

## **Model Characteristics of First and Republic Category Referees in the Sport of Boxing**

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**Abstract:** Based on the results of the research presented in this article, the correlation and factor characteristics of model classifications of referees with different categories in the sport of boxing are analyzed, along with the correlogram of the relationships between them.

**Keywords:** boxing, first and republic category referee, model characteristics.

**Relevance of the research.** The Decree of the President of the Republic of Uzbekistan, Sh.M. Mirziyoyev, No. PQ-5099 dated April 29, 2021, "On Measures for the Further Development of Boxing" clearly defines tasks aimed at strengthening the scientific and methodological foundation for training professional coaches, referees, and athletes in the field of boxing. This decree serves as a legal basis for elevating Uzbek boxers to higher levels in international sports arenas (1).

Currently, refereeing in boxing is considered a controversial and debatable activity by the international sports community, including the International Olympic Committee (IOC). In recent years, incidents involving disputes, corruption, and fixed matches in this field—particularly during Olympic Games—have led to serious objections.

The President of the IOC, Thomas Bach, has repeatedly criticized the International Boxing Association (IBA), announcing decisions to remove it from the Olympic program, effectively stripping its right to organize boxing competitions. These decisions stem largely from questionable refereeing decisions, incorrect scoring, and match-fixing that occurred during the 2012 London and 2016 Rio de Janeiro Olympic Games.

In such a context, ensuring that refereeing is conducted transparently, fairly, and by highly qualified professionals has become a pressing issue not only for international sports organizations but also for national sports systems. It is especially necessary to develop clear strategies for training referees in boxing, enhancing their knowledge and skills, and fostering specialists capable of ensuring impartial and systematic approaches in matches.

This, in turn, requires special attention to be given to improving the theoretical knowledge and practical skills of students specializing in boxing within the sports education system. The competency, decision-making ability, and professional conduct of these referees directly impact the quality of boxing competitions, the rights of athletes, and the fairness of match outcomes.

From this point of view, studying the professional activities of boxing referees, identifying modern requirements placed upon them, and optimizing the system for developing knowledge, skills, and qualifications among students specializing in boxing refereeing is of great importance.

Research conducted by scholars worldwide shows that there are significant issues in the process of training professional boxing referees, particularly concerning the requirements for refereeing and the enhancement of their knowledge and skills [O.B. Dmitriev, P.K. Petrov, V.A. Shirokov, E.R. Akhmedzyanov, 2000; Yu.F. Kuznetsov, 2000; Ya.A. Grinbergas, 2006; A.R. Khayrullin, 2008; R.D. Khalmukhamedov, 2021]. It has been proven that in striking combat sports, referees are an essential component of the sports process, and their tasks are diverse and complex. At the same time, many authors [N.V. Zuev, 1999; O.B. Dmitriev, P.K. Petrov, V.A. Shirokov, E.R. Akhmedzyanov, 2000; Yu.F. Kuznetsov, 2000; Ya.A. Grinbergas, 2006; A.R. Khayrullin, 2008] point out existing challenges in ensuring high-quality and fair refereeing in modern sports competitions.

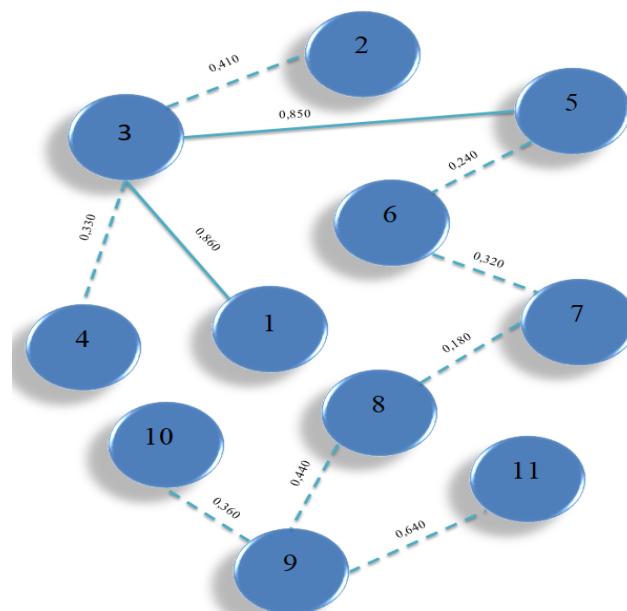
**The object of research** – To develop model characteristics of referees with different categories in the sport of boxing.

**The task of research** – To examine the correlation and factor characteristics of the model classifications of referees with different categories in the sport of boxing.

**The methods of research** – Analysis of scientific and methodological literature, expert evaluation methods, surveys, interviews, and theoretical analysis. During the research process, the structural model classifications of boxing referees were studied. The following statistical methods were used to process the data: arithmetic mean, standard deviation, standard error, and Student's *t*-test.

**Organization and Methods of the Research** – Through surveys, the main requirements essential for the refereeing activities of first-category and republic-category referees were identified. The discrepancy between the preparedness level of students specializing in boxing and the identified requirements served as the foundation for developing a training curriculum for boxing referees.

During the research process, we compared the theoretically developed program with the actual characteristics of highly qualified referees. By making adjustments to the initial version of the program, we used correlation analysis methods based on data obtained from questionnaire results. As a result, models of first-category and republic-category boxing referees were developed, as well as a knowledge-based model of the characteristics of sports refereeing, illustrated in Figure 1.



**Figure 1. Correlation diagram of the relationship between knowledge and referee characteristics.**

*Note: Correlations with significance level  $p < 0.05$*

*Correlations with significance level  $p < 0.01$*

1. Organization of competitions. 2. General concepts. 3. Evaluation. 4. Referee training. 5. Conducting competitions. 6. Number of correct answers. 7. Response time. 8. Age characteristics. 9. Refereeing experience. 10. Coaching experience. 11. Sports title.

The upper part of the correlogram includes the “evaluation” indicator. At the same time, it serves as the main center of the correlogram, i.e., it represents the connection between the main sections of knowledge about refereeing and pedagogical activity. This indicates, firstly, that the average score mainly reflects the knowledge level of the students. Secondly, the position of this center and the presence of significant positive correlation coefficients point to a low level of knowledge, as in most cases the scores did not exceed 3 points.

It is worth noting that the knowledge block and its evaluation are interconnected with the “organization of competitions” section and other components such as the number of correct answers (related to the sports and refereeing characteristics of the students).

The second center of the correlogram is the experience in practicing the sport of boxing. This is logical, as it confirms the idea that refereeing experience is gained (or more precisely, earned) through personal participation in competitions.

This is also confirmed by practical referee training. The reflection of refereeing experience and the importance of knowledge for the referee’s practical activity highlight the need to improve the effectiveness and relevance of the referee training courses.

When reviewing the correlation matrix (Table 1), very close relationships between qualification levels were identified: between first, republic, national, and international categories.

Accordingly, the study recommends not only focusing on the "first category" but also considering the relationship between the first and republic categories in referee training. Based on this, correlograms were created for referees with actual experience in the first and republic categories.

**Table 1. Proximity indicators of the correlation of equal-level referee qualifications based on expert survey results**

Referee Qualification Level	First Category	Republic Category	National Category	International Category
First Category	xxx	0,699	0,289	0,215
Republic Category	0,699	xxx	0,434	0,342
National Category	0,289	0,434	xxx	0,875
International Category	0,215	0,342	0,844	xxx

As shown by the correlation analysis, the “qualification–refereeing experience” knowledge section can only be formed based on ten years of experience. In this case, qualification is linked to other components (reaction speed and sports title) solely through experience.

Knowledge is also closely correlated with ten years of experience and the structure of a first-category referee.

To verify this, we created model tables of referees in the first and republican categories, incorporating various levels of experience (tenure) into the structure.

For a republican category referee with three years of experience, a correlation with a sports title is characteristic (often, achievements in sports help athletes reach the peak of refereeing qualifications). For five years of experience, the key correlation is with reaction speed. Only ten years of experience shows a correlation with knowledge indicators.

It should be noted that in the experienced group undergoing training based on the developed program, as well as in the experienced referee model with ten years of experience in the

republican category, the trajectory in the table progresses from the sports title to reaction speed. In the rest of the table, however, the entire group of participants demonstrates significant differences.

Analysis of Model Classifications of First and Republican Category Referees with Three Years of Experience For this group of referees, the following correlations were identified:

“Republican category” has the highest correlation coefficient (0.698), indicating a strong aspiration among referees to achieve republican status and participate in national-level competitions. This may be explained by their ambition for professional development.

“Competition rules” and the republican category show a moderate positive correlation (0.620), emphasizing the importance for this group of referees to have a solid understanding of the rules and to follow them strictly.

“Sports title” has a low positive correlation (0.272), showing that while sporting achievements are important for success in refereeing, they are not sufficient on their own. This suggests that refereeing requires additional skills and knowledge.

“Reaction speed” (0.209) and “Competition execution” (0.147) show very low positive correlation, indicating that these aspects are not yet well developed in referees with three years of experience.

“Competition organization (P-2) and execution (P-3)” also show very low correlation (0.153), highlighting the lack of experience in organizing and conducting competitions.

This analysis shows that for referees with three years of experience, knowledge of competition rules and the aspiration to reach the republican category are important. At the same time, their reaction speed and skills in organizing and conducting competitions still require further development.

Analysis of Model Classifications of First and Republican Category Referees with Four Years of Experience

For this group of referees, the following correlations were identified:

“First category” has the highest correlation coefficient (0.698), indicating that for referees with five years of experience, belonging to the first category is highly important. This may be related to their desire to improve and validate their qualifications.

The correlation coefficient for the “Republican category” (0.319) is lower compared to the “First category.” This indicates that some referees may not be striving to reach the republican level, or it may take more time to achieve this status.

The correlation with “Competition rules” (0.266) highlights the importance of knowing and adhering to rules, although the coefficient is not high.

The low correlation with “Sports title” (0.209) suggests that achievements in sports have a limited impact on refereeing performance.

Very low correlations with “Competition organization” (0.147) and P-2, P-3 (0.153) indicate that these aspects are not yet significantly important for referees with five years of experience, and they likely lack sufficient experience in this area.

Correlation analysis of the model classifications of first and republican category referees with three years of experience:

For this group, the following correlations were identified:

The “First category” shows the highest correlation (0.698), demonstrating that having first-category status is important for referees with three years of experience.

The low correlation with “Republican category” (0.243) suggests that most referees are not yet ready to advance to the republican level or lack sufficient experience for it.

The very low correlation with “Refereeing experience” (0.183) shows that three years of experience is not yet sufficient for fully developing refereeing skills.

The very low correlation with “P-2, P-3” (0.113) reflects the minimal significance of these factors for referees with only three years of experience.

The low correlation with “Reaction speed” (0.209) suggests that although reaction speed is important in refereeing, it has not yet been adequately developed in referees with this level of experience.

The very low correlation between “Sports title” and “R-3” (0.149) also indicates that the influence of sports titles on refereeing activity is limited.

Correlation analysis of the model classifications of republican and national category referees with five years of refereeing experience:

For this group of referees, the following correlations were identified:

The “First category” shows the highest correlation (0.620), indicating that holding first-category status remains important for referees with five years of experience.

The correlation with “3 years of refereeing experience” (0.485) suggests that a three-year tenure plays a significant role for five-year referees, likely because this period is when fundamental skills are formed.

The correlation with “5 years of refereeing experience” (0.205) is relatively low, which indicates that five years alone may be sufficient for practical refereeing, but further qualitative development becomes crucial beyond this point.

The lowest correlation is with “10 years of refereeing experience” (0.183), indicating that for five-year referees, having ten years of experience is still considered relevant and desirable.

The low correlation with “Sports title” (0.209) implies that while sporting achievements are important in refereeing, they are not decisive.

The moderate correlation (0.272) between “Reaction speed” and “P-2, P-3” indicates the importance of these factors in refereeing activity, but the coefficient is not high.

Correlation graph of the model classifications of republican-category referees with different years of experience:

The “5 years of refereeing experience” shows the highest correlation (0.458), indicating that five years of experience is important for republican-category referees. During this period, essential skills and experience required for refereeing are developed.

The correlation with “3 years of experience” is also noticeable (0.387), showing that the foundation laid within the first three years is crucial for future success.

The correlation with “Republican category” (0.243) suggests that aligning with the category level is important, though the coefficient is not high.

The correlation with “10 years of experience” is low (0.183), suggesting that for republican referees, having ten years of experience is not a top priority.

The low correlation with “P-1, P-2,” and “Reaction speed” (0.184) suggests that although these factors are important, they are not yet fully developed among republican-category referees.

The correlation with “Sports title” (0.272) implies that sporting achievements play a role in refereeing but are not decisive.

The very low correlation with “P-2” (0.149) shows that this factor has limited significance for republican-category referees.

Based on these findings, the content of the training program we developed for students studying boxing as a field of sport education confirms the validity of the initially designed curriculum. The model is oriented toward referees with ten years of experience at the republican level.

Correlation graph of the model classifications of republican-category referees with ten years of experience:

The correlation with “Category” (0.243) indicates that aligning with one's category is important for referees with ten years of experience, although the coefficient is not very high. This suggests that for referees with long-term experience, other factors may take precedence over category alignment.

The low correlation with “Refereeing experience” (0.183) shows that ten years of experience alone is not sufficient for effective refereeing. Quality of experience and continuous development are of critical importance.

The very low correlation with “P-2, P-3” (0.113) demonstrates that these factors have limited relevance for referees with ten years of experience.

The correlation with “Reaction speed” (0.209) confirms its significance in refereeing, though it is not highly developed in referees with ten years of experience.

The very low correlation with “Sports title” and “P-3” (0.149) suggests that these factors have limited significance for referees with ten years of experience.

As we can see, in the model of a referee with such qualifications, the sports title and reaction speed are characterized as occupying second place compared to refereeing experience, which is closely related to the title.

Based on indicators that may influence the knowledge, skills, and competency development in boxing education within sports activities, a factor analysis of the referee model structure (physical preparation, knowledge of competition organization and management, refereeing experience, general education, sports qualifications, primary job – coaching, against the backdrop of overall growth in refereeing competence over 3, 5, and 10 years) made it possible to identify highly similar factors that contribute almost equally to explaining fluctuations, regardless of refereeing experience (3, 5, or 10 years), with percentages of 64.7%, 62.5%, and 61.6%, respectively.

This indicates that the obtained data are sufficiently reliable. Moreover, under the conditions of higher education institutions (HEIs), the unexplained factor appears to be associated with non-sports-related psychological elements (see Table 1).

As shown in Table 2, four factors were identified:

Factor I – Qualification Factor: Refereeing experience is included under minor experience qualification. The factor load ranges from 20.4% to 24.3%.

Factor II – Personal Preparation Factor: This includes physical readiness, the referee's sports title, and general education level. The factor weight ranges from 18.0% to 18.3%.

**Table 2. Factor Structure of Model Characteristics of First and National Category Referees**

Indicators	I Factor			II Factor		
	3 yil	5 yil	10 yil	3 yil	5 yil	10 yil
physical fitness of the boxing referee	0,067	0,074	0,092	0,630	0,656	0,565
Technical and tactical knowledge of boxing	-0,056	-0,120	-0,143	-0,027	-0,052	-0,026
Reaction speed for making quick and accurate decisions	0,016	0,064	0,084	0,142	0,176	0,283
Years of refereeing experience	0,747	0,524	0,301	0,286	0,427	0,059

(seniority)						
Referee's sports achievements (personal results in sports)	0,026	-0,055	-0,071	0,617	0,565	0,716
Education	0,100	0,054	0,112	0,804	0,789	0,772
Main occupation – coach	-0,046	-0,084	-0,067	0,247	0,171	0,401
Knowledge and correct application of competition rules	0,146	0,183	0,112	-0,243	0,257	-0,064
First category	0,930	0,872	0,890	-0,049	-0,045	-0,011
National (Republican) category	0,830	0,888	0,908	0,002	0,036	0,092

Indicators	III Factor			IV Factor		
	3 yil	5 yil	10 yil	3 yil	5 yil	10 yil
physical fitness of the boxing referee	0,229	-0,249	0,442	0,227	0,222	0,221
Technical and tactical knowledge of boxing	-0,113	-0,080	-0,155	0,805	0,764	0,772
Reaction speed for making quick and accurate decisions	0,218	0,193	0,110	0,617	0,704	0,492
Years of refereeing experience (seniority)	0,109	-0,029	0,256	0,069	0,118	0,592
Referee's sports achievements (personal results in sports)	0,459	0,510	0,229	0,144	0,115	0,067
Education	0,094	0,155	0,055	0,090	0,109	0,016
Main occupation – coach	0,652	0,700	0,567	-0,003	-0,036	-0,015
Knowledge and correct application of competition rules	0,741	0,701	0,773	0,076	0,107	0,136
First category	0,094	-0,062	-0,066	-0,097	-0,121	-0,121
National (Republican) category	0,030	0,119	0,107	-0,015	-0,017	-0,068

Factor III – Special Knowledge and Skills Factor: This includes indicators such as pedagogical activity as a coach and knowledge of refereeing rules. The factor weight ranges from 13.5% to 13.9%.

Factor IV – Refereeing Technique Factor: This includes knowledge of boxing techniques and tactics, reaction speed indicators, and refereeing experience among seasoned referees. The factor load ranges from 11.6% to 12.4%.

The quantitative and qualitative closeness of these factors, and the overall structure of the referee model in relation to internal factors, indicate that not only have we chosen the right direction in preparing referees of national category, but we have also considered certain components typical for and required of such referees.

**Conclusion.** The focus of the curriculum on the “considered experience” period is highly appropriate, specifically targeting the model of a national category referee with ten years of experience. Such a program can significantly enhance the quality of referee training. In particular, a deeper understanding of theoretical sections helps to address certain shortcomings in refereeing practice.

According to the research conducted, essential components of the program must include competition organization and direct management, as these elements play a leading role in the

model characteristics of a qualified and proficient referee. Therefore, only through a thorough mastery of knowledge and skills in this area can one become a truly professional referee.

The results of the study provide opportunities to further improve the training programs for first and national category referees, enhance their theoretical knowledge, develop practical skills, and boost physical readiness.

The close quantitative and qualitative structure of these factors, and the overall factor structure of the referee model in relation to internal components, once again confirms that we not only correctly chose the direction for training first-category referees, but also took into account certain essential elements that match the standards and requirements of national category referees.

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