

## Research Article

# Application of the Multiple Regression Method in Football Tactical Analysis

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Aiming at the unreasonable problem of current football tactical analysis, this paper studies the application method of the multiple regression method in football tactical analysis. Build a football tactical rehearsal model, optimize player information and tactical analysis management functions, and analyze football player status. Using the multiple regression method to choose the appropriate position of the players, make the football attack and defense plan. At the same time, the application of the multiple regression method to the analysis of football tactics can better select the optimal tactical plan, to ensure the rationality of football tactical selection.

## 1. Introduction

For football players, the purpose of training is to improve their comprehensive literacy, so as to obtain better performance in the process of competition. In addition to the physical quality and professional quality of football players, football tactical analysis is extremely important. The composition of football tactical analysis is relatively complex, which is a comprehensive manifestation of physical fitness, technical ability, and intelligence [1], and plays an important role in achieving training goals, correcting training deviations, and improving training and game strategies. For competitive football, the real goal of the game is to win, which is not only a test for football players but also a test for football coaches. Football coaches need to formulate appropriate tactics for football players according to the situation. Under the influence of many factors such as game strategies, tactics, teammates, venues, opponents, and climate, the performance of game tactics is often in dynamic changes. Traditional game data such as tackles, ball possession, passing, and distance run can provide a lot of specific information, but it is difficult to provide clues about the final outcome of the game. Tactics are the key to winning a football match [2]. The traditional football tactical analysis will use the symbolic analy-

sis method to analyze the event data and sports behaviors such as passing, ball control, and ball grabbing in the game, so as to formulate an appropriate winning play, but it is difficult to analyze the information in the field. The application effect of traditional football tactical analysis is often not good. A high level of tactical ability is very important to a football player's performance in the game. With the progress of player tracking technology and the use of advanced computer technology to collect data, the quality of the game data has met the requirements of football tactical analysis, which has promoted the development of football tactical analysis methods. In particular, the position data can accurately reflect the position of each player and the ball, which will help to identify tactical patterns in football matches [3]. Traditional location data can only provide big data with a single spatial model, but in the context of big data, football tactical analysis needs to integrate detailed data from multiple different sources, so this method also cannot meet the tactical requirements of modern football players.

It can be seen from the comprehensive research status that there are few research results on the analysis of football tactics at present. Most of them are limited in theory and focus on the analysis of factors affecting football matches, which has certain limitations. This paper introduces

regression methods and deep learning techniques into football tactical analysis, trying to comprehensively describe the research landscape in the field of football tactical analysis, as well as the internal connections and development trends of these studies. This paper firstly creates a football tactical rehearsal model according to the state of the team and opponents and uses big data technology to conduct multilevel organizational analysis of football tactics, process the data, and then collect data according to statistical indicators and conduct football tactics based on multiple regression algorithms. And finally let the players form a football tactical training awareness and complete the football tactical analysis. Finally, the superiority of this research method compared with comparison method is verified by experiments.

## 2. Application of the Multiple Regression Method in Football Tactical Analysis

*2.1. Football Tactical Rehearsal Model.* In order to ensure the successful implementation of tactics at all levels, coaches need to consider the status of the team and opponents, as well as external factors such as home and away games and even the weather [4]. In order to achieve a specific goal, the team needs to use a predesigned spatial tactical formation as a tactic, and the coach needs to understand the proportion of time the team's tactical formation remains consistent and under what circumstances the team is forced to change the tactical formation. It is also important to understand the use of tactical formation and the changing period of tactical formation when preparing for the competition with future opponents [5]. The tactical formation is the position of the player on the field, representing the position relative to other objects. In space, the tactical formation, that is to say, the specific position of the player in the game area, can be fixed. Spatially, the tactical formation may change but keep the relative direction between the players stable or the total movement of the defensive line on the pitch. According to the actual needs of tactical design and rehearsal in football training, teaching, and competition, football tactical rehearsal includes login module, rapid tactical formation layout module, tactical design and rehearsal module, export tactical map module, battle recording and playback module, tactical management module, response tactical module, and player management [6]. Figure 1 shows the functional requirements of the football tactical rehearsal model.

Players who play a specific role in a tactical formation can clearly change roles through replacement, or they can dynamically change roles according to tactical needs [7]. In short, football tactical analysis can be described as the result of a complex process, which includes strategic decisions made before the game and tactical behaviors executed at different organizational levels in the process of the game [8]. According to the research results of football special theory, this paper expounds the classification results of football match tactical knowledge and football basic skills, which can be divided into individual tactics, group tactics, and team tactics. The results of hierarchical division of tactical knowledge in football games are shown in Table 1.

Tactical variables are usually related to the position, distance, space, and numerical relationship of players. The position coordinates of players are the basis of tactical analysis [9]. From the perspective of mathematics, the player's court position can be accurately determined by the multiple regression method ( $x$  coordinate and  $y$  coordinate). Through the collected data, the game space-time pattern generated from the game dynamics can provide new information about the analysis of football tactics. In practical application, location coordinates can be used as a form of data visualization to generate heat map or point map [10]. This can be used to understand the characteristic movement patterns of individuals, group players, or a team. Here, the positions of all players are displayed in real time in the form of  $XY$  coordinates. The obtained data is called position data or tracking data. On the one hand, the evaluation of location data will have obvious speed advantages. On the other hand, compared with event data, location data is large, diverse, and accurate, which can provide detailed data sets for sports visualization researchers [11]. Visualization is not only the key technology of data analysis but also the key technology of data analysis result presentation. Location data can be used not only to formulate, describe, and understand team performance indicators of game dynamics but also to explore dynamic patterns before key events, such as scoring opportunities and goals. The evaluation indicators of tactical drills based on location data are shown in Table 2.

Multilevel organizational analysis of football tactics should be carried out using big data technology. In addition to video and observational data, the necessary infrastructure is required to collect physiological and tracking data. In order to ensure effective data storage and data access, it is necessary to establish a processing path, extract relevant information from the data, and then combine the information to build interpretation and prediction models [12]. All these processing levels need reporting and visualization functions to monitor different processing steps and exchange results. The main purpose of establishing the multiple regression method is to combine the information from different fields, so as to draw a conclusion about the performance of the game, that is to say, the performance of individuals and teams [13]. Therefore, before the multiple regression method becomes a feasible method for football research, the problem of data management must be solved. In terms of data analysis, we should seek cooperation based solutions among research institutions as far as possible and introduce the necessary computer expertise into the field of football research.

*2.2. Analysis and Evaluation Algorithm of Football Tactics Based on Multiple Regression.* The first step of football tactical analysis and evaluation based on multiple regression is to collect data according to statistical indicators. According to different collection times, it can be divided into on-the-spot collection and postgame collection. On-the-spot collection refers to the real-time collection of techniques and tactics during the competition of athletes [14]. The on-the-spot collection of data indicators is less, and the amount of information reflected is also less, but the collection time is short,

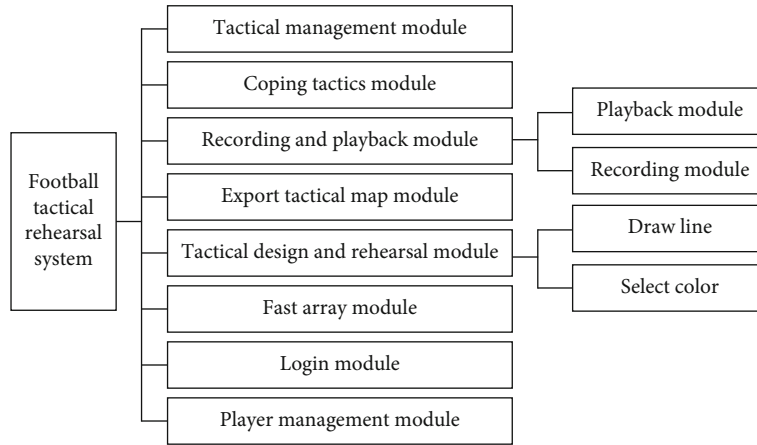


FIGURE 1: Functional requirements of the football tactical rehearsal model.

TABLE 1: Hierarchical division results of tactical knowledge in football matches.

Arrangement	Content	Basic requirements
Personal tactics	Offensive and defensive principle	Understand the rules and requirements of tactical behavior in football matches
	Application of basic technology	Master the tactical requirements of basic technologies such as transmission, receiving, transportation, and shooting
	Position selection	Master the position selection principle and operation requirements during personal action
Group tactics	Protect	Master the timing and location requirements of protecting companions
	Complement	Master the position relationship of the replacement and the cooperation requirements among the team members
	Two to one cooperation	Master the basic requirements and position selection of two to one attack and defense
Team tactics	Match formation	Understand the responsibility division of each position in the formation and the relationship in the game
	Offensive and defensive conversion	Master the action principles and the cooperation requirements of the whole team in the process of attack and defense conversion
	Match rhythm	Understand the role and main methods of controlling the rhythm of the game

TABLE 2: Evaluation index of tactical rehearsal based on location data.

Key performance indicators	Method	Describe
Length, width, space	Distance	Measure the average expansion of a team
Space control	Tyson polygon	Space control is modeled with the Tyson polygon graph
Event identification	Rule-based decision tree	Identify time from location data
Path clustering	Clustering algorithm	Select groups from the movement patterns of one or more players
Pass evaluation	Motion mode and passable area	Calculation area
Distance to the center of the team	Euclidean metric	Calculate the distance between the player and the center of the team
Formation	Mean and principal component analysis	Calculate the average position to determine an actual tactical formation

which is conducive to rapid tactical planning. It is mainly used for the technical and tactical statistics of sports teams during the competition. After the competition, the collection refers to the collection of techniques and tactics by watching video data after the competition. Because this collection is not limited by time [15], the required technical and tactical indicators can be observed and recorded as much as possi-

ble, which is conducive to a more detailed and in-depth technical and tactical research on the game. Taking the score or loss of the last shot of each round as the observation point, one can divide the athletes' competition ability into serve rush attack section, receive rush attack section, and stalemate section as a whole [16]. On this basis, through a large number of practical research, this paper puts forward

the empirical model of winning the football game (i.e., strength evaluation standard), including the scoring rate and utilization rate of each segment. Figure 2 shows the optimized three-stage evaluation theory evaluation index system.

The principle of symmetry means that the evaluation model designed in this study should make the technical and tactical data of both sides symmetrical, which is conducive to the comparative analysis of technical and tactical aspects [17, 18]. This is a problem that has not been perfectly solved in the previous technical and tactical analysis methods. Therefore, this study proposes a division method. According to the law of football match, when party A scores, it is party B's loss of points. This ball is classified as party A's stalemate I score, that is to say, party B's stalemate II loss of points. When party A loses points, it is the score of party B. This ball is classified as the loss of points in the sending and grabbing section of party A; that is to say, after the score division of the receiving and grabbing section of party B, the four-section structure of a game is shown in Figure 3.

The tactical formation and position division of players in football match have great differences in the competition responsibilities and tasks of players, resulting in the differences of tactical awareness requirements of players with different position responsibilities in the game. This difference in the requirements of players' tactical consciousness in different positions is also another concrete embodiment of the effectiveness characteristics of football players' tactical consciousness [19]. Therefore, in the development process of tactical consciousness at different levels and stages, we should put forward the general requirements of tactical consciousness and the specific requirements of different positions. Multiple regression analysis is one of the most commonly used statistical methods. It is used to analyze the relationship between a dependent variable and multiple independent variables, especially in two aspects: one is to quantitatively describe and explain the relationship and the other is to predict or estimate the value of the dependent variable [20]. Therefore, the multivariate regression method is reliable to analyze the advantages between variables, and the prediction can be achieved through the analysis of variables. In this study, the multivariate regression analysis is applied in the process of football tactical analysis, and the effectiveness of tactics can be analyzed through key factors.

If the dependent variable is  $y$ , it is necessary to study its correlation with  $m$  independent variables  $x_{t1}, x_{t2}, \dots, x_{tm}$ , and assume that the dependent variable  $\varepsilon_t$  is a random variable, while  $\beta_0, \beta_1, \dots, \beta_m$  is a general variable, which is a typical multiple linear regression problem. Assuming that the dependent variable  $y_t$  is linearly related to  $(\varepsilon_i, \varepsilon_j)$ , the collected  $n$  groups of data  $\sigma$  meet the following regression model:

$$y_t = \beta_0 + \beta_1 x_{t1} + \beta_2 x_{t2} + \dots + \beta_m x_{tm} + n\varepsilon_t, \quad (1)$$

$$E(\varepsilon_t) = \text{Var}(\varepsilon_t) - \sigma^2 \text{Cov}(\varepsilon_i, \varepsilon_j).$$

Through the construction of the above football position tactics and evaluation parameter index system, the original

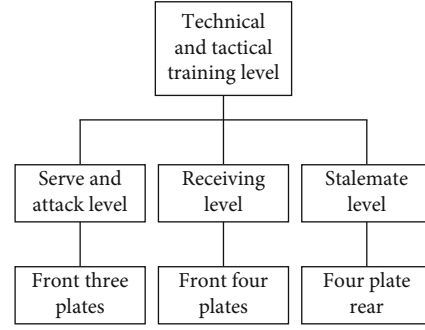


FIGURE 2: Evaluation index system structure of three-stage evaluation theory.

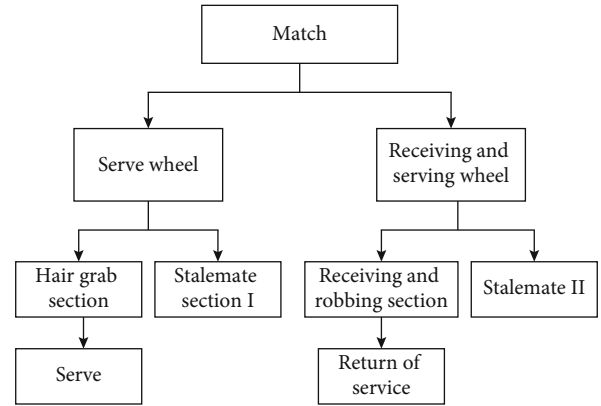


FIGURE 3: Four-section structure model.

sample data of the dynamic detection and evaluation index of football players' position tactics are obtained. Based on the multiple linear regression analysis method, the dynamic detection of football players' position tactics is carried out. Firstly, the maximum oxygen uptake  $x_i$  (max/kg), the maximum anaerobic work  $x_{i+\tau}$ , and the fatigue coefficient of anaerobic work decrease are independent variables. Multiple regression discriminant statistics are defined, and the expression is

$$Q_{\text{rev}}(\tau) = \frac{1}{N - y_t \tau} - E(\varepsilon_t) \sum_{i=1}^N (x_i - x_{i+\tau})^3. \quad (2)$$

In the above formula,  $N$  represents the discriminant statistics of multiple regression,  $\tau$  represents the sequence of positional tactical parameters,  $\varphi_i$  represents the statistical frequency of athletes' positional tactics, and  $\omega$  is the monitoring interval. Conduct a sigma test on the collected data before and after the two training cycles. Take the maximum oxygen uptake  $\eta_{n-j}$  and  $w_{n-i}$  that can reflect the aerobic position tactics as the independent variable and other indicators as the dependent variable; construct the multiple linear regression equation surface. The inclusion standard is  $a = 0.05$ , and the multiple linear regression equation is obtained

as follows:

$$\sigma_s = a\omega + Q_{\text{rev}}(\tau) - \kappa \sum_{i=1}^p \varphi_i w_{n-i} - \eta_{n-j}, \quad (3)$$

where  $\kappa$  is the fatigue index,  $\sigma_s$  is the independent identically distributed variance of the maximum anaerobic work,  $\langle Q_x \rangle$  is called the multiple linear autoregressive coefficient, which, respectively, represents IgA, IgG, IgM, bun, and other indicators, and  $R$  is called the significance factor of multiple correlation analysis of football players. These are the parameters to be evaluated in the model. Realize the multiple autoregressive dynamic test of the metabolic cycle mechanism of football players. In the inspection process, it is necessary to define the difference significance to represent the significant difference, which is

$$S = \frac{R|\langle Q_x \rangle - Q_0|}{\sigma_s \|IgA - IgG - IgM\|}. \quad (4)$$

The method of calculating the simple correlation coefficient between dependent variables and explanatory variables is used to analyze the correlation of observed data. The correlation coefficient, also known as Pearson correlation coefficient, describes the close relationship between two fixed distance variables. It is generally expressed in  $R$ , and the calculation formula is

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}, \quad (5)$$

where  $y_i$  is the observed sample size and  $x$  and  $y$  are the mean values of the observed values of the two variables, respectively.  $R$  represents the degree of linear correlation between two variables, and its value is between -1 and +1. The greater the absolute value of  $x_{ip}$ , is, the stronger the correlation is. If  $r > 0$ , the two variables are positively correlated; that is to say, the greater the value of one variable, the greater the value of the other variable will be. If  $r < 0$ , the two variables are negatively correlated; that is to say, the greater the value of one variable, the smaller the value of the other variable will be. When  $r = 0$ , there is no linear relationship between the two variables, but note that  $r = 0$  does not mean that there is no relationship. Because the correlation coefficient only measures the strength of the linear relationship, the least square estimation method is used to estimate the parameters  $\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_p$  of the multiple linear regression equation. Using the least square estimation method to estimate the regression model  $y = XB + E$  in the form of matrix is to try to find the estimated values  $B$  of parameters  $E$ , so as to make the sum of squares of deviations.

$$Q(\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_p) = R \sum_{i=1}^n (y_i - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \dots - \hat{\beta}_p x_{ip})^2. \quad (6)$$

After the least square estimation of regression coefficient is calculated, the regression value and residual of dependent variable can be calculated by the following formula:

$$\hat{y} = r - Q(\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_p). \quad (7)$$

In multiple linear regression analysis, many variables are involved, and the units of each variable are often different, which brings some difficulties to the structural analysis with regression equation; on the other hand, the amount of data involved in multiple regression analysis is very large, which may make the calculation result not ideal due to the rounding error. Therefore, it is necessary to do some related processing to the original data.

*2.3. Realization of Football Tactical Analysis.* Through the summary of the research on the content of consciousness structure, we can know that tactical consciousness is gradually mastered and developed through the cognitive learning process. The formation process of tactical consciousness conforms to the general law of cognitive learning process and is the process of acquiring knowledge and skills and accumulating experience. Consciousness is formed in competition practice. Figure 4 shows the steps to optimize the formation of awareness of football tactical training.

It can be seen from the figure that during the formation of players' competition consciousness, firstly, the players form nerve impulses after being perceived by internal and external receptors through vision, hearing, and touch and then form nerve impulses through afferent nerves to the brain. The brain analyzes, processes, and makes decisions on the incoming attack and defense information and then sends the decision results to the effector through efferent nerves. Players make various response actions. The vision, hearing, and touch in perception are vision, that is to say, observation for football players. As a direct channel for athletes to obtain information, sports perception is the basis and premise of tactical consciousness. The observation characteristics and manifestations of football players in the game are shown in Figure 5.

Tactical awareness in football match is a special ability composed of football tactical knowledge and football sports skills. Then, the content of this special ability structure formed in the mind and expressed in the behavior should include football tactical knowledge and football sports skills. Tactical knowledge is the players' understanding and understanding of the law of football game through learning and experience accumulation. Sports skills are obtained by athletes through practice, which is the action mode or action to successfully complete the activities of football matches. It can be seen that the tactical consciousness in football match is the organic combination of knowledge and experience and the way of competition activities. Athletes who do not master sports skills cannot show good tactical awareness; on the contrary, athletes who do not acquire tactical knowledge of football matches and accumulate competition experience cannot show good skill level. Therefore, tactical awareness is expressed through competition skills, and good

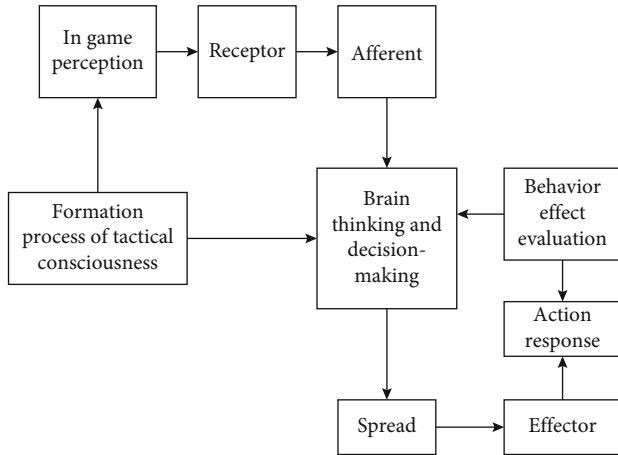


FIGURE 4: Formation steps of football tactical training consciousness.

tactical awareness will promote the development of competition skills. The two complement each other. In the response tactical function module, we need to use hybrid knowledge to simulate tactical thinking. In the flash, we can add monitoring events to each film editing element, so in the process of computer programming, the method of monitoring the linear distance between athletes can be used to monitor the monitoring events of each athlete, as shown in Table 3.

The perception of soccer players to special sports in soccer matches is reflected in the organization and processing of the visual information observed on the field in time and space. It mainly includes the judgment of the position and distance of the ball and athletes, the direction and speed of the ball and athletes, and the judgment of the timing and effect of the application of mobilization technology; judgment on occupying space and obtaining benefits; judgment on the implementation and selection of technical actions; judgment on the application method of group tactics; and judgment of the tactical application effect of the whole team. The content of football special sports perception and its main role in football games are shown in Table 4.

Observation is the perceptual understanding of the ever-changing reality of the game and the basis for the formation of tactical awareness. Only by improving our observation ability can we use our techniques and tactics to complete the task of the game. This is also the reason why observation is the premise for the formation of tactical awareness. The tactical consciousness of athletes in the game is fed back to the athletes' sports organs through comprehensive observation, thinking, and decision-making, so as to guide the players' tactical actions in the game. Football tactics refers to the means and methods taken by one party to win the other under the restriction of football rules. As a coordination and restraint mechanism, it requires not only individual behavior to obey the collective but also the mutual cooperation between individuals and others to play the role of coordinated attack and defense. In order to achieve this coordination, it must be based on personal high technical level and tactical awareness. The classification of specific football tactics is shown in Figure 6.

As can be seen from Figure 6, football tactical knowledge has a certain level, from individual tactical actions in the game to local cooperative tactical actions and then to the overall tactical actions of the whole team. However, in the process of learning and mastering, there is no strict boundary distinction, and there are a certain intersection and integration between all levels. Individual tactical actions shall meet local tactical action requirements. Local tactical actions should be integrated into the overall tactical application of the whole team. The hierarchical structure of tactical awareness in football matches is still reflected in two aspects: thinking activities and behavior activities. The first is the different levels of performance of special sports perception, special sports attention, special sports memory, and special sports decision-making in the content structure of football game tactical consciousness. Second, it is the hierarchy shown in the process of mastering football tactical knowledge and acquiring football sports skills. When athletes learn and master football tactical knowledge and football sports skills, they will show hierarchical characteristics in different contents and levels. Athletes step up the demand for knowledge and skills.

*2.4. Analysis of Experimental Results.* With the continuous acceleration of attack and defense speed and the increasingly fierce confrontation in modern football games, the winning law and the contradiction between attack and defense determine that the players on the field must compete and control the "ball" with the other party as a whole. This is the full embodiment of modern football's "ball as the center, collective confrontation as the soul." At the same time, modern football also puts forward new and higher requirements for football technology, and football tactical awareness plays an increasingly important role in the game. On this basis, the tactical awareness of the team under different tactical methods is compared and analyzed, as shown in Table 5.

Through the analysis of Tables 5 and 6, it can be seen that the overall advantages of the method proposed in this study are obviously superior to those of the traditional method, and it is reliable.

Through the interpretation of the concept of football tactical awareness, we know that the tactical awareness of football games is mainly a special ability to reflect the rules of football games through the players' brain thinking activities. It can be seen that it is the soul of the player and the guide that guides all actions of the player in the game. Tactical awareness in football games is the sum of players' technical awareness, tactical awareness, and physical awareness. Its main characteristics are the timeliness of observation, the potential of thinking, the immediacy of decision-making, and the embodiment of action. The survey on the cognitive level of the tactical awareness structure is shown in Table 7.

The skill application of athletes in the competition is not only an important factor affecting the effect of tactical application but also one of the main contents of the application of competition tactics. There have been many research results on the general law of athletes' skill mastery. Here, we only discuss the characteristics of skill application of athletes of different ages in the competition, so as to provide basis for

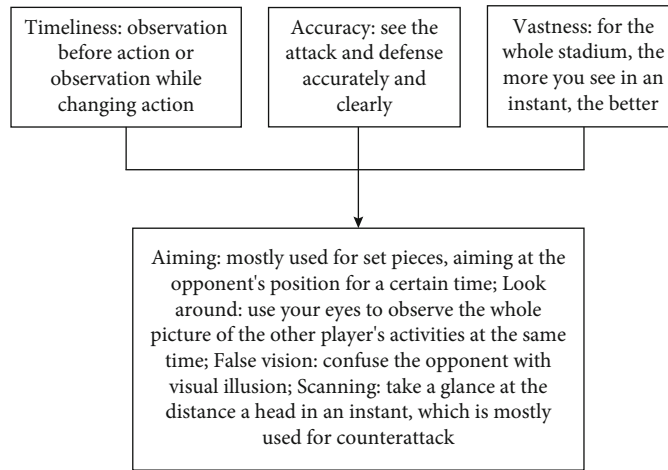


FIGURE 5: Tactical organization ability system in football match.

TABLE 3: Description of coping tactical rules.

Listening object	Description of listening event
Football	When the direct distance between the football and the control team member is greater than a certain value, the ball is sent out, indicating that the control team member has passed the ball and can stop monitoring
Ball-controlling player	Judge the identity of the ball control player. If it is less than a certain value, the player is regarded as the ball control player
Stop the attacker	Determine the identity of the organization offensive team member. If the distance from the ball control team member is between a certain value, it is regarded as the organization offensive team member
Cooperate with offensive players	After being judged to cooperate with the attacking player, when the ball moves to the range where he can control the ball, do the ball facing movement
Man-marking player	Make the identity of the man-marking player. When the straight-line distance from the ball control player is greater than a certain value, it is regarded as the man-marking player

TABLE 4: Contents of football special sports perception and its main role in football matches.

The main contents of football special sports perception	Role in football match
Judgment of the position and distance of the ball and players	Select and adjust personal location
Judgment of the direction and speed of the ball and players	Select and adjust personal running position
Judge the direction and speed of the ball and player	Judge the development direction of real-time competition
Judgment on occupying space and gaining benefits	Choose the timing of personal position selection and running
Judgment on the implementation and selection of technical actions	Choose personal tactics
Judgment on the application method of group tactics	Select the local tactical method of this pair
Judgment on the tactical application effect of the whole team	Select the overall technical and tactical methods of the team

different requirements of training. Experts believe that the purpose, rationality, and adaptability of athletes' skill application in football match are the performance of different levels of skill application. In the competition, the main feature of U15 athletes' skill application is that the purpose of application is relatively clear, but the rationality, adaptability, and effectiveness are still insufficient. U17 and U19 athletes have made great progress in the rationality and adaptability of skill application. The poor ability of skill application is a common problem in these three age groups.

In the questionnaire survey of athletes, U17 and U19 athletes generally believe that their "dribbling breakthrough ability" and "ball snatching ability" are one of the main abilities they lack when answering "their most deficient ability." Obviously, the confrontational ability of skill application is the basis of the rationality and adaptability of skill application. U17 and U19 athletes urgently need to develop the confrontational ability of skill application. It is also because the rationality and adaptability of skill application put forward higher requirements for the confrontational ability. The

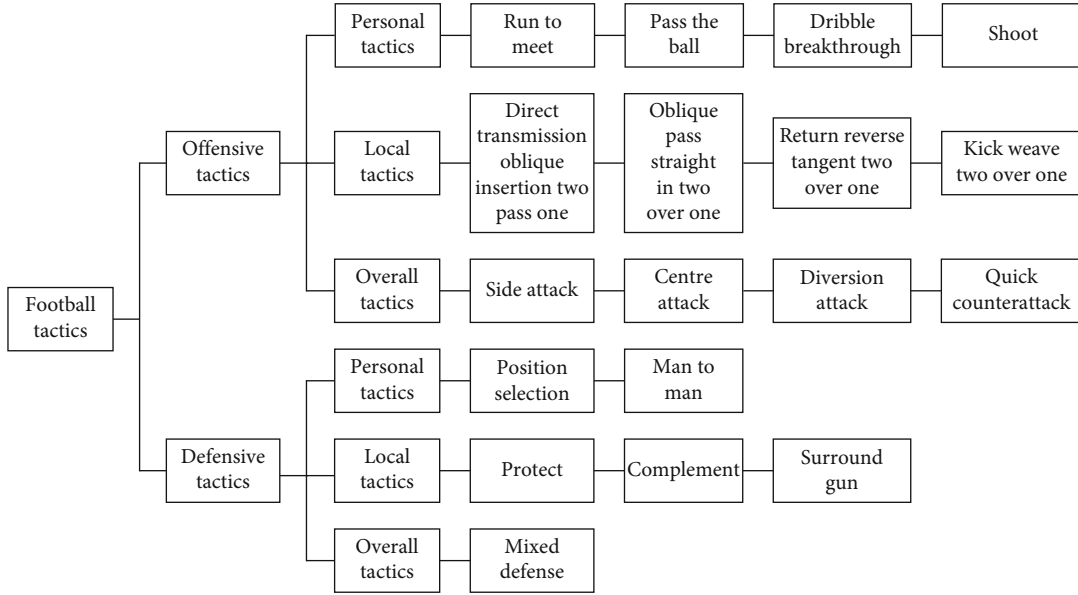


FIGURE 6: Football tactical scheme design system.

TABLE 5: Investigation of team tactical satisfaction under traditional methods.

Satisfaction	Very important		More important		Not very important		Unimportance	
	People	%	People	%	People	%	People	%
Coach	64	66	52	56	46	55	34	—
Athletes	55	58	61	42	62	64	59	—

TABLE 6: Investigation of team tactical satisfaction under the method of this paper.

Satisfaction	Very important		More important		Not very important		Unimportance	
	People	%	People	%	People	%	People	%
Coach	88	81	85	84	82	90	88	—
Athletes	85	89	85	85	89	88	89	15

TABLE 7: Investigation on cognitive level of tactical consciousness structure.

	The team		Professional youth team	
	People	%	People	%
Very well	11	8	18	68
Better understanding	16	12	9	33
I do not know much	61	42	2	5
Do not understand	63	45	—	—

football tactical analysis method based on position data is used to test the rationality of tactical plan selection together with the method in this paper and the traditional method. The comparison results are shown in Figure 7.

According to Figure 7, compared with the traditional method and the analysis method based on position data, the method has higher practicability and steering. In the

process of learning tactical knowledge and acquiring sports skills in football matches, we should start with personal tactical knowledge and skills and gradually transition to group tactical knowledge and skills. Finally, learn and master the tactical knowledge and skills of the whole team. Personal tactical knowledge and skills are the basis of the tactical knowledge and skills of the team and the whole team. For example, the knowledge of position selection and movement is the basis of understanding the tactical knowledge of protection, replacement, and cooperation. Without good position selection and movement knowledge, it is impossible to master the basic principles of protection, replacement, and cooperation. Similarly, when choosing the time of learning, we should consider the intersection and complementarity of all levels. When the low-level content has not been mastered skillfully, we can timely introduce the high-level content learning, so that the two contents can promote and supplement each other in the cross learning, which is beneficial to the athletes' understanding and mastery of the learning content, and achieve the effect of common improvement.



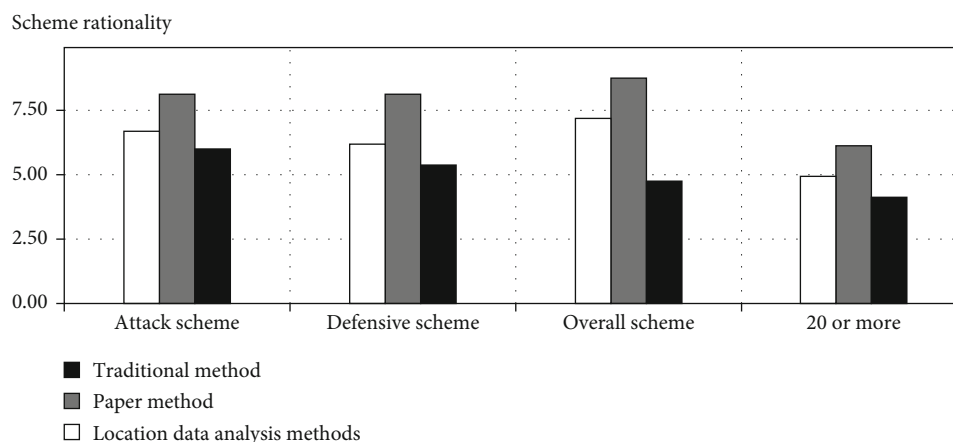


FIGURE 7: Rationality test results of tactical scheme selection.

### 3. Concluding Remarks

In recent years, football tactical analysis based on location data has gradually increased, and big data technology is driving changes in the field of football research. However, location data based on video analytics technology can only provide big data in a single spatial pattern, while wearable devices can provide real-time data, which includes the physiological data of each player in a football match. In view of this, future research should provide objective information for coaches and optimize the prediction of performance results to a certain extent by integrating training demands, cyclic load, game format, player fitness, and fatigue and using data visualization and reporting. In particular, new AI methods of multiple regression and deep learning techniques are expected to provide new avenues for football tactical research. This paper analyzes football tactics based on the multiple regression method, first establishes the football rehearsal model, then uses the big data technology to analyze the football tactics at multiple levels, and finally analyzes and evaluates the football tactics based on the multiple regression algorithm, so that the players can form a football tactical training awareness and complete the football tactics. Compared with the traditional method and the improved method, this method has higher practicability and operability than the traditional method. The method in this paper is expected to provide a research reference for future computer science researchers, sports science researchers, and football coaches.

### Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

### Conflicts of Interest

The authors declare that they have no conflicts of interest to report regarding the present study.

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