

Characterization of the serve-receive techniques of Chinese outstanding female table tennis players with hearing impairment

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Abstract: *In recent years, table tennis for the disabled has been highly emphasized, and athletes have made a lot of achievements in the World Championships and the Olympic Games and other competitions, which is a proud achievement. The serve-receive technique is a very difficult technique for hearing-impaired table tennis players, who cannot hear the sound of the opponent's serve and cannot clearly recognize the strength of the spin of the incoming ball, but can only observe it with their eyes. Therefore, it is very necessary to analyze individual players' serve-receiving techniques, reflect the deficiencies of players' serve-receiving techniques through data, and better improve techniques and tactics. This paper adopts the literature method, video observation method, three-stage statistical method, logical analysis method, etc., to take the technical and tactics of four female members of the China National Table Tennis Team for the Hearing Impaired in domestic and international competitions in 2015-2017 as the research object, and analyze the athletes' serve techniques in a more detailed way, so that it can be used as a better foundation for the technical training of the athletes with the hearing impaired in the future.*

Keywords: *hearing impaired athletes; table tennis; serve receive; technique*

1. Preface

After reviewing a large amount of literature, we found that 90% of the articles about individual tactics analysis are mainly about the tactics of able-bodied athletes. Hearing-impaired athletes have hearing deficiencies, so they do not understand coaching instructions as well as able-bodied athletes, so there is still a certain gap between their techniques and those of able-bodied athletes^[1]. The results of our technical and tactical analysis can give them visual feedback, which can let them see their technical and tactical deficiencies more clearly, and make up for the obstacle of auditory input^[2].

In this paper, the statistics on the serve-receiving techniques of Chinese outstanding female table tennis players with hearing impairment in domestic and international competitions are conducted to find out the advantages and disadvantages, which will provide certain references for the future training and competitions of female table tennis players with hearing impairment^[3].

2. Objects of Study and Research Methodology

2.1 Objects of study

This paper studies the skills and tactics of the four female starters who participated in the Turkey Hearing Impaired Olympic Games in 2017 in China. Lin Huan is a chipper whose hearing impairment is acquired and is mild, and she can communicate with normal people after wearing hearing aids. Shi Shu's hearing impairment is congenital, one ear is completely deaf, the other ear can hear but not clear, and can communicate with people normally. Huang Mengping, whose hearing impairment is congenital, is completely deaf in both ears and cannot communicate with people, but can only use sign language. Wang Zhe, whose hearing impairment is congenital, was able to communicate with others after wearing a cochlear implant. The number of matches selected for this paper is limited due to the relatively small number of matches played by hearing impaired table tennis players.

2.2 Research methodology

2.2.1 Video observation method

By looking at 16 key matches in major international competitions that four athletes competed in from 2015 to 2017.

2.2.1.1 Content of observations

Watching the videos of four female table tennis players with hearing impairment against major domestic and foreign opponents in domestic and international competitions from 2015-2017, to have an intuitive understanding of the technical and tactical characteristics used by the four athletes in the matches, as well as technical statistics. A total of 24 match videos were selected, including Shi Shu's 2 matches against domestic athletes and 2 matches against foreign athletes, Huang Mengping's 71 matches against domestic athletes and 3 matches against foreign athletes, Lin Huan's 2 matches against domestic athletes and 2 matches against foreign athletes, and Wang Zhe's 3 matches against domestic athletes and 1 match against foreign athletes.

2.2.1.2 Description of video selection

For the four female hearing-impaired athletes, the selection of video recordings was limited relative to able-bodied matches because they participated in fewer domestic and international table tennis matches for the hearing impaired, and this paper is the first technical and tactical characterization of domestic female hearing-impaired table tennis players. Therefore, in this study, the opponents of the four athletes were categorized into two categories according to domestic and foreign opponents, with a view to identifying their common and individual characteristics in the different categories. The opponents in each category are selected according to the principle of the top world ranking in that category, but there are still some limitations, for example, the hearing-impaired athletes have fewer competitions, and each time before the domestic and international competitions are held, they are selected from various teams in the country to participate in the training, so their world ranking is not stable enough. However, in its current form, some of the main rivals of the top world rankings who participated in the 2017 Hearing Impaired Olympics were selected as the main subjects of observation in this thesis.

2.2.1.3 Classification of concepts in statistics

For the purpose of record keeping and statistics, the concepts of techniques, landing points and lines utilized by the athletes in the competition are uniformly classified as follows:

- 1) Serving techniques: side spin, downward spin, upward spin^[4].
- 2) Serve Drop: With reference to the opponent's orientation, it is divided into short ball on forehand, short ball on middle, short ball on backhand, long ball on forehand, long ball on middle, long ball on backhand, and half-introduced ball.
- 3) Receiving the ball landing point: take the opponent's orientation as reference, divided into forehand position, middle and backhand position.
- 4) Offensive techniques: forehand pull, backhand pull, side pull, twist, pick, skim.
- 5) Controlling techniques: short swing, long split, long glue including scraping, skimming and squeezing.
- 6) Holding landing points: take the opponent's orientation as a reference, divided into forehand position, middle and backhand position.

2.2.2 Three-stage statistical method

This statistic was conducted using the current commonly used table tennis three-stage statistic method. Since no evaluation criteria have been done for hearing impaired athletes, the ordinary and most commonly used three-stage statistic criteria were used for evaluation^[5].

3. Analysis of results

3.1 Athletes' Receiving and Serving Technique Statistics

Table 1: Statistical Table of Athlete Receiving and Serving Techniques

Athlete	Score of gains and losses	Put	Strike	Pick,cast	Twist	Forehand pull	Backhand pull	Side pull	Total
Shi Ce	Gains	20	20	8	5	8	8	6	75
	Losses	13	14	10	3	1	4	5	50
	Scoring rate	60.60%	58.82%	44.44%	62.50%	88.88%	66.66%	54.54%	60.00%
	Usage rate	26.40%	27.20%	14.40%	6.40%	7.20%	9.60%	8.80%	100%
Huang Mengping	Gains	12	10	10	15	13	7	10	77
	Losses	13	4	3	12	6	6	6	66
	Scoring rate	48.00%	71.42%	76.92%	55.55%	68.42%	53.84%	62.50%	53.84%
	Usage rate	17.48%	9.79%	9.09%	18.88%	11.88%	9.09%	11.18%	100%
Lin Huan	Gains	15	18	12	0	2	0	3	57
	Losses	12	10	20	8	9	0	6	65
	Scoring rate	55.55%	64.28%	37.50%	0.00%	18.18%	0.00%	33.33%	46.72%
	Usage rate	22.13%	22.95%	26.22%	6.55%	9.01%	0.00%	7.37%	100%
Wang Zhe	Gains	13	9	8	7	8	10	12	67
	Losses	5	4	3	3	4	8	9	36
	Scoring rate	72.22%	69.23%	72.72%	70.00%	66.66%	55.55%	57.14%	65.04%
	Usage rate	17.47%	12.62%	10.67%	9.70%	11.65%	17.47%	20.38%	100%

As shown in Table 1, the most used technique for receiving serve is forehand chop, most of them are forehand chop long to the opponent's backhand baseline, and the picking technique for receiving serve is less used. Forehand split is also an advantage of the history of a technology, the history of the forehand glue, she can send the opponent near the net slower downspin ball split long for the speed of the bottom line ball, which makes it difficult for the opponent to side on the hand, and the history of the forehand split the long landing point change is more flexible, to split to the opponent's backhand baseline based on the split to the opponent's forehand with the split to the corner of the big. At the same time, the history of the reception of the long split combined with the pick, in many cases to make the long split in preparation for the moment of contact with the ball into the pick, so that the long split of the suddenness of the strong, with a certain degree of threat, so that the long split of the effect of the better. From the other technical point of view, the forehand pull backhand pull and side pull offensive techniques are used less, inevitably leaving the opponent a chance to attack on the third board. From the point of view of his hearing, because he could not judge the degree of rotation of the opponent's serve by the sound when he received the serve, he dared not easily go on the attack. On the whole, Shih Chuan's serve-receiving is still dominated by control, with less use of offensive techniques.

Athlete Huang Mengping serve receive use swing short, twist pull and forehand pull more, swing short mainly to backhand swing short to the opponent's forehand position small triangle position main, backhand twist pull to twist pull to the opponent's forehand position main, forehand pull mainly to forehand pull punch to the opponent's center mainly, serve receive backhand pull use less. Huang Mengping this athlete's own power quality is better, in the serve receive forehand pull punch is Huang Mengping's advantageous technology, when the opponent serves to Huang Mengping forehand position, Huang Mengping in many cases can pull punch direct score, if the opponent serves to the backhand position, Huang Mengping can also be positive side pull punch, and pull the ball quality is higher, the defense is not good opponents will directly turn to be passive or loss of points, Huang Mengping's forehand to the other side caused a great threat. Huang Mengping's forehand causes great threat to the opponent. Huang Mengping's backhand wringing pull use more, but wringing pull line is more single, will not give the opponent a threat. Huang Mengping's short swing is used more, short swing to the opponent's forehand small triangle and with the backhand split long to the opponent's backhand bottom line, will give the opponent a certain pressure, but also often because of inaccurate judgment of the opponent's serve and lead to their own errors more, and did not become the advantage of the technology. Huang Mengping is completely deaf in both ears, there is still a certain gap between her and Shi Shu and Wang Zhe in serve receiving, and not being able to hear the sound will definitely have a certain impact on her serve receiving. On the whole, Huang Mengping has more advantages in serve-receiving forehand pull punch, but her control technique is not good, her judgment is accurate, and she makes more mistakes.

As a chipper, Lin Huan's serve-receiving is mainly based on control techniques such as swinging,

chopping, skimming, etc. Swinging short is dominated by the opponent's short ball in the middle, chopping long is dominated by the opponent's forehand and backhand in the two big corners, and skimming is mainly concentrated in the opponent's middle. Lin Huan's forehand chopping long is his advantageous technique, thanks to the chipper's good forehand chipping technique, forehand chopping long with forehand short swing, making the serve receive more sudden, with a certain threat, the serve receive can be the opponent to send over the rotating ball better control, turn passive into active, the effect is better. Lin Huan's backhand skimming technique is used more, but there are also more errors, and the quality is not high, which can easily cause the opponent's counterattack. Lin Huan's hearing condition is better, so it is mainly a technical problem in the serve receive stage. On the whole, Lin Huan whose hearing is the best, is not much affected by his hearing in the serve-receive phase, and it is mainly a technical defect. In the serve-receive segment athlete Lin Huan's backhand control technique is slightly worse and does not have an advantage.

Athlete Wang Zhe receive serve to offensive techniques, backhand pull and side pull use more. The backhand pull is mainly to pull to the opponent's forehand position, and the side pull is mainly to slash. The serve-control technique is mainly based on the forehand and backhand short swing, and the main twist pull is used less. This athlete Wang Zhe has a fast conversion of forehand and backhand, and he mainly focuses on the quickness in the serve-receive link, turning passive into active, and when the opponent serves to the backhand position, he can actively pull the side body to charge and the speed is faster, which suppresses the opponent to a certain extent. The controlling technique of swinging short to the opponent's backhand position and the middle is mainly used, but due to its hearing, it is also unable to judge the opponent's serve, which leads to the poor quality of the receive, and cannot create a good opportunity for the fourth board of the opponent. The main reason for the less use of the forehand and backhand chopping length was also the poor judgment of the serve reception and the lack of decisiveness in the serve reception. On the whole, Wang Zhe used more offensive techniques and less control techniques in serve-receiving, and his judgment of serve-receiving was not good.

As shown in Table 1, after the athlete Shih Chuan used the techniques of swing, chop, skim, pick, twist, forehand pull, backhand pull, side pull and other techniques to receive the ball, the effect of the use of the forehand pull of the receiving ball was better, and the scoring rate of this point reached 88.88%, and the effect of the picking and hitting of the receiving ball was poorer, and the scoring rate of this point was only 44.44%. It shows that the history book receiving serve picking and skimming controlling technique is still a short board. History book in the game, offensive techniques still have a certain threat, high scoring rate, the effect is better.

Among the various serve-receive techniques used by athlete Huang Mengping in the match, the use of split and pendulum was more effective, and the score rate of this point reached more than 70%. The effect of receiving backhand swing short was poorer, the score rate of this point was 48.00%, indicating that receiving backhand swing short is still a short board of Huang Mengping. The effect of Huang Mengping's backhand pull was poor, the score rate of this point was 53.84%, indicating that the quality of Huang Mengping's backhand pull was not high enough. In addition, the effect of Huang Mengping's forehand pull and sideways pull was still better. Overall, Huang Mengping's backhand technique still needs to be improved.

Among the various serve-receive techniques used by athlete Lin Huan in the match, the technique of splitting the length was the most effective, with a score rate of 64.8% for this point. The use of picking and skimming in the serve receive was less effective, leading to the opponent's direct upward movement, and the scoring rate of this point was only 37.50%. Lin Huan, a chipper, used fewer offensive techniques on the serve receive and scored fewer points. Overall, Lin Huan's serve-receive technique is not advantageous, and as a defensive player, he should have better control technique.

Athlete Wang Zhe's use of various techniques in receiving and serving in the match was more balanced and effective. Among them, the pick and skimming technique was the best, with higher speed and quality, which in many cases could directly score or lay a good foundation for the attack of the fourth board, and the scoring rate of this point reached 72.72%. The use of backhand pull of Wang Zhe's serve-receiving was relatively poor, the quality of backhand pull was not high, the landing point was relatively single, which was the short board of Wang Zhe's serve-receiving, and the movement effect of other offensive techniques was better. On the whole, Wang Zhe's serve-receive technique was better.

3.2 Athletes' Receiving and Serving Drops Statistical Table

Table 2: Statistical table of landing points for athletes receiving and serving the ball

Athlete	Score of gains and losses	Forehand position	Middle road	Backhand location	Nothing	Total
Shi Ce	Gains	30	15	28	2	75
	Losses	18	10	12	10	50
	Scoring rate	62.50%	60.00%	70.00%	16.66%	60.00%
	Usage rate	38.40%	20.00%	32.00%	9.60%	100%
Huang Mengping	Gains	35	23	15	4	77
	Losses	18	15	10	23	66
	Scoring rate	66.03%	47.91%	60.00%	14.81%	53.84%
	Usage rate	37.06%	26.57%	17.48%	18.88%	100%
Lin Huan	Gains	20	19	14	4	57
	Losses	10	13	10	32	65
	Scoring rate	66.66%	59.37%	58.33%	11.11%	46.72%
	Usage rate	24.59%	26.22%	19.67%	29.50%	100%
Wang Zhe	Gains	28	10	20	9	67
	Losses	12	5	10	9	36
	Scoring rate	70.00%	66.66%	66.66%	50.00%	65.04%
	Usage rate	38.83%	14.56%	29.12%	17.47%	100%

Note: No points on the drop point means the opponent's serve error, no points on the drop point means Fan Zhendong's serve receive goes into the net or is introduced

Dividing the four athletes' serve-serve landing points according to the opponent's forehand position, the opponent's middle, and the opponent's backhand position, as shown in Table 2, from the point of view of the utilization rate, the Historical Book receives the serve mainly in the opponent's forehand position, with a utilization rate of 38.40%, the serve-serve to the opponent's backhand position is second, and the serve-serve to the opponent's middle is at least 20.00%. In terms of the overall scoring rate, the Historical Records received the serve to the opponent's backhand position scoring rate is higher, received the serve to its to the opponent's center of the scoring rate is relatively slightly lower, the main reason is that the change of the receiving line ignored the opponent's center. In the match, the quality of Shih's forehand chopping to the opponent's backhand position was very high, and combined with picking, it made the serve-serve to the opponent's backhand position caused some pressure.

From the utilization rate, Huang Mengping's serve receive is mainly to the opponent's forehand position, the utilization rate is 37.06%, the serve receive to the opponent's center is second, the serve receive to the opponent's backhand position is less 17.48%. From the point of view of the overall scoring rate, Huang Mengping received serve to the opponent's forehand position scoring rate is higher, receive serve to the opponent's center scoring rate is a little lower, the main reason is that in the judgment of the receive serve, judgment is not accurate when you cannot make a decisive decision, too much hesitation will receive the opponent's center and the quality of the lower. In the match, the scoring rate of Huang Mengping's swinging to the opponent's forehand small triangle and twisting and pulling to the bottom line of the forehand is very high, which also makes Huang Mengping take the initiative in the match.

In terms of utilization rate, Lin Huan receives serve mainly to the middle of the opponent's court, with a utilization rate of 26.22%, followed by serve to the opponent's forehand, and serve to the opponent's backhand is less at 19.67%. From the point of view of the overall scoring rate, Lin Huan had the highest scoring rate in serving to the opponent's forehand, and his scoring rate in serving to other lines was not much different. Lin Huan's service reception errors in the match were more, mainly due to the poor judgment of the opponent's serve.

Wang Zhe receive serve from the utilization rate, Wang Zhe receive serve mainly to the opponent's forehand position, the utilization rate of 38.83%, receive serve to the opponent's backhand position of the utilization rate of the second, receive serve to the opponent's middle of the ball at least, only 14.56%, from the overall scoring rate, Wang Zhe receive serve to the opponent's forehand position of the scoring rate of the highest 70.00%, receive serve to the opponent's middle of the road and the backhand position of the scoring rate of the the score rate of serve receive to the opponent's center and backhand was 66.66%, and there was not much difference in the score rate of this point in serve receive. Wang Zhe did not make many service reception errors in the match, but in many cases the quality of service reception was low because he could not judge the opponent's serve.

3.3 Technical Statistics of Athletes' Direct Points Scored and Lost in Receiving Serve

Table 3: Statistical table of direct gains and losses for athletes receiving and serving the ball

Athlete	Score of gains and losses	Put	Strike	Pick,cast	Twist	Forehand pull	Backhand pull	Side pull	Total
Shi Ce	Gains	8	15	3	1	3	2	1	1
	Losses	7	8	3	3	5	4	2	0
	Scoring rate	53.33%	65.21%	50.00%	25.00%	37.50%	33.33%	33.33%	100%
	Usage rate	22.72%	34.84%	9.09%	6.06%	12.12%	9.09%	4.54%	1.51%
Huang Mengping	Gains	8	10	7	3	3	3	2	0
	Losses	4	13	3	10	0	2	2	0
	Scoring rate	66.66%	43.47%	70.00%	30.00%	100%	60.00%	50.00%	0.00%
	Usage rate	17.14%	32.85%	14.28%	18.57%	4.28%	7.14%	5.71%	0.00%
Lin Huan	Gains	5	10	0	0	0	0	0	0
	Losses	9	8	0	0	0	0	1	0
	Scoring rate	35.71%	55.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Usage rate	42.43%	54.54%	0.00%	0.00%	0.00%	0.00%	3.03%	0.00%
Wang Zhe	Gains	10	6	3	3	4	2	0	0
	Losses	4	2	1	1	1	2	3	0
	Scoring rate	71.42%	75.00%	75.00%	75.00%	80.00%	50.00%	0.00%	0.00%
	Usage rate	33.33%	19.05%	9.52%	9.52%	11.90%	9.52%	7.14%	0.00%

According to the statistics in Table 3, the techniques of direct scoring of serve-receiving in the history book are, swing, split, pick, skim, twist, forehand pull, side pull, which include almost all the serve-receiving techniques. From the comprehensive scoring rate, split the highest 65.21%, the pendulum short second also reached 53.33%, indicating that the history of the book to control the serve to the main technology, and serve more direct scoring, forehand split the longest scoring rate is the highest, to the opponents caused a certain amount of pressure. However, the scoring rate of History's offensive technique is not high, the forehand pull, backhand pull and sideways pull did not reach 40%, which shows that History's technique of receiving the serve and direct attacking has some defects, and needs to be further improved. However, the scoring rate of forehand pull is slightly higher, so for a short period of time, the forehand pull is chosen to make up for the shortcomings on the backhand when conditions permit. In terms of the comprehensive utilization rate, the scoring rate of the history book is mainly concentrated in the split, with a utilization rate of 34.84%, and the utilization rates of the pendulum and forehand pull are also above 10%, while the utilization rates of the backhand pull and sideways pull are lower. The low usage rate of the backhand wring, which has the lowest scoring rate, makes the shortcomings of the history book in serve-receive less obvious, and the most important shortcoming is still the offensive technique. From observing the video, it can be seen that History's split-length swing technique is more threatening to fast attackers and less threatening to chippers. History's forehand pick and forehand pull are more threatening to defensive players. History's forehand foreglue is faster, and the serve-receive offense still poses a certain threat to opponents. Serve-receiving backhand pull and twisting pull are not effective for all kinds of athletes, the reason is in with its own mistakes more, the quality of the hit is not high. The serve-receive sideways pull is a big threat to chippers, but it is less used.

According to the statistics in Table 3, Huang Mengping's serve-receiving direct scoring techniques are, swinging, chopping, picking, skimming, twisting, forehand pulling, sideways pulling, which include almost all the serve-receiving techniques. From the comprehensive scoring rate, forehand pull scoring rate up to 100%, forehand pick second also reached 70.00%, indicating that the scoring rate of Huang Mengping's serve-receive direct attack is very high, serve-receive direct scoring is more, forehand pull scoring rate is the highest, which caused some pressure on the opponent. But the scoring rate of Huang Mengping's backhand technique is not high, backhand wringing, backhand chopping, did not reach 50%, indicating that the technique of Huang Mengping's backhand serve receive has certain defects, and needs to be further improved. From the comprehensive utilization rate, Huang Mengping's scores and losses were mainly concentrated in the split, with a utilization rate of 32.85%, and the utilization rates of pendulum, picking and backhand wringing were all above 10%, while the utilization rates of forehand pull, backhand pull and sideways pull were relatively low, and the most important deficiency was still in the backhand technique. From observing the video, it can be seen that Huang Mengping's split-length swing technique is more threatening to fast attackers and less threatening to chippers. Huang Mengping's

forehand picking and forehand pulling are more threatening to all athletes. Huang Mengping's forehand pulling is more powerful, and the direct attack of receiving serve will still cause a certain threat to the opponent. The backhand pull and twisting pull are not good for all kinds of athletes, the reason is that they are not flexible enough with their own errors. Serve-receive sideways pull has a certain threat to all athletes, but the use of sideways pull is less, to be further improved.

According to the statistics in Table 3, Lin Huan's direct scoring techniques for serve receive include pendulum and chop, and the use of serve receive techniques is less transformed. From the point of view of the comprehensive score rate, the highest score rate of 55.55% for forehand and backhand chop, followed by 35.71% for forehand and backhand swing. This shows that Lin Huan's score rate of serve control is relatively high compared to other techniques, and the direct score of forehand and backhand chop is high, which poses a certain threat to the opponent. However, Lin Huan's offensive skills are almost non-existent, and he still needs to strengthen his main ball attack. In addition, it is to actively change the serve-control techniques, boldly use skimming, scraping, popping and other techniques. From the comprehensive utilization rate, Lin Huan scored and lost points mainly in swinging and chopping, with the utilization rate of 42.43% and 52.54% respectively. From observing the video, it can be seen that Lin Huan has some advantages in receiving serve against the chipping players. The drop point of receiving serve is more flexible and of higher quality, and when the opponent serves the ball with topspin or side topspin, Lin Huan is able to reasonably change the ball into a strong downspin and change the passive into active. When Lin Huan plays against offensive players, his serve receive occupies a certain advantage in splits, but not in other serve receive techniques, or even at a disadvantage. There are two main reasons for this, one is that when the opponent serves, Lin Huan hesitates to serve in many cases and does not know which technique to choose to serve, which leads to a poor quality of return or direct error. Secondly, the serve-receiving technique is too single, and the opponent can easily know Lin Huan's intention to receive the serve. Lin Huan also needs to strengthen his attacking technique, a sudden serve receive attack will give the opponent the feeling of being caught off guard, and he can also receive the serve and score directly. Lin Huan's serve receive needs to be strengthened.

According to the statistics in Table 3, Wang Zhe's serve-receive direct scoring techniques include: swing, chop, pick, skim, twist, forehand pull, and sideways pull, which include almost all serve-receive techniques. From the comprehensive scoring rate except for the side and backhand pull, the scoring rate of the other techniques is above 70%, which shows that Wang Zhe's serve-receive technique is still very good and poses a certain threat to his opponents. However, the use of his side body is less, mainly because of the slower movement of the footwork, backhand pull of the score rate is slightly lower, there are still some technical defects. Therefore, the backhand should be strengthened in a short period of time to make up for the shortcomings on the backhand. From the comprehensive usage rate, besides the control technique, the use of offensive technique is still less. From observing the video, it can be seen that Wang Zhe had a higher hitting rate of receiving serves in the match, and his overall performance was better.

4. Conclusion

1) Historical serve-receive technique is more comprehensive, more stable on-court play, and the quality of serve-receive is higher, with more direct scores. History offensive techniques do not score at a high rate and need further improvement.

2) Huang Mengping's serve-receiving technique is more comprehensive, with control technique as the main combination of picking and twisting and pulling inside the table, the quality of offensive technique is higher, and the direct score is more. Huang Mengping's backhand serve-receiving technique has some defects, and the use of side pull is less, which needs to be further improved.

3) Lin Huan is a chipper, and Lin Huan's serve-receiving techniques are too homogeneous, almost all of which are control techniques, mainly swinging short and chopping long, with less use of control techniques such as picking and skimming.

4) Wang Zhe's serve-receive technique is more comprehensive, mainly control technique combined with offensive technique such as picking in the table, more direct points in serve-receive, backhand pulling a little bit lower scoring rate, there are still some defects in the technique. Therefore, the backhand should be strengthened in a short time to make up for the shortcomings of the backhand.

References

- [1] Lv Xiaolei. *The development of table tennis for the disabled in China* [J]. *Science and Technology Information*. 2010, 01.
- [2] Xinhua Dictionary. <http://xh.5156edu.com/>.
- [3] Tian Maijiu. *Athletic training science* [M]. *People's Education Press*. 2005:310.
- [4] Yue H. Zhang Yingqiu. *Analysis of the technical effect of table tennis doubles matches - A technical study on the doubles matches of China's outstanding male table tennis players* [J]. *Sports Science and Technology Literature Bulletin*. 2016.26(03).
- [5] Su Piren. *A new theory of table tennis tactics* [J]. *Journal of Nanyang Normal College*. 2003, 12(02): 85-87.