

# BACK to the ZONE

Optimum Gaze and Anticipation to Enter the Zone



Damien Lafont, PhD



Australian Grand Slam®  
Coaches' Conference

# Outlines

- The Zone
- Keys
- Observation
- **Anticipation**
- **Visual & Mental Skills**
- **Zone**
- Training

# THE ZONE



Damien Lafont, PhD



Australian Grand Slam®  
Coaches' Conference

# Zone

- Time
- Sensations
- Effortless
- Memory
- Quest





# Zone

Where are we?

- Description of the Flow/Zone
- 7, 9, 15 ... components
- Neuroscience, Neurophysiology
- Hormones
- Alpha brain waves



# Zone

## Roadblocks

- Analysis, judgment, outcome focus
- Awareness
- If you are surprised, you lose it!
- **Beyond conscious control**

# Zone

## How to create the best conditions?

- Rhythm
- Balance (effort/letting go, doing/not doing)
- Concentration, sense of control
- Immersion in action (≠ thinking of your movement)
- Sensations, sense of movement (kinesthetic...)

# Zone

## How to create the best conditions?

- Rhythm
- Balance (effort/letting go, doing/not doing)
- Concentration, sense of control
- Immersion in action (≠ thinking of your movement)
- Sensations, sense of movement (kinesthetic...)



## Visual/Cognitive Approach

- Gaze Control
- Anticipation

FROM A SIMPLE  
OBSERVATION ...

TO A LEADING-EDGE  
SCIENTIFIC QUESTION

# Observation

Roger Federer - Backhand / Post-impact



© Advantage Tennis - McCarron



# Observation

Roger Federer - Forehand / Post-impact





# Observation

Roger Federer shows a **specific gaze behavior** during the hitting phase :

- **Soft eyes fixation** on the contact zone during the follow-through

 **Unique signature ?**

# High-speed photo analysis

## Gaze Control

- Involves movements of **EYES, HEAD and TRUNK** coordinated in a way that allows for both flexibility of movement and stability of gaze (Land, 2006)



## Head Position

### ■ Data

- + 10,000 photos – top 100 ATP
- Backhand & forehand groundstrokes
- **Hitting phase**
  - Impact / Post-impact

# 3 hitting profiles

- Backhand **AND** forehand  
« **Soft eyes Fixation** »
- Backhand **OR** forehand  
or « intermittent » fixation  
« **Partial fixation** »
- No fixation

# « Soft eyes fixation »



# « Partial fixation »



© Bakalian - Fedephot



© AP



# « No fixation »



■ Different head positions

# ATP - Top 100

ATP ranking 8/20/2007

Top 20

1. **Federer**, Nadal, Djokovic, Davydenko, Roddick, Blake, Gonzalez, Robredo, Berdych, Haas, Youzhny, Ljubicic, Gasquet, Canas, Ferrer, Hewitt, Moya, Baghdatis, Murray, Chela, Ferrero, Mathieu, Monaco, Nalbandian, Safin, Nieminen, Tursunov, Almagro, Vollandri, Soderling, Starace, Melzer, Karlovic, Stepanek, Verdasco, Hrbaty, Ancic, Kohlschreiber, Andreev, Simon, Clement, Lee, Santoro, Monfils, Gicquel, Montanes, Querrey, Calleri, Becker, Fish, Tipsarevic, Mayer, Hernandez, Eschauer, Rochus, Malisse, Wawrinka, Bjorkman, Del Potro, Massu, Llodra, Lopez, Benneteau, Spadea, Koubek, Ginepri, Russell, Dancevic, Acasuso, Mahut, Delic, Johansson, Vassallo Arguello, Tsonga, Hartfield, Berlocq, Seppi, Roitman, Grosjean, Lapentti, Korolev, Vliegen, Zabaleta, Berrer, Garcia-Lopez, Horna, Bolelli, Guccione, Gulbis, Serra, Luczak, Henman, Kunitsyn, Gabashvili, Haase, Goldstein, Pavel, Pless, Navarro Pastor, Zverev.



Soft eyes Fixation : 10 players

Partial fixation : 36 players

No fixation : 54 players



# Observations

The best players :

- Seem to follow the ball longer
- Fix the contact zone **after the impact**

 **Switch from the ball to the contact zone**



# Observations

- Top tennis players **hold their head still** when hitting the tennis ball – even **after contact**, apparently inhibiting their desire to watch the ball after it leaves the racquet.
- Link between **gaze/head movement** and ...
  - Expertise
  - **Peak performance & Zone**

# Other Sports

- Experts in many tasks show similar **'soft eyes fixation stage'**



- High-level athletes' performances suggest that there are fundamental **benefits** in adopting this gaze behaviour just after contact.

# WHAT DO WE LEARN?

# What do we learn?

## A world tour ...

Penn State  
Prof. David  
Rosenbaum  
**anticipation  
inhibition**

McGill Univ.  
Prof. Dan Guitton  
**visual info**

Paul  
Dorochenko  
**dominant eye**

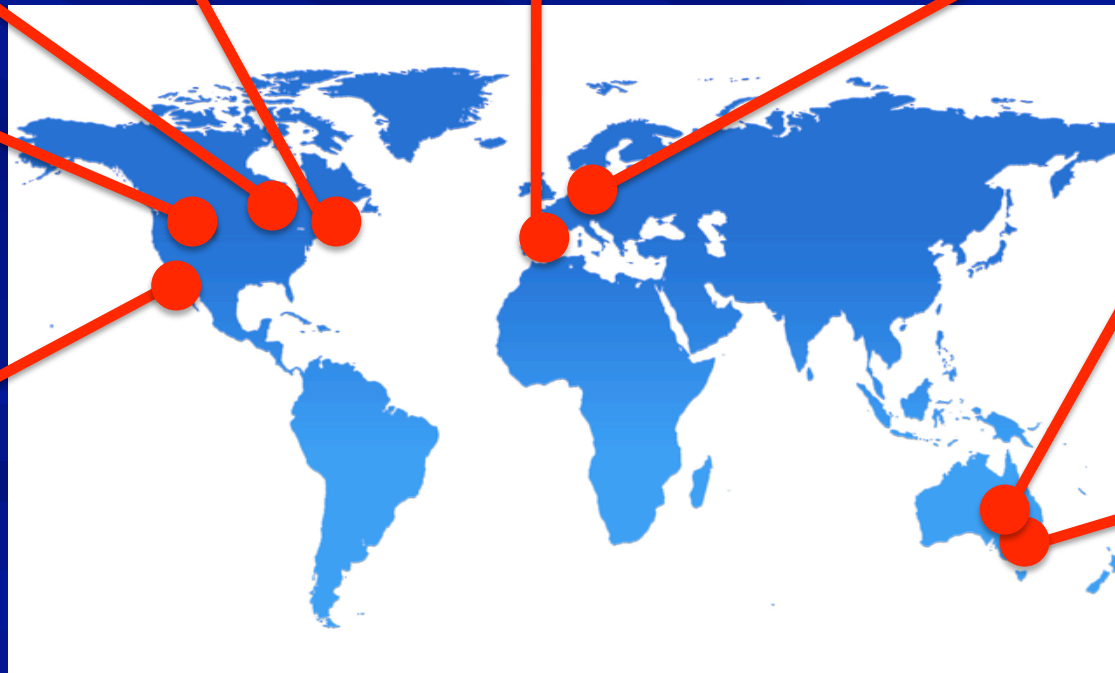
Univ. Louvain Belgium  
Prof. Marcus Missal  
**cognition**

Scott Ford  
**visual input  
& Zone**

Drew Ginn  
Fiona Taylor  
**"soft eyes"  
zone**

Univ. Southern  
California  
Prof. Carole  
Weinstein  
**vision  
movement**

Univ. Victoria  
Prof. Damian  
Farrow  
**visual  
strategies**



# What do we learn?

## Eye movement

- “Gaze anchoring”
- The **organization** of the information chain
- The **simplification** of visual input

## Cognition

- **Hierarchical** treatment and organization of information



# What do we learn?

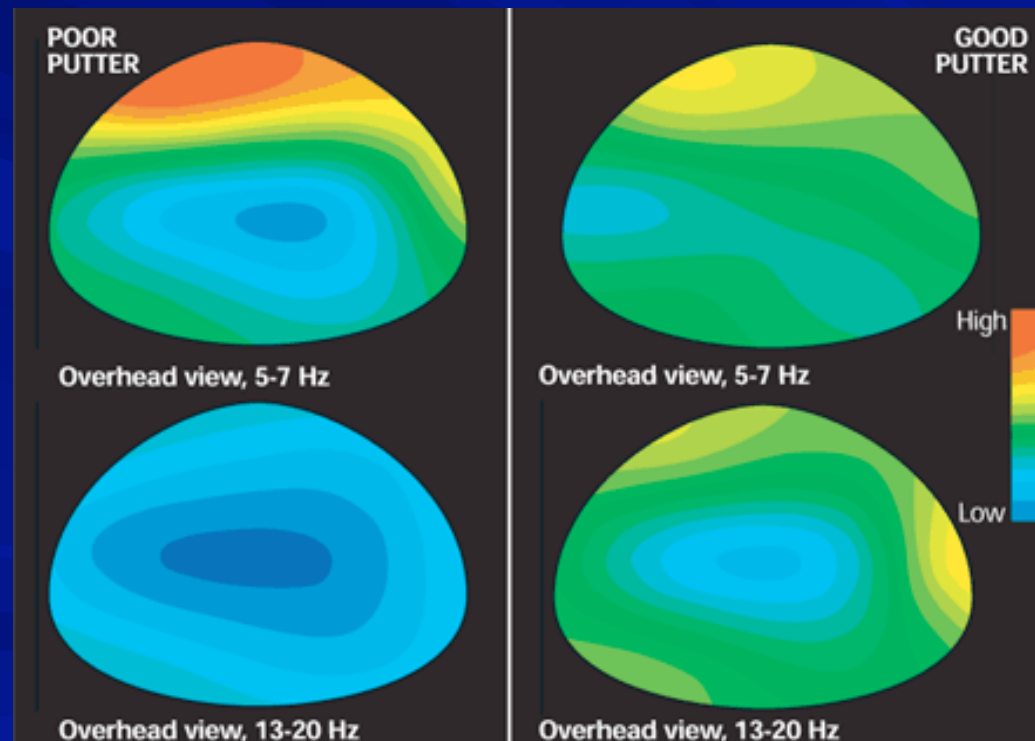
## Cognition

- Prevents the inflow of visual inputs that could interfere with the aiming commands set earlier
  - i.e. the numerous fixations as the ball traverses along its path
- **More time** without **interference** from other sources.
- **Limits the number of variables** to be controlled.
- **Limits inaccurate movement**



# Interferences

- EEG – Vickers and Crews (2002)
- Golf – brain activation and gaze control



# A NEW APPROACH OF ANTICIPATION

# Anticipation

## Current Approach

- Players' performance at a given time is influenced by **what they plan to do next.**
- In sport, there are benefits **to think and see ahead.**

# Anticipation

## Current Approach

Tennis and other ball games :

“The secret”:

- to know what the ball is going to do  
as far ahead as possible
- to allow time for the planning  
and execution of accurate  
responses.

# Anticipation

## Current Approach

- The early part of the movement / ball trajectory (before contact) has been widely studied and is recognized as the most critical.
- Most of studies highlight the potential benefits of early anticipation.



**However**, there is much to learn about the way that eyes should point in **the transition of consecutive actions**.

# Anticipation

## New Approach

### Observation - TENNIS

- The capture of subsequent cues and evaluation of the upcoming event **is NOT immediately useful after contact**

# Anticipation

## New Approach

- In specific situations, visual search initiated **too early** after contact would be even **maladaptive** for the movement.

Anticipating  Over-anticipating



# Anticipation

## New Approach

- In specific situations, visual search initiated too early after contact would be even **maladaptive** for the movement.

Anticipating  Over-anticipating

- The period of time after contact **when the GAZE IS STABLE** would serve as **inhibitory process** of too early anticipation process for the next action.

 **“Time window”**  
... When anticipation should be initiated ?

# Anticipation

## New Approach



**Removing visual feedback of post-contact trajectory** will have **beneficial effects**

- Cognitive skills
- Visual Skills
- Mental Skills

# SOFT EYES FIXATION & COGNITIVE SKILLS

# Cognitive Skills



## Soft eyes fixation

- Removes visual interferences
- Simplifies the treatment of information

# Cognitive Skills

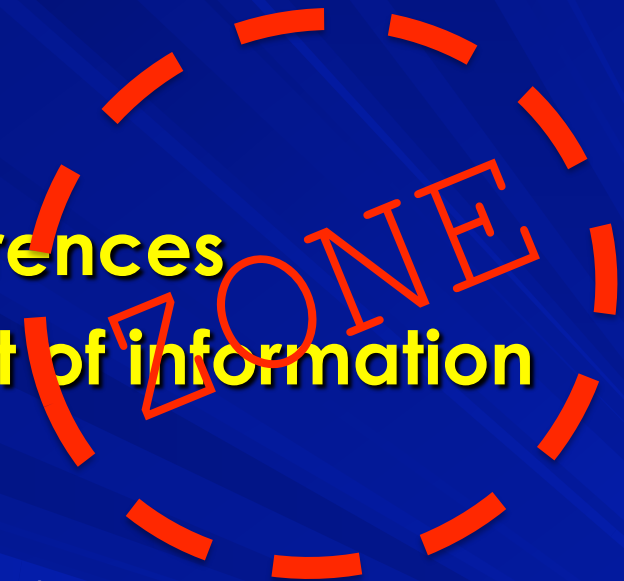


## Soft eyes fixation

- Removes visual interferences
- Simplifies the treatment of information

## ■ Peak Performance, Zone :

- To be efficient: Simplify!



# SOFT EYES FIXATION & VISUAL SKILLS



Damien Lafont, PhD



Australian Grand Slam®  
Coaches' Conference



# Visual Skills

- Keep your eyes off the ball !



## Soft eyes fixation

- Keeps the attentional flexibility
- Shift to a dominant kinesthetic mode

# Visual Skills

- Keep your eyes off the ball !

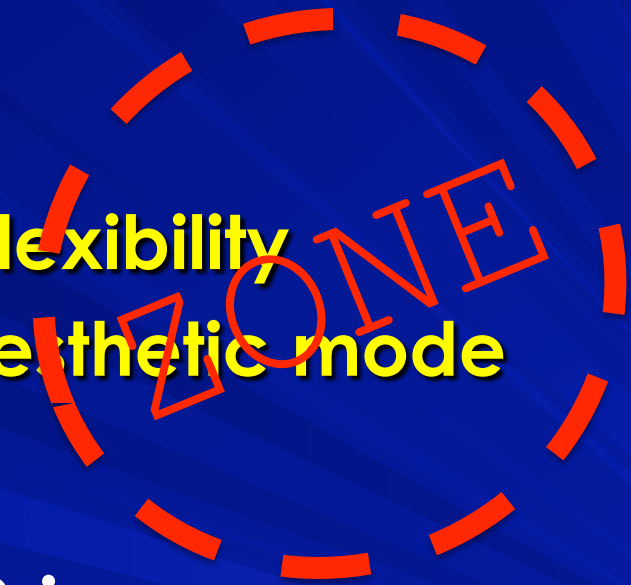


## Soft eyes fixation

- Keeps the attentional flexibility
- Shift to a dominant kinesthetic mode

## ■ Peak Performance, Zone :

- Attentional flexibility, Soft eyes, Sensations



# SOFT EYES FIXATION & MENTAL SKILLS

# **Mental Skills**

## **Attention/Concentration**

### **■ Problems:**

- Past and future, outcome focus**
- Choking under pressure**
  - Decrease of the attentional flexibility**

# Mental Skills

## Attention/Concentration

### ■ Problems:

- Past and future, outcome focus
- Choking under pressure
  - Decrease of the attentional flexibility

➡ **Soft eyes fixation**

- **Focus on the present**



# Mental Skills Control



## **Soft eyes fixation**

- **Concentration on the task at hand**
- **Limits « overanalysis »**



# Mental Skills Control



## Soft eyes fixation

- Concentration on the task at hand
- Limits « overanalysis »

## ■ Peak Performance, Zone :

- Mental and emotional control



# Soft Eyes Fixation & Mental Skills

## After Contact

Focus  
on the ball

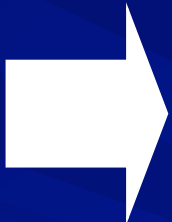


« Outcome » focus  
lack of control

# Soft Eyes Fixation & Mental Skills


## After Contact

Focus  
on the ball




« Outcome » focus  
lack of control

Soft eyes  
fixation  
on the  
contact zone



Concentration  
Present  
Control  
Confidence



« Zone »

# SOFT EYES FIXATION & ZONE

# Soft Eyes Fixation & Zone

## Mental Keys

- Concentration
- Control
- Focus on the present/task



# Soft Eyes Fixation & Zone

## Mental Keys

- Concentration
- Control
- Focus on the present/task

## Visual Keys

- Attentional flexibility
- « Soft eyes »



➡ **Shift to kinesthetic mode**  
**Increased sensations**



# SOFT EYES FIXATION TRAINING



Damien Lafont, PhD



Australian Grand Slam®  
Coaches' Conference

# Training

## Static Drills



# Training

## Dynamic Drills

- **Balance**
- **Fatigue**
- **Simple**
- **Unconscious**
- **% Accuracy**



**Collaboration & Development**

Enrique Guldberg

Elite Tennis Academy, Spain

# Zone

- Focus on anything that increases mind/body **awareness**, sensations
- Not only a question of mind ...  
**Your body, your senses can help you!**
- **Keep your eyes off the ball !**



# Thank you for your attention



# Back to the Zone

Sport and Inner Experiences

- [www.damienlafont.com](http://www.damienlafont.com)
- [damien.lafont@gmail.com](mailto:damien.lafont@gmail.com)





# The question of gender difference ...

## WTA Ranking 8/27/2007

1. *Henin*, *Sharapova*, *Jankovic*, Kuznetsova, *Ivanovic*, Chakvetadze, Mauresmo, Petrova, Williams, Bartoli, Hantuchova, Schnyder, Dementieva, *Williams V.*, Vaidisova, Safina, Hingis, Golovin, Peer, Bammer, Bondarenko, Li, Safarova, *Srebotnik*, Schiavone, Garbin, *Mirza*, Zvonareva, Santangelo, Sugiyama, Szavay, Radwanska, Krajicek, Medina Garrigues, Stosur, *Kirilenko*, Razzano, *Danilidou*, Loit, Muller, Azarenka, Dulko, Paszek, Kanepi, Tu, Poutchkova, Peng, Shaughnessy, *Nakamura*, Vakulenko, *Vinci*, *Morigami*, Bondarenko, *Dechy*, Sequera, Vesnina, Knapp, Dushevina, Likhovtseva, *Granville*, Rezai, Meusburger, Cibulkova, Kudryavtseva, Govortsova, Chan, Kerber, Pratt, *Molik*, Shvedova, Bremond, King, Tanasugarn, Osterloh, Dominguez Lino, Camerin, *Yan*, Craybas, *Ruano Pascual*, Gallovits, Zakopalova, *Harkleroad*, Pennetta, Olaru, Poutchek, Wozniacki, Rodionova, Benesova, Kostanic, Dellacqua, Pin, Wozniak, Cohen-Aloro, *Bacsinszky*, Arn, Cornet, Obzilzer, Amanmuradova, Bychkova, Bardina

➡ Fixation: 1 player ?!  
Partial fixation: 18 players

# « Soft Eyes Fixation »



© AFP



# References

- Lafont, D. (2008). **Gaze control during the hitting phase in tennis: a preliminary study**, International Journal of Performance Analysis in Sport, 8(1), 85-100.
- Lafont, D. (2007). **High-speed photo analysis of top players' gaze behaviour**, Tennis Science and Technology 3, ITF publication, London, 227-233.
- Lafont, D. (2007). **Towards a new hitting model in tennis**, International Journal of Performance Analysis in Sport, 7(3), 104-114.
- Lafont, D. (2007). **Watch the ball?** ITF Coaching and Sport Science Review, 43, p.11.

Damien Lafont  
[www.damienlafont.com](http://www.damienlafont.com)  
[damien.lafont@gmail.com](mailto:damien.lafont@gmail.com)