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## Construction of the technical sensitivity training model theory of Chinese footballer and empirical analysis

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### ABSTRACT

The effectiveness of footballer technology application depends on the specific situation of the sensitive degree of the football players, which can reflect the basic qualities of the football player. In view of this context, in the study of footballer technical sensitivity training, the related training model should be constructed to make the footballer technical sensitivity training better. In this area, first of all, the research objects of the model construction must be chose effectively. By carrying out the specific sensitivity training process to fully reflect the value of the model. Secondly, according to the fields involved in the football technical sensitivity training, the appropriate construction process must be given to the structure of its model, so that the model construction can reflect the improvement of the power and quality of player in various aspects. After that, based on the players' technical sensitivity training methods, the study carries out the specific inquiry and experiment to insure the efficient data for the application process of the model. Finally, the corresponding verification model construction should be carried out for this model, so as to verify the effectiveness and reliability of the application of footballer sensitivity structure model and the verification results can provide the effective information feedback for the specific application of the model. This is the main idea of this research, which is also able to reflect the specific research process and research steps, and research purposes have also been reflected more clearly.

### KEYWORDS

Football game; Sensitivity training model; Verification model; Theory construction; Empirical analysis.



## INTRODUCTION

From the perspective of action analysis, the football technical action is diversity. And the effective accomplish of these techniques need a strong sensitivity as a fundamental guarantee. So from this perspective, the sensitivity training for the footballers' technology is especially important. This study carries out the corresponding research on the related fields combined with this aspect, so as to fully reflect the value of the training model and testing model. The study of the related field is carried out combining with the establishment of the footballer sensitivity quality structure model, the selection of the training methods, the statistic of the load, the design of the testing model structure and the design principles. It can fully reflect the scientific and reasonable of the research process, so as to lay a solid theoretical and data foundation for the continuous improvement of the usefulness of the model construction.

### THE EXPERIMENTAL SUBJECTS AND THE CONSTRUCTION OF PLAYERS' SENSITIVITY STRUCTURE MODEL

#### The experimental subjects

In the construction process of the quality structure model of footballers sensitivity, this study selects twelve young football players in the relevant football club as the research object and the basic situation of the 12 players is reflected clearly in TABLE 1.

**TABLE 1 : The statistics of the basic situation of the experimental subjects**

Name	Age	Standing long jump(m)	30 m sprints (s)	6 * 5m shuttle run (s)	Test (s)
Li Jialong	10	1.57	5.76	11.76	18.9
Song Jinkai	10	1.66	5.37	11.02	18.31
Wu Hao	10	1.53	6.01	11.23	18.55
Teng Zihao	11	1.73	5.16	9.68	14.81
Gao Yu	11	1.77	5.04	9.65	14.84
Li Jiangquan	11	1.69	5.18	10.28	16.07
Xie Zhaoyu	12	1.93	4.78	9.23	14.81
Gao Tianyu	12	1.77	5.36	10.76	16.41
Chen Tianyu	12	1.87	4.97	9.39	15.11
Gao Binbin	12	1.81	5.12	10.33	16.03
Jin Peng	13	1.98	4.72	9.18	14.26
Jia Xiaoda	13	1.90	4.90	9.65	15.22

#### The construction of the football players' sensitivity quality structure model

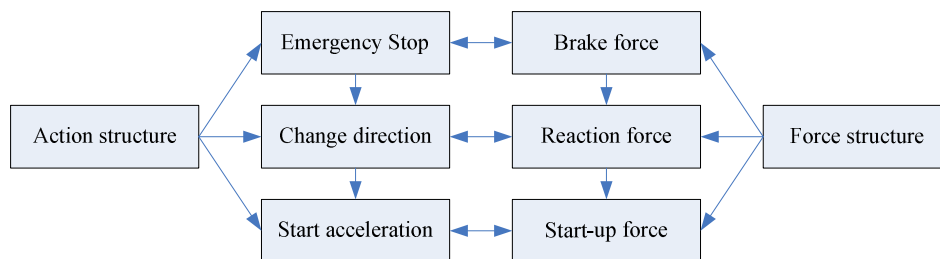
In the construction and study process of the football players' sensitivity structure mode, first, it should be combined with the specific characteristics of kinematics and the development ideas of dynamics to make the specific exploration, so as to make the footballer sensitivity quality training have a strong theoretical basis. The typical performances of kinematic of footballer sensitivity quality are based on the rocket start, instant stop, change to accelerate and start - up speed as the basis, so that the football player can complete more complex technical action at high speed movement. With the rapid development of football, a lot of researchers classify the rapid forces specifically and form the brake force, start-up force and explosive strength<sup>[1]</sup>. The definition of the start-up force is to display the lower limbs strength in the greatest degree in the shortest time, which is the foundation of the acceleration forces. Also, it can overcome the external resistance in the maximum degree in the shortest time, so as to provide an effective power for the high-speed running. Usually, this is called the explosive strength.

The so-called brake force is the corresponding stretch reaction produced by the muscles of human body in the quick movement of mankind, so that the movement can be stopped in the shortest time. The process of the brake force is because that it receives the stimulation of relevant receptor so that the stretch reflex of human body can be corrected timely, so the reflex movement is formed. However, such a reflex movement may make the body produce a certain reverse acceleration motion during the movement. This can strengthen the ability of reverse movement continuously, which is the basic condition for the composition of brake force. However, the reaction force is formed from the process of centrifugal stretched of muscles to the concentric contraction. It fully uses the storage and release of elastic energy, making the reflex force can be out broken effectively. And this power is used as the power base of buffer and kicking actions.

The research depth of the rapid force and the development speed of the research process lay a solid foundation for the training of football players' sensitivity, also it the important criteria to reflect whether the sensitivity quality training of football players can meet the requirements of scientific and effectiveness. It can be fully seen that the inner strength quality of football players' sensitivity includes the start force, brake force, reaction force and explosive force, and so on. However, for the sensitivity of football players, the fast or slow of the movement speed is not the specific performance. And the specific performance is to accomplish its action effectively in the process of high-speed movement and to improve the efficiency of

completing the technical action<sup>[2]</sup>. In this regard, the core structures of football players' sensitivity model are mainly defined as emergency stop, change direction and start, while its inner strength support is mainly reflected in the brake force, reaction force and start-up force.

In the process of the sensitivity quality training of football players, it gives the movement and the basic characteristics of a special campaign the effective research to make a strong consistency between them, so as to make the footballer sensitivity training process achieve the special requirements. And the formation and development of the rapid force quality is the basic element of the construction of players' sensitivity quality. In the construction process of football players' sensitivity quality structure model, the fast force should be analyzed and researched specifically. The specific model is shown in Figure 1.



**Figure 1 : The football players' sensitivity quality structure model**

**THE SELECTION OF TRAINING METHODS**

From the perspective of the actual practice of the footballers' sensitivity quality structure model, the study makes a unified planning and collation for the training means of the coaches to make the reaction force, start-up force and brake force get better development. The specific training methods are shown in TABLE 2.

**TABLE 2 : Summary of common training methods**

	<b>Brake force</b>	<b>Reaction force</b>	<b>Start-up force</b>
Training methods	1. Various of jumping practice of higher height 2. Run to different directions 3. The impedance practice of muscle centrifugal contraction	1. Various of jumping practice of lower height in different directions 2. Different jumping practice, such as continuous jump, Continuous jump with one foot and jump the steps.	1. A variety of sprint practice such as sand running, uphill running, running stairs, etc. 2. Run to different directions. 3. Run by holding the heavy objects, using a variety of power do buildup, traction run and a variety of positions run by listening to the starting signal. In addition, the practice of developing jumping reaction is also a good way to develop the start-up force.

In the construction process of football players' technical sensitivity training model, the training methods are selected effectively based on TABLE 2, so that its training contents can be selected more effectively. When selecting the training method, the jumping exercises and corresponding varied pace should be combined scientifically. So, the sensitivity practice degree of the research objects would be able to achieve the goals, so as to reflect the effect of the practice process directly. After the repeated demonstration, the height of the jump practice is set to 50 cm, and the main reason to set the height is that it can minimize the joint damage of the players. At the same time, it also can make the connection with the next technical movements more smoothly for the players to achieve the ultimate goal of promoting the players' brake force. However, the jump height of the left and right direction generally is chose as 30 cm, and the main reason is that the height would be able to reach the muscle stretch training standards easily; so as to make the reaction force of players can be strengthened significantly. The speed agility run mainly has the positive effect on the improvement of the star-up force and brake force of football players to make the sensitivity quality of players can be developed in certain extent<sup>[3]</sup>.

**THE STATISTICS OF LOAD**

During the training process of football players sensitivity, the method which is used is repetitive training, and each training time is usually set between 30-40 seconds. Every training process is divided into four groups and the training times for each group are kept at six to eight. For the training load, the heart rate can usually reach from 160 times to 180 times. When achieving the level, the training is stopped. After the heart rate decreases to 100 beats per minute, the second training should be started. And the specific statistical results are:

The total loads of speed agility run, the corresponding reaction force and brake force can achieve 5760, 2048 and 2048 respectively. The average load can reach as much as 180, 64 and 64. From this part, it can be seen that the realization of

the sensitivity quality training can achieve a positive effect on the load adaption degree for the football players, also it provides a more effective data support for the improvement of football players' sensitive quality.

**COMPARISON OF THE TEST INDICATORS BEFORE AND AFTER THE EXPERIMENT**

After sorting the data in TABLE 3, people can conclude that after the eight weeks' physical sensitivity training, the training indicators of the player have been improved significantly. The sensitivity quality is 6 \* 5m shuttle run and its training indicators improves 5%, while P <0.01. This data can reflect that there are obvious differences between the testing indicators of the two tests before the experiment and after the experiment. And the Illinois and test indicators have improved 0.46 seconds, also the overall lift magnitude is as much as 3%, and P <0.01. This aspect can show that there are some differences between the test indicators before and after the experiment, which makes the study has a strong accuracy for the construction of the sensitivity structure model of the football players and has a good effect on the brake force, start-up force and reaction force of the football players. For the standing long jump, the indicator of players increases to 0.11m and the rate of increasing is 6%, while P<0.01. And, after the test of the 30 m sprints, the players can accomplish their tasks less than 0.24 seconds than before and the total amount increase to 5%, while P<0.01. Through the indicator data in these two areas, it can be seen that there are big differences between the training indicators during the test training and the training indicators after the test training. This plays a positive influence on the brake force, reaction force and start-up force of the football players and offers the help for the strength quality training and speed displacement quality training of the players<sup>[4]</sup>. From the data analysis process, you can also see that the training to the footballers' sensitivity quality can produce an effective effect on promoting the quality of the other aspects, so that makes people usually have confusions between the speed training and the strength quality training of the sensitive quality training.

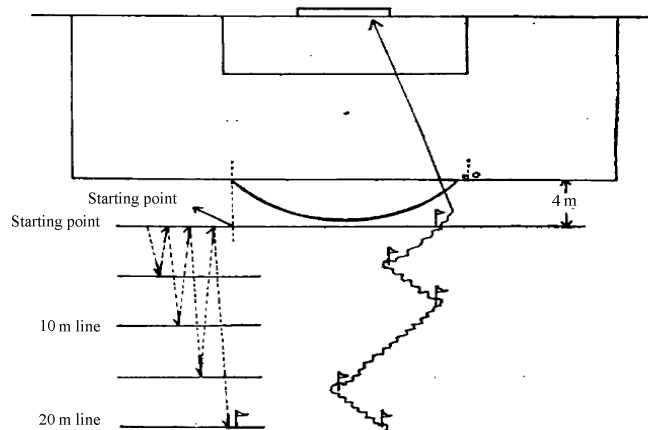
**TABLE 3 : The comparison of the test indicators before and after the experiment (N =12)**

	Standing long jump(m)	30 m sprints (s)	6 * 5m shuttle run (s)	Test (s)
Before the experiment	1.93±0.14	4.95±0.36	9.84±0.85	15.03±1.62
After the experiment	2.04±0.19	4.71±0.33	9.30±0.69	14.57±1.20
Increase the magnitude	0.11	0.24	0.54	0.46
Increase the magnitude%	6	5	5	3
T	-4.517	3.956	4.777	3.788
P	P<0.01	P<0.01	P<0.01	P<0.01

**THE STRUCTURE DESIGN AND DESIGN PRINCIPLES OF THE VERIFICATION MODEL**

**The structure design of the model**

In the construction process of the verification model for the sensitivity quality training of footballers, through the continuous communication and research of the 60 corresponding experts and scholars, the verification model is constructed effectively. After several modification and improvement, the verification model is confirmed finally. The model construction is shown in Figure 3<sup>[5]</sup>. In this model, based on the 20m shuttle run, the training content is tested furtherly by the appropriate sensitivity training means. It provides the specific testing progress for the training effect of the players' start-up force, brake force and reaction force. This process needs to combine the main features of the sensitivity quality of football players' structure model to fully protect the validity and reliability of the verification model. The special speed integrated test model of the excellent foot players is shown as Figure 2.



**Figure 2 : The special speed integrated test model of the excellent foot players**

## The test of the verification model

### The game statistics test of the structural elements of the verification model

In the construction process of the verification model, the main features of footballers' sensitivity quality structure model system should be reflected in concrete, making specific conditions which the model needs can be offered to show the specific value and the meaning of the footballer sensitivity quality structure model clearly. TABLE 4 is the detailed investigation and research for the main activities of footballers' sensitivity quality training process to make the effective statistic for the training situations of the 12 football players<sup>[6]</sup>. By the statistical results, the verification model mainly contains the major forms of footballers' sensitivity training process, as well as the linear distance produced by the players in the different training processes. This makes a strong consistency between the verification model and the construction of the footballers' sensitivity quality structure model, which can reflect the specific situations of the sensitivity training process of the players scientifically and effectively. At the same time, it can reflect the training methods and other factors of the training process and lay a solid data foundation for the continuous improvement of the practical value.

**TABLE 4 : The training statistical results of the various representation forms of the special speed**

Project	Start	Fast run	Hustle	Access and control breakthrough	Access and control dispense	$\Sigma$	Emergency stop times	Combined with the transmission	Statistics of the number of people
The total number of actions	206	22	57	101	130	722	54	159	12
The times of per person in per game( $\bar{X}$ )	17.17	19.00	4.75	8.42	10.83				
The total distance of actions(m)	1030	3714	369	1406	719	7238			
The distance of per person in per game( $\bar{X}$ )	85.83	309.5	30.75	117.2	59.92				
The distance of per person in per game( $\bar{X}$ )	5.00	16.29	6.47	13.92	5.53				

### The statistics analysis of the reliability and validity of model

The construction process of footballers' sensitivity model is the corresponding research process for its practical value. And it is the process to combine with the literature data to test the reliability and validity of the model. Through the compilation of relevant data, it can be seen that the model has strong reliability and validity in the statistics point of view<sup>[7]</sup>. From the perspective of statistics, the construction of sensitivity model can meet specific requirements of the sensitivity training of players, so that the study has a high degree of credibility. The specific data is shown in TABLE 5.

**TABLE 5 : The inspection results of the reliability and validity of the testing of each team's model**

Project	Beijing team	Shanghai team	Dalian team
Reliability coefficient(k)	0.9613	0.9248	0.8085
Validity coefficient(k)	0.8940	0.9133	0.8225
Validation(p)	<0.01	<0.01	<0.01

## CONCLUSIONS

These mentioned above are the specific research and discussion process for the construction of the technical sensitivity training model theory of Chinese footballer and empirical analysis. In the study, the construction of the players' sensitivity structure model, the verification of the structure and the design principles are the important part, which reflect the specific purpose and the application value of the research. The author hopes that it can lay a solid theoretical and practical

basis for the carrying out of the subsequent further research, and has the positive effect on the technology sensitivity of Chinese football players.

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