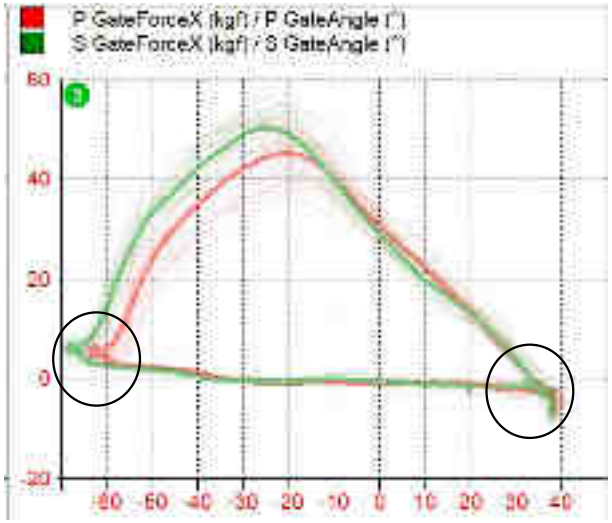
FISA YOUTH COACHES CONFERENCE

1st – 4th November 2018 - Bucharest, Romania

How to combine on-water biomechanical information with strength and conditioning training in Junior Rowing



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Junior Rowing at Clubs and Schools

Collection of beliefs & experiences from coaches …

What do coaches aim to teach early to introduce Rowing to young athletes?

- Building a culture/ creating team/ club dynamics
- Teach 'Balance' – inside & outside of the boat ('stress causes tension – tension causes imbalance' …NOT JUST IN THE BOAT)
- Try to teach the athletes to be physically & mentally strong (athletes maybe realise they have more potential than actually known about (especially girls)

HOW to keep the athletes interested in Rowing:

- Keep the training interesting and diverse – even though you stick to the basics
- Educate the athletes WHY to teach good technical habits that include constant stretching, mobilisation and strengthening of the growing body outside of the boat
- Avoid too much training load in the early phases.
- Kids love to do 'team races' on the ergo over 500m or so. (Changing team members)

Rowing during Puberty:

- Huge amount of changes (growth spurts, chemical, start of menstruation (female athletes); keep regular track of height. weight arm span)
- Technique can get worth during growth spurts – need to re-learn coordination

Junior Rowing at Clubs and Schools

Guidance by Rowing specialised Sports Physio/ Sport & Exercise Physicians

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- Sport specific screenings can identify whether a young, growing body has enough flexibility, movement control and strength to participated in their main chosen sport as they start to specialise.
- These assessments can assist with performance optimisation and also injury prevention and, especially if completed throughout the growing years or just prior to puberty.
- The most common rowing injury of both the young developing rower and the elite rower is low back pain.

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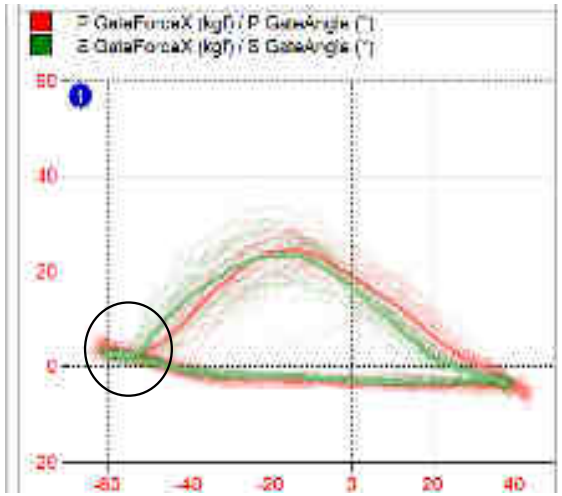
Ideal Technique vs. Common technical Breakdowns: CATCH

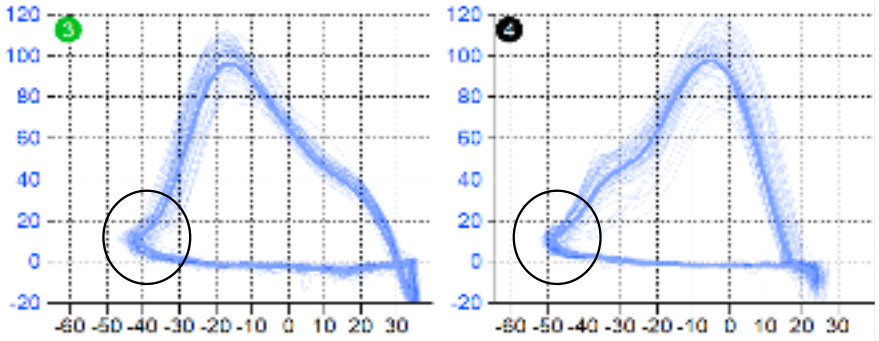
IDEAL TECHNIQUE: CATCH

CATCH

- Heels slightly off
- Shins vertical
- Pelvis forward
- Pressure on front of sit bones
- Hip slightly externally rotated
- Spine neutral
- Shoulders mid socket
- Upper arms slightly ER

BIOMECHANICAL ON-WATER DISPLAY





Common technical BREAK DOWNS CATCH

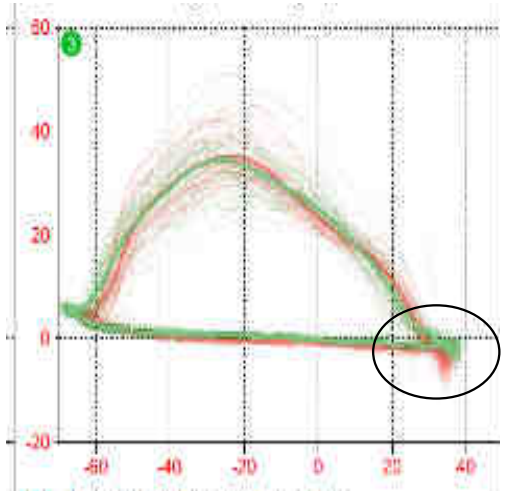
CATCH

- Poor ankle compression
- Poor Hip compression
- Poor pelvic/rock over
- Lower spine flexion
- Upper spine flexion
- Forward Head Posture
- Shoulder forward (sublux)

Ideal Technique vs. Common technical Breakdowns: **FINISH**

IDEAL TECHNIQUE: FINISH

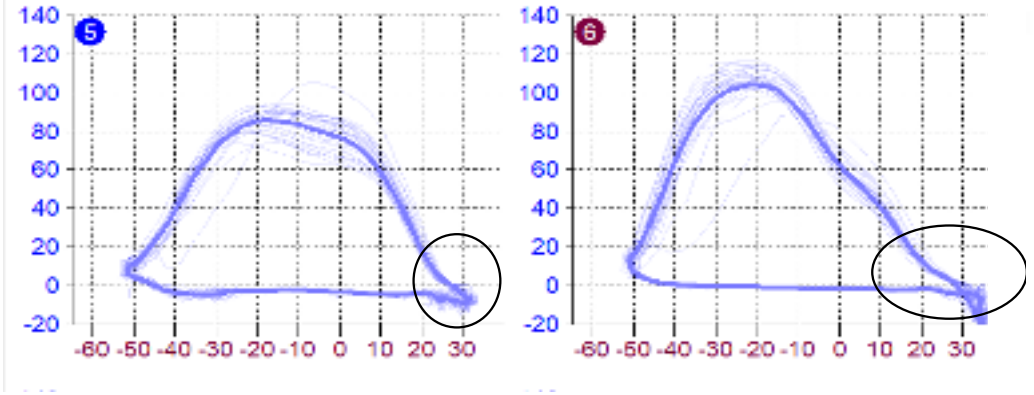
BIOMECHANICAL ON-WATER DISPLAY



Common BREAKDOWNS FINISH

FINISH

- Pelvis just past neutral
- Pressure on back of sit bones
- Neutral spine
- Glutes engaged
- Shoulders set

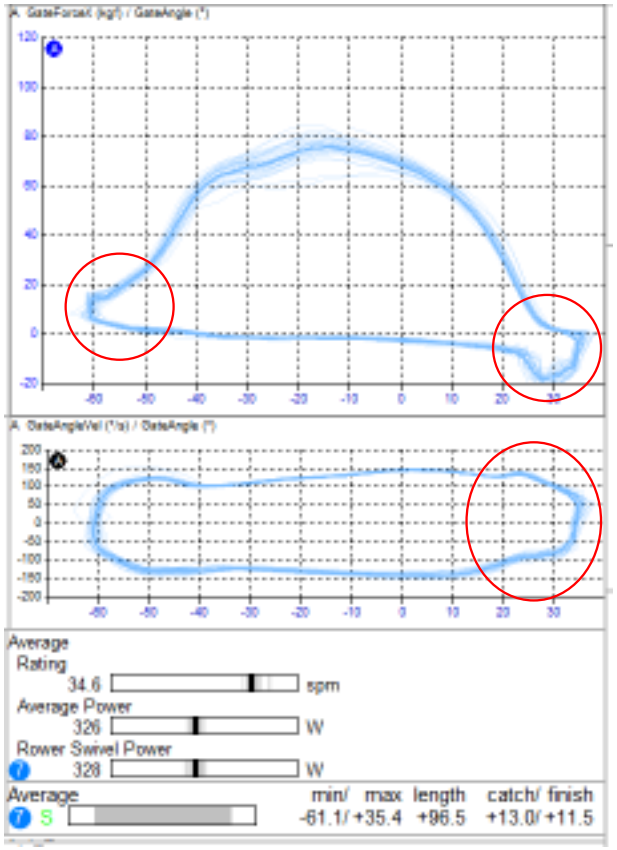


FINISH

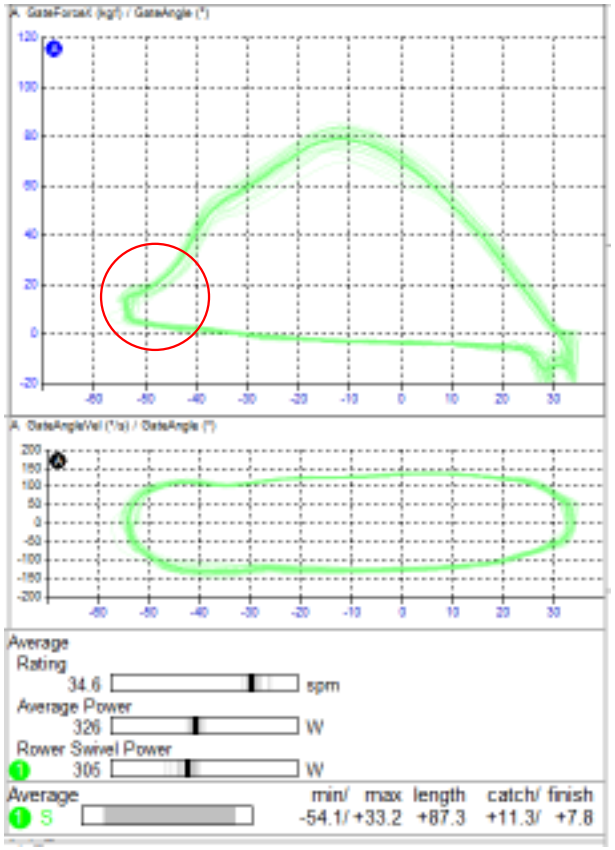
- Glutes off too early/over reliance on hip flexors
- Collapse at back end
- Over extension of upper Tx
- Forward head posture

Practical Part: Coaching analysis of biomechanical on-water data

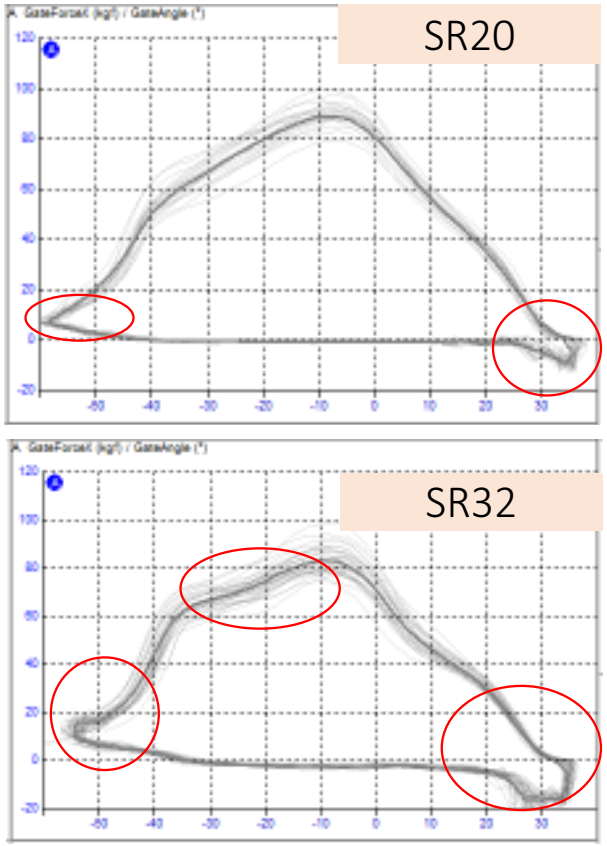
Example 1 – early body opening from the catch



Example 2 – connecting with arms



Example 3 – change in technique as SR increases

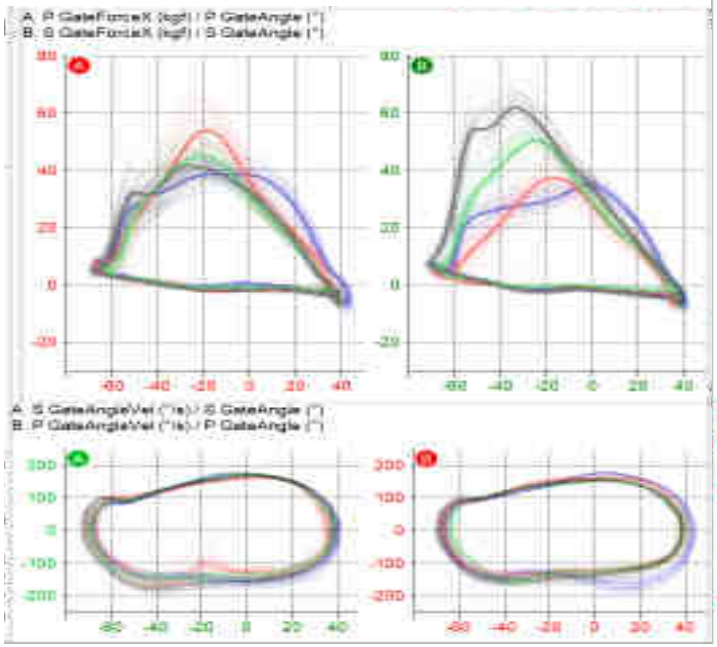


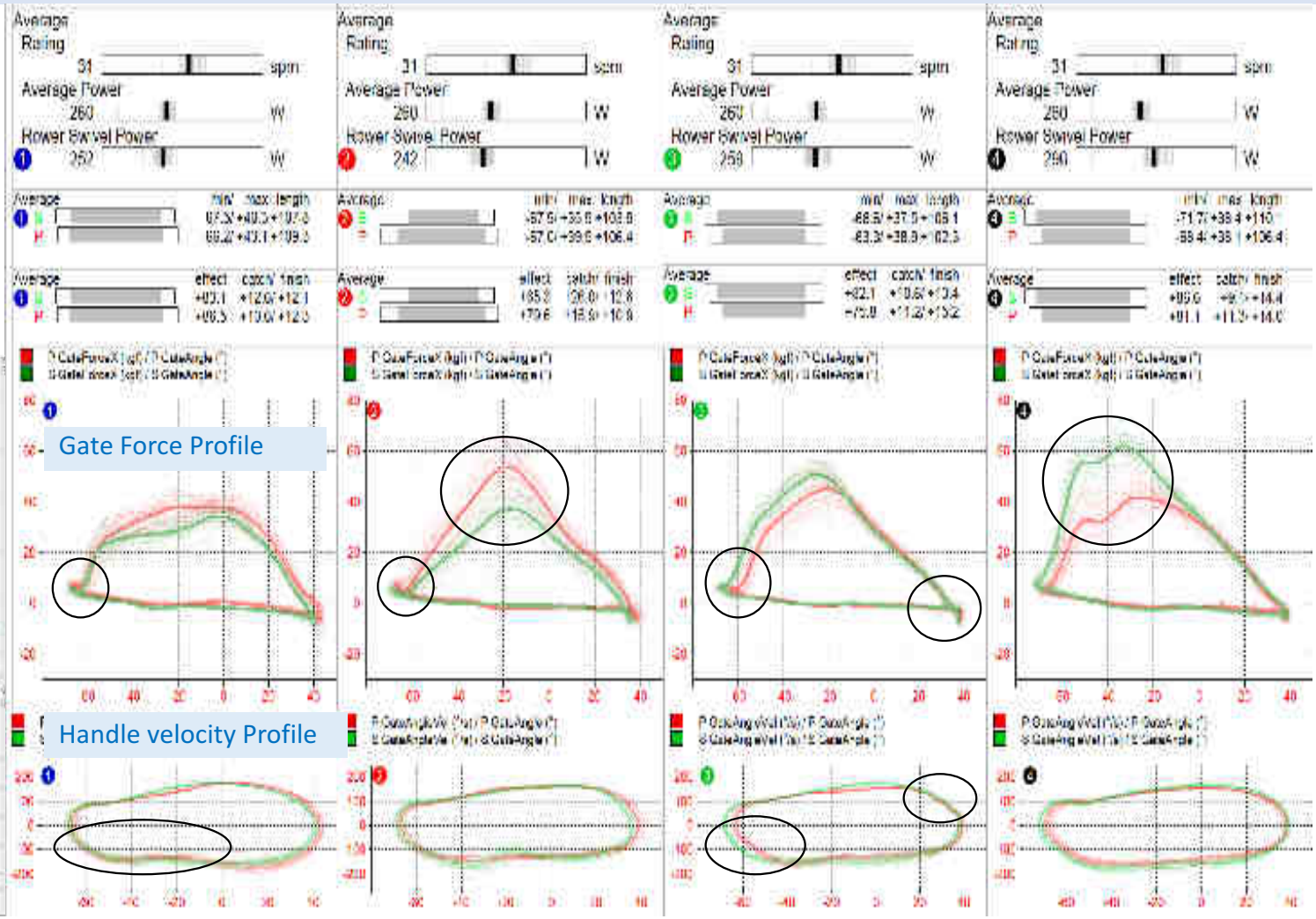
Example #1: Youth Rowing: JM4x+ (90s @ SR32)

Crew Overlay:

(left (stroke/port); right (bow/ starboard)

- Gate Force Profile (top)
- Handle velocity Profile (bottom)



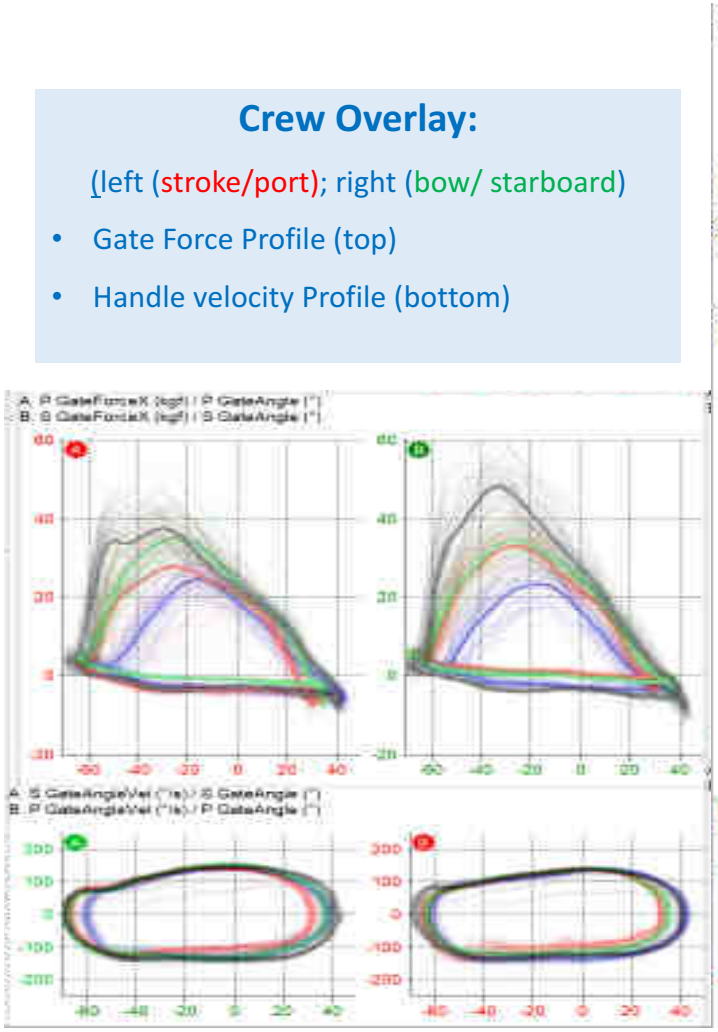


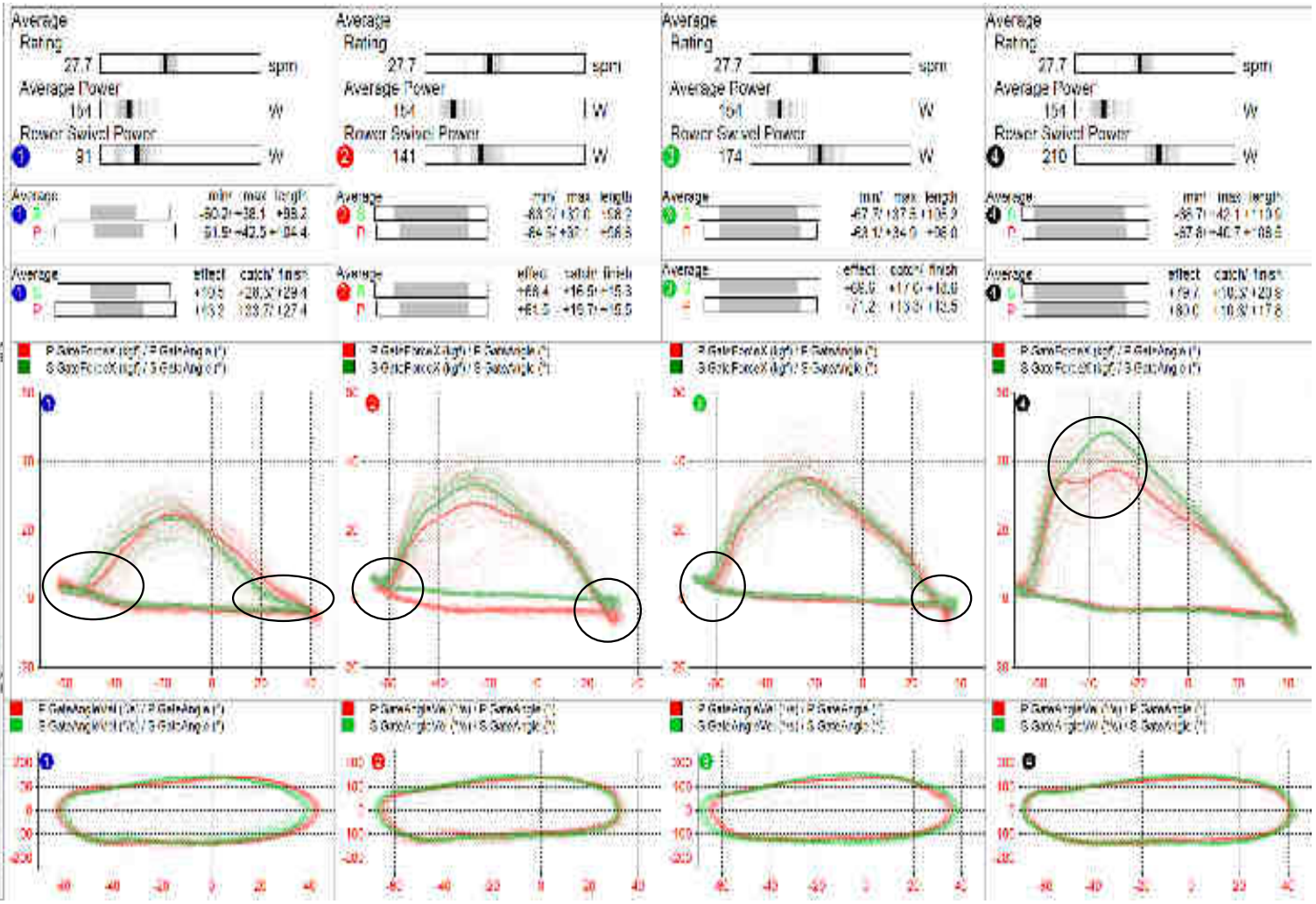
Example #2: Youth Rowing: JW4x+ (120s @ SR28)

Crew Overlay:

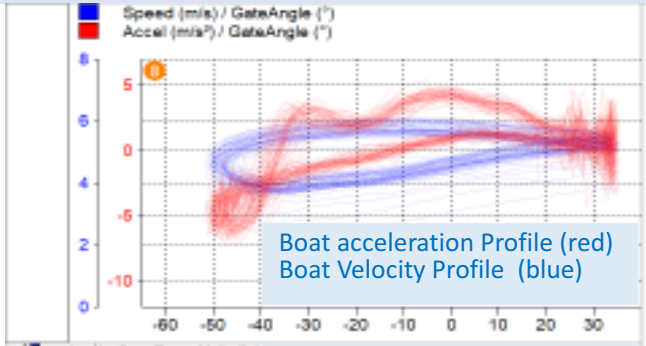
(left (stroke/port); right (bow/ starboard)

- Gate Force Profile (top)
- Handle velocity Profile (bottom)

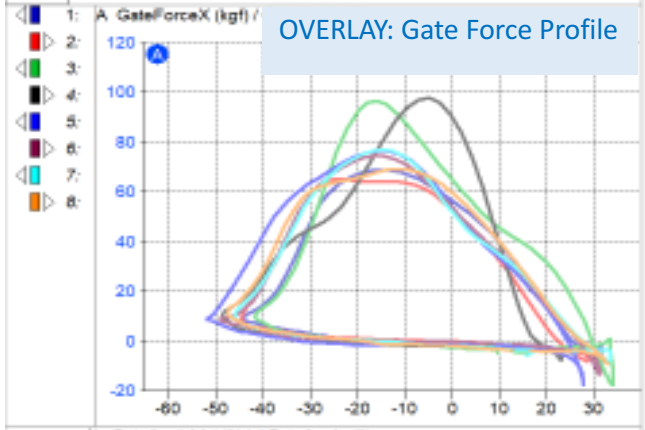




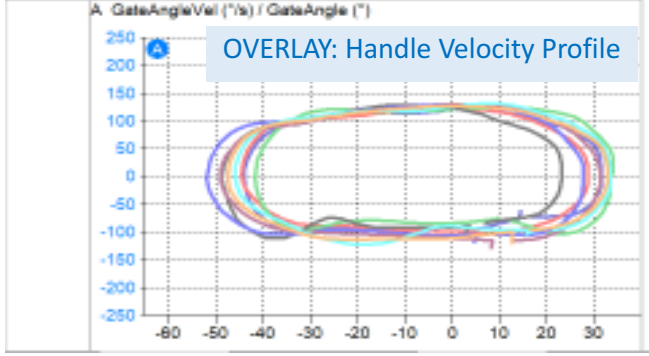
Example #3: Youth Rowing: U19 W8+ (500m @ SR34)



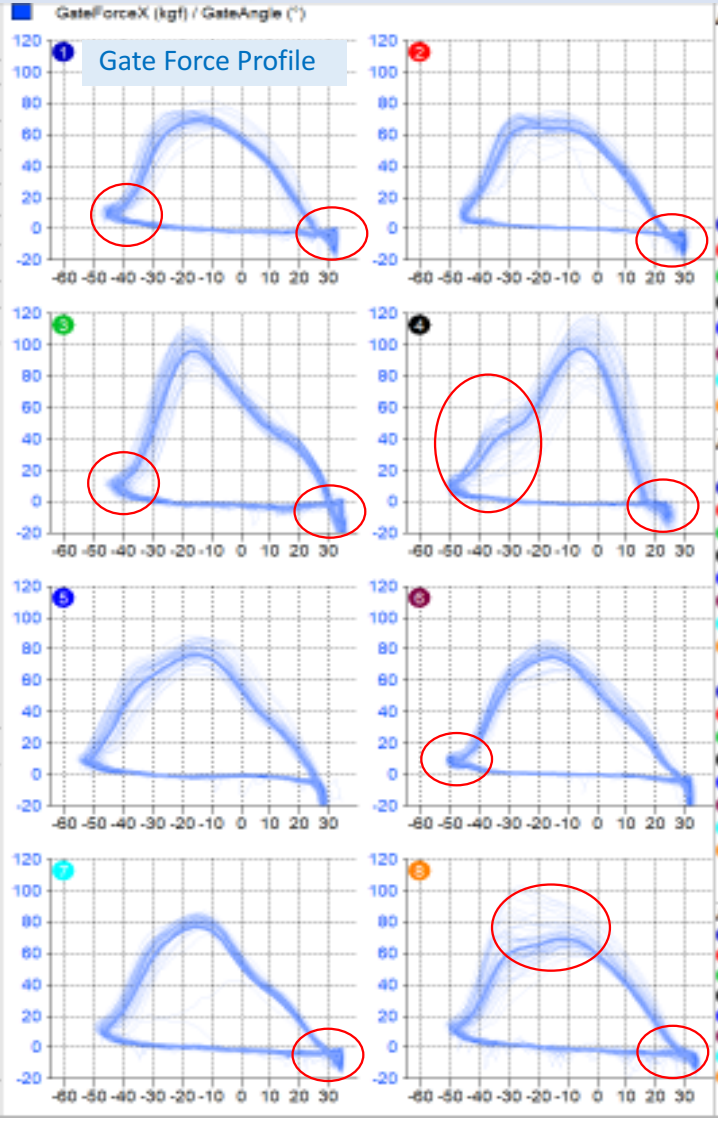
Boat acceleration Profile (red)
Boat Velocity Profile (blue)



OVERLAY: Gate Force Profile



OVERLAY: Handle Velocity Profile



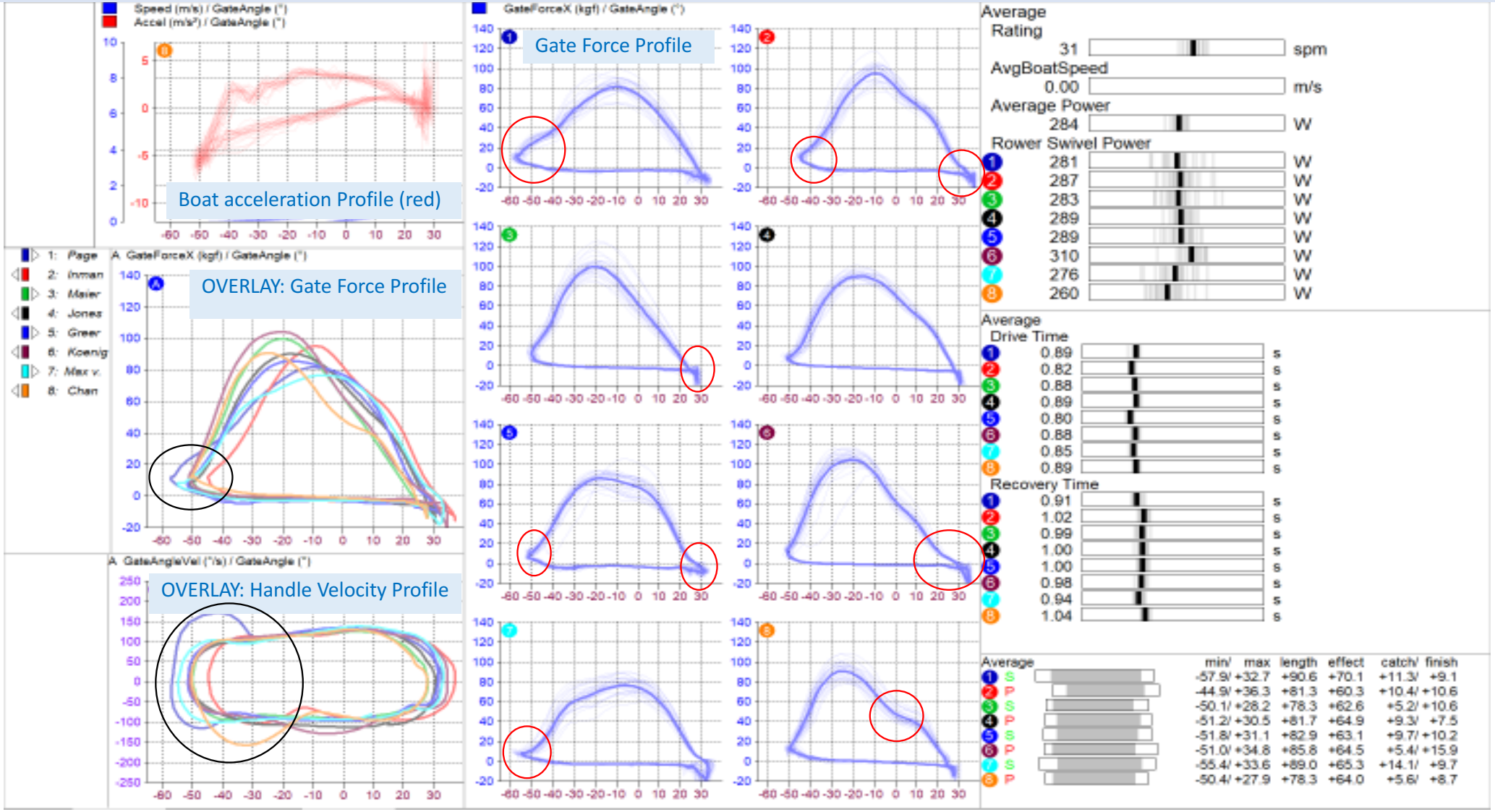
Gate Force Profile

Average		
Rating	32.4	spm
AvgBoatSpeed	5.0	m/s
Average Power	240	W
Rower Swivel Power		
1	216	W
2	212	W
3	272	W
4	259	W
5	252	W
6	235	W
7	235	W
8	242	W

Average		
Drive Time		
1	0.82	s
2	0.79	s
3	0.74	s
4	0.87	s
5	0.86	s
6	0.88	s
7	0.82	s
8	0.90	s
Recovery Time		
1	1.05	s
2	0.99	s
3	1.03	s
4	0.97	s
5	1.03	s
6	0.98	s
7	1.10	s
8	0.99	s

Average		min/	max	length	effect	catch/	finish
1	P	-45.3/	+32.3	+77.5	+54.6	+10.5/	+12.4
2	S	-45.5/	+29.2	+74.7	+55.2	+7.3/	+12.2
3	P	-43.0/	+35.3	+78.2	+60.7	+9.5/	+8.0
4	S	-49.6/	+23.6	+73.2	+53.1	+11.4/	+8.8
5	P	-53.0/	+28.2	+81.2	+64.0	+8.7/	+8.6
6	S	-50.2/	+31.8	+82.0	+58.8	+11.5/	+11.7
7	P	-47.3/	+33.9	+81.2	+59.2	+9.0/	+12.9
8	S	-48.7/	+33.2	+81.9	+60.5	+9.2/	+12.3

Example #4: Youth Rowing: JM8+ (90s @ SR32)



Example #5: Change of technique during a training session

Intercollegiate W8+; inexperienced novice female rower

Rowing technique of inexperienced athlete can change dramatically during a hard training session

Comparison of the rowing technique & performance during a 70min on-water rowing session:

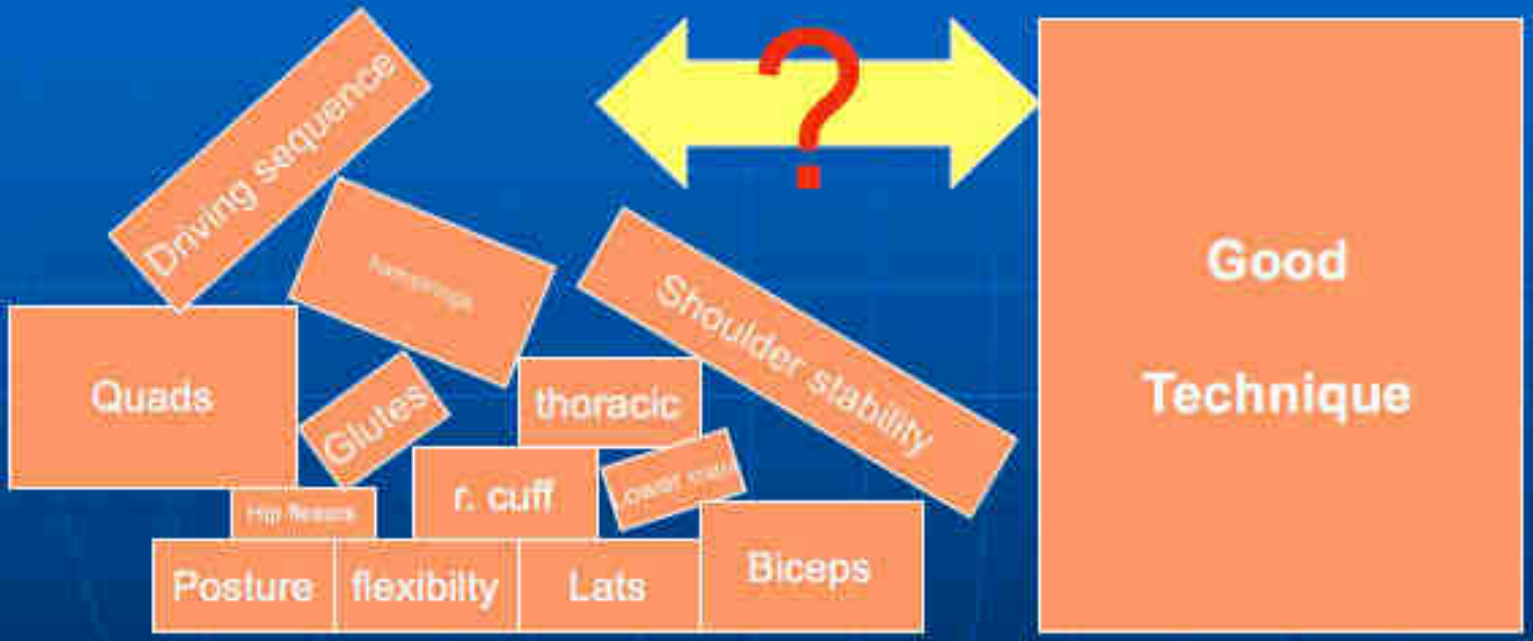
after warm-up (30+min)

after 60mins

Data gathered & analysed with the Peach system

Developing H P Novices

- Make the bricks before the wall



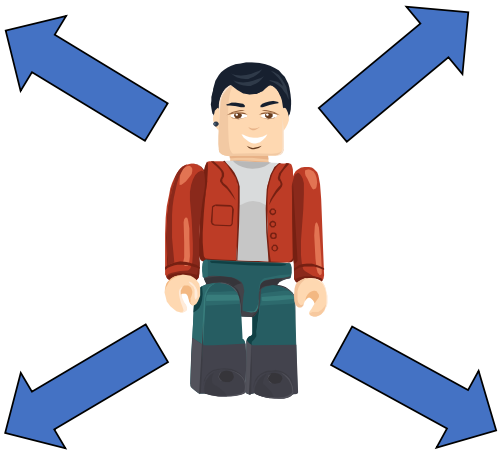
Steve Gunn, FISA Conference 2011

SWOT ANALYSIS

Strengths

- Well “balanced”
- Ambition grows with knowledge

Novice/ Junior rower



Weaknesses

- Lack of Power
- Limited Levers

Opportunities

- Will learn faster
- Fit into crews easily

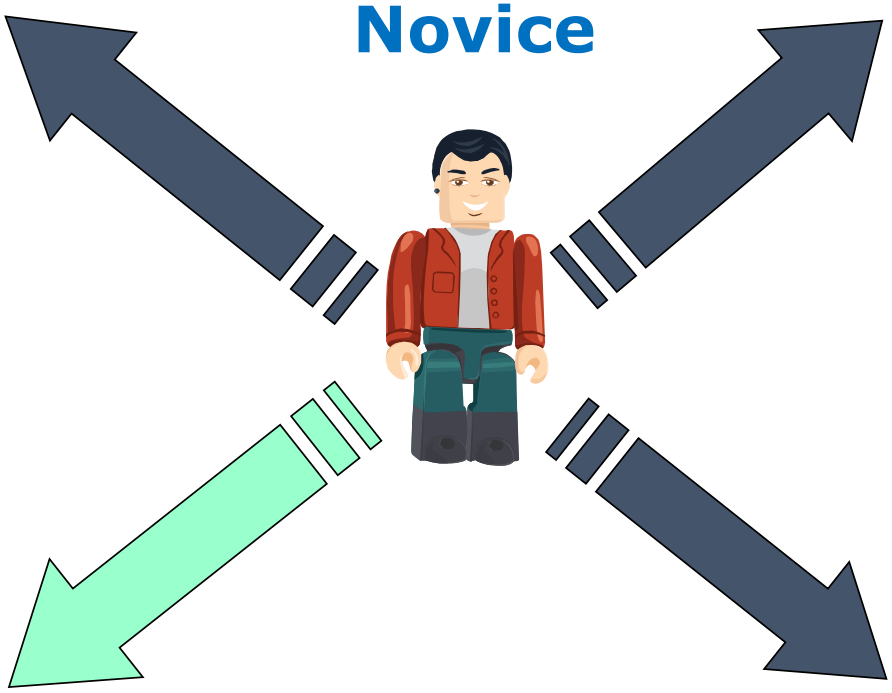
Threats

- Limited possibilities

Steve Gunn, FISA Conference 2011

SWOT ANALYSIS

High Performance Novice



Strengths

- Abnormally tall (good levers)
- Very Strong Major Drive Muscles.
- Fit, Highly motivated

Weaknesses

- Other muscles comparatively weak,
- poor posture & flexibility,
- Naive / ignorant

Opportunities

- Very high power outputs,
- Big Ergo Scores,
- Major Boat Mover

Threats

- Injury,
- learns bad technique,
- builds a limiting factor in trying to learn,
- load too quickly

Steve Gunn, FISA Conference 2011

STRETCH HIP FLEXORS AFTER EVERY SESSION 1-2min L+R

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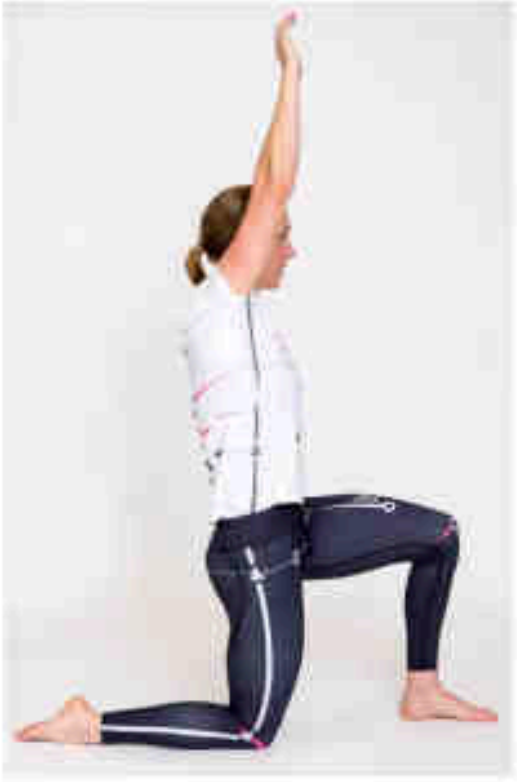

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STRETCH GLUTS AFTER EVERY SESSION 1-2min L+R
1-2min HOLD L+R

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HAMSTRING FLEXIBILITY & TRUNK STRENGTH

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Image credit: ; F Wilson 2016; Artist V Earle

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TRUNK STRENGTH & ENDURANCE

(Roy et al 1990, Perich et al 2009, McGregor 2002, Parkin 2001, Pollock 2009)

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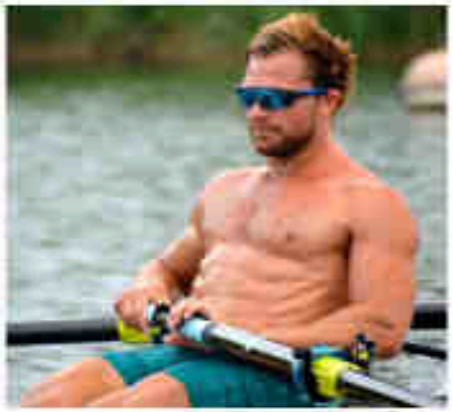

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Strength/ Conditioning & Sports Biomechanics - an integral part of Rowing

- Athleticism, and the ability to learn and apply fundamental movement patterns - *essential for optimal performance.*

"Must have the PHYSICAL to do the TECHNICAL,
and the TECHNICAL to do the TACTICAL"

(Giles, 2004)

- Understand whether technical limitation(s) stems from:
  a. *Learning capacity – technical*
  b. *Physical limitation – physiological and/ or mechanical - functional??*
  c. *Mental-emotional*

(Youngson, 2012)

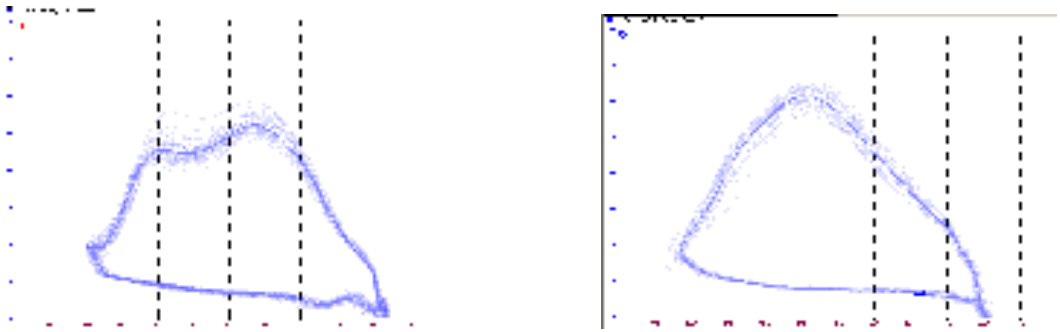
(J. Youngson, 2012 Aus Row Conf.)

Movement Before Muscles

1. Starting point – what are you aiming to achieve:

   Structural-functional strengths & weaknesses

2. Define fundamental *movement patterns* and *physical-technical demands* of rowing



Slip vs. **No slip**

(J. Youngson, 2012 Aus Row Conf.)

Movement Before Muscles

- Developing transferrable strength and power -
  - Using Total Kinetic Chain
    - Good posture – *"line of force"*
    - Sound Mobility
    - Body and spatial awareness

- Exercises are tools: external load is a means to enhance ability to deliver AND absorb forces/ physical stress.

- <u>Guide to exercise progression: (3)</u>
  - Static to Dynamic
  - Slow to Fast
  - Simple to Complex
  - Unloaded to Loaded
  - Long Contacts to Short Contacts

(J. Youngson, 2012 Aus Row Conf.)

Identify & correct faults: Correction

- ✓ Variability for Exploration and Adaptability
  Variability for Enhancing Skill

Low Variability

- Stable environment
- Highly structured
- Comfortable & familiar (training environment)

High Variability

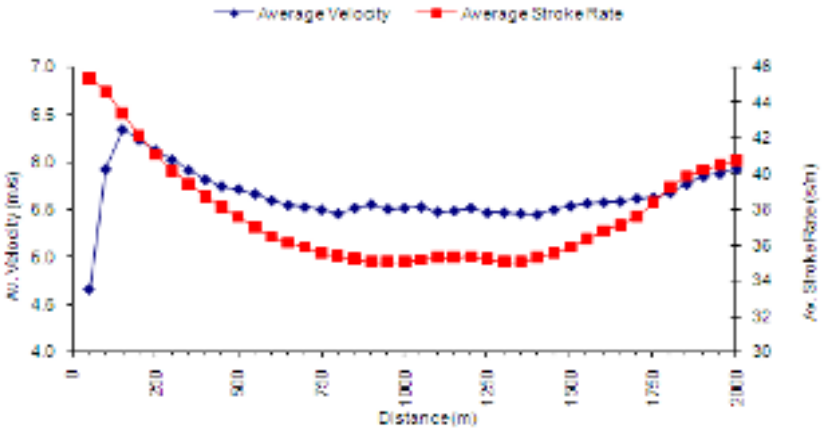
- Unstable environment
- Numerous changes
- Promotes the need to explore and adapt skills

(Gorman, A 2012)

What is the workout & what is the goal in training and competition?

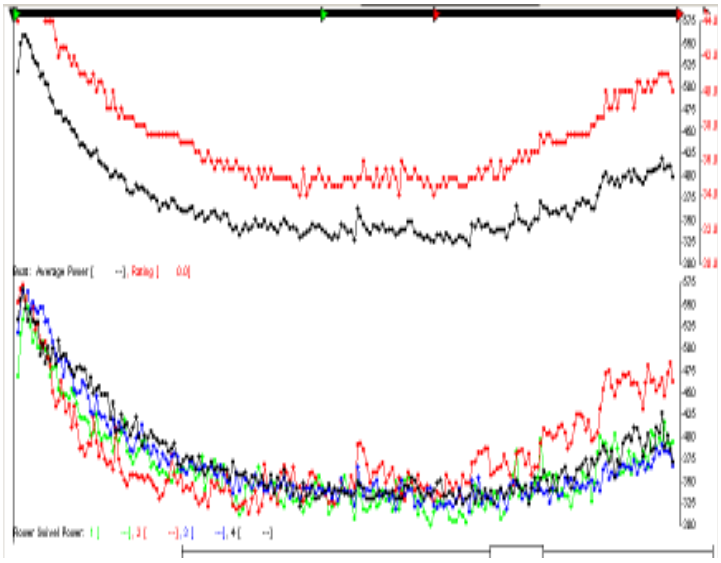
Technical | Tactical

Psychological | Physiological



Race Analysis (analysed with Catapult)
(i.e. Catapult GPS system (MinimaxX); boat information)

Stroke rate/ 50m
Boat velocity/ 50m



Race Analysis (analysed with Peach)
(i.e. Peach system; boat & athlete information)

Stroke Rate/ stroke
Average Crew Power/ stroke

4 individual handle power output/ stroke/ rower (Seat **4-3-2-1**)

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THANK YOU FOR YOUR ATTENTION!

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