

ITF Coaches Education Programme

Coaching High Performance Players Course

The Forehand



By Machar Reid & Miguel Crespo

The Features of the “3” Forehand Grips

	EASTERN	SEMI-WESTERN	WESTERN
+ 'S	Easier adaptation to the net game	↑ topspin production Favorable impact position	Even greater topspin production Ease in dealing with high balls
- 'S	Provides for less topspin Difficulties with higher bouncing balls	Difficulties with lower bouncing balls Less advantageous for net game	Difficulties with lower bouncing balls Volleying



Differences in racket velocities

	FORWARD VELOCITY (m/s)		VERTICAL VELOCITY (m/s)	
	EASTERN	WESTERN	EASTERN	WESTERN
FLAT	17.0	16.8	6.8	7.9*
TOPSPIN	14.0	13.9	10.4	11.9*
TOPSPIN LOB	8.9	8.7	11.2	13.3*

Backswing

Looped backswing

**Multisegment swing often begins with
backward elbow movement**

Shoulder and racquet rotate beyond 90° passed the baseline

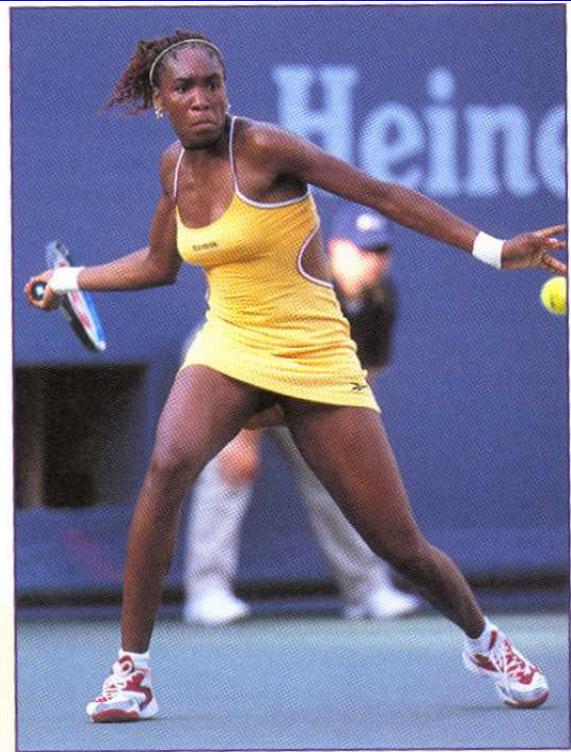
Increased Distance & Elastic Recoil → Increased Power

(World-Class Tennis
Technique, 2001)

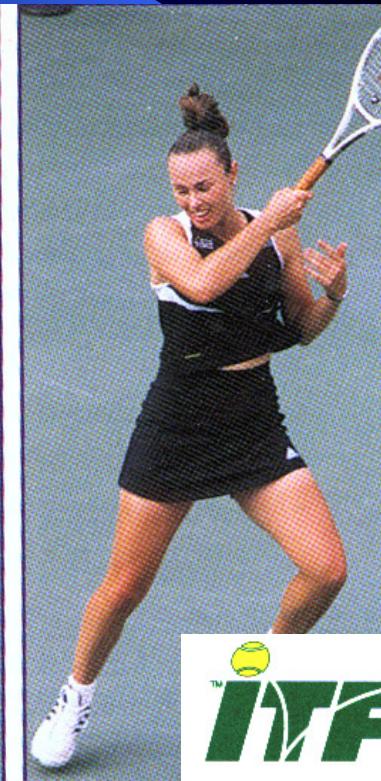
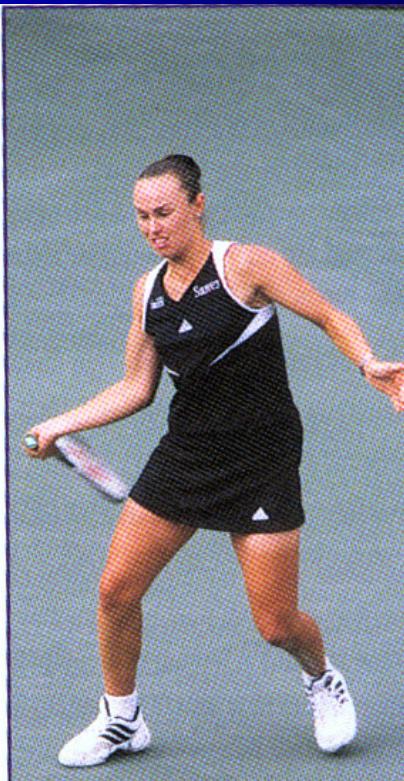
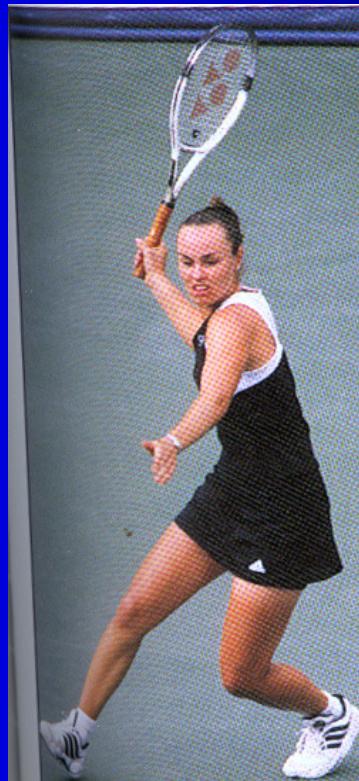


The Racket and Shoulder Alignment Rotate Beyond a Line Perpendicular to the “Back-Fence” in the Forehand

Increased Distance & Elastic Recoil → Increased Power



Note: Separation angle between Shoulder-Hip alignments



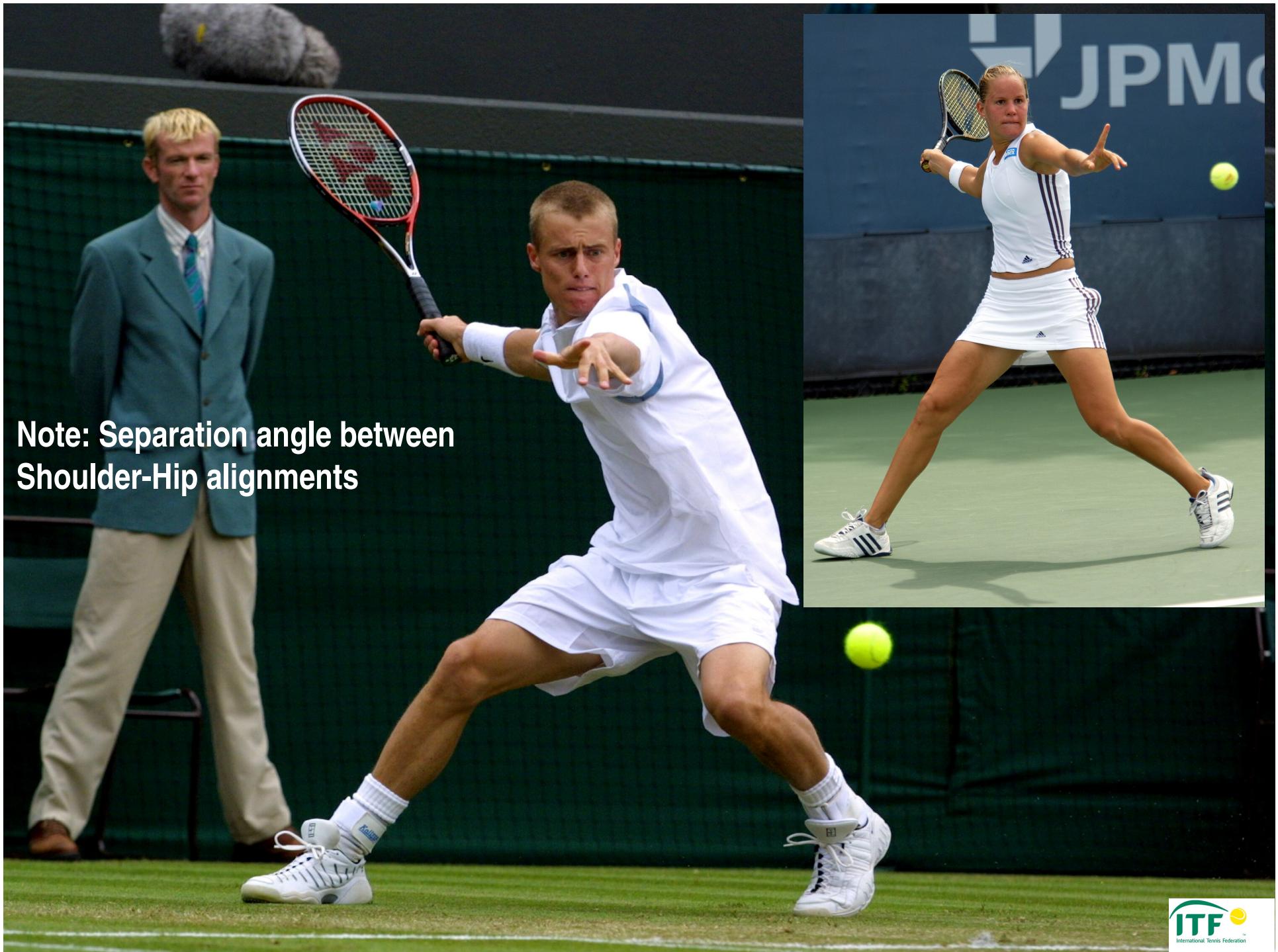
(World-Class Tennis
Technique, 2001)



**The Racket and Shoulder Alignment Rotate Beyond a Line
Perpendicular to the “Back-Fence” in the Forehand**

Increased Distance & Elastic Recoil → Increased Power







Rotation - a key

Key differences between

high and moderate speed strokes, are:

- Increased Trunk Rotation Speed
- Increased Time-Lag Between Trunk and Upper Arm Forward Movement

(Fujisawa et al., 1997 ISBS Conf.)

Trunk Orientation - Backswing

	<i>EASTERN</i>	<i>WESTERN</i>
<u>SHOULDER ALIGNMENT</u>	-120°	-120°
<u>TRUNK TWIST</u>	-36°	-36°

Trunk Orientation - Impact

	<i>EASTERN</i>	<i>WESTERN</i>
<u>SHOULDER ALIGNMENT</u>	-5°	0°
<u>TRUNK TWIST</u>	14°	10°

Trunk Orientation

		<i>EASTERN</i>	<i>WESTERN</i>
<u>SHOULDER</u>	BS	-120°	-120°
<u>ALIGNMENT</u>	IMP	-5°	0°
<u>TRUNK</u>	BS	-36°	-36°
<u>TWIST</u>	IMP	14°	10°

Backswing



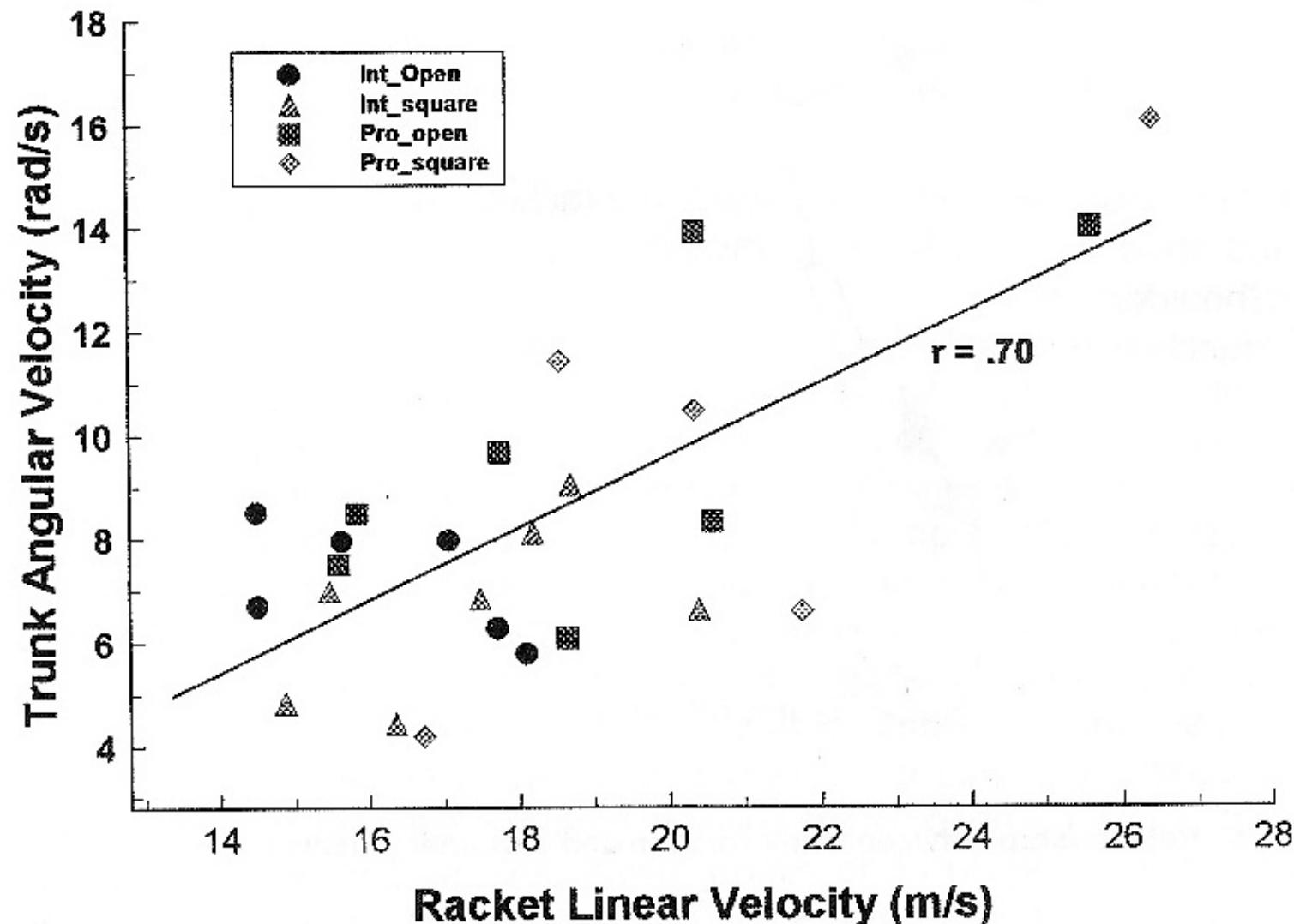
Impact



(Elliott et al., 1996)



Regardless of Stance SPEED OF TRUNK ROTATION was Correlated with Racket Velocity



(Bahamonde, 1999)

Open or Square Stance?

Forehand Preparation

80% Open stance

20% Semi Open

88% of players DO NOT step into the ball

≈ 6% Step In

≈ 6% Step Back

No difference between male and female

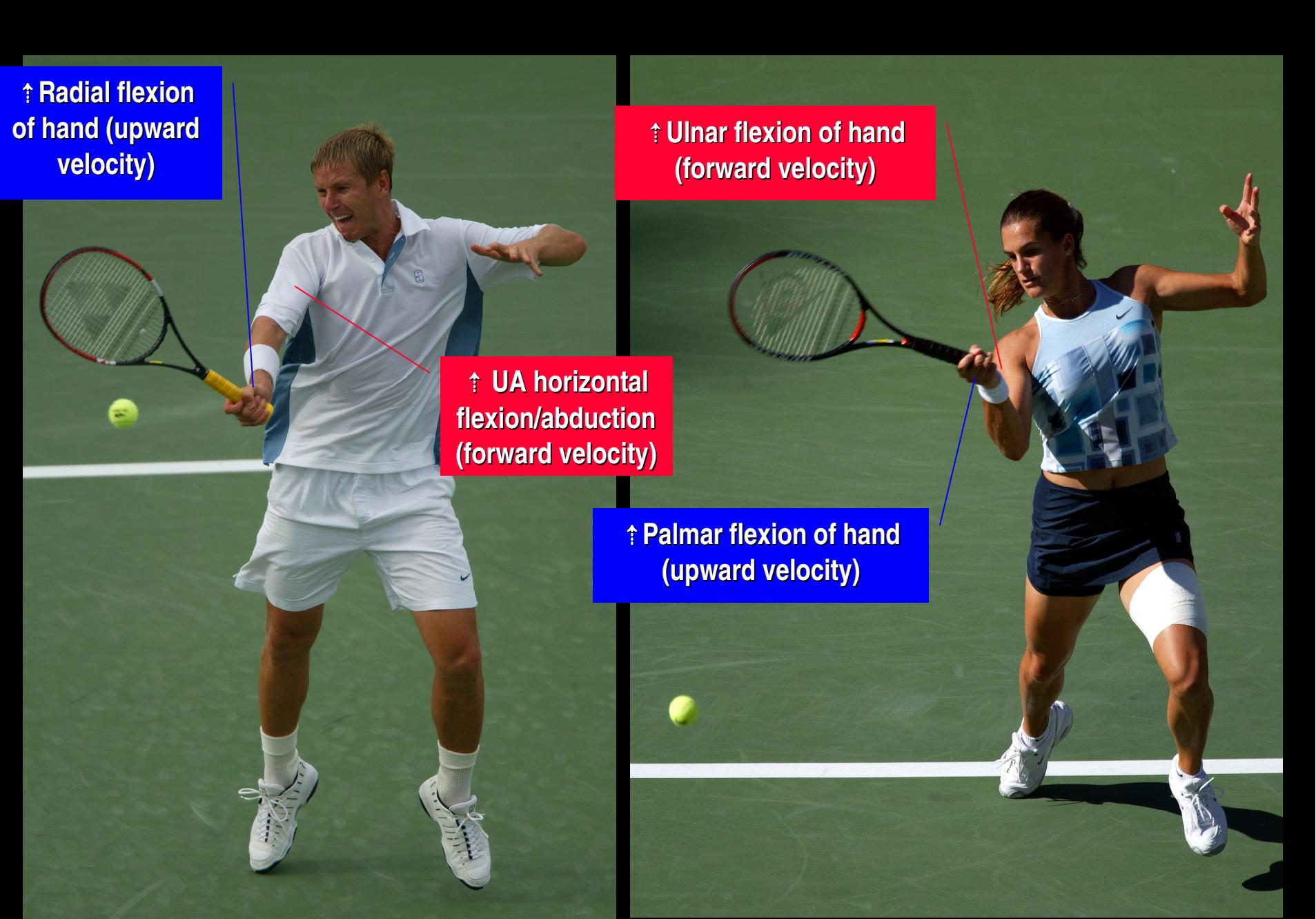
220 Male and 130 Female Top Players: 4 Clay Court Tournaments



**Optimising balance
to load...**

Appreciating the Role of Internal Rotation





Racket orientation

AT IMPACT

Flat	86.6°
Topspin	84.8°
Lob	91.0°



Racket trajectory

PRE IMPACT

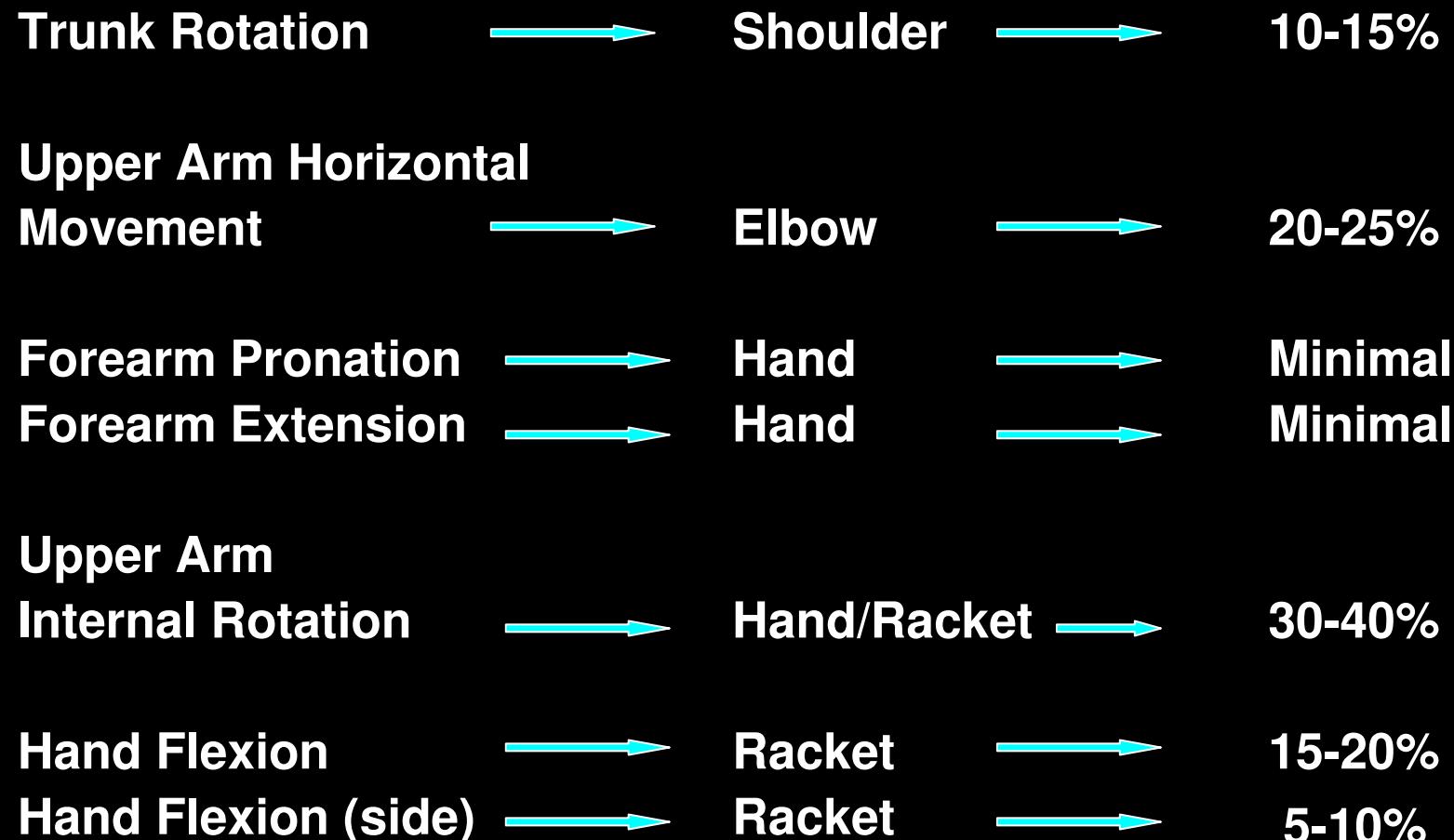
Flat	21.2°
Topspin	36.7°
Lob	52.1°

POST IMPACT

37.2°
52.1°
72.8°

(Takahashi et al., 1996)

Contributors To Racket Velocity At Impact



So What's Important?

1. TRUNK ROTATION

IMPORTANT FOR

Racket velocity ✓✓ Places muscles on stretch.

Drives hitting shoulder FW and UW.

2. UPPER ARM FORWARD AND OUTWARD MOVEMENT

Racket velocity ✓

3. UPPER ARM INTERNAL ROTATION

Racket velocity ✓✓ Occurs very late.

4. FLEXION/EXTENSION AT ELBOW

5. FORWARD ROTATION (FLEXION)
OF THE HAND

6. SIDEWARD ROTATION OF THE HAND
(TOWARDS THE LITTLE FINGER)

7. FOLLOW THROUGH

IMPORTANT FOR

Racket velocity ✗ Racket positioning ✓

Racket velocity ✓ From a hyperextended position, rotates forward by 10°.

Racket velocity ✓ (with Western grip)

Injury prevention ✓



The Influence of the Different Grips

PRIMARY CONTRIBUTORS → Trunk rotation, horizontal flexion/abduction and internal rotation of the upper arm

Forward racket velocity		Upward racket velocity	
Eastern	Semi-western	Eastern	Semi-western
↑Upper arm horizontal flexion/abduction	↑Ulnar flexion of the hand	↑Radial flexion of the hand	↑Palmar flexion of the hand





Follow Through



Influential factors:

- *Tactical intention*
- *Grip*
- *Height of impact*
- *Amount of internal rotation and forearm pronation*



FOREHAND GROUNDSTROKES

FORWARD RACKET VELOCITY (M S⁻¹)

	EASTERN GRIP	WESTERN GRIP
FLAT	17.0	16.8
TOPSPIN	14.0	13.9
LOB	8.9	8.7

ELLIOTT, TAKAHASHI & NOFFAL, 1996

VERTICAL RACKET VELOCITY (M S⁻¹)

	EASTERN GRIP	WESTERN GRIP
FLAT	6.8	7.9+
TOPSPIN	10.4	11.9+
TOPSPIN LOB	11.2	13.3+

ELLIOTT, TAKAHASHI & NOFFAL, 1996



Racket orientation

AT IMPACT

Flat	86.6°
Topspin	84.8°
Lob	91.0°



Racket trajectory

PRE IMPACT

Flat	21.2°
Topspin	36.7°
Lob	52.1°

POST IMPACT

37.2°
52.1°
72.8°

(Takahashi et al., 1996)

