



# **LEISTUNGSDIAGNOSTIK IN SPANIEN**

## ***PERFORMANCE DIAGNOSTIC AND TEST IN SPAIN***

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M.Crespo. Internationales DTB-  
Symposium 2005



# Index

- Introduction
- Performance diagnostic and testing
- Match play diagnostic and testing
- Biomechanical / technical diagnostic and testing
- Physical diagnostic and testing
- Medical diagnostic and testing
- Psychological diagnostic and testing
- Other criteria
- Conclusion

# Introduction

## *General Situation & Overview*

- Testing has long tradition in sports science and sports
- Tennis testing is not too common
- Most used in: Physical conditioning, medicine, psychology...
- Least used in: Tactics and technique
- Gradual increase in the use of tests by coaches



# Performance diagnostic & testing

## *Definition*

- *Assessment of the player overall condition*

### *Who is it performed by?*

- *MEDICAL SCREENING – Doctor*
- *PSYCHOLOGICAL SCREENING – Psychologist*
- *M/SKELETAL SCREENING – Physiotherapist*
- *TACTICAL TESTING– Coach*
- *BIOMECHANICAL TESTING– Coach or Biomechanist*

# Performance diagnostic & testing *Types*

- Match play
- Biomechanical / technical
- Physical
- Medical
- Psychological

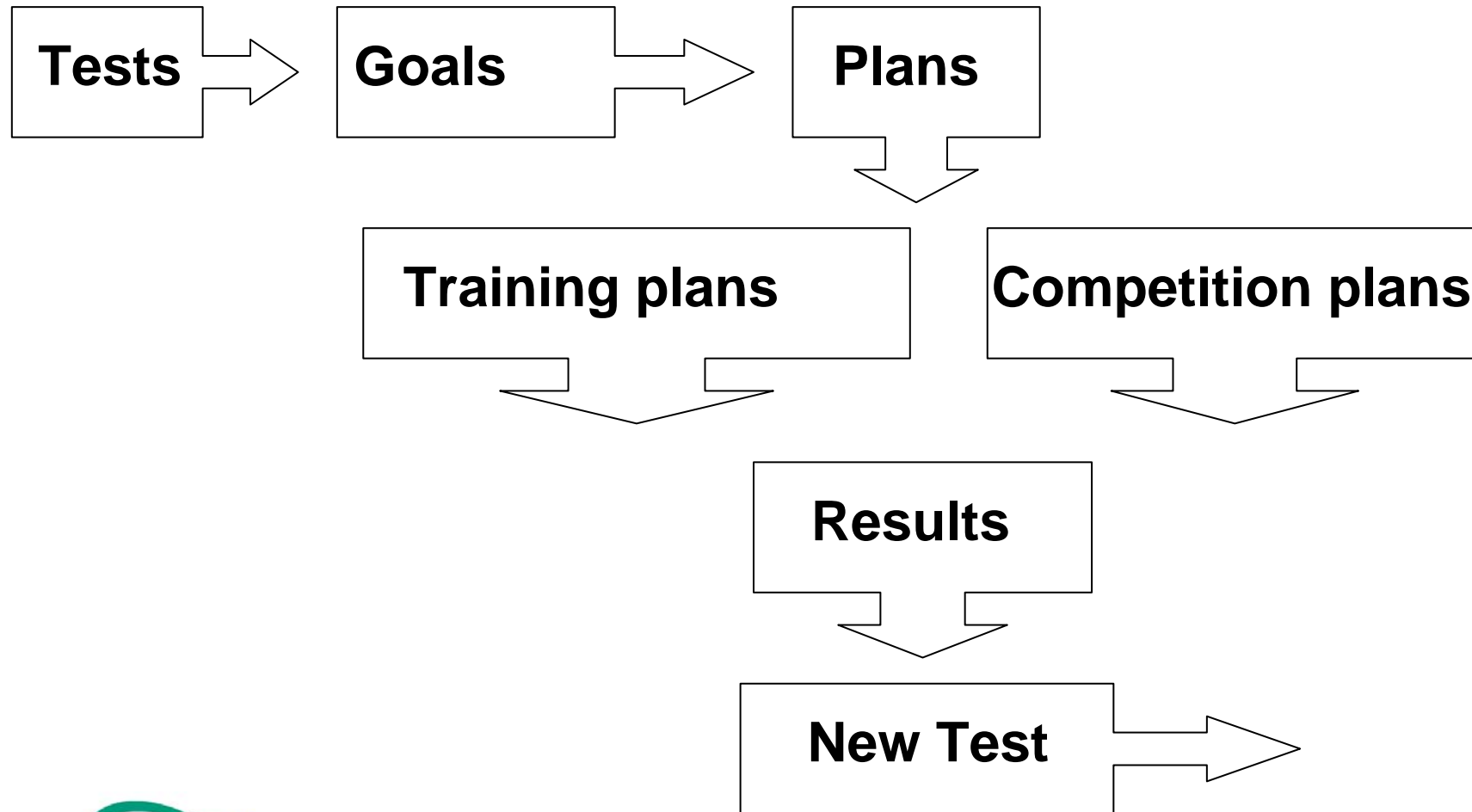
CHARACTERISTICS	LAB TESTS	FIELD TESTS
Precision of measurement	√ √	√
Ease of administration and interpretation	√	√ √
Cost	√	√ √
Specificity	√ √	√

# Performance diagnostic & testing

## *Utility & Practical application*

- **Reliability:** the need to administer the tests so that potential sources of error are minimised
- **Validity:** The need to design tests that measure that which they are supposed to!
- **Specificity:** The need to design tests that are specific to tennis
- **User-friendly:** The need to design tests than can be used by coaches
- Can help to prevent injury
- Physical programmes can be individualised
- Create, amend and improve training programmes
- Improve performance
- Increase motivation
- Supplement a coach's subjective appraisal;
- Monitor an athlete's progress;
- Predictor of performance potential.

# Performance diagnostic & testing *Process*



# Womens' tennis project in Spain 2004 - 2012

- Evolution of womens' tennis worldwide
  - Elite players
  - Junior players
- Technique and tactics
- Conditioning
- Mental toughness
- Analysis of Spanish womens' tennis

## GOAL

- To detect a large group of young female players
- Certain technical, physical and mental characteristics
- Guide them towards competitive tennis
- Following all the steps to ensure they develop adequately as human beings and sportswomen



## **WHICH KIND OF PLAYERS ARE WE SEARCHING FOR?**

- Age: 9 to 11 years old
- Physical qualities
- Medical assessment
- Technical capacities

## **WHICH SELECTION CRITERIA WILL BE USED?**

- Physical: Height, weight, mobility, coordination .....
- Technical: Skilled gestures (hand), consistency, arm acceleration, .....
- Psychological: Motivation, commitment, interest, competitiveness, .....
- “Clinical eye” of the coaches
- Other



## **WHERE WILL WE FIND THE PLAYERS?**

- Clubs
- Schools
- Community programmes
- Regional Federations programmes

## **WHO COULD HELP US TO FIND THEM?**

- Regional Federations
- Clubs
- Schools
- Local governments, Regional governments and State agencies

# Womens' tennis project in Spain 2004 – 2012: Stages

## REGIONAL STAGES

- Regional Technical Director proposes 25 players (aprox.) with the specific characteristics set by the RFET.
- Miguel Margets, Regional Technical Director and volunteer coaches will conduct the stage during 4 hours.
- Initial selection of 15 players (aprox.)

## ZONAL STAGES

- North, Central, South, North-West, South-East zones
- RFET co-ordinator, doctor, trainer, psychologist
- 2 days with 60 players
- Technical, physical, medical and psychological tests
- Final selection of the players

## **INDIVIDUAL AGREEMENTS**

- Meetings with parents, coaches, assessment of needs and individual agreements

## **WHAT DO WE ASK OF THE SELECTED PLAYERS?**

- To accept being included in the national project of womens' tennis
- To accept the technical direction of the R.F.E.T.
- To be ready to work intensively in order to become a good player

## **WHAT DO WE OFFER TO THE SELECTED PLAYERS?**

- Being part of a national project
- Technical management and advice
- Planning and periodisation of training (technical and physical)
- Medical control and follow up
- Taking part in stages
- Participating in competitions

## **HOW DO WE WANT THEM TO WORK?**

- In their own environment
- With their current coach
- With and individualised programme
- Under the control of the Federation

## WHICH WILL BE THE GOALS?

- Short term:
  - Having fun playing tennis
  - Training according to a plan
- Mid term:
  - Developing positively
- Long term:
  - Achieving competitive results

## CONTINUOUS EVALUATION

- Control of work
- Goal achievement
- Necessary adjustments

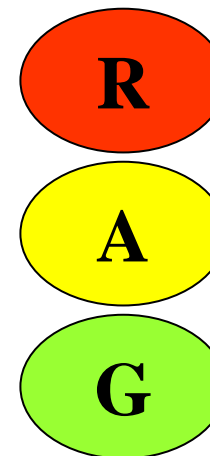
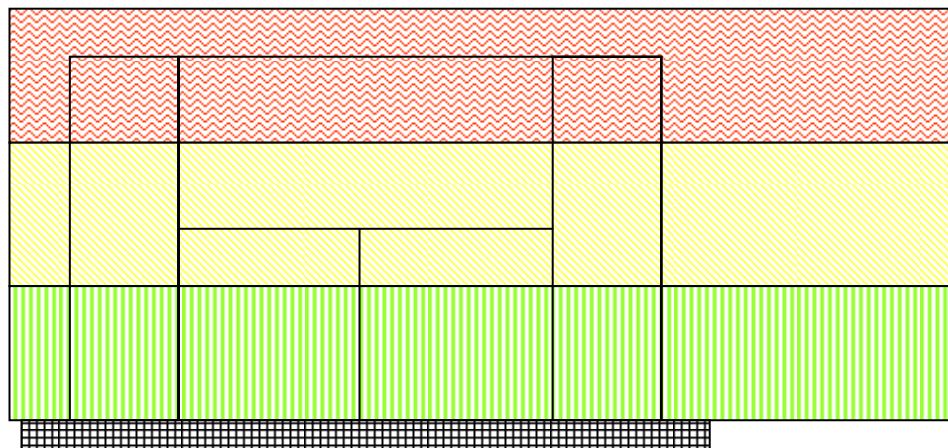
## WHICH PROBLEMS SHOULD WE CONTROL?

- Individualised work in a global project
- Non-fulfilment of the programme due to different motives
- Lack of resources
- Other

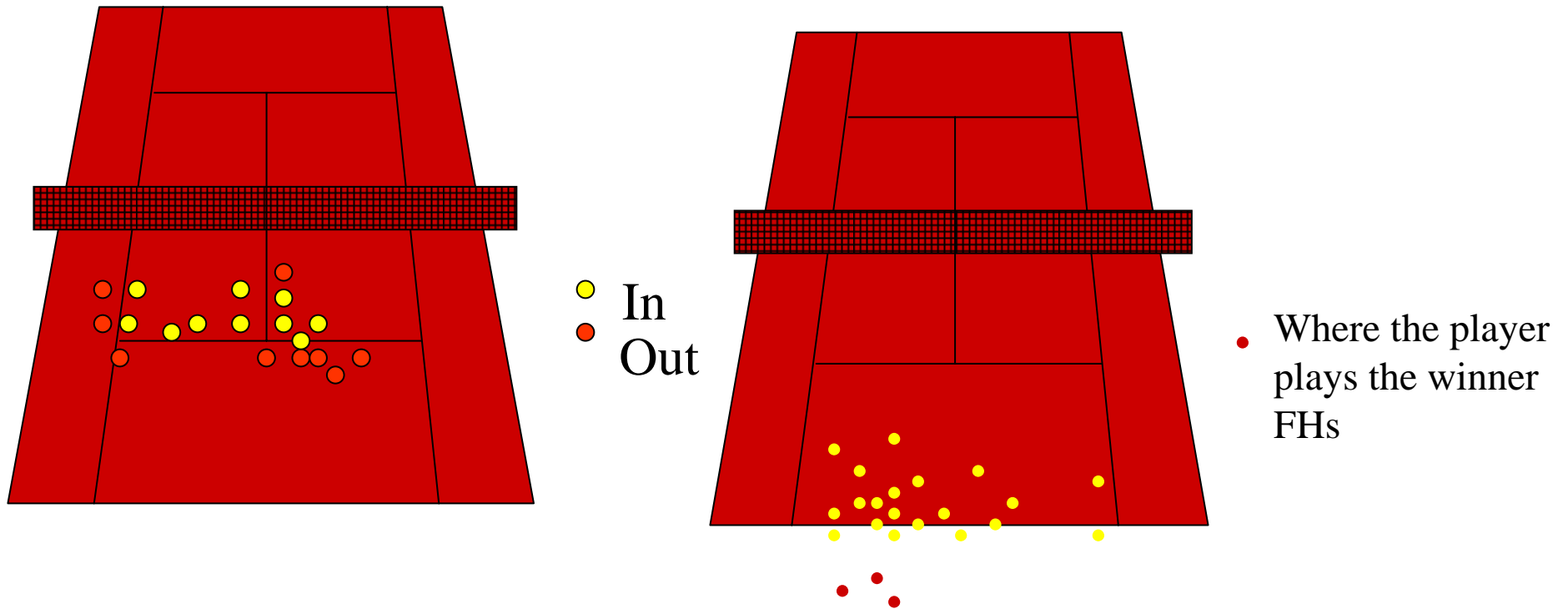


# Match play diagnostic and testing

Service	Score	Games	Remarks
A	BABBAAAA	1-0	5- Serve and volley +
B	BBABB	1-1	Strong serve!
A	AABBAA	2-1	3- Risky FH, 6- Risky FH



# Match play diagnostic and testing



# Charting and match analysis

## Overview

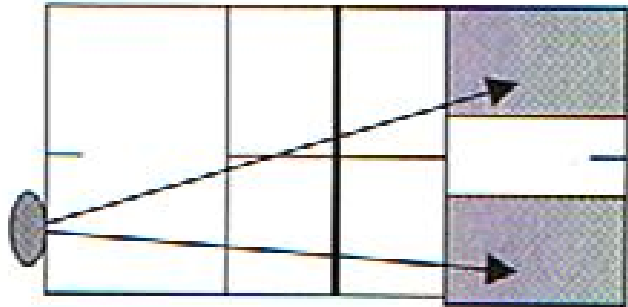
<b>Statistics</b>	<b>Score</b>	<b>Behaviour</b>	<b>Time</b>	<b>Intention</b>
Technique / tactics	Tactics / mental	Mental / tactics	Physical / Mental	Tactics / Technique / Mental
% 1st serve % 2nd serve Winners Forced errors Unforced errors	First point Series of points Big points	Positive physical response Relaxation Preparation Rituals Distractions	Concentration curve Load:rest	W B P N E Chocking Risk taking

# Technical diagnostic and testing

- Not very common
- Coach's "eye"

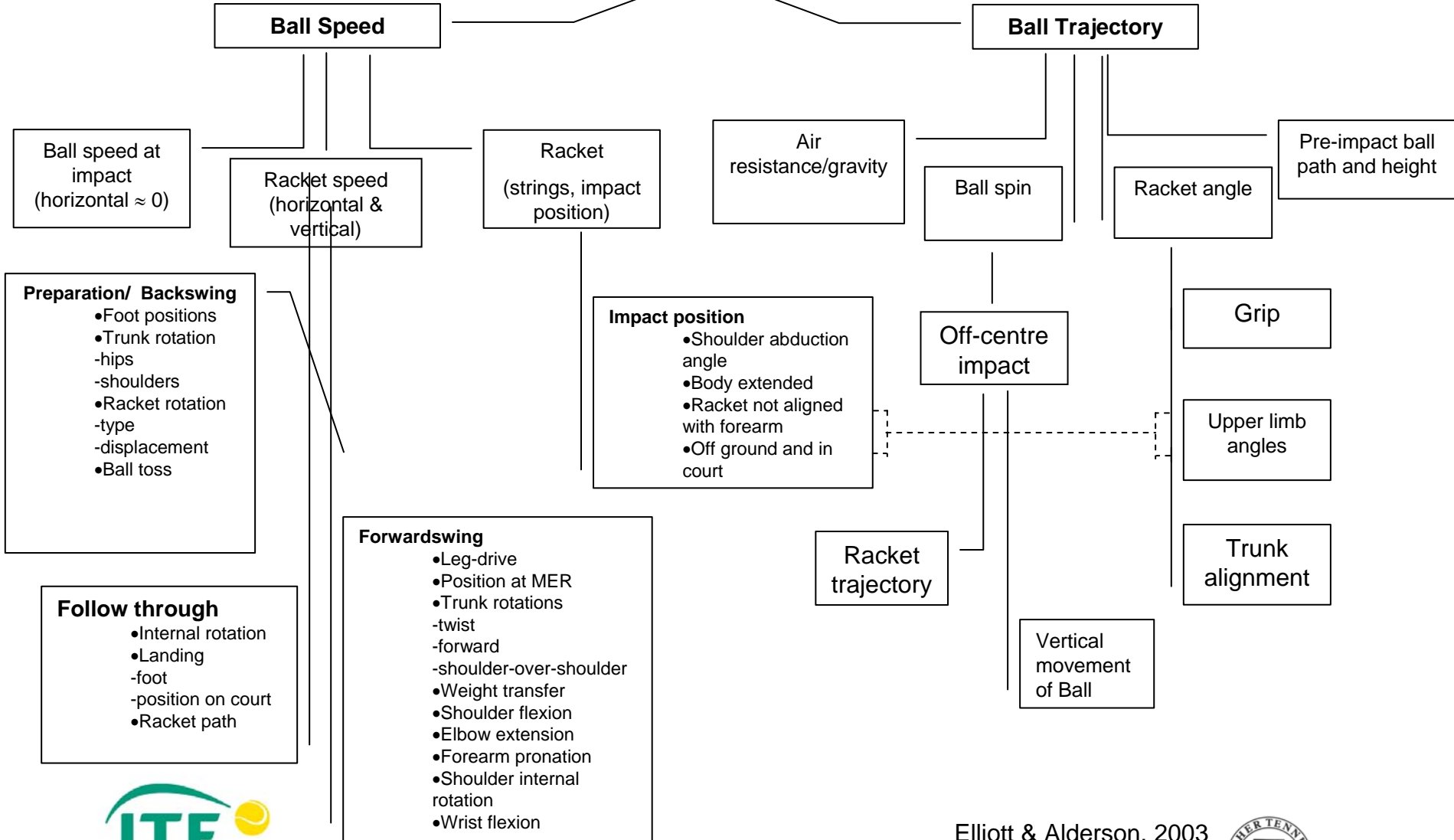
EQUELITE/FERRERO  
ACADEMY  
TECHNICAL TEST:

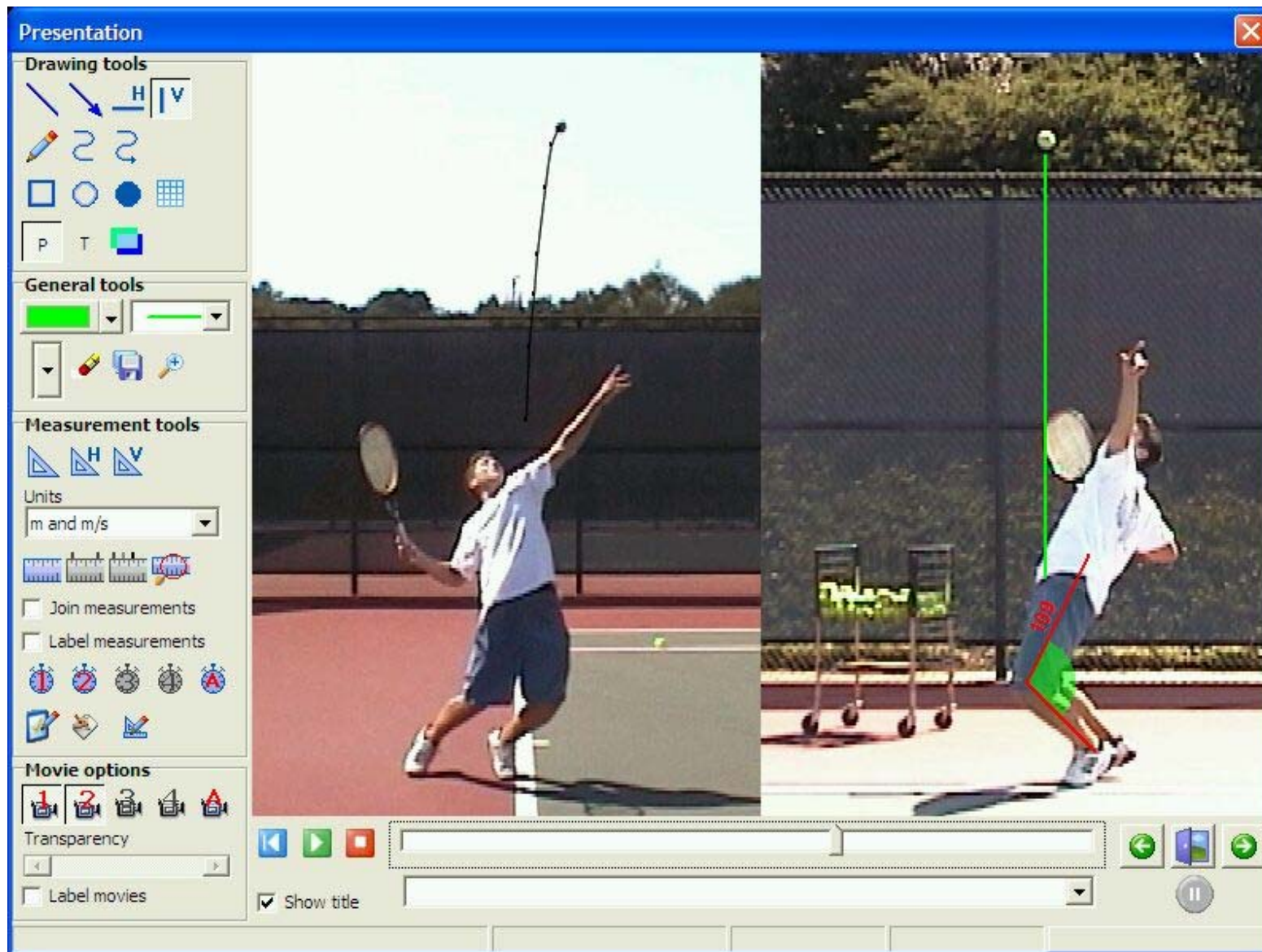
- FH angle change
- BH angle change
- FH & BH angle ch.
- SV to angles
- RT to angles





**BIOMECHANICAL  
MODEL POWER SERVE**





New report -

Name	Value	Movement	Priority	SC6
<b>Tennis Serve</b>				
Ball Release and B...				
Ball Toss	Ball pushed upward a...	✓	ok	
Max Ball Height	1	✗	ok	
Foot Position	Foot position good ...	✓	ok	
Peak Knee Flexion	0	✗	ok	
Hips move for...	yes	✓	ok	
Hip and Shoul...	Hips and Shoulders r ...	✓	ok	
Trunk Angle to ...	0	✗	ok	
Arm in Power P...	yes	✓	ok	
Leg Drive				
Shoulder Upwa...	0	✗	ok	
Racquet Position	0	✓	ok	
Swing to Impact				
Shoulder Align...	0	✗	ok	
Trunk Rotation	Shoulders move thro...	✓	ok	
Upper Arm Elev...	Upper arm not high e...	✗	ok	
Forearm Exte...	Arm too extended-n...	✗	ok	
Ball Contact				
Impact Height	1	✓	ok	
Racquet Speed	10	✓	ok	

Aspect Image

Exemplar Image

Aspect Notes

Type in your coaching comments here...

Help

Push ball upward and forward of toes

# Medical diagnostic and testing

- 1. *Medical:*** Comprehensive evaluation of general health and injury risk.
  
- 2. *Musculoskeletal:*** Comprehensive evaluation of posture, flexibility, strength and stability of musculoskeletal system.

# Examinations

## MUSCULO SKELETAL

- Trunk/spine.
- Shoulder girdle.
- Elbow and forearm.
- Wrist and hand.
- Pelvic girdle.
- Hip and thigh.
- Knee and shank.
- Ankle and foot.

## MEDICAL

- Ear, Nose, and Throat.
- Skin.
- Cardiovascular.Chest.
- Spirometry (Lung capacity).
- Abdomen.
- Excessive joint mobility or hypermobility.
- Neurological examination.
- Tanner stages of development.
- Pathology.
- Marfanoid Feature.

# Functional Movement Testing

- Assess the fundamental movement qualities of range of motion, balance and stability.
- Largely concerned with quality of execution, not quantity of executions!
- Can complement musculoskeletal screening, should not be considered a definitive substitute.
- Lower Limbs / Pelvic Mobility
- Core Stability / Knees and Ankles
- Shoulder Girdle / Shoulder Mobility
- Trunk Stability

# Physiological assessment

COMPONENT	FIELD TESTS	LAB TESTS
<b>Anthropometrics</b>	Height (cm), Weight (kg)	Body fat (cm)
<b>Flexibility</b>	Assessed in m/skeletal screening.	
<b>Aerobic endurance</b>	Multi-stage fitness test, 2.4km run, Cooper 12 min run	VO2 max test Staged track test
<b>Anaerobic endurance</b>	Tennis-specific agility endurance test (% decrement)	Field tests with timing gates
<b>Strength</b>	Repetition maximum or maximum bodyweight measures	Muscle biopsies
<b>Upper body power</b>	Medicine ball throws	Service speed, racquet velocities
<b>Lower body power</b>	Vertical or standing long jumps/hops	Force platform data
<b>Speed</b>	5, 10, 20m sprints	Field test with timing gates
<b>Agility and coordination</b>	Planned and unplanned movement tests	Field tests with timing gates, specific coordination tests

# Anthropometrics Tests

- **Height:** measured in centimetres.
- **Weight:** measured in kilograms.
- **Body Fat:**
  - Sum of 7 skinfolds: Triceps, Biceps, Subscapular, Supraspinatus, Mid-abdominal, Front thigh, and Medial calf.
  - Consult a specialist at the closest accredited sport science laboratory.
  - Recommended that the tester have a recognized anthropometry accreditation.
  - Very sensitive area, especially for female players and those with potential eating disorders.



# Psychological Questionnaires

- **SELF-CONFIDENCE:**
  - State Self confidence Inventory (SSCI) and Trait (TSCI) (Vealey, 1988)
- **MOOD STATES**
  - Profile of Mood States (POMS, 1991)
- **SELF-EFFICACY:**
  - Self-efficacy test (Bandura)
- **MOTIVATION (GOAL-SETTING/ GOAL PERSPECTIVES) AND MOTIVATIONAL CLIMATE:**
  - TEOSQ (Duda, 1989;
  - PMCSQ-2 (Walling & Duda, 1993).
- **ANXIETY:**
  - CSAI-2 (Martens, Vealey, & Burton, 1990)
  - STAI (Spielberger)
- **ATTENTION:**
  - Test of Interpersonal and Attentional Styles(TAIS, Nideffer, 1976).
  - Test of Interpersonal and Attentional Styles in Tennis (Van Schoyck & Grasha, 1981)
- Etc.

# Mental toughness self-check

HOW GOOD AM I AT?

Motivate myself (1 – 10): \_\_\_\_\_

Prepare for a match (1 – 10): \_\_\_\_\_

Focus during the match (1 – 10): \_\_\_\_\_

Eyes controlled (1 – 10): \_\_\_\_\_

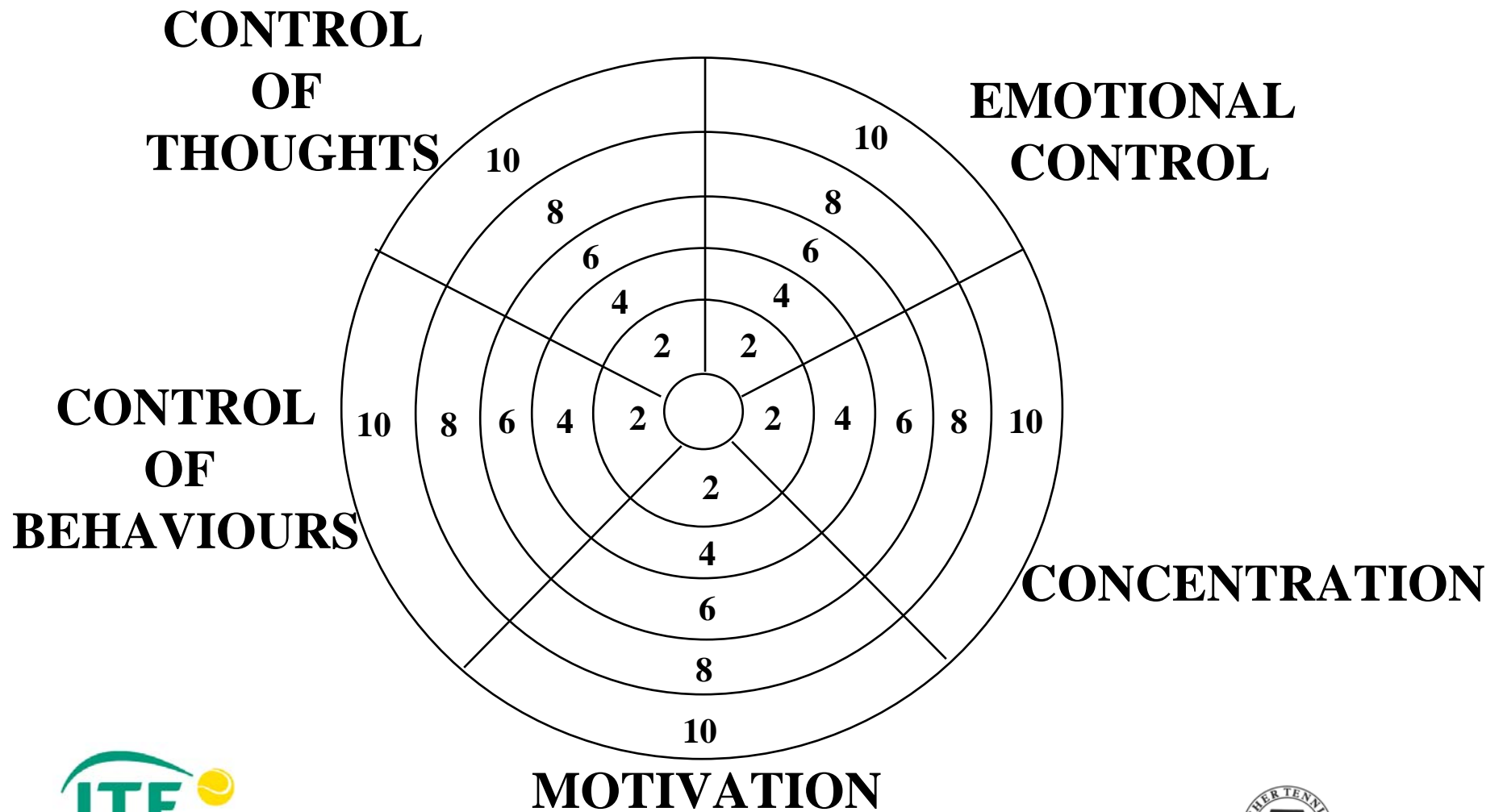
Shoulders back, head up (1 – 10): \_\_\_\_\_

High energy walk (1 – 10): \_\_\_\_\_

Be in control when playing (1 – 10): \_\_\_\_\_

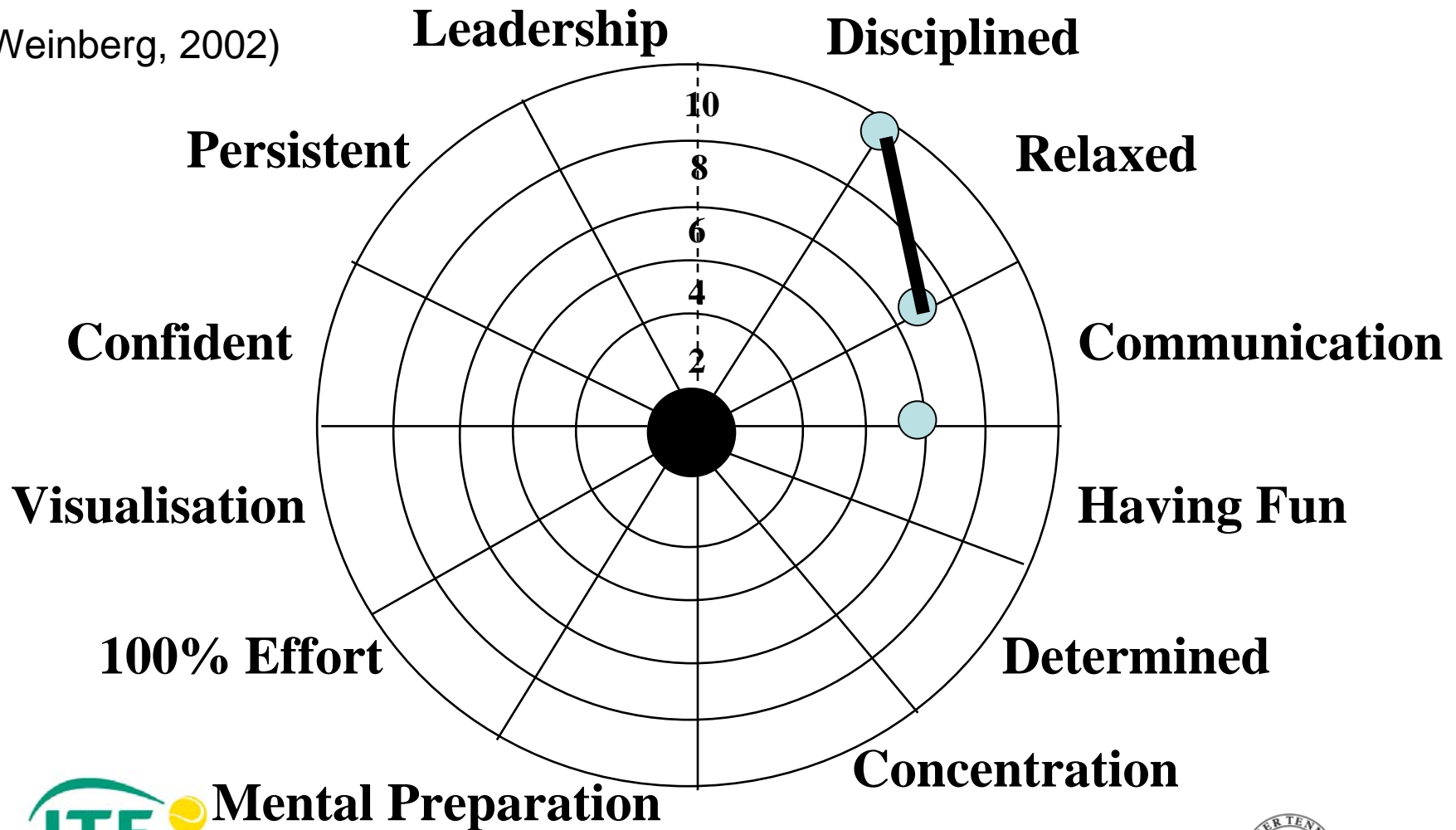


# Basic Mental Performance Profile



# Specific Mental Performance Profile

(Weinberg, 2002)



**Mental Preparation**

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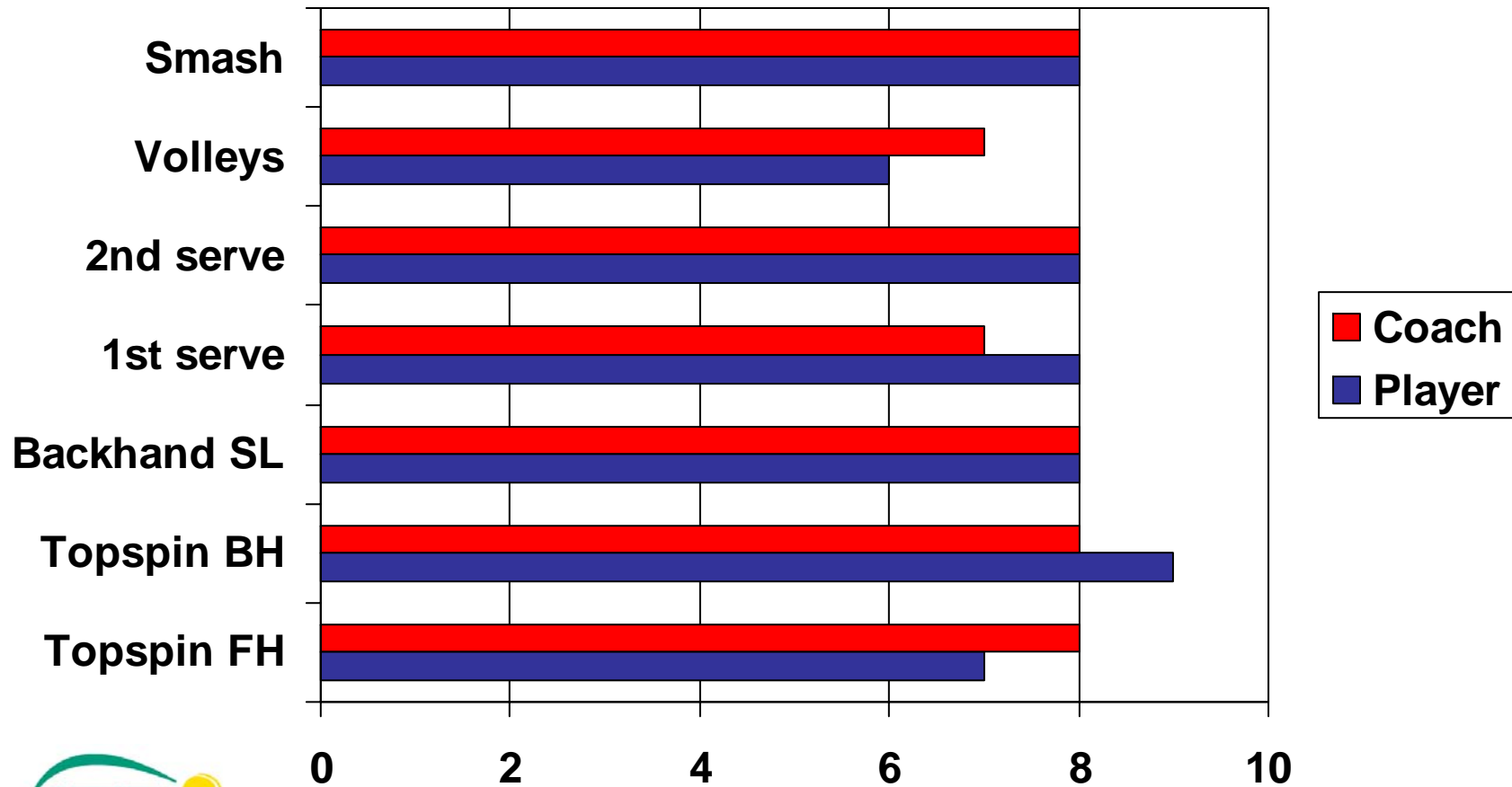


Game situations / Strokes	Psychological Variables	Exercises / Drills
Serve (Flat, Spin, Slice, 1 <sup>st</sup> , 2 <sup>nd</sup> Other variations)	Motivation	Goal setting Fun activities Modelised training / Role play
Return (FH, BH, block, attack, 1 <sup>st</sup> serve, 2 <sup>nd</sup> serve, other variations)	Concentration	Focusing strategies Breathing Visualisation
Baseline game (FH, BH, topspin, slice, attacking, defending, other variations)	Control of thoughts, self confidence	Self-talk Visualisation
Approaching the net and net game (approach FH, BH, volleys, smashes, other variations)	Emotional control	Relaxation techniques: - Progressive muscle relaxation - Music - Yoga - Breathing Activation techniques: - Movement - Music - Breathing
Passing the net player (FH, BH pass, FH, BH lob, other variations)	Preparation	Routines: - Before the match - During the match: Before, during and after the point. - After the match
Before the match	Anticipation and visual search	Focusing strategies
During changeovers	Momentum	Focusing strategies
In point pressure situations (calls, crowd, weather, injury, etc.)		

# Overall Performance Profile Comparison

Butler & Hardy (1992)

Comparison between player and coach evaluation



# ¿ What do I need?

Technical/Tactical skills

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Other skills

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Physical skills

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Name of  
Tennis Player

Psychological skills

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# Performance diagnostic & testing

## *Integrated approach*

- *Coaches should have a basic understanding of the areas examined and common, related problems encountered by tennis players.*

