

Survey of the game styles of some of the best Asian players at the 12th World University Table Tennis Championships (Sofia, 1998)

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Abstract What are the basic strokes, currently used by the best player? What are their reliability and effectiveness? How long is the ball in play? What is the importance of services and of the ways they are received for the outcome of the matches?

By answering these questions we are trying to objectively establish and analyses some tendencies in the style of the present-day table tennis. Such a research aim requires solving the following primary tasks:

- establishment of the exact number of strokes for each point;
- specifying the percentage of each predominant type of stroke and the percentage of its reliability and effectiveness;
- defining the number and type of employed services and the ways they are received as well as the percentage of their priority usage and effectiveness.

We have applied the methods of literature analysis, pedagogic observation of video- and audio-cassettes with registration of certain game indicators by modified and original recording methodology, alternative analysis, etc.

Here we have analyzed some of the major matches of the new Chinese sports star Jinhao Guo (CHN), who completed the team competition without losing a match, and of the winner in men's singles Ryo Yuzawa (JPN) at the 12th World University Table Tennis Championship.

On the basis of accurately recorded and calculated data we could establish the percentage ratios of the game indicators we are interested in for each of the aforesaid tasks of the survey. The obtained results are tabulated and graphically presented.

The comprehensive comparative data analysis has enabled us to draw some valuable conclusions and make recommendations of practical-importance aimed at the improvement of table tennis training.

1 Introduction and formulation of the problem

The analysis of the modern competitive game shows that it becomes more and more dynamic. The balls sent in different directions with different forces and rotations compel the competitors to do the most complex movements in fractions

of a second. These movements include rapid movement by steps, lunges and jumps, combined with simultaneous body turns in different directions and delivery of strokes with great force and rotational velocity on the ball. In these movements, the muscles of the legs, of the shoulder girdle and of the whole body as well as of the arms take part. The combining these movements with the barely noticeable movements of the elbow and wrist, at a continuously changing tempo of the game, requires a considerable co-ordination and dexterity.

In fact, modern table tennis is built mostly on imparting to the ball of rotary motions of various kinds, character and speed and their rational combinations within the game. This is possible by using the rich arsenal of different strokes applied in today's practice.

The scientific explanation and the clarifying of the substance and the characteristic of the modern game is the way to understand its development, but of the world literature is deficient in studies that objectify the motor density in a particular competitive encounter.

Chinese authors - Chunhwei, Tsu et al. (1982) have reported data from studies on world championships. According to them, the measured motor density in an competitive encounter of three games is from 302 to 1 246 hand movements, i.e. an average from 0.26 to 0.69 movements per second. The three-game encounters take from 18 to 44 minutes depending on the style of play of the competitors, the time for actual play with the ball being from 51 % to 83 % of the total. We set forth the hypothesis, that the modern game is much more fast and dynamic, the ball stays for only a short time in game and the points are decided by a few strokes only.

Japanese authors - Nobuo Yuza et al. (1992) - have analysed the play of top Japanese players and have reported data for the average rally time (in sec.) for each point: 6.8 ± 4.23 seconds at an average number of 8.5 ± 4.93 strokes for each point and at a waiting time of $0.79'' \pm 0.094''$ between points.

Y. Drianovski - in "Tactics of Modern Table Tennis" (1979) - has studied the attacking style of game and has found that foreign competitors tended to finish the attack by the fifth ball with decisive finishing strokes 82 % of the time, whereas the corresponding number for the Bulgarian competitors was only 40%.

We considered it very topical and of great practical importance to study the rally time and the number of strokes for each point in the modern competitive game. This enabled us to study these indicators in order to clarify of the model characteristics of the present-day table tennis.

2 Organization and methods of research

Our study of the game styles of some of the best attackers in present-day table tennis let us answer the question: What main strokes do they build their game on?

The reliability and effectiveness of the main strokes of the particular players as well as the comparative analyses of the results from our previous studies let us determine the most general trends in the development of present-day tennis. However, the picture would be incomplete if we did not find out and analyse how long the ball currently stays in play, what are the intervals of intense work and

relative rest between the separate, as well as what is the role and the importance of the services and the ways to return them.

By posing these questions we set the research aim to find out what is the core of the modern competitive game and to make an attempt to find out its main model characteristics. To achieve this aim, we had to work on the solving of the following primary tasks:

1. Establishment of the percentage of predominant execution of a stroke; and the percentage of reliability and effectiveness of the strokes used between two attacking-style competitors.
2. Establishment of the exact number of strokes for each Point.
3. Establishment of the exact rally time for each point.
4. Establishment of the time interval for inaction between points.
5. Establishment of the importance and significance of services, on the outcome of the match.

In our study, we have applied the methods of literature analysis, video-recording, chronometry, pedagogic observation of certain indicators and their registration by a modified recording technique, mathematical and statistical methods, etc.

The subject of research is the competitive activity of the best Asian attackers during the 12th. World University Table Tennis Championship- (Sofia, '98), the new rising Chinese star Jinhao Guo (who completed the team competition without losing a match) and the winner in men's singles - the Japanese Ryo Yuzawa. We analyze here the data for these competitors from five of their most important matches.

The object of research has been: the application of the different strokes in the present-day competitive activity as game indicators according to the primary tasks.

The research data have been statistically processed and presented in tables.

The comprehensive comparative data analysis has enabled us to draw some valuable conclusions and make recommendations of practical importance aimed at the improvement of table tennis training.

3 Results and analysis

For the first indicator for the studied competitors, the data have been assembled as in Table 1. Analysing the data for the game style, we have found out that the Chinese competitor Jinhao Guo, is a universal attacker playing with tennis grip, the right hand close to the table and main strokes 35 % "top-spin" (forehand and backhand), which he uses with a great percentage of reliability - 75 % in a competitive situation. He has shown a high effectiveness in the top-spin strokes and the lift strokes as well - 59 % and 37 % respectively.

The Japanese competitor Ryo Yuzawa, with an attacking game, playing close to the table, tennis grip - left hand, builds his game around top-spin forehand 38 % and skilfully combines these strokes with powerful kill forehand strokes 10 % with a high percentage of reliability 78 % - 66 % and a high effectiveness 64 % - 38 %.

Table 1 KINDS OF STROKES predominant execution of the strokes in %

	Attacking strokes		Defensive strokes		Top-spin		Lift strokes		Contra attack strokes		Kill strokes		Forehand over head		Drop shot		Defensive chops		Defensive push		Intermediate strokes	
	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
Jinbao Guo China	47%	24%	12%	7%	23%	10%	8%	5%	6%	4%	4%	2%	1%	3%	3%	2%	10%	5%	6%	4%		
	Percentage of reliability of the strokes																					
	48 %																					
	58 %																					
	36 %																					
	42 %																					
	40 %																					
	39 %																					
	Percentage of effectiveness of the strokes																					
	59 %																					
	37 %																					
	24 %																					
	10%																					
	8%																					
	10%																					
	3%																					
	5%																					
	6%																					
	5%																					
	10%																					
	11%																					
	5%																					
	81%																					
	10%																					
	6%																					
	2%																					
Ryo Yuzawa Japan	59%	15%	8%	10%	38%	-	3%	5%	6%	5%	10%	-	-	11%	5%	-	-	-	81%	10%	6%	2%
	Percentage of reliability																					
	78 %																					
	56 %																					
	58 %																					
	66 %																					
	34 %																					
	46 %																					
	38 %																					
	Percentage of effectiveness																					
	64 %																					
	38 %																					
	-																					
	-																					
	14 %																					
	-																					
	38 %																					

Table 2 KINDS OF SERVICES IN PERCENTS

	F. rev. chop long		F. rev. with B. Spin Short		F. rev. with Comb. long		F. rev. with Comb. short		F. without Spin short		F. rev. with B. Spin and S. Spin long		F. rev. with T. Spin and S. Spin long		F. rev. with Spin short		F. high serve with B. Spin		F. rev. with T. Spin and S. Spin short		F. rev. with B. Spin and B. Spin short	
	F. rev. with B. Spin and S. Spin short	30.8 %	F. rev. chop long	6.1 %	F. rev. with B. Spin Short	16.3 %	F. rev. with Comb. long	6.1 %	F. rev. with Comb. short	12.2 %	F. without Spin short	7.1 %	F. rev. with B. Spin and S. Spin long	8.1 %	F. rev. with Spin short	13.6 %	F. high serve with B. Spin	5.4 %	F. rev. with T. Spin and S. Spin short	6.3 %	F. rev. with B. Spin and B. Spin short	6.1 %
Jinbao Guo - China		4.5																				9.48
Ryo Yuzawa - Japan		3.5																				9.35
	Average number of strokes for each point		Average rally time (in sec.)		Average time interval for inactive actions between points																	

Legend:

F. rev. - Forehand reverse diagonal
 F. rev. | - Forehand diagonal
 F. rev. | - Forehand reverse straight line

B. | - Backhand straight line
 S. Spin - Side spin
 S. - Spin

Comb. - comb. left side spin and back spin or right side spin and top spin
 B. Spin - Back spin
 T. Spin - Top spin

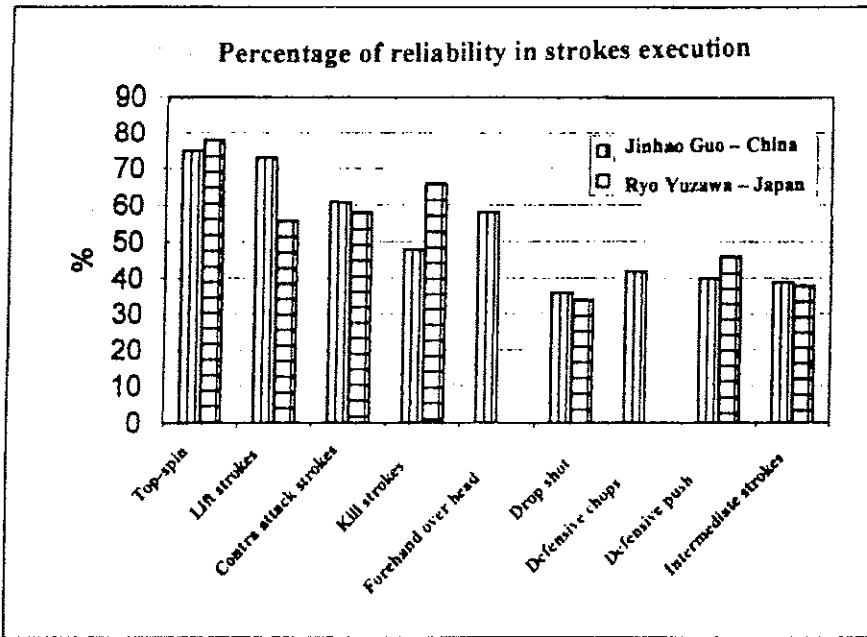


Figure 1.

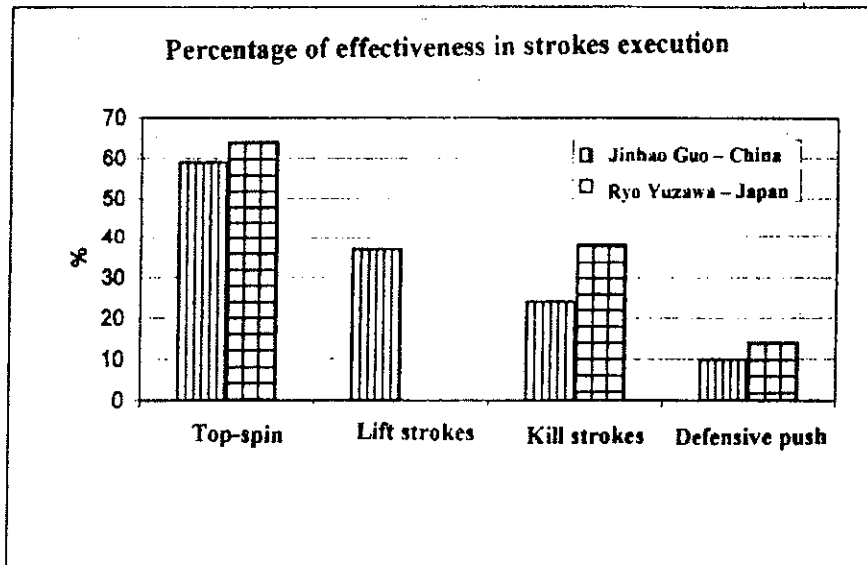


Figure 2.

The studied indicators for primary tasks 2, 3 and 4 are given in Table 2 in percentages.



Our hypothesis of a smaller number of strokes in a shorter rally has been fully confirmed by the data. The Japanese competitor keeps the ball in play up to seven strokes at most. The longest point for him is 6 seconds and the shortest is 2 seconds; for the Chinese competitor - 7 seconds and 3 seconds, respectively.

These data considerably differ from the data reported by Chunhwei, Tsu et al.

(1982) and Nobuo Yuza et al. (1992).

The data for the fifth primary task are shown in Table 2.

Both studied competitors show a rather great variety, nine kinds, of services.

It is worth noting that the service most often used by the Chinese competitor is the forehand  backspin and side spin (short and long) - 38.9 %, and the Japanese competitor plays mainly with the forehand  top-spin and side spin (short and long) - 45 %.

When returning the services, the active ways predominate (top-spin, lift stroke, etc.) executed by Jinhao Guo 60 % to 40 %, and by Ryo Yuzawa 60 % to 38 % (forehand and backhand strokes). In principle the longer services are returned with top-spin.

4 Conclusions and recommendations

On the base of the obtained results, the following conclusions and recommendations could be made.

1. Modern tennis becomes more and more fast and dynamic.
2. The rally is decided with a few strokes (2 to 4). mainly highly-rotatory top-spin strokes and strong kill strokes.
3. The time for a rally is considerably shortened - 3 to 7 seconds depending on the style of playing.
4. The time for inaction between points increases from 8 seconds - 19 seconds, and the time for play is only 32% of the total time of the game (according to the Chinese authors it is 51 % to 83 %).
5. The outcome of the point is decided within 2 to 3 strokes, this causing the game to lose its spectacular character and to become comprehensible for narrow specialists, only.
6. The clear difference between the average 3.6 seconds of work and 9.41 seconds of rest in the game between two attackers necessitates modeling the training conditions in the same way.
7. The non-working interval between the points-should be used, according to the situation, for relaxation and tactical correction in the game.
8. To save the spectacular character of the game, changes in the basic rules are necessary: increasing of the net height, enlarging of the ball, changes in the rules for the service in order to limit the advantages for the server, changes in the rules concerning the covering of the racket (thickness, material, etc).

5 References

- Drianovski Y (1979) Tactics of the modern table tennis.
Tsu C et al. (1982) Table Tennis (translated from Chinese).
Yuza N et al. (1992) Game analysis of table tennis in top Japanese players of different playing styles. International Journal of Table Tennis Sciences No.1, The ITTF - International Academy of Table Tennis Sciences (ATTSc).

Appendix.
(For 1 game)

Number of strokes	Result		For rally	For inactive actions
4	1	0	4 sec.	9 sec.
2	2	0	2 sec.	10 sec.
4	3	0	3 sec.	8 sec.
3	4	0	3 sec.	9 sec.
3	5	0	3 sec.	16 sec.
4	1	5	3 sec.	8 sec.
3	1	6	3 sec.	9 sec.
3	2	6	3 sec.	9 sec.
4	2	7	4 sec.	10 sec.
3	3	7	3 sec.	15 sec.
2	8	3	2 sec.	10 sec.
3	9	3	3 sec.	8 sec.
4	9	4	3 sec.	9 sec.
4	10	4	4 sec.	8 sec.
4	10	5	4 sec.	16 sec.
3	5	11	3 sec.	10 sec.
4	6	11	4 sec.	9 sec.
3	7	11	3 sec.	10 sec.
4	8	11	3 sec.	10 sec.
4	8	12	3 sec.	15 sec.
3	12	9	3 sec.	10 sec.
3	12	10	3 sec.	8 sec.
4	13	10	4 sec.	10 sec.
3	14	10	3 sec.	10 sec.
1	14	11	2 sec.	15 sec.
3	12	14	3 sec.	9 sec.
2	12	15	2 sec.	10 sec.
4	12	16	4 sec.	8 sec.
3	13	16	3 sec.	8 sec.
1	13	17	2 sec.	17 sec.
3	17	14	3 sec.	8 sec.
4	17	15	3 sec.	8 sec.
4	18	15	3 sec.	8 sec.
3	19	15	4 sec.	9 sec.
4	19	16	4 sec.	11 sec.
3	17	19	3 sec.	10 sec.
4	18	19	3 sec.	10 sec.
4	19	19	3 sec.	10 sec.
3	20	19	3 sec.	10 sec.
4	21	19	4 sec.	8 sec.

Ryo Yuzawa serving
 8.31 min. - the whole game
 2.01 min. - net play
 6.30 min. - time for inactive actions