

**THE 6TH
INTERNATIONAL TABLE TENNIS FEDERATION
SPORTS SCIENCE CONGRESS**



**PROGRAMME
&
ABSTRACTS**

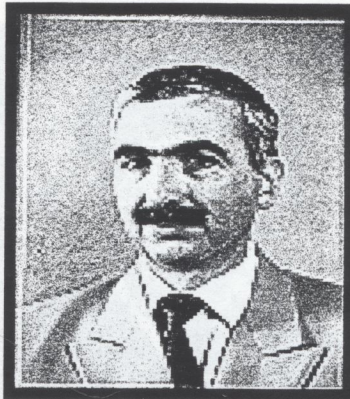


**18-19 FEBRUARY, 2000
Park Plaza Hotel, Kuala Lumpur, Malaysia**

**National Sports Institute of Malaysia (ISN)
National Sports Council of Malaysia (NSC)**



**THE 6TH
INTERNATIONAL TABLE TENNIS FEDERATION
SPORTS SCIENCE CONGRESS**



As Chairman of the ITTF Sports Science Committee, I would like to thank the organising committee of The Dawei 2000 World Team Table Tennis Championships for arranging in the very short time extraordinary scientific programme for our 6th Sports Science Congress . During two days, we will not exchange balls, but ideas and results about training psychology, physiology, biomechanics, history, development, etc.

I would like to thank also my colleagues from Malaysia , who accepted to take part in our congress and who proposed to hold one session in the National Sports Institute of Malaysia.

On behalf of the ITTF, I am happy to welcome in Kuala Lumpur more than fifty scientists coming from all over the world, and working on and for Table Tennis.

I wish every success to all participants,

Dr. Jean-Francois Kahn,
Chairman, ITTF Sports Science Committee

Dr. Ramhan Abd. Aziz
Director, National Sports Institute of Malaysia (NSI)
and
Chairman, Organizing Committee
6th ITTF Sports Science Congress



It is a great honour for Table Tennis Association of Malaysia to be given the opportunity to host the 6th ITTF Sports Science Congress, prior to the 45th World Team Table Tennis Championships. The Championships will be held from 19-26th February, 2000 in the indoor Putra Stadium at Bukit Jalil, Kuala Lumpur.

Firstly, I would like to welcome you and express our appreciation for your unselfish contributions toward making this Congress a success. Your expertise from research and experiences in your own field will certainly benefit the future development of table tennis all over the world.

I am confident all the participants gathered here will achieve fruitful results, derived from the proceeding of this Congress. We also hope you will continue to stay on to watch the Championships ; to enjoy the hospitality and beauty of the diverse culture in Malaysia.

Thank you.

Warmest regards,

Dato' Chan Kong Choy
President,
Table Tennis Association of Malaysia.



It is indeed a great honour and pleasure for the National Sports Institute of Malaysia (ISN) to be given the responsibility of co-organizing the 6th ITTF Sports Science Congress with the Table Tennis Association of Malaysia. The fact that it is held in conjunction with the 45th World Team Table Tennis Championships, which follows it, renders it as a significant event which will be indelibly stamped in ISN's history. As full-time practitioners of sports medicine and sports science involved in Malaysian elite sport, the ISN is at the forefront of efforts to promote sports science applications in training and coaching, in a quest to achieve optimal performance from our athletes. The promotional efforts would include activities such as seminars and conferences such as this one, and the sheer scale and significance of this conference will be a tremendous boost to sports science and coaching in this country in general and table tennis in particular.

We would like to bid a very warm Malaysian welcome to all the delegates and participants and wish you an enjoyable and fruitful time participating in the Congress.

We are grateful for the trust and faith shown to us by ITTF and TTAM and we hope to see a successful Congress ; the success which the hard work of all those involved truly deserve and to them we reserve a special note of thanks for their self-less work and sacrifice in putting the Congress together.

Thank you.

Dr. Ramlan Abd. Aziz
Director, National Sports Institute of Malaysia (ISN)
and
Chairman, Organizing Committee
6th ITTF Sports Science Congress

**THE ORGANISING COMMITTEE OF THE
6TH ITTF SPORTS SCIENCE CONGRESS
IN KUALA LUMPUR, MALAYSIA**

CHAIRMAN	:	DR. RAMLAN ABDUL AZIZ
VICE CHAIRMAN	:	CHUA AH TOK
PROGRAM COORDINATOR	:	M.P. HARIDAS
SECRETARY	:	CHUI KWONG SANG
ASSISTANT SEC.	:	LAM FEI ENG

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CHANG SIEW KAI	KHIRLATULAZAHA SETIA
DAVID CHAN YOU CHEE	AEIDA LAZIM
DAVID WONG	NORLIDA MAT ROHANI
NICHOLAS KWAN	MOHD RAFFLI BUANG

THE 6TH ITTF SPORTS SCIENCE CONGRESS

Theme : *"Factors Which Substantially Influence Sport Results in Table Tennis"*

THURSDAY 17 FEBRUARY 2000

0900 to 1700 Registration (1) For Foreign Participants

FRIDAY 18 FEBRUARY 2000

0800 Registration (2)

0900 Opening Ceremony : YB. Datuk Ong Tee Keat
Hon. Deputy Minister of Youth and Sports, Malaysia

0920 Opening Lecture Prof. Dr. Leonard A De Vries

1000 Keynote Lecture Mr. George Segun (ITTF)

1030 Coffee Break

PROGRAMME

- A study of the development trend of chop and attack play in table tennis. Pan Yongzhi et. al
- Survey on the game style of some of the best Asian players at the 21th World University Table Tennis. Yoto Dryanovski et.al
- Brief discussion on the early stage of training for junior table tennis players. Zhong Yujing
- Contribution of science into table tennis through the system "Coach-sportsman" Yuri Poholenchuk et.al
- Research on the relationship between the invention of skills, the innovation of styles of play and the change of the rules of table tennis. Jiling Cai et. al

1300 Lunch at Park Plaza International Hotel

1400 Departures to the National Sports Institute (ISN)
National Sports Council of Malaysia

1500 Keynote lecture : Athlete preparation for international competition :
Our Malaysian experience Dr. Ramliani Abd. Aziz

THE 6TH ITTF SPORTS SCIENCE CONGRESS

Theme : “Factors Which Substantially Influence Sport Results in Table Tennis”

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1030 Coffee Break

1045 **Session 1 Chairperson : Prof. Madya Dr. Mohd Noh Che' Nor (UM)**

- Research into the development trend of the fast attack of outward pimped rubber bat penholders in Asia. Zhang Ruobo et. al
- A study of the development trend of chop and attack play in table tennis. Pan Yongzhi et. al
- Survey on the game style of some of the best Asian players at the 21th World University Table Tennis. Yoto Dryanovski et.al
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1300 Lunch at Park Plaza International Hotel

1400 Departures to the National Sports Institute (ISN)
National Sports Council of Malaysia

1500 **Keynote lecture** : Athlete preparation for international competition :
Our Malaysian experience Dr. Ramlan Abd. Aziz

- Research on physical efficiency training of table tennis players.
Tao Zhixiang
 - The analysis of competitive and training loads in table tennis
players during matches. G.V Barchukova et. al
 - Science in training elite sportsmen. Oleg Matytsine et. al
- 1300 Lunch
- 1400 **Session 6 Chairperson : Prof. Madya Dr. Leo Ann Mean (U.M)**
- From pastime to performance Lord Ivor Montagu and the pioneers
of the International Table Tennis Federation (1925-1939). Jean-Mare Silvain
 - The influence of the evolution of table tennis rules on skill
of table tennis and its developing tendency. Qingchuan Yu et. al
 - Deng Yaping's technical development and comparison with
main opponents before the 26th Olympics Games. Wei Wei et. al
 - Distance education in improvement of professional skill of coaches.
M.Shestakov et. al
 - On the value system and prospects of table tennis. Zhang Zhijie et. al
 - Program of scientific and research work (directions) for the
development of table tennis for 2000-2004. Yuri Poholenchuk et. al
- 1600 Coffee break
- 1615 **Session 7 Chairperson : Mr. Michel Gagne (ISN)**
- On the effect of mood upon the results of table tennis players.
Xiuwen Wu et. al
 - Psychology and the modern table tennis player.
Femi Olugbile and Oleg Matytsine
 - An inquiry into the ways of selecting children table tennis
players a study of the training possibilities of turning a right hand
player into a left hand one. Zheng Jin-Fan et. al
 - The analysis of the I.Q test of the teenage table tennis players of
Shanghai. Wang Yujing et. al
 - On the striking position. Ling Qunli et. al
- 1745 End of Congress
- 1830 Departure to Putra Stadium – Dinner
- 1930 An Invitation to attend the Opening Ceremony of The DAWEI 2000 World Team
Table Tennis Championship

ABSTRACTS

Title: (1) Research into the Development Trend of the Fast Attack Play of Outward
pimpled Rubber bat Pen-Holders in Asia
Name: Zhang Ruobo School Ball Teaching and Research Section, Beijing University of Physical Education
Zhang Jian Physical Education Teaching and Research Section, Nanjing Chemical Engineering University
Pan Yongzhi Sports Training Department, Beijing University of Physical Education

Since the retirement of elite players, such as Jiang Jialiang, Chen Longcan, Kim Waa, the traditional fast attack play of outward pimpled rubber bat pen-holders has been on the decline. No significant result of this kind of play was achieved in the competitions during the period from the end of the 1980s to the middle of the 1990s. At the 26th Olympics in Atlanta, Chinese player Liu Guoliang, a fast attack outward pimpled rubber bat pen-holder, defeated all his opponents and won the two gold medals of men's singles and men's doubles. His success has made the traditional fast attack play of outward pimpled rubber bat pen-holders a trend in the world. In a study, Liu Guoliang has already mastered the fast attack play of outward pimpled rubber bat pen-holders in all service, and he has won the world championship in the 26th Olympic Games. This study is aimed at analyzing the fast attack play of outward pimpled rubber bat pen-holders, and offering guiding principles of training and competitions for the fast attack play of outward pimpled rubber bat pen-holders.

SESSION 1

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (1) Research into the Development Trend of the Fast Attack Play of Outward pimped Rubber bat Pen-Holders in Asia

Name: Zhang Ruobo (Small Ball Teaching and Research Section, Beijing University of Physical Education)
Zhang Jian (Physical Educ. Teaching and Research Section, Nanjing Chemical Engineering University)
Pan Yongzhi (Sports Training Department, Beijing University of Physical Education)

Since the retirement of elite players, such as Jiang Jialiang, Chen Longcan, Kin Wan, the traditional fast attack play of outward pimped rubber bat pen-holders has been on the decline. No significant result of this kind of play was achieved in the competitions during the period from the end of the 1980s to the middle of the 1990s. At the 26th Olympics in Atlanta, Chinese player Liu Guoliang, a fast attack outward pimped rubber bat pen-holder, defeated all his opponents and won the two gold medals of men's singles and men's doubles. His success has made the traditional fast attack play of outward pimped rubber bat pen-holders in Asia rise sharply again in the table tennis world. In our study, statistics and analysis were made of the gain and loss rates in the service, attack after service, receiving a service, and exchanging shots performed by Liu Guoliang at the 26th Olympics, the 43rd and the 44th World Table Tennis Championship against the elite loop players such as Waldner, Roskopf Jorg. Guiding principles of training and competitions for the fast attack play of outward pimped rubber bat pen-holders were offered.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (2) **A Study of the Development Trend Of Chop and Attack Play in Table Tennis**
Name: Pan Yongzhi (Sports Training Department, Beijing University of Physical Education)
 Zhang Ruobo (Small Ball Teaching and Research Section, Beijing University of Physical Education)
 Zhang Yingqiu (Small Ball Teaching and Research Section, Beijing University of Physical Education)

Chop and attack play was once a major school of technique in table tennis. Outstanding results were achieved in the past by using this kind of play, which was greatly favored by the spectators. However, since the 1990s, with the further development of the technique of attacking loop, chop and attack play has encountered great difficulties. Especially for male players, the number of players who use this kind of play has decreased sharply, and the strength of chop and attack players has weakened. For this reason, the enjoyable effect of table tennis has suffered. Through our observation and statistics, interviews and documentary study, we have come to the conclusion that there is great potential in the technique and tactics of chop and attack play. The chop and attack players will regain their top places in table tennis in the world as long as they have the courage to invent something new and to solve the main problems of the technique and tactics.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (3) 'Survey on the Game Style of Some of the Best Asian Players at the 12th World University Table Tennis Championship'

Name: Asson. Prof. Yoto Dryanovski, Ph.D, Galina Ocheve, Assistant National Sport Academy - Sofia

Which are the basic strokes, currently used by the best players? What is their reliability and game effectiveness they guarantee? 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 I~- J~ LL~lTh ~.~.e - CuaI.~ ~ ~uourch ~t m ffl~'ptl r~s tii eril ~ie the following primary tacks:

- establishment of the exact number of strokes for each point;
- specifying the per cent of each predominant type of a stroke and the per cent of its reliability and effectiveness;
- defining the number and type of employed services and the ways they are received as well as the per cent 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 analysed 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 (JAP) at the 12th World University Table Tennis Championship.

On the basis of accurately recorded and calculated data we could establish the percentage ratios of 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 come valuable conclusions and make recommendations of practical importance aimed at the improvement of table tennis training.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (4) **BRIEF DISCUSSION ON THE EARLY STAGE OF TRAINING FOR JUNIOR TABLE TENNIS PLAYERS**

Name: ZHONG YUJING Master Degree

(Box.505.Graduate Department in Beijing University of Physical Education.

Beijing, China 100084)

The path for the world championships is never even and no athletes can be successful without a chronic, systematic and scientific major training, so the training in juvenile stage is a very important ladder for athletes to develop their excellent skills, and it is also the prerequisite for them to make a good performance. Based on the methods of data, comparative experiment, questionnaire and statistics as well, this article deals with the two areas of selecting table tennis players and training them in juvenile stage at length. In the light of her experiences, the author in this article comes up with her own views about the issues mentioned above in order to provide some reference to coaches engaged in junior table tennis players rudimentary training.

Title: (5) Contribution of science into table tennis through the system "coach-sportsman"

Name: YU. POHOLENCHUK (UKRAINE)

YU. POSEVIN (RUSSIA)

A. SHARARA (CANADA)

Page: 1/2

A coach is the key person in sport. The success in increase in involvement, achieving better results in table tennis depends upon his activity. While training the sportsmen the coach solves a number of pedagogical tasks which are related not only to getting a sportsman ready for competition but also to his evolution of his personality.

On the other hand, the coach is a manager as well, as training and upbringing of a sportsman is a dynamic probabilistic process which needs control. In his work a coach performs typical management functions: planning, decision making, organization, control, coordination, account and monitoring, follow-up and monitoring. Coach work efficiency depends not only upon his pedagogical skill, but also to great degree to his work as an expert in the system of "scientist-coach".

Asking experts "What is the practical contribution of science into achievement of the top results in the sport" you may be given contradictory, often alternative answers representing different views: some of them would say that nowadays science effects sports greatly. The greatest struggle takes place in the calmness of laboratories, computer centres, design institutions which produce thoroughly computered programmes of training sessions and food rations, new medicines accelerating recovery and enhancing working efficiency, sports implements, exercisers.

Other would say that researchers do really investigate sportsmen very closely and for a long time, but without real advantages for a coach and a sportsman.

The conclusion is that the truth is in between, as a rule.

At the same time leading coaches and sportsmen would face significant difficulties should they loose the support of physicians 'and 'biologists videorecords, recovery complexes etc..

The existing system of scientific support for leading sportsmen training envisages the following forms:

- prediction of the result required to succeed at different stages of training;
- competition activities analysis and prediction, the degree of readiness from different points of view;
- analysis and programming of training session aimed at reaching the planned result.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: Contribution of science into table tennis through the system "coach-sportsman"
Name: YU. POHOLENCHUK (UKRAINE)
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Page: 2/2

Each of the above mentioned types of activity consists of sportsman's condition monitoring, that is check of compliance of the sportsman's attributes with model performances and of development of new methods of the sportsman training and his recovery and methods of monitoring of their effect upon organism.

The problem of scientific support for coaching the qualified (professional) table tennis players is complicated and involved. One can not manage to describe all the aspects of the problem thoroughly.

The problem may be simplified to three main questions: whether it is possible to reduce the efforts of scientists, coaches, sportsmen and increase work efficiency; how to ensure efficiency and reliability of modern training, what are the prompt ways of using scientific achievements in practice.

At the initial stage of studying of these questions it is expedient to consider the problem in terms of methodology.

It means:

1. Problem formulation, determination of its nature and urgency of its solution.
2. Revealing of conditions under which the problem can be resolved.
3. Determination of initial principles being the necessary prerequisites for the problem resolution.
4. Consideration of maximum number of approaches towards solution.
5. Detection of difficulties (controversial items), limiting factors, which, being overcome, may ensure success of the study.

To avoid misunderstanding one should point out that in this case we do not speak of training-pedagogical process methodology as a whole (the range of question, covered there is much wider) but of methodological analysis of specific scientific. problem - "scientist-coach", "coach-sportsman", theory and practice of which we disclose herein.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (6) Research on the Relationship between the Invention of skills, the Innovation of styles of play and the Change of the Rules of table tennis

Name: Jiling Cai, Jianjiu Tang, xueling Cai, Tao zhixiang

(Beijing University of Physical Education Teaching and Research Section of Small Ball, 100084,
PR China)

In order to make table tennis a sport that people enjoy watching and taking part in, it is necessary to inquire, into the relationship between the invention of table tennis skills, the innovation of styles of play and the change of rules in the development of table tennis. The purpose is to understand the role that the rules of table tennis play in the development of the sport from an angle of historical development. Through the study of literature and general statistics, this paper analyzes that the rules of table tennis play in the invention of table tennis skills, the innovation of styles of play and in insuring the Fairness of competition and the value of enjoyment. The results of the research show that:

1. The invention of table tennis skills and the innovation of styles of play take the interests of the country and the national team as the principle, and take it as the goal to beat the opponent with the simplest methods.
2. The change of the rules of table tennis is shown not only in their protection and support of the invention of skills and the innovation of styles put on the invention and the innovation of styles of play, the principle on which the rules are based is to make different countries and teams keep an appropriate balance on the development of the sport, and its enjoyment and entertainment, The invention of table tennis skills and the innovation of styles of play are the motive power of the sport's development, while the rules of the sport are the regulator of this power.

SESSION 2

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

**Title: (7) ENHANCING PERFORMANCE OF TABLE TENNIS PLAYERS
THROUGH THE USE OF IMAGERY IN FLOATATION TANK .**

Name: Othman, Zaiton
(National Sports Institute Of Malaysia)

**Key Words : Performance enhance, imagery, floatation tank
Psychological skills training (PST)**

Imagery is one of the most powerful psychological skills training (PST) tool in sports performance. There are some skills in table tennis which cannot be trained or developed through physical training for some reasons or other, e.g the return of the actual service, the desired top spin etc, but can be achieved through imagery training.

Floatation tank is a state of the art equipment used for many purpose, e.g from relaxation to stress management and weight reduction. The purpose of this paper is to present the practical use of the tank in enhancing table tennis performance. While we have used the tank for performance enhancement in athletes from other sports ; we did not have the opportunity to work with the national table tennis players.

However, the positive results achieved so far in other sports is a clear indication of the benefit in the usage of the floatation tank. We believe that this is one the area coaches should venture into in helping athletes realizing their full potential.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (8) MEASUREMENT AND EVALUATION OF FITNESS PROFILE OF MALAYSIAN NATIONAL
TABLE TENNIS PLAYERS.

Name: A.H Norlizah
(Exercise Physiology Unit, National Sports Institute, National Sports Council of
Malaysia, Kuala Lumpur)

Keywords : Fitness profile , Fitness tests, Database

The purpose of this study was to establish a database on the fitness profile of the Malaysian National table tennis players.

The subjects were four male and three female National table tennis players.

The tests included anthropometric measurements, sit and reach for flexibility, weight throw and sit-ups for muscular strength and endurance, agility, reaction time and balance.

The results and finding were tabulated.

THE 6TH I.T.T.F SPORTS SCIENCE CONGRESS

**Title : (9) ATHLETIC CONDITIONING FOR TABLE TENNIS :
AN OVERVIEW OF THE 'TRIAGE MODEL FOR
PHYSICAL PREPARATION' WITH IDENTIFICATION
AND REVIEW OF ADVANCED PRACTICAL
TRAINING EXERCISES AND TECHNIQUES**

**Name : Joseph Dolcetti
(MSc, C.S.C.S., E.S.T)
National Sports Institute of Malaysia.**

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ABSTRACT :

Successful competition at international competition demands the holistic development of the human organism. Therefore, the physical preparation of elite athletes though results oriented, requires a practical and technical understanding of the synergistic relationship that exists between the three elemental components of the Triage Model. These include:

- (a) enhanced physiological function and performance
- (b) enhanced injury resistance and
- (c) enhanced training output (ability to train).

This presentation will review each of these components as they apply to table tennis and will introduce and review advanced practical training techniques and exercises addressing each of these areas of physical development.

The 1991 I.T.P. Sports Science Congress

Abstract 1001 The Analysis of the Effect of Serving and Attack after Serving. (Sevenside Attack after Service) By some of the Elite Foreign and Chinese Male Players during the 45th World Team Table Tennis Championships (WTTC).

Keywords: Wu Li, Zhang Yinguo, Zhang Yimin.

Abstract 1002 Coaching and Teaching for Backhand. During the study of Chinese Backhand, Backhand is the main

Abstract 1003 was the study of the success rate on serving, attack after serving and defense after attack, and how after serving performed by some of the elite Chinese and Foreign Male Table Tennis players during the 45th World Team Table Tennis Championships, as well as analysis the results between the Chinese players and foreign players in the study of serving the technique and tactics of the skills mentioned above. Also comparison between the foreign player who had the highest success rate and the Chinese players was made. The aim of the study was to find out the development trend of the technique.

SESSION 3

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (10) The Analysis of the Effect of Serving and Attack after Service, Successive Attacks after Service by some of the Elite Foreign and Chinese Male Players during the 45th (World Team Table Tennis Championships) WTTC.

Name: Wu Fei, Zhang Yingqiu, Zhang Yimin

(Small Ball Teaching and Research, Beijing University of Physical Education, Beijing, China 100084)

Statistical data were obtained of the success rate in serving, attack after service and successive attacks and drives after service performed by some of the elite Chinese and foreign male table tennis players during the 45th World Table Tennis Championship. Comparison, as well as analysis, was made between the Chinese players and foreign players in the success rate of using the technique and tactics of the skills mentioned above. Also, comparison between the foreign player who had the highest success rate and the Chinese players was made. The aim of the study was to find out the development trend of the technique and tactics of the skills mentioned above and to discover the shortcomings of the Chinese male players, so as to offer theoretical basis for the training and competition of the Chinese table tennis men's team.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (11) The Analysis of the Effect of Serving, Attack after Service by Female Elite Chinese and Foreign Players During The 45th WTTC (World Table Tennis Championships).

Name: Zhang Yingqiu, Wu Fei, Liu Guobin

(Small Ball Teaching and Research, Beijing University of Physical Education, Beijing, China 100084)

Statistical data were obtained of the success rate in serving, attack after service and successive attacks and drives after service performed by some of the elite Chinese and foreign female table tennis players the 45th World Table Tennis Championships. Comparison, as well as analysis, was made between the Chinese players and foreign players in the success rate of using the technique and tactics of the skills mentioned above. Also, comparison between the foreign players who had the highest success rate and Chinese players was made. The aim of the study was to find out the development trend of the technique and tactics of the skills mentioned above and to discover the shortcomings of the Chinese female players, so as to offer theoretical basis for the training and competition of the Chinese table tennis women's team.

Title: (12) TABLE TENNIS COACHING A SITUATED ACTION APPROACH

Name: Carole Seve & Marc Durand

(French Table Tennis Association & Universiti of Montpellier, France)

The study of expertise in coaches is a recent development in the sport sciences. Because the implications of sport competition and the means allowed to preparing for top-level performance are so great, it has become necessary to improve our knowledge of the conditions ensuring the effectiveness of the coaching process to design reason-based coaching methods. The purpose of this study was to analyze the practical knowledge and certain temporal components of the actions of French table tennis expert coaches. Observation data were recorded during training sessions and complemented with data obtained from induced verbalization. Inductive coding and categorization allowed for the identification of the constitutive series in the coaches' actions :

- a) organization of the athletes' actions,
- b) definition of the athletes' actions,
- c) guidance of the athletes' actions,
- d) support of the athletes' actions,
- e) supervision of the athletes' actions
- f) assessment of the athletes' actions.

The results showed that coaching tasks were considered by coaches as a set of interacting constraints which generate complex, contradictory and ill defined problem. The coaches' actions fit into different (linear and periodical) and embedded (the immediate action depends on the previous action and foreshadows the future action) temporalities. Such temporal dynamics is not reflective of a precriptive planning action but rather of the emergence of an organization of actions based on a dynamical coupling with the situational elements. The discussion focuses on the relevance of "situated action" models to study coaching.

Title: (13) ESTIMATION OF GAME ACTIVITY OF TENNIS PLAYERS OF DIFFERENT QUALIFICATION

Name: Shesterkin O., Matytsin O. and Shestakov M.

(Russian State Academy of Physical Education, Moscow, Russia)

In sport games, in particular in table tennis, a technique of athlete's actions during competition can be estimated only in relation to the actions of the opponent. Nevertheless, the analysis of scientific & methodic literature showed, that usually the analysis of game activity is done without analysis of the actions of the opponent. The goal of this research is to analyze game activity of table tennis players of different qualification.

All technical actions of tennis players were divided into 3 groups. The first group (low difficulty) included those actions of the player that changed only one parameter of the flight of the ball (block, smash); the actions included into the second group (moderate difficulty) changed two parameters of the flight of the ball (loop, back-spin stroke, ballon, skip); the actions of the third group changed three parameters (high difficulty) (top-spin, cut).

The subjects (table tennis players) were divided into groups according to their qualification: top class athletes (n=7), athletes of high qualification (n=30); athletes of moderate qualification (n=24) and beginners (n=24).

Results.

It was found out that the athletes usually did not use more than 40% of the technical actions, and there is a considerable difference between the number of technical elements used by the athletes of different qualification. Athletes of high qualification and top class athletes use the whole range of technical means, and the athletes of moderate qualification and beginners use less than 50% of technical elements although in training they master all technical elements.

Top class athletes and athletes of high qualification usually use such technical combinations, when actions of high difficulty are done in response to the actions of moderate difficulty ($p < 0,05$). It should be also noted, that higher is qualification of an athlete, more often does he use rather simple actions, for example, the maximal number of simple combinations ("action - counteraction") is used by top-class athletes.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (14) **Research on the table tennis doubles partnership of the outstanding players of the world**

Name: Xueling Cai, Jianjun Tan, Bin Gao , Jiling Cai
(Associate professors of Beijing University of Physical Education)

According to the research on the partnership of the worldwide outstanding 50 couples of the doubles players, it is indicated that most couples are combined with different racket hand players (in different hands, left in one's and right in the other's), either for the men's doubles, or for the mixed doubles. The reasons are: (1) good for the positioning of the players; (2) save the footwork range of the players; (3) attack ability of the players could be fully brought into play.

Besides the difference of the racket hand of the double players, the technical style of the double players is totally different. Such players of the doubles could bring the characteristic of the technique and tactic of each one into the double play, they would, support each other with their own advantage and overcome the other's weakness. At present, the technique of the table tennis is developing into a style of ferocious speed.

We should also try to select the doubles players in reasonable combination of the nerve types to get them in fully cooperation, in good faith to each other, and in strong confidence and fighting will.

Title: (15) Consideration of 40mm ball based on aerodynamics

Name: Yuraka Tsuji

(Department of Mechanophysics Engineering, Osaka University, Suita, Osaka, JAPAN)

The purpose of the work is to clarify the effects of various factors such as size, weight and atmospheric conditions on ball motion. The mathematical model is based on the Newtonian equation of motion taking into account of drag, lift and gravitational forces. Systematic calculations have been done changing the following parameters.

Study 1: ball diameter (38mm, 39mm, 40mm)

Study 2: ball weight (2.5g, 2.4g, 2.3g)

Study 3: air temperature (0°C, 10°C, 20°C)

Study 4: altitude (0m, 1000m, 1500m)

Study 5: large size ball (40mm, 42mm, 44mm, 46mm)

SESSION 4

In Study 1, Study 2 and Study 3 where the effects of diameter and weight were investigated, the conditions of standard air (20°C and sea level) were used in the calculations. In Study 1 investigating the effects of the ball diameter, the ball weight was assumed to be the same as the standard ball (2.5g) through the diameter increases. In Study 2 investigating the effects of the ball weight, the ball diameter was assumed to be the same as the standard ball (38mm) though the weight decreases. In Study 3 and Study 4 investigating the effects of air condition (temperature and altitude), the standard ball was used in the calculation.

As is expected, Study 1 showed that the larger the diameter, the lower the final ball velocity. The final velocity of the largest ball 40 mm is less than that of the velocity of the standard ball by 4.2% ~ 6.2%. This is because the effects of fluid dynamic drag force is larger for large size balls when the weight is unchanged. Study 2 showed similar differences between light balls and the standard ball. The lighter the weight, the lower the final velocity. The difference between the lightest ball (2.3g) and the standard ball (2.5g) was 4.5%. Study 3 showed that the final ball velocity at 0°C was about 3.6% less than that at 20°C. The effects of altitude, which lower pressure and density, were more significant. At low density, air drag has less effect. The final velocity at 1500m is 10% higher than at sea level. On the other hand, Study 5 showed that the test balls do not show significant difference in motion from that of the standard ball. This is because the increase in weight counteracts the increase in drag force. Particularly in the case of heaviest test balls (2.751(A)2.800g), the difference from the present ball is extremely small.

Title: (15) Consideration of 40mm ball based on aerodynamics

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(Department of Mechanophysics Engineering, Osaka University, Suita, Osaka, JAPAN)

The purpose of the work is to clarify the effects of various factors such as size, weight and atmospheric conditions on ball motion. The mathematical model is based on the Newtonian equation of motion taking into account of drag, lift and gravitational forces. Systematic calculations have been done changing the following parameters.

Study 1: ball diameter (38mm, 39mm, 40mm)

Study 2: ball weight (2.5g, 2.4g, 2.3g)

Study 3: air temperature (0!n, 10!n, 20!n)

Study 4: altitude of play ground (0m, 500m, 1500m)

Study 5: large ball manufactured in practice (40mm, 2.6 - 2.8g)

In Study 1, Study 2 and Study 5 where the effects of diameter and weight were investigated, the conditions of standard air (20!n and sea level) were used in the calculations. In Study 1 investigating the effects of the ball diameter, the ball weight was assumed to be the same as the standard ball (2.5g) through the diameter increases. In Study 2 investigating the effects of the ball weight, the ball diameter was assumed to be the same as the standard ball (38mm) though the weight decreases. In Study 3 and Study 4 investigating the effects of air condition (temperature and altitude), the standard ball was used in the calculation.

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Title: (16) **The Effect of the 40mm Diameter Balls on Table Tennis Matches**

Name: Zhang Xiaopeng (National Research Institute of Sports Science, China)

With the development of table tennis equipment and the player's techniques, the ball's speed and spin have been increased greatly, which makes the rallies of each point decreased apparently. The ordinary spectators feel difficult to appreciate and gradually lose their interest in table tennis matches. Undoubtedly, it is very important for the sport to take an active attitude to add up more attractiveness and to draw the spectators attention to the table tennis. Therefore, in 1996, the Council of the ITTF adopted a proposal to carry out experiments on 40 mm balls based on the presumption that the speed and spin be reduced and the rallies of each point be increased and the matches become more exciting. At that time, the speed and spin of 40 mm and 38 mm balls were dynamically measured and the comparative studies were done by the CTTA. For the purpose of the wide inquiries of the reactions of the large balls from all walks of lives, an international tournament using 40 mm balls was brought out by the ITTF and organized by the CTTA in 1998 in SuZhou China in connection with the ITTF EC meeting. And also a questionnaire investigation was made by a research group of the CTTA. Based on the results of spin and speed experiment, 16 top world players attending the tournament, 8 ITTF Executive Committee members and 38 Chinese spectators were investigated by the questionnaires, and each rally of every point of all the matches in this tournament was counted. The results are as follows:

1. Both the experiment and questionnaire showed that the 40 mm ball's speed is lower than the 38 mm ball's.
2. The questionnaire for the players in the tournament showed that the 40 mm ball's spin is not as strong as the 38 mm balls', which is identical with the experimental results,
3. Most people think in the questionnaire that using the 40 mm balls could produce more rallies than that of the 38 mm ones. But the increase is not significant through the rally counting. The players felt that it is resulted from the less practice with the 40 mm balls.
4. It is very necessary to make a reform to table tennis, but the players need more practice and the making of the last decision needs more experiments.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (17) **Shoulder Range of Motion and Postural Assessment in Table Tennis Players**

Name: Lima, Femando V. Zuin, Alysson L. Carneiro, Ricardo L.

(Federal University of Minas Gerais, Physical Education School, Center of Sports Excellence)

Several studies showed that there is an important relationship between throwing/serving sports practice and shoulder strength and mobility modifications. Internal and external rotation are directly related to the glenohumeral joint translation, and the early detection of these modifications can lead to prevention of performance-decreasing injuries. Furthermore, it is necessary the investigation of postural modifications in athletes involved in unilateral sports. The purpose of this study is to assess shoulder Range of Motion (ROM) and to determine postural faults/modifications and correlate them with the specific techniques, using an assessment of the playing action and the muscles involved in these actions. Sixty Brazilian and French table tennis players had their dominant and non-dominant shoulders range of motion measured with a manual goniometer. The internal and external rotation's range of motion were measured with the athlete in supine, shoulder abducted 90° and elbow flexed 90°, starting from an neutral rotation. The movements were taken until and end-feel was reached, before it occurred an scapular protraction and/or a shoulder upward rotation (in internal rotation) or before the back bowed (external rotation). The postural assessment was done in anterior, posterior and lateral views, using a simetograph and ground marks as reference. The postural assessment was repeated photographically in the same views. All the athletes showed a significant difference between dominant and non-dominant shoulders in internal and external rotations. The dominant shoulders internal rotation was significantly smaller than the non-dominant shoulders. Also the dominant arm's external rotation was larger. Most of the athletes had an increase in neck protusion, thoracic ciphosis and also had an important shoulder drop (the dominant shoulder was lower than the non-dominant shoulder). This study suggests that there is a postural/mechanical compensation in high level table tennis players.

Title: (18) TECHNICAL TRAINING IN TABLE TENNIS ON THE BASIS OF BIOMECHANICAL STRUCTURE OF GAME ACTIONS

Name: Titov Dmitry, Barchukova Galina, Voronov Andrey
(Russian State Academy of Physical Education, Russia)

Page: 1/2

Introduction. In any kind of sports the technical skill has important meaning, therefore scientific researches in this area get the large importance. In the literature on table tennis have found reflection general principles of the mechanics of impacts, owing to what it is possible to give the description of technical elements. However internal structure of impellent actions is investigated unsufficiently full.

In this connection by the purpose of our research was the substantiation of a technique of perfection of attacking impacts in table tennis on the basis of their biomechanical structure.

During research the following tasks were decided:

1. To carry out the analysis and to reveal the tendencies of competitive activity in table tennis.
2. To reveal and to compare biomechanical structure of the most effective technical elements and exercises used for their perfection.

Technique. By the purpose of the analysis of competitive activity was to define the tendency of development of table tennis and to reveal the most reliable and effective technical actions. The analysis of competitive activity was carried out by processing videomaterials of Championships of the World, Europe, Russia and Olympic games for last 10 years, therefore were defined frequency of application of techniques, their reliability and efficiency. To study muscle coordination and muscle activeness we have used a myograph which allowed us to register electric impulses from the acting muscles. The moment of the ball biting against the racket has been registered by a special racket provided with a sensor. All data obtained by these means have been processed with the help of a computer. The myograph sensor were fixed on the following muscles: on the triceps brachii, the biceps brachii and the brachioradialis.

Object of research was the table tennis players-men in the age of 17-21 years, high qualification. The following techniques were analyzed: loop on the right, top-spin on the right, finishing impact on the right. The impacts were carried out on thrown balls in standard conditions without movings the sportsman.

Results. During the analysis of competitive activity is revealed, that most effective in modern table tennis are top-spin, loop and finishing impact. The brightly expressed tendency of growth of reliability of the above mentioned technical elements is observed.

The biomechanical analysis of muscle work has shown its general tendency. The triceps brachii is playing the leading role and does the most of job while executing these techniques. The main task of this muscle is speeding up the arm, and, consequently, the bat. Then, the biceps brachii becomes active, since the movement of the arm has arc-like trajectory and the impulse is transmitted to the forearm. At this point, the brachioradialis starts acting, which not only helps to speed up the bat, but mainly does its principal job - it adjusts the right slope of the bat trajectory. Though its impact may seem not very big, judging from its total activeness, if compared with the other muscles, at the same time it should be noted that the hitting of the ball against the exact point of the table depends on the accurate correction of the movement.

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Page: 2/2

The big variety of the registered indicates while executing chop and loop shows us that a table tennis player can change time and dynamics of the striking movement with tow speed of the arm movements, as in top-spin execution, the variety lessens and the movement stabilizes.

As it has been discovered, time sequence and total activeness of muscle work of the players differ, which could be explained by different qualification levels of the players and efficiency of their techniques.

The received results of research allow to make the following **conclusions**:

- In modern table tennis the tendency of growth of reliability and efficiency of attacking impacts (top-spin, loop, finishing impact) is observed, and also submissions, hence in training process it is necessary to make accent on perfection just of these technical elements;
- The biomechanical analysis of the main table tennis techniques helped us to discover some peculiarities of the game techniques and showed that in order to raise the efficiency of the stroke techniques it could be recommended not only the visual analysis of competition and training, but also the following biomechanical indices:
 - time of muscle work;
 - sequence of their functioning;
 - total activeness of muscle work;
 - coincidence of maximum activeness of the brachioradialis with the hitting moment.

The analysis helps us to discover the efficiency of the game technique.

- The exercises with burdenings render negative influence on coordination of muscle and structure of game action, hence it will be expedient to exclude them from training process.

The further detailed study of the muscle work will enable us to develop specific methods of training and improving the table tennis techniques.

Title: (19) STRUCTURE OF COMPETITORS' ACTIVITIES OF TOP TABLE TENNIS PLAYERS

Name: Prof. Zoran Djokic
Magistry work at Faculty of Physical Education
(University in Novi Sad - YUGOSLAVIA)

Page: 1/2

Subject of this research is the structure of competitors' activities in sample of 62 top table tennis players (mostly leading World players - rank in the first 100 at ITTF Rank list as Kong Linhui, Liu Guoliang, Samsonov V., Wang Liqin, Waldner J.O., Primorac Z., Ma Lin, Persson J., Gaten J.P.,...) in competing seasons 1996/97, 1997/98, 1998/99. mostly in final matches at Pro Tour tournaments, European and World Championships, and European Champions League.

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.

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Page: 2/2

Research consists of the analysis of competitor's activities for all players, and from the aspect of:

1. Success in play (winners and losers),
2. Quality of players (position at ITTF Rank list) (better player, and lower ranked).

For every analyzed activity basic statistical data, frequency data, percentage in complete activity and group of activity, as a characteristic from the aspect of success of play and quality of player, are done.

The statistical importance differences between:

- winners and losers
- better and lower ranked are fortified, and interpretation of these differences from the aspect of expert analyses, which show the way of training process in producing the champion players with high performance in play and with great chances to play a winning play.

The research consists of interpretation 3 part structure of competitors' activities of top table tennis players (as the results of Cluster analysis) and interpretation of the main factors of modern table tennis. The structure of analyzed players is fortified, also.

Basic aim of this research is rationalization and higher effectively of training process in table tennis. Considering this results of research, which are explaining modern concept of table tennis game, and factors which influence success of play and quality of play and players. This research consist a lot of graphic showing and also, one of the product of this research is a software for analyzing table tennis match in all this activities.

Title: (20) Blood Hemodynamics of Female Ping-Pong Players

Name: Cheng Yun-Feng

(Hainan Institute of Physical Education, Hainan, Hainan Province, P.R.China)

Page 11

This article developed further into the influence of Ping-Pong sports on the circulatory system varied the mechanism of physical strength through the test and the analysis of female Ping-Pong player's blood hemodynamics.

18 people are tested. Among them, athletic group is composed of 8 female Ping-Pong players, who have received training for more than 5 years. Contrasted group is composed of 10 healthy female university students.

SESSION 5

Pulse rate: at rest, the pulse rate of athletic group is lower than that of contrasted group, after fixed exercises, the pulse rate of athletic group is still lower than that of contrasted group. The pulse rate is low, it shows that the functions are saved, so we know that the cardiovascular system of female Ping-Pong player has stronger adaptability to sports.

Stroke volume: either at rest or after fixed exercises, stroke volumes of athletic group are lower than that of contrasted group. The research proves that they can use the reserves of their hearts, when their hearts are in the diastole and the systole, especially endurance training. So stroke volume becomes more increasing. However, some people don't undergo training, their hearts can only use the reserves of systole. The increasing of cardiac output is limited.

Cardiac output: after exercises, cardiac output of two groups increase. But athletic group possesses notable significance ($p < 0.05$). Following the need of metabolism, cardiac output of athletic group will increase considerably. This shows that the hearts of female Ping-Pong player have higher efficiency.

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Name: Cheng Yun-Feng

(Harbin Institute of Physical Education, Heilongjiang Province, P.R.China.)

Page: 1 / 2

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18 people are tested. Among them, athletic group is composed of 8 female Ping-Pong players, who have received training for more than 5 years. Contrasted group is composed of 10 healthy female university students.

Now we progressively analyse the targets and the results of blood hemodynamics, which are tested from the research.

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Title: Research On the Blood Hemodynamics of Female Ping-Pong Players

Name: Cheng Yum-Feng

(Harbin Institute of Physical Education, Heilongjiang Province, P.R.China.)

Page: 2/2

athletic group. The results show that effective ejection of left ventricle of athletic group is higher than that of contrasted group.

General Peripheral Resistance: at rest, either of groups have no obvious difference. After exercises, the peripheral resistance of contrasted group increases obviously, yet that of athletic group evidently reduces.

A reduction of peripheral resistance is beneficial to the blood ventricle pumped rapidly flows to the working muscle, and let the muscle get more arid more oxygen supply, it also helps get rid of the product of metabolism and effectively recovers the organism after exercises.

Blood viscosity: after exercises, the blood viscosity of two groups improve to varying degrees, but blood viscosity of contrasted group may produce much higher increasing, it is obviously different from athletic group ($P < 0.05$). The reason is that blood vessels of contrasted group are acted on higher peripheral resistance, the blood consume much energy during its flowing, therefore, when the blood is circulating around the body, its flow rate is lower.

I propose are a few of results and analyses. It expresses that female Ping-Pong player's cardiac out put will increase by fixed exercises. The increasing or minute output are got from lower heart rate and much higher' stroke volume. This verifies that a table tennis sport is a kind of oxygenic sports which can promote the function of heart. Secondly, when female Ping-Pong players finish any fixed exercises, their peripheral resistance of circulator system becomes low. The practitioners may obtain better adjusted ability of the vascomotion by table tennis sorts, and vascular walls can keep good elasticity too. Besides, blood viscosity of Ping-Pong player relatively reduces, their blood can flows smoothly.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (21) "The Effect of Table Tennis Exercise on Cerebral Blood Flow"

Name: Teruaki Mori

Associate Professor, Department of Neurosurgery

Oita Medical Medical University

Purpose : To investigate the effect of table tennis exercise on regional cerebral blood flow in table tennis player.

Method : Regional cerebral blood flow (rCBF) of six male table tennis players was measured with single photon emission computed tomography (SPECT) imaging with ^{99m}Tc -ECD (ethyl cisteinatedimer) 740MBq. The r CBF value in four areas (frontal lobe, parietal lobe) midbrain, cerebellum) on transaxial SPECT images were calculated and analyzed quantitatively by Patlak plot method. Immediately after a player smashed 40 balls/min released from a machine during 10 minutes, r CBF was measured and compared with at rest.

Result : r CBF in four out of six players increased after exercise, one unchanged, another one decreased. The areas of increased r CBF were cerebellum, pons, midbain and motor area and an increase rate is 40 - 100 percent. On the other hand, the case with decreased r CBF was a beginner player. It was guessed that the exercise condition was severely for him. It became known that r CBF increased or decreased easily by a table tennis exercise.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (22) Research on physical efficiency training of table tennis players

Name: Tao Zhixiang

(Teaching and research section of small ball, Beijing University of physical Education,
Beijing 100084, P. R. China)

Physical efficiency is one of the most important factors of competitive ability for every sports event. It is not only the base for improve level of sport technique and competition tactics, but also the base for bearing large training load and competition stress and keeping stable mental status. It is helpful for prolong players competitive life. In this research, the author visits some Chinese national table tennis team coaches and players. A lot of material about physical efficiency training was collected. According to the physiological characteristics of table tennis. The author put forward content method and points for attention about modern table tennis player's physical efficiency training.

I propose are a few of results and analyses. It expresses that female Ping-Pong player's cardiac output will increase by fixed exercises. The increasing of minute output are got from lower heart rate and much higher stroke volume. This verifies that a table tennis sport is a kind of oxygenic sports which can promote the function of heart. Secondly, when female Ping-Pong players finish any fixed exercises, their peripheral resistance of circulator system becomes low. The practitioners may check better adjusted ability of the vasomotion by table tennis sports and vascular walls can keep good elasticity too. Besides, blood viscosity of Ping-Pong player relatively reduces, that blood can flow smoothly

Title: (23) **The analysis of competitive and training loads in table tennis**

Name: Barchukova G.V., D.Sci (Pedagogics), Pliomichev A.S.

(Russian State Academy of Physical Culture, Moscow, Russia)

The purpose of the study was to analyze training and competitive loads in qualified as a result some features were revealed differing competitive and training regimens. It was shown that the main factors of pulse rate increase during training were the This contradiction between the contents of competitive activity and training process.

Title: (24) **Science In Training Elite Sportsmen**

Name: O.Matytsine, M, Shestakov.

(Russian State Academy Of Physical Education)

Page: 1/2

The main trends in sport science. The existing system of scientific ensuring of training the elite sportsmen contains the following points:

- forecasting a sport result for succeeding at different stages of training;
- analyzing and modelling the competitive activity of a sportsman;
- analyzing and modelling Various aspects of the condition of a sportsman;
- analyzing and modelling sport training aimed at the achievement of the result planned.

Each of these points includes; controlling the condition of a sportsman and working out new methods of training and recovering and new methods to control their influence on the human organism.

Complex control. Complex control is one of the main links in the system of training elite sportsmen.

Among all the methods of complex control there are distinguished 4 levels (or subsystems) 1st level - integral indices, which reflect, the complex effect of many aspects of the condition of a sportsman, 2nd level -complex indices, which characterize one of the functional systems of the organism (for example, muscular system). 3rd level differential indices, which characterize Only one feature of the functional system of the organism (for example, muscular composition). 4th level single indices, which characterize a single feature of a functional system (for example, summary electric activity of a single muscle).

The content of complex control depends on the specific features of a sport. But there are common aspects which allow to unite different subsystems of control.

Today about 1000 technical means are used in complex control. Besides that about 300 instrumental methods are used to examine more than 3000 parameters of the condition of a sportsman. So it is necessary to find the most trustworthy methods and characteristics of the control.

The main ways of introducing the results of scientific researches into practice. The first way of interaction between sport science and practical work of a coach is the use of data of fundamental theoretical sciences which examine different sides of training process.

The second way is the so called scientific and methodical ensuring of training process.

Title: Science In Training Elite Sportsmen
Name: O.Matytsine, M,Shestakov.
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Page: 2/2

How to solve this problem. One of the perspective ways of the development of sport science is the elaboration (on the base of fundamental sciences - anatomy, physiology, biochemistry, psyco-physiology) of simulation models of different functional systems of human organism, which work in the system of a real time. When the identification of such models with the empirical data is done, one can analyze the reaction of those systems on training process.

The advantages of this method:

- the synthesis of theoretical and practical approaches;
- the possibility to obtain the results of prolonged processes in a short time period of time and without a real sportsman;
- the possibility to explain theoretically complicated phenomena;
- the possibility to work out individual models of training.

After the analysis of the work of such models one will be able to plan sport training, prognosticating the final result.

The technical base for the qualitative realization of a program control of the training process is the automatization of scientific researches on the base of Computers. Today the actual problem is the elaboration of computer programme (among them - programme using the artificial intelligence).

SESSION 6

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (25) From pastime to performance : Lord Ivor Montagu and the pioneers of the International Table Tennis Federation (1925-1939)

Name: Jean-Marc Silvain,

Centre de recherche en analyse du sport, Université Charles de Gaulle, Lille III FRANCE

The International Table Tennis Federation was set up almost by chance in 1926. What appears to have been the result of a whim of a handful of individuals, emerged rapidly into an institution which within a decade, transformed into a real sport and required a truly international dimension.

This episode gives food for thought as to the circumstances which are necessary for the birth and development of a sport. Each attempt at developing a game does not necessarily lead to the birth of a sport. Its success is very much dependant on certain prerequisites among which, most notably, the presence of determined and active managers. Our project is to shed light, through the development of table tennis during its first stages, on the role and influence of a few men on the launch of the game. Among these, the attention will be focused on Lord Ivor Montagu, whose astonishing capacity for work and sense of diplomacy led to him becoming the president of ITTF from 1926 to 1967. We will look at the man himself, at the role he played in the spread of table tennis into an internationally played game, at his successes, at his failures. In so doing, we shall come across other individuals who took part in this adventure. Who were these pioneers ? What led them to transform table tennis which, in its early stages, was merely a pastime for a more well off section of society, into a serious sport orientated towards performance and worldwide confrontations. Was there, for Ivor Montagu as well as for other table tennis representatives, similar motivation and common objectives ?

These are the hypotheses of research of this paper. The success of new born institution depends largely, as it is widely known, upon the ability and will of those who are involved in it. Through the study of table tennis in its early days, we shall also attempt to describe and understand prominent figures of this period.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title(26) The Influence of the Evolution of Table Tennis Rules on the Skill of Table Tennis and its Developing Tendency

Name: Mr. Qingchuan Yu Senior Visiting Scholar Scholar.
Mr. Xiuwen Wu Professor
Mr. Piren Su Professor

Abstract : This paper deals with what influence the changed rules for international competitions of table tennis in their process of evolution since 1980 has had upon the pattern of table tennis circles of China and the world, upon its skill development and its development tendency of future table tennis circles; and authors make a sum- up and an analysis from the collected data, making some results, aiming at the status quo, on the changing of ruled which may:

1. Restrict some skills and shots, but can make the game move toward a more attractive trend;
2. Push table tennis skills toward the trend of "being all-sided, stressing one's strong point, trying to gain the initiative and foregrounding the forehand",
3. In order to keep abreast of the changing of new skills, the authors make a suggestion that the training and research on the basic skills will be strengthened; and on the basis of absorbing other advanced skills and shots, Chinese strategy of pen-hold quick drive will be enriched; moreover, player's constitution must be well-trained.

Key Words: Rules, skills, Racket, Long Pimples Rubber, Service

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Mr. Qingchuan Yu

On the Effect of Mood upon the Results of Table Tennis Players

Mr. Xiuwen Wu Professor
Mr. Piren Su Professor
Mr. Qingchuan Yu Senior Visiting Scholar

(Graduate Department in Beijing University of Physical Education, China. 100084)
(The P.E. Department, Nanyang Teachers College, Henan, China. 473061)

Title: (27) Deng Yaping's Technical Development and Comparison With Main Opponents Before The 26th Olympic Games

Name: Wei Wei (Tianjin University 300072 China)

Li Zhenbiao (Tianjin institute of Physical Education 300381)

Page: 1/3

For the 26th Olympic Games Deng Yaping trained very hard and made good technical and psychological preparation. We followed her to make technical statistics and analysis and compared with main opponents.

1 Research method and subject

1.1 Research method Statistics and analysis of match video tapes.

Evaluation of 3 technical sections

1.2 Gold medal winner of 25th Olympic Games-Deng Yaping

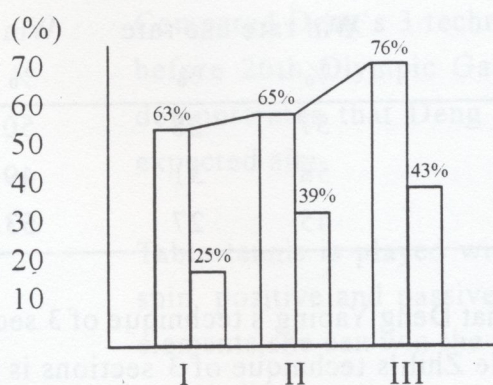
Gold medal winner of 24th Olympic Games-Chen Jing

Gold medal winner of 12th Asian Games-He Zhii

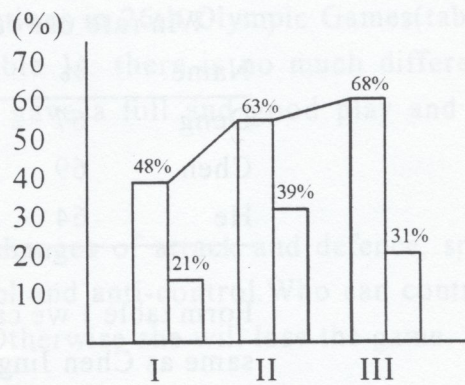
2 Research result and analysis

2.1 Deng Yaping's technical development from 1994 to 1995

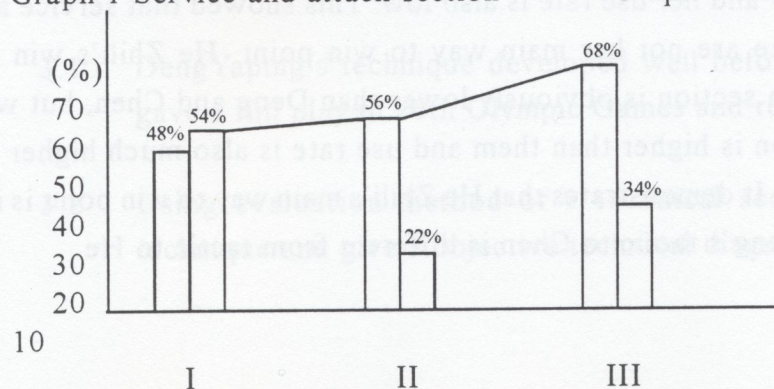
We made statistics of Deng's match in women's single final of 12th Asian Games in 1994 match in women's team final of 43th World Table Tennis Championship in 1995 and match in women's team final of Asian Cup in order to know Deng's technical development. The result is as following (graph 1.2.3)



Graph 1 Service and attack section



Graph 2 Service return section



Graph 3

Rally

Section

Note:

I - 1994

II - 1995 (May)

III - 1995 (Nov)

Title: Deng Yaping's technical development and comparison with main opponents before the 26th Olympic Games

Name: Wei Wei (Tianjin University 300072 China)

Li Zhenbiao (Tianjin institute of Physical Education 300381)

Page: 2/3

From graph we can see that Deng Yaping's technique of 3 sections rises gradually from 1994 to 1995. This showed that her technique furthermore perfected. Especially her win bat of rally section improved. It laid good foundation for the 26th Olympic Games in 1996.

2.2 Comparison of Deng Yaping's technique with main opponents. After analysing Deng's technical development, we analysed her main opponents-Chen Jing who is gold medal winner of 24th Olympic Games and He Zhili who is gold medal winner of 12th Asian Games.

We compared their technique from 3 sections. The result see table 1. Table 1 Comparison of 3 technical sections among Deng, Chen and He before 26th Olympic Games

Service and attack			Service return		Rally	
Win rate use rate			Win rate use rate		Win rate use rate	
Name	%	%	%	%	%	%
Deng	67	31	57	28	50	41
Chen	69	31	58	31	49	38
He	64	14	45	27	53	59

Form table 1 we can see that Deng Yaping's technique of 3 sections is almost same as Chen Jing. But He Zhili's technique of 3 sections is much different from Deng and Chen. He Zhili's win rate of service and attack after service is low and her use rate is also low. This showed that service and attack after service are not her main way to win point. He Zhili's win rate of service return section is obviously lower than Deng and Chen, but win rate of rally section is higher than them and use rate is also much higher than Deng and Chen. It demonstrates that He Zhili's main way to win point is in rally section. So Deng's tactic to Chen is different from tactic to He.

Title: Deng Yaping's Technical development and comparison with main opponents before the 26th Olympic Games

Name: Wei Wei (Tianjin University 300072 China)
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Page: 3/3

2.3 The result and analysis of 26th Olympic Games

Through hard struggle, Deng Yaping defeated Chen Jing with 3:2 in women's single final of 26th Olympic Games and got the gold medal. Chen Jing got the silver medal and He Zhili got the 5th place. Their technical statistics of 3 sections see table 2.

Table 2 Comparison of 3 technical sections among Deng, Chen and He in

26 th Olympic Games						
Service and attack			Service return		Rally	
Win rate use rate			Win rate use rate		Win rate use rate	
Name	%	%	%	%	%	%
Deng	65	25	58	31	49	44
Chen	52	26	50	31	43	43
He	53	15	42	24	46	61

Compared Deng's 3 technical sections in 26th Olympic Games(table 2)and before 26th Olympic Games (table 1), there is no much difference.this demonstrates that Deng Yaping gave a full and good play and reached expected aim.

Table tennis is played with the changes of attack and defence, speed and spin, positive and passive, control and anti-control.Who can control these elements,she can win the game. Otherwise she will lose the game.

3 Conclusion

- 3.1 DengYaping's technique developed well before 26th Olympic Games. She gave a full play in 26th Olympic Games and reached expected aim.
- 3.2 Using evaluation method of 3 technical sections can compare players technique and give a objective technical diagnosis.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (28) DISTANCE EDUCATION IN IMPROVEMENT OF PROFESSIONAL SKILL OF COACHES

Name: Shestakov M., Matytsin O.

(Russian State Academy of Physical Education, Moscow, Russia)

At present modern information technologies can be used for the improvement of professional skill of coaches by the system of distance education. The worldwide information network Internet made it possible for professors of RSAPE to communicate with students living in any country of the world. A special educational course was worked out for this educational system, and it is based on business games and computer simulation modeling. A five day course consists of daily lessons (6 hours per day).

Students are united into groups, and a professor gives a concrete problem situation on any of the themes to each of the groups. The students discuss it within their groups and elaborate several decisions. These are discussed later between the students and the professor. Then the professor gives lecture to all of them. At the end of the Internet session a new problem situation on the same theme is given, and the students solve it using the acquired knowledge. Such lessons allow the students to communicate with each other under a constant control of the professor, and computer simulation modeling allows them to estimate this or that decision. Computer models simulating functions of various systems of the organism of an athlete are based on multiple scientific researches in anatomy, biomechanics, physiology, psychology, pedagogy, neuro-physiology, theory and methods of sport training. Modern methods of simulation modeling, artificial intellect, theories of neuron networks were also used.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (29) On the Value-system and Prospects of Table Tennis

Name: Zhang Zhijie & Guo Yujin

(Luoyang Table Tennis Association, Luoyang City, Henan Province, P.R. China)

The paper explores, first of all, the value-system of table tennis. With competition playing a key role, the system also includes aesthetic value, bodybuilding value, honor value, economic value, as well as appreciation and participation on the part of the spectators.

But due to such factors as the ball is too small, the spinning is too strong, the speed is too fast, and the changes are too many, it is difficult for the players to give full play to their skills and for the spectators to appreciate the performance. This undoubtedly reduces the interest of the spectators and consequently the economic benefits of this game. That is why table tennis cannot hold a candle to tennis in terms of economics.

So table tennis must be reformed. The author thinks that it is essential to enlarge the ball, but it is not enough to enlarge the ball alone. The following conditions must be realized at the same time:

1. To increase the ball in weight in proportion to its increase in size so as to keep the high-speed characteristic of this game;
2. To reduce spinning intensity and unnecessary faults, so as to increase intense, exciting scenes for the spectators;
3. To enlarge the table as well as the court;
4. To designate service area so that the players can engage in heated competition from the very beginning.

My suggestion for the size and weight of the ball is:

Ball A: 4.0cm, 2.9g; ball B: 4.2cm, 3.2g; and ball C: 4.5cm, 3.7g.

The size of the table and the court is also suggested.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (30) **PROGRAMME OF SCIENTIFIC AND RESEARCH WORK (DIRECTIONS) FOR THE DEVELOPMENT OF TABLE TENNIS FOR 2000-2004**

Name: YU. POHOLENCHUK (UKRAINE)

YU. POSEVIN (RUSSIA)

A. SHARARA (CANADA)

Page: 1/5

Further growth of sports movements is largely dependent on the objective analysis of the Status of scientific research and methodological studies in table tennis, clear definition of ways and approaches to their definition and practical fulfillment.

In spite of distinctive results achieved in handling theoretical and applied problems of training highly qualified sportsmen, many vital problems still remain out of sight of the specialists and are being solved quite ineffectively. Insufficiently studied are the questions of rational configuration of training 'process in 'the preparation of sports reserves in the system of children's and youth sports. Slow progress is shown in studying a most important problem of selecting promising young sportsmen which acquires special prominence in connection with the preparation of national teams.

No doubt the system of scientific and methodological support (especially psychological and medical and biological) in the process of training qualified tennis players needs further improvement.

Making the competitor act in the conditions when he has not enough time to react and take decisions fully coincides with the leading concept of today's table tennis - a fight for time. A search for such instruments is above all connected with the analysis of the tennis player's ability to quickly respond to the situations of the game when time is extremely short, take optimal decisions to perform motional tasks in sports fights.

Little attention is paid to perfecting the comprehensive system of facilities and methods of improvement and restoration of sportsmen's ability to perform, use of non-traditional facilities and natural adaptogenic factors to raise efficiency in the conditions of training and competitions.

Additional scientific study is required in the problem of application of training management methods, improvement of physical fitness, optimal structuring of long time training in the conditions of strenuous learning, training and competing activities. Significant improvement in scientific studies is essential for the questions related to perfecting training and retraining of coaching personnel, raising the quality of information support, coordination of scientific research, publication of scientific and methodological literature and introduction of advanced methods.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

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A. SHARARA (CANADA)

Page: 2/5

DIRECTIONS OF SCIENTIFIC AND METHODOLOGICAL WORK IN THE DEVELOPMENT OF TABLE TENNIS FOR 1997/2001

DIRECTION I - TABLE TENNIS AS AN INSTRUMENT OF UP BRINING AND HEALTH IMPROVEMENT

Subjects:

- 1.1. Table tennis in the process of training specialists.
- 1.2. The place of table tennis in international movement.
- 1.3. Ways and means of formation of ideological (religious), moral, esthetic and volitional personal qualities of the tennis player in the process of training.
- 1.4. Table tennis in the system of physical education.
- 1.5. Substantiation and use of ways and methods adopted in table tennis for the prevention of illness, restoration of health and workability.
- 1.6. General laws of influence of table tennis on aging organism.

DIRECTION II - PERFECTION OF THE SYSTEM OF TRAINING HIGHLY QUALIFIED SPORTSMEN IN TABLE TENNIS (BIOMECHANICS, EXERCISING)

Subjects:

- 2.1. Sports orientation and selection in the process of long time training.
- 2.2. Perfection of the system of training of sports reserves.
- 2.3. Scientific substantiation of configuration and composition of training process.
- 2.4. Sources of perfection of different training aspects and structure of competitive activities for tennis players of highest qualification.
- 2.5. Functional reserves of tennis players as an object of directed actions in the process of adaptation to high training and competitive strains.

Title: PROGRAMME OF SCIENTIFIC AND RESEARCH WORK (DIRECTIONS) FOR
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YU. POSEVIN (RUSSIA)

A. SHARARA (CANADA)

Page: 3/5

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- 2.6. Substantiation of optimal variants of training configuration at the stage of direct training for important competitions of the season.
 - 2.7. Differentiation and individualization in training of tennis players at different stages of long time perfection.
 - 2.8. Objective approach to methods of controlling parameters of training and competitive strains depending on technical and tactical aspects of training of tennis players.
 - 2.9. Management of education and training process taking into account individual morphological and functional features of the organism of tennis player.
 - 2.10. Special training of tennis players at different stages of specialized training.
 - 2.11. Perfection of facilities and methods of development of tennis player orientation.
 - 2.12. Experimental substantiation of facilities and methods of development of speed and strain endurance during the game in relation to other qualities during long time preparation of tennis players.
 - 2.13. Optimization of planning of programming literature in the process of education and training of tennis players.
 - 2.14. Psychological basis of individualization of education and training process for tennis players.
 - 2.15. Optimization of game techniques, formation, perfection and development of motional qualities, skills and practices in the process of training.
 - 2.16. Organizational forms of education and training process to improve sporting skills of players. Competitive practice as an effective instrument of mobilizing functional resources of the tennis player's organism.
 - 2.17. Differentiation of training loads in physical training of young tennis players depending on the levels of biological development.
 - 2.18. Development of specific abilities in sporting activities of the tennis player.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

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A. SHARARA (CANADA)

Page: 4/5

DIRECTION III - MEDICAL, BIOLOGICAL AND PSYCHOLOGICAL SUBSTANTIATION OF THE SYSTEM OF TRAINING IN TABLE TENNIS

- 3.1. Optimisation of planning and management of education and training process basing on the assessment of physical, psychophysical condition and social and ecological aspects of environmental effects.
- 3.2. Medical and biological criteria to assess the effectiveness of composition, forms, facilities and methods of playing. Development of uniform facilities and methods of express information of physical and psychophysical condition of the tennis player's organism during education and training.
- 3.3. Development and perfection of medical and pedagogical observations in the process of education and training.
- 3.4. Relation between motional activity, functional condition and physical efficiency of tennis players.
- 3.5. Development and substantiation of a comprehensive system of facilities and methods of restoring efficiency of tennis players after high training and competition strains.
- 3.6. Development and substantiation of hygienic nutritional norms for tennis players in different climatic and geographical zones.
- 3.7. Optimisation of training process for the purpose of improvement of sports skills and health preservation.
- 3.8. Planning training process for qualified women players taking into account specific features of female organism.
- 3.9. Effective facilities and methods of restoration of specific efficiency of highly qualified tennis players.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

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A. SHARARA (CANADA)

Page: 5 5

DIRECTION IV - PERFECTION OF THE SYSTEM OF TRAINING AND RAISING QUALIFICATION OF TABLE TENNIS STAFF

- 4.1. Theory and methods of training table tennis players: structure, composition, training techniques in table tennis.
- 4.2. Psychological and pedagogical evaluation of professional activities of table tennis specialist.
- 4.3. Ways of improving quality of training table tennis specialists.
- 4.4. Development of sports terminology, special vocabulary and phraseology in table tennis.

DIRECTION V - DEVELOPMENT AND PERFECTION OF SCIENTIFIC INSTRUMENTS, TRAINING AND SPORTING TOOLS AND EQUIPMENT

- 5.1. Development and perfection of technical facilities and their use to increase efficiency of education and training process, improve organisation and management of sports competitions.
- 5.2. Development of scientific instruments to perform experimental studies in table tennis.
- 5.3. Development of telemetric systems to control functional condition of the tennis player.
- 5.4. Perfection of sports tools and equipment for table tennis training camps.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (31) On the Effect of Mood upon the Results of Table Tennis Players

Name: Mr Xiuwen Wu Professor
Mr Piren Su Professor
Mr Qingchuan Yu Senior Visiting Scholar
(Graduate Department in Beijing University of Physical Education, China, 100084)
(The P.E. Department, Nanyang Teachers College, Henan, China, 473061)

This paper discusses the concept, function and features of mood, what role mood plays in the game competition and how important the role will be, making an analysis and a sum-up of the following aspects of problems through their investigations made on some juvenile players in China.

1. the relation between mood and competition;
 2. how mood has itself shown externally before competition;
 3. the effect of mood on the results of the game by players;
 4. some measures to control the mood of players;
 5. the effect of mood on the results of the game by players.
- Through the above-mentioned analysis and summary, it will be helpful to find some methods and regular patterns which may be beneficial to improve the competition results and the game level in the teaching, training and competition of table tennis in future.

SESSION 7

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (31) **On the Effect of Mood upon the Results of Table Tennis Players**

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This paper discusses the concept, function and features of mood, what role mood plays in the game competition and how important the role will be, making an analysis and a sum-up of the following aspects of problems through their investigations made on some juvenile players in China:

1. the relation between mood and competition;
2. how mood has itself shown externally before competition;
3. the relation between mood and the results gained by players;
4. the influence of a coach upon the mood of a player;
5. other factors affecting the results of players, through the above-mentioned analysis and summary, it will be helpful to find some methods and regular patters which may be beneficial to improve the competition results and the game level in the teaching, training and competition of table tennis in future.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (32) Psychology And The Modern Table Tennis Player
Name: Dr.Femi Olugbile and Oleg Matytsine

This paper contains an analysis of the responses of athletes from different parts of the world to the Athletes' Questionnaire of the Sports Science Committee of the International Table Tennis Federation.

From June 1998, questionnaires were sent out to top table tennis players, male and female, in the major table tennis playing nations of the world. Responses were obtained from the following countries: Yugoslavia, Nigeria, England, USA, Germany, Japan, and China. In all, there were 91 male and 69 female respondents.

The 10 item Psychology Section of the questionnaire surveyed their attitudes to, and knowledge of, Psychology and psychological techniques, and the influence they consider these to have on their results.

The analysis involves comparisons between the athlete population as a whole, as well as across groups such as male: female, country:country, continent:continent.

At the end, observations and recommendations are made about how to increase the use of Psychology in uplifting performance in the game of Table Tennis.

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (33) An Inquiry into the Ways of Selecting Children Table tennis Player-A Study of the Training Possibilities of turning a Right-hand Player into a Left-hand Ones

Name: Zeng Jing-Fan, Liang Yan-Xiang, Xu Zhi-Ping

An Inquiry into the Ways of Selecting Children Table tennis Player

- A Study of the Training Possibilities of turning a Right-hand Player into a Left-hand Ones. A left-hand player has some advantage over a right-hand one in matches. Whereas, the selecting of such a player is quite difficult. So, we selected twenty-four right-hand players from our sparetime school, and began training them to play left-handedly. One year later, the data showed that, there was no difference with other children in physical growth, technique, psychology and so on. Moreover, their intrinsic ability of playing with their left-hand became visible.

Five years later, they achieved excellent results in a provincial children table tennis match. This illustrates the feasibility of this method, and finds way of training left-hand players in great number.

The I.Q. Comparison Chart of the Different Level Players

	Group A (N=25) Group B (N=14)			
	x1	x2	s1	s2
The verbal I.Q.	90.08	14.19	80.3	13.32
The handling I.Q.	101.84	10.4	92.71	13.79
The full I.Q.	94.6	10.98	84	14.4
	0.027	1.96		0.042
				0.014

*p < 0.05

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (34) The Analysis of The I.Q. Test of The Teenage Table Tennis Players of Shanghai

Name: Wang Yujing, Liu Wei (Ball Games Dept. ,Shanghai Institute of P.E.,200438,PRC)
Sun Qiling (P.E Dept. of Jiao Tong University,200030,PRC)

Our research group has chosen 39 players among the top level winners of the teenage table tennis competitions in Shanghai for a intelligence question test (W4IS-CR), which was finished in The Second Medicine University of Shanghai, and got a result and an analysis by computerizing all the data processing.

The result and analysis of the I.Q. tests to the teenage plays are as follows:

1. The average value of the full I.Q. is 90.79. The S.D. (statistic term) is 13.18, which belongs to the medium level and might be the result of their limited knowledge.

So we consider that the teenage players should pay close attention to their studies at school and increasing their reading after school.

2. The handling I.Q. is 98.92, which is obviously higher than the verbal I.Q of 86.64. It proves that the long term training of the table tennis will for a certain degree promote the development of the handling I.Q.

3. According to the sports level of these teenage players, we divided them into two groups, and group A is superior to group B. The result of the analysis also proves that the verbal I.Q., the handling I.Q. and the full I.Q. of the players in group A are about 10 marks Higher Than the players in group B. The difference between two groups is quite obvious (see the chart below). Therefore we reason that the intelligence level and the sports level are likely to have some cause and effect relationship.

The I.Q Comparison Chart of the Different Level Players

	Group A (N=25)		Group B (N=14)		t	p
	x1	s1	x2	s2		
The verbal I.Q.	90.08	14.19	80.5	15.35	1.96	0.057
The handling I.Q.	101.84	10.4	93.71	13.79	2.08*	0.045
The full I.Q.	94.6	10.98	84	14.4	2.58*	0.014

*P < 0.05

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (35) On the Striking Position

Name: Ling Qunli and Hu Leyong
Nanjing Institute of Physical Education

Abstract

Table Tennis is a two-way sport, which requires the player to decide on the right position of striking and strike the ball back within a very short time after it touched the table. After an analysis of different striking position, this paper discusses the role of the right striking position, its relevant factors and the command of it. The striking position, except for a serve, should be on the second arc of the return; it is the point in space where the bat and the ball touch.

The leading factors affecting the position of striking include performance of the bat; time of striking; scope of motion; position of the bat and striking spot; timing, direction and degree of exertion; direction, length and height of the arc; and also footwork. The leading factors involve a comprehensive application for each specific strike. The internal factors consist of perception of response; ability of distinguishing the properties of the ball; temporal and spatial perception and direction; tactical and technical purposes; style; adaptability; and psychological adjustment, etc.

The striking position is the key to the combined benefits that internal factors are expected to produce. Better use will be able to be made of the advantages of the right striking position, if more efforts enter into research on the performance of the ball, into the application in practical training of the striking position, and into raising the awareness of the importance of the right striking.

Key Words

table, tennis, striking, position, factor; selections

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: (36) Sportsmedizin Concerning The Heart-Rate And Locate During Competition Of Young Table Tennis Players, aged 13 to 17 years.

Name: Dr. Wolfgang Friedrich (Germany).

Presentation 1:

There are not too many studies concerning sportsmedicinal parameters of young table tennis players. In our study ten young healthy table tennis players aged from 13 to 17 years (average age: 14.7) took part. They were already playing in table tennis teams with adult/senior colleagues. All were regional junior squad players. The experiment took place at regional practice sessions. The players played real table tennis matches against each other. The variables that were collected were heart rates (beats per min.) and blood lactate (mmol/l). The games were video taped so that also the net playing time could be measured.

Results: The rallies lasted an average of 2.78 seconds (range 1-13 sec.). The breaks lasted an average of 8.62 seconds (range 3-25 seconds). The net playing time for one set lasted an average of 7.11 minutes. The relation between playing time and breaks was 1:3. The blood lactate was on an average 1.27mmol/ (range 0.49mmol/l to 3.2mmol/l). Mean heart rate during the matches was 145 beats per minute (range 75bpm to 192bpm).

Compared to the results of studies with adult table-tennis players the heart-rates and the blood-lactate are lower with junior squad players. Our results show that the physiological work load of table tennis games from junior squad players is comparable to the games of senior players. From the physiological point of view junior squad players can play in teams with senior players.

Presentation 2:

All in all 160 (91 males/69 females) questionnaires of the ITTF Questionnaire were analysed.

1. Which liquid do you consider the best in preventing the side effects of dehydration (loss of body water) ?

Water: 57.5 %	Fruit Juice: 8.5%	Soft Drink: 5%	Sport Drink: 17.5%
Other: 2%			

THE 6TH I.T.T.F. SPORTS SCIENCE CONGRESS

Title: Sports Medicin Concerning The Heart-Rate And Locate During Competition Of Young Table Tennis Players, aged 13 to 17 years.

Name: Dr. Wolfgang Friedrich (Germany).

2. Do you agree that the dehydration during a tournament is a real risk for players ?
Correct: 73.5% I'm not sure: 18.5% Wrong: 5.5%
3. Players have to start drinking fluids before and during the competition to prevent dehydration and decrease in their playing ability :
Correct: 70% I'm not sure: 17.5% Wrong: 10.5%
4. The loss of 2-3% of the boby fluid caused by dehydration can lead to a decrease in the playing ability of 8-10% :
Correct: 28.5% I'm not sure: 61.5% Wrong: 21%
5. During prolonged exersice it is most important to substitute salt:
Correct: 43% I'm not sure: 38.5% Wrong: 13%
6. Do you modify or alter your nutrition before and during competition ?
YES: 55.5% NO: 37.5%
7. Do you routinely take the following supplements to help your performance ?
Vitamins: 54% Amino acids: 7% Others:2.5%
8. Do you think it is better to replace the loss of carbohydrates (glucids) during a tournament with a so called "power-bar" than with a sport drink containing carbohydrates ?
Correct: 14.5% I'm not sure: 57.5% Wrong: 23%
9. A well balanced sport-drink can prevent players from getting cramps:
Correct: 42.5% I'm not sure: 35.5% Wrong: 11.5 %
10. How many litres do you drink on tournament days ?
Up to 1 litre: 29% Between 1 and 2 litres: 49.5% More than 2 litres: 20%

