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### **ITTF SCORED A GOAL (changes of rules in table tennis during 2000-2003)**

#### **Abstract**

*In late nineties the ITTF estimated that table tennis has no bright future without changes of the rules. The need for changes was inevitable. Though the order of changes was adjusted nobody could predict how those changes would affect table tennis.*

*The system which would analyze the structure of the competitive activity of table tennis players was required in order to find out the consequences caused by the change of rules. Activities had to be representative and objective in order to perceive possible variations within them (related to the change of rules) and related to the logical group of the activities to which they belong. Competitors' activities were analyzed in 61 activities (variables), grouping in 3 systems of activities (variables):*

- 1. System of variables for evaluation of frequency, way of realization and effective of technical and tactical elements (30 variables)*
  - frequency of technical and tactical elements, effect of these elements, stroke placement zone, stroke realization zone.*
- 2. System of variables for evaluation of realization service stroke (and returning of service) and effective after service stroke (and returning service) (23 variables)*
  - realization of service stroke (type of service and service placement zone), effect of service stroke and activity after the service, realization (type) of returning service, effect of returning stroke*
- 3. System of variables for evaluation of movement activities (8 variables)*
  - side and deep movements, change of forehand and backhand position, stroke in forehand/backhand position and arm swinging for forehand/backhand strokes*

*The analyses were done in the following competitive periods:*

- Competitive season 2000/2001 - 40mm ball play*
- Competitive season 2001/2002 - 11-2 system of play*
- Competitive season 2002/2003 - new service rule*

*For every analyzed period the most important changes were defined and described.*

*The comparative analysis of the final matches at the Olympic Games in Atlanta (1996), Sidney (2000) and Athens (2004) was made.*

*The influence on the ranking in European and World table tennis (trend) was observed – analysis of the first 50 players at the European and World rank lists, and the changes in rank regarding the changes of rules)*

*A special attention was given to comparison of the Asian and European players (both before changes and after).*

**Key words:** *table tennis, game rules*

#### **1 Introduction**

In late nineties the ITTF estimated that table tennis has no bright future without changes of the rules. The need for changes was inevitable. Though the order of changes was adjusted nobody could predict how those changes would affect table tennis.

Toward the end of 2000, the ITTF started with rules changes aimed at making table tennis more viable as a televised spectator sport. First, the older 38 mm balls were officially replaced by 40 mm balls. This increased the ball's air resistance and slowed down the game. By that time, players had begun increasing the thickness of the fast sponge layer on their bats, which made the game excessively fast, and difficult to watch on television. Secondly, the ITTF changed from a 21 to an 11 point scoring system. This was intended to make games more fast-paced and exciting. The ITTF also changed the

rules on service to prevent a player from hiding the ball during service, in order to increase the average length of rallies and to reduce the server's advantage.

This was a sign for the experts, coaches and players to adopt themselves to these changes the fastest and best they could, in order to retain their positions or achieve better results. There were no great changes in the world's top table tennis, but the ability to easily adapt is what makes the great players "great". This research on exact way show - what really happened in structure of game through this period of changes.

The basic aim of this research is rationalization and to improve the efficiency of training in table tennis. Considering these results of research, which are explaining change and model of modern concept of table tennis game, also, can be and sign for further ideas for changing the rules in this game.

## **2 Methods**

The system which analyzes the structure of the competitive activity of table tennis players was used in order to find out the consequences caused by the change of rules. Activities had to be representative and objective in order to perceive possible variations within them (related to the change of rules) and related to the logical group of the activities to which they belong. Competitors' activities were analyzed in 61 activities (variables), grouping in 3 systems of activities (variables):

1. System of variables for evaluation of frequency, way of realization and effective of technical and tactical elements (30 variables)
2. System of variables for evaluation of realization service stroke (and returning of service) and effective after service stroke (and returning service) (23 variables)
3. System of variables for evaluation of movement activities (8 variables)

### **2.1 Participants**

Subject of this research were 240 top table tennis players. 4 groups of 60 players were made (Group 1 – from season 1994/95 till 2000, Group 2 – season 2000/2001, Group 3 – season 2001/2002 and Group 4 – season 2002/2003 - 2004/2005.) (mostly leading World players - rank in the first 100 at ITTF Rank list) Data were collected by video recordings of matches.

### **2.2 Procedure**

#### **2.2.1 Statistical analyses**

For all analyzed activities following statistical parameters are done:

Descriptive statistics:

- Arithmetic Middle
- Standard Deviation
- Variation (Maximum and Minimum results)
- Simple and relative Frequency

Percentage in complete activity and group of activity are done. Discriminative analyses and Multivariate Analysis of Variance (MANOVA) was used (and FOLLOW UP - ANOVA) were used for the defining of existing differences between analyzed groups of players (group of players with 38 mm ball - 40 mm ball - system of play until 11 points - new service rule play ) and other groups (winner/loser – top ranked/lower ranked players).

## **3 Results**

In the game with 38 mm ball the conception of the aggressive forehand game was clearly recognizable and the great influence of the service and its effect on the ultimate result.

**Competitive season 2000/2001 - 40mm ball play**

Introducing the 40mm ball caused confusion in the game, so the ratio of forehand strokes decreased and become more equal with backhand play. The influence of the service considerably increased, return of the service became more aggressive and the ball was more "active".

**Table 1** Comparison analyses of 38mm ball play and 40mm ball play

	<b>38mm ball till 21pt</b>	<b>40mm ball till 21pt</b>
Rally per point (without service)	3.52	3.81
Forehand/Backhand play	57/43%	54/46%
Efficacy of strokes	23.47%	24.63%
Errors	23.75%	25.07%
Service efficacy	43.61%	51.23%
Playing near the table	88.69%	85.51%

- The number of strokes in the rally per point increased for 0.29 strokes, after the enlargement of ball (21 points game).
- Errors slightly increased for about 1.32%, as a consequence of players' adaptation to new ball. This result also, and an increase of the stroke efficacy for 1.16%.
- Points won directly with the service and in action after service increased about 7.62%. But when we look in this group of activities carefully we can make some conclusions. SERACE (ace service) - increased from 12.02% (in all service activities) to 17.81%. SERWFS (point won with first stroke after service) - decrease from 27.36% to 26.39%. SERACT (point won with action after service (more than one stroke)) - increase from 4.23% to 7.03%. SERLOS (point lost after service) - increase from 40.67% to 42.13%. SERERR (service error) - stayed in nearly the same relation.

Larger ball make players during return of services much more confident, and because adaptation to the rotation and bounce of new ball wasn't on adequate level, they made much more mistake in return of service. On the other hand, open play after service with more rallies is notable, which is very important for next stage of play.

Expecting that new ball is slower, players accept to play much more near the table, which cause more errors during play. These is also, and cause of much more equalizing of the forehand and backhand play in game.

**Competitive season 2001/2002 - 11-2 system of play**

With the new system of game to 11 points with 2 services each, every point became precious. The players adapted to the bigger ball, the service and the return of it became more secure, the game became more open with lot of spin strokes, concept of the game started to look more like that of the game with 38 mm ball, the strong forehand game and secure backhand game with few errors near the table, after which the initiative was taken and the point won.

**Table 2** Comparison analyses of 40mm ball play and play till 11 points

	<b>40mm ball till 21pt</b>	<b>till 11pt/2 service</b>
Rally per point (without service)	3.81	3.97
Forehand/Backhand play	54/46%	60/40%
Efficacy of strokes	24.63%	21.54%
Errors	25.07%	23.34%
Service efficacy	51.23%	44.86%
Playing near the table	85.51%	87.52%

- After the change of system of play from 21 to 11 points, the number of strokes in the rally increased for 0.16 strokes. Efficacy of strokes decreased for 3.09%. Errors in the play during the match decreased for 1.73%.
- Points won directly with the service and in action after service decreased for 6.37%. This is the activities where the changes are the most notable. SERACE (ace service) - decreased from 17.81% to 13.60%. SERWFS (point won with first stroke after service) - decrease from 26.39% to 24.88%. SERACT (point won with action after service (more than one stroke)) – slightly decrease from 7.03% to 6.38%. SERLOS (point lost after service) - increase from 42.13% to 45.77%. Players adapt to larger ball during return of services, because errors during return decrease from 19.34% to 13.38%.

Forehand play again is dominant. Also, because importance of every point players changes playing more rallies in zone far from table.

### **Competitive season 2002/2003 - new service rule**

With the introducing of new service rule no important differences in the game concept were noticed, probably because of the judging criteria, and not the players themselves.

In stead of previous change rule period, number of strokes in point increases for 0.05 strokes, forehand play become more dominant in stead of backhand play. Service efficacies decrease further more for 2.85%. The other parameters stayed nearly at the same level like before. Probably caused of better concentration of players on return of the opponents service, because more importance for every stroke and point in game.

### ***The comparative analysis of the final matches at the Olympic Games in Atlanta (1996), Sidney (2000) and Athens (2004)***

The object of analyzes were only the final games of Olympic tournament in men category. Because, it is only one game, these results can be right measure of the changes in structure of the game, but, they can show to us some details. Analyzed games were following:

- 1996 - Atlanta LIU Guoliang (CHN) vs. WANG Tao (CHN)
- 2000 - Sydney KONG Ling Hui (CHN) vs. WALDNER Jan Ove (SWE)
- 2004 - Athens RYU Seung Min (KOR) vs. WANG Hao (CHN)

Games from 1996. and 2000. Olympiad were analyzed together (because they were played under the same rules), in stead of the game from 2004. Number of strokes is increased for about 0.53 per point. Efficacy of service is decreased for about 8%. Unfortunately, changes of rules happened in period from 2000/2001 to 2002/2003, so in four year period was impossible to see what happened with game during these changes individually.

***The influence on the ranking in European and World table tennis (trend) was observed – analysis of the first 50 players at the World rank lists, and the changes in rank regarding the changes of rules)***

ITTF World Rank lists were analyzed on every 2 month from the beginning of changing rules in table tennis.

Only in season 2002/2003, exactly in 2003. there was a change in top of the World table tennis. After domination of Chinese players, there was significant development in ranking of European players (Timo Boll and Werner Schlager and at position no 3 was also and Vladimir Samsonov). First half of 2003. mark Boll, and after Schlager (winning a World Championship in Paris).

We can get conclusion that service was key element in domination of Chinese players in stead of others. By decreasing of number from five to two services in game, and with changing rule of service visibility, in period of adaptation to these rules, difference between European players and Chinese players was reduced. With less point in game, larger ball, game become more uncertainly, and the best European players (Boll, Schlager, Samsonov, Kreanga) find their change and take advantage.

After that, again come period of adaptation of Chinese players to these changes and they gain again top position in World table tennis.

#### 4 Discussion/Conclusion

For modern table tennis we can say that it is “born again” after these changes. Today it represents a new, dynamic, attractive and exciting game, which draws the attention the audience again. From the data in Table 3 we see, that game become attractive and dynamic with less points and time of playing. That service is not dominant so much as before, and that game gives equal chances to players (if they are on nearly same level).

**Table 3** Comparison analyses of 38mm ball play and actual system of play

	<b>38mm ball till 21pt</b>	<b>actual system</b>
Rally per point (without service)	3.52	4.02
Forehand/Backhand play	57/43%	61/39%
Efficacy of strokes	23.47%	21.78%
Errors	23.75%	23.45%
Service efficacy	43.61%	42.01%
Playing near the table	88.69%	86.79%

Ability of quick adaptation in game is one of the most important abilities in modern table tennis which cause the results efficacy. Adaptation to changes of rules is in correlation with training technology.

From the following, we can see that Chinese approach to training technology, in stead of the others (no mater in individual cases), is more serious and efficacy in long term. The reasons are in high education of their coaches, and also, with the serious attention in analyzes of trends in game and thinking how to leave it behind in most efficacious ways. European table tennis, if think to “stay in game” must to give more attention in education of coaches, change in way of thinking, development of training technology to higher level.

Generally, training technology in some sports as football, basketball and volleyball are in top level, and they represent leaders in innovations in this field, while table tennis stay behind them. If Europe thinks to become serious threat to China, needs it need awaking, and serious efforts in next four year period.

It means, that it is not necessary organizing camps for the best players for training, this camps should be and some kind of “surround tables” of leading table tennis experts and coaches with new ideas in innovation of training. Because, competitive European

players in stead of Chinese, are one of the reason for more attractiveness in this game at the Championships and TV broadcasts.

If International Table Tennis Federation have interest to continue with changes in way of equalizing of players, these changes should be pointed in area of decreasing of influence of service, which is still dominant element in result efficacy, and the one of the main cause of efficacy of the European and Asian players.

So, these ideas, maybe, should be next step in thinking of some future change:

1. Enlargement of ball diameter to 44mm (it should slow down game and decrease efficacy of strokes and service with increase of rally in point).
2. Increasing of net high (which should have directly influence in service efficacy and service performance).
3. Alternate performance of service (it should have influence in increase of dynamic in game, and eventually in some way neutralize advantage of excellent service performers).
4. Alternate service – one forehand service – one backhand service.
5. Introduction of strict zone place of service (for example, one service should be placed in forehand and the other in backhand zone, this way return of service would be relieved).
6. Perform of one long and one short service (player on service, can choose which kind of service will be first (if the first one is long, another should be short (it means that the other bounce of ball should be on table in stead of long service). If short service in second bounce is going out of table and the receiver notice that, he should let ball to drop out, player on service lose point)).
7. Prohibition of gluing.

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