectiveness in standing and parterre positions). A theoretical model of style genesis was scientifically substantiated, explaining the formation of new combat manners through the emergence effect when combining and dominating certain motor qualities in combination with the athlete's physique and psyche. It was established that transitional forms of styles are formed due to the transformation of basic properties, where success is achieved through specific compensatory mechanisms and the realization of individual advantages.

It was proven that the "favorite technique" constitutes the core of the individual style structure, the choice of which directly correlates with the topography of muscle strength and anthropometric parameters. A method for the objectification of technical mastery control was introduced using patented training devices. The device for practicing the "rolling turn" (nakat) allows for a quantitative assessment of the mannequin's compression force, maximum torque, and execution time, while the "shvung" device provides measurements of explosive power, force, and speed of preparatory actions. A strategic three-stage individualization algorithm was proposed: the stage of predisposition detection (up to 1 year), the stage of style formation (4.5–5.5 years), and the stage of perfection throughout the entire sports career. Objective criteria for predicting development were established: a correlation coefficient $r > 0.3$ indicates a predisposition to a style, while $r > 0.5$ indicates its final formation. The effectiveness of the approach was experimentally confirmed: in the experimental group, the number of wrestlers with a high degree of style formation increased by 52.4%, and the average degree of compliance with model fitness profiles increased by 45.2%. The reliability of the method was confirmed by its coincidence with expert evaluations of leading coaches in 94.4% of cases.

**Objective.** The research aims to develop and scientifically substantiate a holistic system of individualization for wrestlers' preparation, based on the dialectical unity of an athlete's natural predispositions and the requirements of modern competitive activity under conditions of constant intensification of Olympic sports and frequent changes in competition rules.

**Conclusions.** Implementation of a holistic individualization system based on typical styles allows for a transition from a subjective search for a fighting manner to a scientifically managed process of training. This ensures the maximum realization of the wrestler's natural

potential, minimizes errors in the selection of promising cadet and junior athletes, and significantly increases wrestlers' competitiveness in elite sports.

**Key words:** wrestling, individualization of training, fighting styles, model characteristics, favorite technique, management system, correlation analysis, training devices, long-term preparation.

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## 1. Introduction

In the modern system of sports science, the theory and methodology of individualized athletic training remain among the most pressing areas of research. Today, the issue of individualizing training for wrestlers has become significantly more acute due to the intense commercialization of Olympic sports and constant changes to competition rules aimed at increasing the spectacle, intensity, and dynamism of matches. Modern wrestling has become a highly intense activity that places critical demands on all aspects of an athlete's specialized training.

Improving the effectiveness of the training process is possible only through strict individualization of its management. This is particularly significant in freestyle and Greco-Roman wrestling, where high results can be achieved through substantially different approaches to conducting a match, making it practically impossible to create a single model of the "ideal wrestler." Furthermore, the limited opportunities to select promising children in the club force coaches to adopt an individualized approach to each talented athlete.

The theoretical and methodological foundations of managing the sports training process are viewed in modern sports science as a systematically organized process of planning, monitoring, and adjusting the training impact on the athlete using feedback mechanisms.

Ukrainian researchers S. V. Latyshev *(Latyshev,2014)*, Y. V. Tropin *(Tropin, 2019)*, T. O. Bompa *(Bompa & Buzzichelli, 2019)*, G. G. Haff *(Haff & Triplett, 2016)*, and M. H. Stone *(Stone et al.,2007)* have addressed technical and tactical preparedness, individual wrestling styles, age-specific characteristics, and factors influencing wrestlers' success. Recent studies focus on athletes' functional capabilities, anthropometric traits, and details of their competitions when optimizing their technical and tactical arsenals.

In combat sports research, the studies by E. Franchini, B. Miarka, and W. Błach *(Błach, et al. 2021)* are important because they analyze technical and tactical training, taking into account the athlete's profile, match structure, and competition specifics. K. Sterkowicz-Przybycień *(Sterkowicz-Przybycień, et al., 2011)*, K. Škugor *(Škugor et al. ,2023)*, and O. R. Barley *(Barley et al., 2021)* discuss age differences, functional abilities, and factors influencing young athletes' success. E. Franchini, D. A. S. Soto *(Soto & Franchini, 2020)*, and W. Wasacz *(Wąsacz et al., 2022)*, explore optimization of technical and tactical arsenals using athletes' anthropometric, biomechanical, and weight characteristics.

Despite considerable scientific progress, comprehensive knowledge of individualized wrestling training remains undeveloped. Most studies are fragmented and focus mainly on elite athletes. Key gaps include: no scientific methods for early identification of young wrestlers' style predisposition; no clear link between individual style stages and long-term training phases; and no unified concept that connects natural aptitudes with modern competitive demands in a coherent management system.

This leads the coach and athlete to search for an individual style, often spontaneously and through trial and error, which significantly reduces the competitiveness of wrestlers on the international stage.

**The aim of the study** is to develop and provide a scientific and methodological justification for a comprehensive, individualized training system for wrestlers, based on identifying each athlete's natural inclination toward one of seven typical wrestling styles.

**The relevance of this research** topic stems from the need for a fundamental reevaluation of athlete training approaches in the current context of Olympic sports development.

**The research topic**, which significantly complements current approaches, involves moving away from the search for a single model of the "ideal wrestler" toward managing training through the dialectical unity of the athlete's natural qualities and the demands of modern competitive activity. Unlike existing fragmented studies, our research considers individualization as a complex open management system encompassing the entire process of long-term improvement – from early identification of aptitude to the conclusion of a sports career.

To achieve these objectives, the research employs a **variety of methods**: system analysis and synthesis, modeling, analysis of competitive activity, correlation analysis, and expert assessment.

## 2. Presentation of the main research material

In modern freestyle wrestling, it has been shown that high athletic performance can be achieved across various styles; therefore, a standardized "ideal model" of a wrestler does not reflect the actual diversity of competitive activity. Within the framework of the concept of individualized training for wrestlers, S. V. Latyshev substantiated the proposition regarding the existence of typical styles of combat, which are formed as a result of the combination of anthropometric characteristics, the level of development of motor skills, psychophysiological characteristics, and the specifics of executing technical and tactical actions in competitive conditions. That is why the individualization of wrestling training should be based not on average standards, but on identifying an athlete's dominant qualities and their targeted improvement (*Latyshev, 2014*).

Analyzing the competitive performance of highly skilled wrestlers has enabled the identification and theoretical substantiation of seven typical wrestling styles. Every highly skilled wrestler can be assigned to one of these styles: "power wrestler," "game wrestler," "long-distance tempo wrestler," "grappler," "grip tempo wrestler," "highly reliable," and "well-rounded" *(Malinskyi, 1999).*

Each style is defined by dominant motor qualities, body type, and psychological traits:

*"Power-type"*: marked by strong maximum and explosive strength, short stature, and resilience.

*"Skill-oriented"*: defined by high coordination, flexibility, intellect, and creativity.

*"Long-distance sprinter"*: noted for highly specialized endurance.

*"Close-range fighter"*: shows flexibility and strength endurance in close, non-standard positions (*Latyshev, 2014*).

The developed theoretical model indicates that new typical styles are formed from the basic styles: "Power Player," "Playmaker," and "Pace Setter." When the characteristics of one basic style decrease and those of others increase in a certain ratio, a new style emerges. This is an emergence effect, where new advantageous qualities appear.

When the specific features of the basic styles are minimally expressed, a "balanced" style emerges, in which success is achieved through "signature" moves and counterattacks perfected to the point of automaticity (*Latyshev, 2014*).

A key tenet of modern methodology is that a wrestler's individual style is not limited to a set of techniques, but rather constitutes a comprehensive system of technical and tactical actions, behavioral responses, and methods for utilizing functional capabilities in specific match situations. In this context, a promising approach is one in which the core of individualization is not an abstract "universal technique," but rather the set of actions most effective for the athlete, developed with consideration of their morphofunctional, psychophysiological, and coordination characteristics. This approach is consistent with studies that consider model characteristics of technical-tactical readiness, sensorimotor reactions, and functional state as the foundation for differentiated management of the training process (*Latyshev, 2014*).

The age-related aspect of individualization becomes particularly significant. For young wrestlers in preliminary training groups, models of physical fitness characteristics have been proposed that can serve as a basis for evaluating and adjusting training interventions. This allows the training process to be constructed not only on the basis of chronological age or athletic rank, but also on the actual level of development of key qualities, functional state, and readiness to master more complex technical and tactical actions *(Cieśliński et al., 2021)*. Thus, a modern system for managing wrestlers' training must combine analysis of fighting style, fitness model characteristics, data from ongoing monitoring, and stage-by-stage adjustment of training methods, ensuring more precise individualization and enhancing the effectiveness of long-term athletic training.

In contemporary research on the theory and methodology of sports wrestling, the individualization of training is considered a key condition for improving the effectiveness of the training process. Ukrainian researchers argue that a wrestler's success is determined not only by their overall level of physical fitness but also by the alignment of training methods with their individual technical-tactical, psychophysiological, and morphofunctional characteristics. In particular, in the works of S. Latyshev, individualization is linked to the development of a wrestling style, while in the studies by Y. Tropin *(Tropin, 2019)*, L. Podrygal, N. Boychenko, R. Pervachuk, and V. Romanenko, it is linked to the construction of model characteristics of wrestlers' physical, technical-tactical, and sensorimotor fitness *(Latyshev at al., 2014)*.

One of the most extensively studied areas is stylistic differentiation among wrestlers. S. Latyshev's study introduces a training program designed to help each wrestler develop an individual style. The experiment included 51 wrestlers aged 16–17: 21 in the experimental group and 30 in the control group. The experiment lasted 2.5 years. This is important because it shows that style can be shaped over years of training, rather than simply described as an athlete's current characteristics (*Latyshev, 2014*).

In parallel, recent research in wrestling supports the use of model characteristics as a tool for managing training. For qualified wrestlers, models of physical fitness have been developed, as well as models of technical and tactical readiness, which take into account the specifics of competitive activity and orient the training process not toward an average "ideal," but toward genuinely meaningful indicators of effectiveness.

A separate area of research focuses on the sensorimotor reactions and specific perceptions of wrestlers of different styles. The works of Y. Tropin, V. Romanenko, R. Pervachuk, and their co-authors demonstrate that differences among athletes extend beyond strength, speed, and endurance to include reaction characteristics, perceptual accuracy, and the processing of motor information *(Tropin, 2019)*. This broadens the understanding of individualization: it must

include not only the selection of exercises but also consideration of the athlete's psychophysiological profile.

Ukrainian authors have found differences in competitive activity structures among various age groups of wrestlers. Relative age effects are more evident at the cadet level and tend to disappear at the adult level. This means trainers should consider both an athlete's current athletic performance and their stage in long-term training when individualizing methods (Table 1).

Table 1

**Mapping of the main areas of research on the individualization of wrestlers' training**

| Authors | Research Focus | Brief Summary | Practical Significance |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| S. Latyshev | Individualization of training in freestyle wrestling | Developed and substantiated a program for the individualization of training and an approach to shaping an individual style of contest performance in wrestlers. | Makes it possible to design training programs that take into account the athlete's individual strengths. |
| Yu. Tropin, M. Latyshev, et al. | Model characteristics of technical and tactical preparedness | Investigated model indicators of wrestlers' technical and tactical readiness and their relationship with competitive performance. | Can be used for monitoring and adjusting technical and tactical training. |
| Yu. Tropin, V. Romanenko, R. Pervachuk, et al. | Sensorimotor reactions and psychophysiological indicators | Examined sensorimotor reactions and specific perceptual abilities as components of the wrestler's individual profile. This is only partially confirmed: the general research direction is supported, but not the exact wording of the earlier claims. | Provides grounds for taking psychophysiological characteristics into account when selecting training means and methods. |
| Yu. Tropin, L. Podrihalo, N. Boychenko | Physical fitness and model characteristics | Studied wrestlers' physical fitness and model benchmarks for athletes of different qualification levels. | Allows for a more objective assessment of a wrestler's readiness and helps plan individualized training loads. |
| I. Cieśliński et al. | Success factors of elite wrestlers | Identified key determinants of success, including anaerobic power, strength endurance, reaction speed, special endurance, and technical preparedness. | Helps clarify which qualities should be developed individually to achieve high-level performance. |
| B. Miarka | Technical-tactical and physiological demands of competitive wrestling | Analyzed the technical-tactical and physiological demands of wrestling bouts. | Makes it possible to combine technical-tactical preparation with the real demands of competitive performance. |
| T. Ambroży et al. | Analysis of technical-tactical mastery | Demonstrated that bout analysis and the calculation of technical-tactical performance indicators form part of coaching control. | Provides a tool for ongoing assessment of the effectiveness of a wrestler's actions. |

Continuation of table 1

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| K. Škugor et al. | Success factors in young wrestlers | Investigated the determinants of success in young wrestlers and showed that medalists demonstrated better indicators of certain motor qualities, whereas anthropometric differences were not always decisive. | Important for the individualization of young athletes' training, as performance depends not only on body build but also on the level of special preparedness. |
| M. Marković et al. | Special work capacity and testing in wrestlers | Examined the sensitivity of field tests for assessing the special work capacity of wrestlers of different performance levels. | Suggests that tests should be selected not formally, but according to the athlete's level and the objectives of assessment. |
| O. Folhes et al. | Influence of skill level and weight category | Analyzed how competitive skill level and weight category affect wrestlers' technical effectiveness and psychophysiological responses. | Confirms that individualization should take into account not only style, but also weight category and athlete level. |

A review of contemporary scientific literature shows that individualizing wrestlers' training is a multi-component system. Here, performance is not determined by a single isolated factor. Instead, it results from the interaction of fighting style, physical fitness, technical and tactical repertoire, sensorimotor reactions, morphofunctional characteristics, and the athlete's age-related traits. In the works of S. Latyshev (*Latyshev, 2014*), individualization is associated with the development of a typical wrestling style and the creation of training based on the wrestler's individual profile. Meanwhile, studies by Y. Tropin, N. Boychenko, L. Podrygal, V. Romanenko, and their co-authors specify this approach. They do so by using model characteristics of the physical, technical-tactical, and psychophysiological preparedness of wrestlers at different skill levels *(Tropin, 2019)*.

Foreign studies complement these findings, showing that competitive success in wrestling is linked to a combination of anthropometric parameters, specific work capacity, strength and anaerobic capabilities, as well as the ability to effectively execute technical and tactical actions under competitive stress *(Miarka, 2016; Kostrikova, 2025)*. For a scientific analysis of the individualization of training, it is advisable to identify the key components that are most frequently considered in Ukrainian and foreign works as decisive for the development of a targeted training process. These components, their content, and their practical significance for managing wrestler training are systematized in Table 2.

A summary of the analysis of the scientific literature indicates that the individualization of wrestlers' training is a multifaceted process that considers the athlete's stylistic, physical, technical-tactical, psychophysiological, morphofunctional, and age-related characteristics. Their interrelationship and significance for the design of the training process are presented in Fig. 1.

As shown in the diagram, the individualization of wrestlers' training is based on a careful consideration of a set of interrelated factors that determine the effectiveness of the training process and the success of competitive performance. These include, first and foremost, the style of wrestling, the level of physical development, the specifics of technical and tactical

Table 2

**Key components of personalized training for wrestlers, as identified in recent studies**

| Component | Content | Significance for the Training Process |
|---|---|---|
| Style of contest performance | A set of individual ways of conducting a bout | Makes it possible to select special training means according to the wrestler's type |
| Physical fitness | Strength, speed-strength, coordination, and endurance indicators | Used for monitoring, comparison, and adjustment of training |
| Technical-tactical preparedness | Effectiveness of actions, variability, and the ability to apply techniques in a bout | Helps individualize the technical arsenal |
| Sensorimotor reactions | Reaction speed, accuracy of perception, and specific responses | Deepens the psychophysiological basis of individualization |
| Age- and stage-related characteristics | Different structures of performance efficiency across age groups | Makes it possible to adapt evaluation criteria to the stage of preparation |

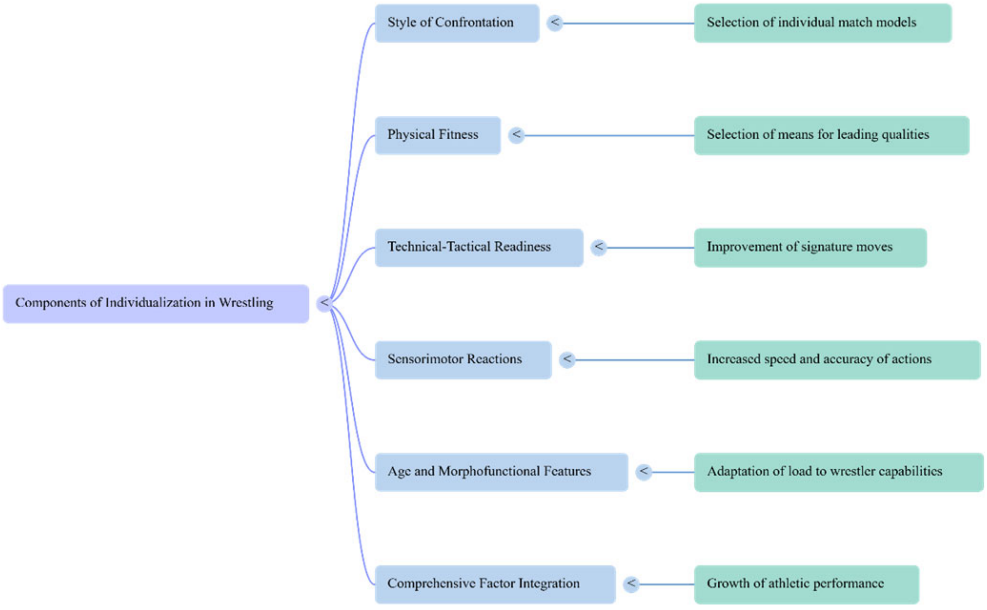


**Fig. 1. Main Approaches to Tailoring Wrestling Training**

preparedness, sensorimotor characteristics, morphofunctional parameters, and the athlete's age-related characteristics *(Blach et al.,2021)*. The interaction of these components forms the wrestler's individual profile, which must serve as the foundation for planning and organizing training. Taking this profile into account allows for the rational selection of training methods and means, the determination of optimal training load parameters, ongoing monitoring of training progress, and timely adjustments to the training program. This creates the conditions for the targeted development of the athlete's key qualities, the compensation of weaknesses, and the improvement of the overall effectiveness of their athletic training.

## 3. Conclusions

The analysis of scientific literature, the synthesis of practical experience, and research findings lead to the conclusion that individualizing wrestlers' training is a key challenge in modern theory and methodology of competitive wrestling. Despite a significant body of scientific work, information on individualized training has long been fragmented and not integrated into a unified system. The systematization of this knowledge has enabled combining an athlete's natural aptitudes with the demands of modern competitive activity into a coherent mechanism for managing the training process.

An important scientific result was the substantiation of the concept of typical wrestling styles. It has been established that in sports wrestling, achieving high athletic results is possible through various match formats, which preclude the existence of a single universal model of the "ideal" wrestler. Within this approach, seven typical styles of wrestling were classified: "power-type," "game-type," "long-distance tempo-type," "grappler," "grip-type tempo-type," "highly reliable," and "well-rounded." It has been proven that each of these styles is formed by a combination of the athlete's dominant motor qualities, physical characteristics, and psychological traits.

During the study, the phased nature of the individualized training process was identified. Three strategic stages were identified: identifying a predisposition toward a specific style, forming the style, and refining it. This sequence ensures the logic and continuity of the training process at various stages of long-term athletic training–from initial specialization to the level of high athletic mastery. Of particular importance is that individualization is viewed not as a one-time corrective measure, but as a continuous process that accompanies the athlete throughout their career.

Therefore, individualizing wrestlers' training should be understood as a holistic system. This system combines assessing natural aptitudes, identifying stylistic characteristics, developing an individual technical and tactical repertoire, monitoring fitness, and adjusting the training process to match modern competitive demands. This approach enables the athlete to fully develop their potential and achieve consistent, high-level results.

**Prospects for further research** should primarily focus on refining the scientific and methodological foundations of the stage of athletic mastery, when an individual's style has already been formed and requires further adaptation to competing against opponents of various tactical types. This is particularly relevant for the final stages of Olympic cycles, where the result depends to a large extent on the athlete's ability to adaptively implement their style under complex competitive conditions.

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