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Analysis of Chinese Eight-Ball Techniques and Tactics and Teaching Strategies

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Abstract: *This study focuses on the analysis of techniques and tactics and teaching strategies of Chinese eight-ball, aiming to improve the teaching quality and technical level of athletes. The study first systematically expounds the basic techniques of Chinese eight-ball, including batting techniques, aiming skills and white ball control, and deeply analyzes the application of these techniques in actual combat. Through a large number of practical observations and data analysis, the study identified three main problems in current teaching: improper batting force, insufficient aiming accuracy and poor white ball control. In response to these problems, this study proposed a series of innovative teaching strategies, including batting force training combining "distance control method" and "speed adjustment method", aiming accuracy exercises of "point-line combination method" and "angle recognition method", and white ball control actual combat exercises of "fixed-point return method" and "multi-ball continuous hitting method", in order to provide theoretical guidance and practical methods for Chinese eight-ball teaching.*

Keywords: *Chinese eight-ball skills; analysis; strategy*

1. Introduction

As a rapidly developing competitive sport, Chinese eight-ball occupies an important position in China's sports industry. According to statistics from the Chinese Billiards Association, as of 2023, there are more than 520,000 registered Chinese eight-ball players nationwide, with an average annual growth rate of 15%[1] . Data from the World Billiards Association (WPA) show that Chinese players have won 62% of the world championships in the past five years, demonstrating their advantage in this event[2] . However, in actual teaching, there are still many challenges. This study aims to deeply analyze the core techniques of Chinese eight-ball, including hitting techniques, aiming skills and white ball control, and explore their practical applications. By systematically sorting out common problems in existing teaching, this paper will propose targeted teaching strategies and training methods. This study not only has direct guiding significance for the teaching practice of Chinese eight-ball, but also will provide new ideas for related theoretical research, and has important practical significance and academic value for promoting the development of Chinese eight-ball.

2. Overview of Chinese Eight-Ball and its techniques

2.1 Overview of Chinese Eight-Ball

Chinese eight-ball is a variation of the traditional American nine-ball billiards sport. It emerged and developed rapidly in China in the 1990s . Its characteristics are that it uses a larger table (2.79 meters long and 1.55 meters wide) and a smaller hole (8 centimeters in diameter), and uses 15 colored balls and 1 white ball for the game[3] . The rules of the game require players to hit the balls in a specified order. The winner is the one who first pockets all of their designated balls and finally knocks down the black 8 ball. Chinese eight-ball combines the characteristics of American and English billiards, requiring players to have precise hitting skills, strategic thinking and excellent psychological qualities. In recent years, the status of Chinese eight-ball in international competitions has continued to rise. It has become one of the official events of the World Professional Billiards Tour, attracting many top players from home and abroad to participate, and promoting the global development of the event.

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2.2 Basic technical analysis of Chinese eight-ball

2.2.1 Batting Technique

Batting technique is one of the core skills of Chinese eight-ball, which directly affects the outcome of the game. Correct batting technique includes a reasonable stance, a stable grip, a coordinated batting action and appropriate batting strength. Players need to master different types of batting methods through long-term training, such as straight-line batting, diagonal batting and curve batting. During the batting process, the contact point between the club head and the ball is crucial, and a slight deviation may lead to a significant change in the batting effect. High-level players can accurately control the batting point and achieve fine control of the white ball, thereby completing various complex tactical arrangements. In addition, the control of batting strength is also a key skill. Players need to flexibly adjust the batting strength according to the position, distance and tactical requirements of the ball to achieve the desired batting effect.

2.2.2 Aiming skills

Aiming skills play an important role in Chinese eight-ball and directly determine the accuracy of hitting the ball. Scientific aiming methods include correct line fixation, accurate judgment of the connection between the target ball and the white ball, and precise selection of the hitting point. Players usually adopt the principle of "eye - hand-club-ball" alignment to ensure the accuracy of the hitting direction[4] . In practice, players need to consider multiple factors, such as the angle between balls, the distance between the ball and the pocket, and the inclination of the table. High-level players can quickly evaluate these factors and make accurate aiming judgments in a very short time. In addition, players also need to master different types of aiming skills, such as direct aiming, indirect aiming, and combined aiming, to cope with various complex situations.

2.2.3 Control the white ball

White ball control is the most complex and advanced part of the Chinese eight-ball technical system. It determines whether the player can create a favorable situation for the next shot after completing the current goal. Superb white ball control technology includes precise landing point control, various rotation techniques and flexible route planning. Players need to adjust the hitting point, force and angle to give the white ball different rotation effects, such as topspin, backspin, left spin, right spin and their combination . These rotation effects can affect the movement trajectory of the white ball on the table and its behavior after collision. In addition, players also need to consider factors such as the friction coefficient of the table, the interaction between balls, and the collision effect between the ball and the edge of the pool. Excellent white ball control ability enables players to take the initiative in the game and lay the foundation for continuous scoring and tactical execution.

3. Common Problems in Chinese Eight-Ball Teaching

3.1 Improper hitting force

Improper hitting force manifests itself in various forms in Chinese eight-ball games, seriously affecting the overall performance of the players. Excessive hitting force often causes the white ball to continue to move at high speed after hitting the target ball, making it difficult to accurately stay in the ideal position. In this case, even if the target ball is successfully hit into the pocket, the white ball may fall into other pockets due to excessive movement, causing an accidental foul. When dealing with close-range billiards, excessive force may also cause the target ball to bounce out of the pocket, losing the chance to score. On the contrary, insufficient force may prevent the target ball from reaching the predetermined position, or even from completing a basic collision. In the case of long billiards, insufficient force may cause the ball to stop halfway, creating a favorable situation for the opponent.

The consequences of improper force control are not limited to a single shot, but can also have a chain reaction on the entire game. Improper force can destroy the original ball shape, making a situation that could have been cleared in one go complicated and difficult to resolve, forcing players to adopt a conservative approach and lose the initiative. Long-term force control problems can seriously undermine players' confidence, increase psychological pressure, and affect performance. In high-level competitions, a small difference in force can become a key factor in winning or losing, and a force error can give the opponent a chance to overtake and change the direction of the entire game. In addition, frequent force errors will increase unnecessary physical exertion, affecting the overall state

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and judgment of players in long-term competitions.

3.2 Insufficient aiming accuracy

Insufficient aiming accuracy is a common technical problem faced by Chinese eight-ball players. Its manifestations are diverse and far-reaching. The most common problem is the misjudgment of the ball's path. Players may underestimate or overestimate the collision angle between balls, causing the target ball to deviate from the intended path. When dealing with side pocket balls, players often misjudge the effective width of the pocket, causing the ball to pass by the edge or completely deviate from the pocket. Cognitive bias in the slope of the table is also a common problem. Especially in unfamiliar competition venues, players may not be able to accurately judge the actual path of the ball, resulting in repeated mistakes in the ball path that should have been easily completed. In addition, when dealing with combination balls, insufficient aiming accuracy can cause the collision point of the middle ball to deviate, making it impossible for the final target ball to enter the pocket as expected.

The consequences of insufficient aiming accuracy not only affect the score of a single shot, but also have a profound impact on the entire game. Repeated aiming errors will seriously undermine the confidence of the players, leading to increased psychological pressure, which in turn affects the subsequent performance. Aiming errors on key balls may directly lead to a reversal of the game situation and create opportunities for the opponent to overtake. Long-term aiming problems will limit the players' tactical options and force them to give up some difficult balls that they could have tried, thereby reducing the viewing and competitive level of the game. In team competitions, a player's aiming error may affect the morale and strategic deployment of the entire team. In addition, frequent aiming adjustments will increase decision-making time, which may lead to violations of time rules and give opponents additional opportunities. Insufficient aiming accuracy will also affect the players' overall control of the situation, making it difficult for them to accurately predict the direction of the next few shots, making it impossible to formulate long-term strategic plans.

3.3 Poor white ball control

Poor control of the white ball is a key factor that hinders Chinese eight-ball players from improving their skills. Its manifestations are diverse and far-reaching. The most common problem is the inability to accurately control the landing point of the white ball, resulting in a difficult situation for the next shot. After hitting the target ball, the white ball may stay in an undesirable position, such as near the edge of the cushion or blocked by other balls. Errors in spin control are also a common problem. Players may not be able to accurately apply the required topspin, backspin or sidespin, causing the trajectory of the white ball on the table to deviate from expectations. When dealing with a ball near the cushion, poor control of the white ball may cause it to accidentally hit the cushion and destroy the original ball shape. In multi-cushion shooting, players may not be able to accurately control the rebound angle of the white ball, making it impossible to execute a previously feasible tactic. In addition, when dealing with a safety ball, poor control of the white ball may result in the inability to effectively block the opponent's offensive route, giving the opponent an opportunity to take advantage.

The consequences of poor white ball control not only affect the score of a single shot, but also have a chain reaction on the entire game. Repeated control errors will force players to adopt a conservative style of play and lose the initiative to attack. In high-level competitions, the inability to effectively control the white ball may cause players to miss the opportunity to clear the table, creating the possibility for opponents to overtake. Long-term white ball control problems will limit players' tactical options, making it difficult for them to implement complex tactical arrangements, and reducing the viewing and competitive level of the game. Control errors on key balls may directly lead to a reversal of the game situation and affect the direction of the entire game. In addition, frequent white ball control adjustments will increase decision-making time and may lead to violations of time rules. Poor white ball control will also affect the player's psychological state, increase competition pressure, and thus affect subsequent performance. In team competitions, a player's control error may affect the strategic deployment of the entire team and reduce the overall competitiveness of the team.

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4. Teaching strategies for Chinese eight-ball skills

4.1 Training methods for hitting force

The batting force training can be carried out by combining the "precision distance control method" and the "variable speed batting method". In the precision distance control training, the coach marks multiple specific distance points on the table, such as 30 cm, 60 cm, 1 meter, 1.5 meters, etc., and requires the students to hit the white ball accurately to these points. At the beginning of the training, 5 points are set, and as the students progress, the number of points is gradually increased to 10 points to increase the difficulty. Practice each distance point 50 times and record the success rate. When the success rate of a certain distance point reaches more than 85%, the difficulty of the point can be increased or a new distance point can be introduced. Variable speed batting training requires students to hit the same target with different forces, which are divided into four forces: light, medium, heavy, and extremely heavy, and practice each force 30 times. The coach uses high-speed camera equipment to record the batting process, analyze the relationship between the rod speed and the ball speed, and help students establish accurate force perception. In addition, set specific scene training, such as long-table slow ball, close-table fast ball, pocket stop ball, etc., practice each scene 20 times, so that students can practice force control in a simulated actual combat environment.

In order to further improve the accuracy of force control, "blind hitting training" and "force gradient training" can be introduced. Blind hitting training requires students to close their eyes to hit the ball, relying entirely on muscle memory to control the force. Each training session requires 30 blind hitting, and then compare the performance with eyes open to find the difference and make adjustments. Force gradient training sets a series of gradually increasing force targets, such as 10%, 20%, 30% to 100% force. Students need to accurately control each force level and practice each level 15 times. In addition, "force control under pressure" training is introduced to simulate the tense atmosphere of the game, such as setting a countdown or adding spectators to test students' ability to control force under pressure. Through these diversified and systematic training methods, students can gradually master the ability to control precise force, laying the foundation for stable performance in the game.

4.2 Practice techniques to improve aiming accuracy

Practice to improve aiming accuracy can be carried out from two levels: basic aiming and complex aiming, combining "point-line combination method" and "angle recognition training". Basic aiming training sets 15 target points on the table, including corners, midpoints and special positions. Students need to accurately hit the white ball to these points from different positions. Practice each point 40 times and record the hit rate. When the hit rate of a certain point reaches more than 90%, increase the difficulty, such as reducing the target area or increasing the hitting distance. Angle recognition training arranges balls at various angles on the table, including 15 degrees, 30 degrees, 45 degrees, 60 degrees and 75 degrees, and requires students to accurately judge the angle and complete the hit. Students should practice 30 times for each angle to strengthen their angle perception ability. Instructors should use laser sights to assist training to help students understand the correct aiming line, but instructors should gradually reduce the use of auxiliary tools to cultivate students' independent aiming ability. The training program should introduce "obstacle aiming training", where instructors set obstacles in the ball path, such as placing interference balls in front of the target ball, forcing students to find alternative routes. Students should practice 25 times for each obstacle scene to improve their aiming flexibility.

To further improve aiming accuracy, "dynamic target training" and "extreme angle training" can be used. Dynamic target training requires the coach or training partner to roll a ball on the table, and the students need to aim at and hit this moving target. Each training session is repeated 50 times, and the speed and complexity of the moving ball are gradually increased. Extreme angle training focuses on practicing the most challenging angles in billiards, such as cutting the ball almost parallel to the edge of the library or entering the pocket at a very small angle. Each extreme angle is practiced 20 times.The training program should introduce "fast aiming training" where instructors set time limits for students, such as completing aiming and hitting the ball within 5 seconds, to cultivate fast and accurate aiming ability. Instructors should utilize virtual reality (VR) technology to create various complex aiming scenes and guide students to practice in a virtual environment. Each VR training lasts 30 minutes. Instructors should conduct aiming accuracy tests regularly, such as a 100-ball continuous aiming test, and record the success rate and average aiming time. The coaching staff should develop a personalized aiming training plan for each student based on the test results. Training supervisors should encourage students to conduct psychological training, such as meditation or breathing exercises, to improve

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concentration, and instruct students to conduct 15 minutes of concentration training every day. Through these comprehensive and in-depth practice methods, students can significantly improve their aiming accuracy and cope with various complex game situations.

4.3 Practical exercises to improve white ball control

Improvement of cue ball control can be achieved through actual combat drills using "precise drop point training" and "multi-ball continuous control method". Precise drop point training divides the table into 25 small areas, each of which is about 20 cm x 20 cm in size. Trainees need to control the cue ball to fall precisely into the designated area after hitting the target ball into the pocket. Trainees should practice each designated area 20 times and instructors should record the success rate. When the success rate of a certain area reaches 80%, reduce the target area or increase the difficulty of hitting the ball. Multi-ball continuous control training places 7-9 balls on the table and requires trainees to hit the balls into the pockets in a specified order while precisely controlling the position of the cue ball to create a favorable situation for the next ball. Each set of training lasts 30 minutes, and the number of balls and difficulty are gradually increased. The training program should introduce "spin ball precision control training" to practice different types of spin, including topspin, backspin, left spin, right spin and their combinations. Trainees should practice each type of spin 25 times, with instructors requiring them to not only control the type of spin, but also precisely control the intensity of the spin. Coaching staff should use high-speed camera equipment to record the trajectory of the cue ball and analyze the spin effect to help trainees understand and improve technical movements.

In order to further improve the actual combat ability of white ball control, "complex situation solution training" and "white ball control under pressure" can be set. Complex situation solution training simulates various difficult game situations, such as snooker breaking, long-distance precision control, multi-court shooting, etc. Each complex situation is practiced 15 times, requiring students to not only solve the current problem, but also create a favorable position for the next shot. White ball control training under pressure simulates the tense atmosphere of the game, such as setting time limits, audience noise, or introducing a reward and punishment mechanism in practice. Each stress training lasts 45 minutes, testing students' control ability under high pressure. Instructors should introduce "blind pocket training", requiring students to control the white ball without knowing the target pocket, and help students cultivate the overall perception of the table. Students should conduct 30 attempts for each training session, while instructors gradually increase the difficulty. The coaching staff should use physical analysis software to analyze the data of students' white ball control, such as rotation speed, deviation of the route, etc., and coaching teams should formulate personalized improvement plans for each student based on the data. Training administrators should hold simulated competitions or small leagues regularly to test and improve the level of white ball control in actual combat. Students are encouraged to conduct case analysis, watch professional players' game videos, analyze their white ball control skills, and imitate and apply them in training. Through these comprehensive and in-depth practical exercises, students can achieve precise white ball control in various complex situations and greatly improve their game performance.

5. Conclusion

This study systematically analyzed the techniques, tactics and teaching practices of Chinese eight-ball, revealing three core problems in current teaching: improper hitting force, insufficient aiming accuracy and poor white ball control. The study innovatively proposed teaching strategies such as "distance precision control method", "angle recognition method" and "multi-ball continuous control method", and constructed a complete technical training system. The research results not only provide theoretical guidance for improving the teaching quality of Chinese eight-ball and the technical level of athletes, but also lay a practical foundation for the sustainable development of the project.

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