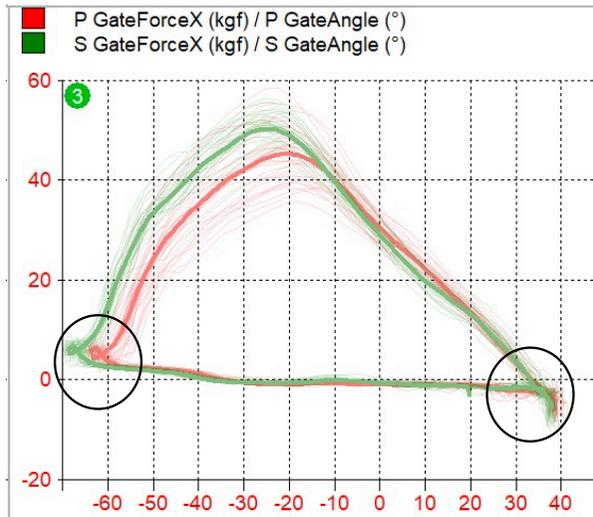


FISA YOUTH COACHES CONFERENCE

7th – 10th November 2019 - Hangzhou, CHINA

Junior Rowing – how biomechanical information can assist coaches during on-water rowing and in the gym



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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



- 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**

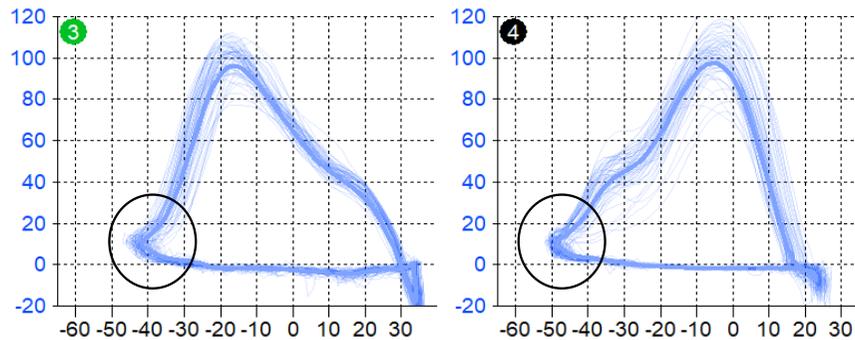
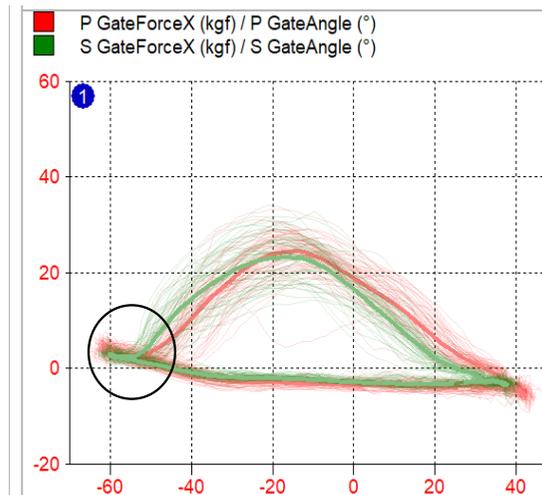
IDEAL TECHNIQUE: **CATCH**



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

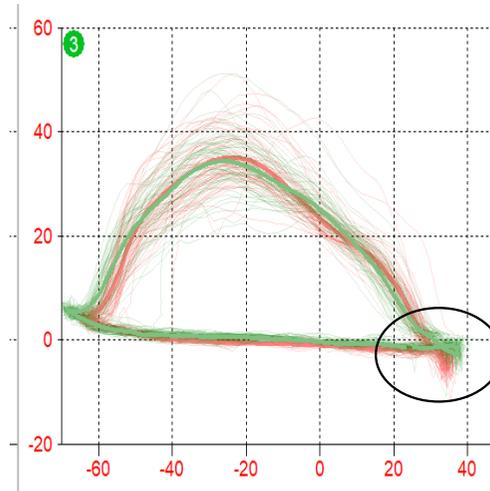
- Poor ankle compression
- Poor Hip compression
- Poor pelvic/rock over
- Lower spine flexion
- Upper spine flexion
- Forward Head Posture
- Shoulder forward (sublux)

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

IDEAL TECHNIQUE: **FINISH**



BIOMECHANICAL ON-WATER DISPLAY

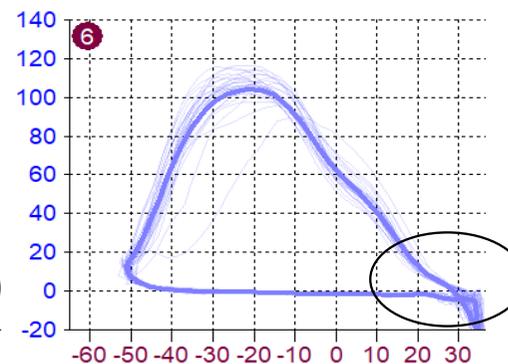
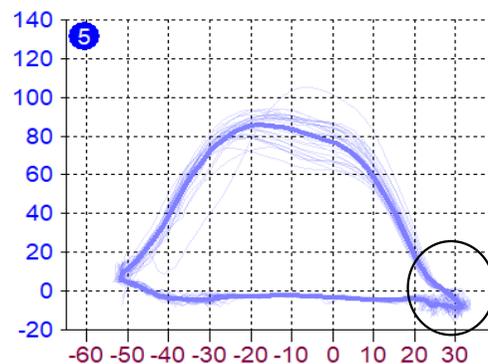


Common BREAKDOWNS **FINISH**



FINISH

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

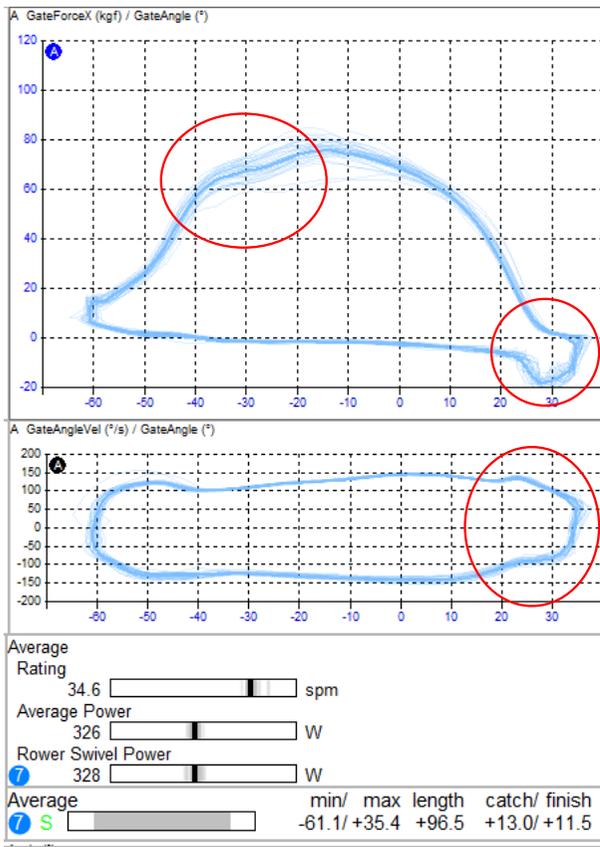


FINISH

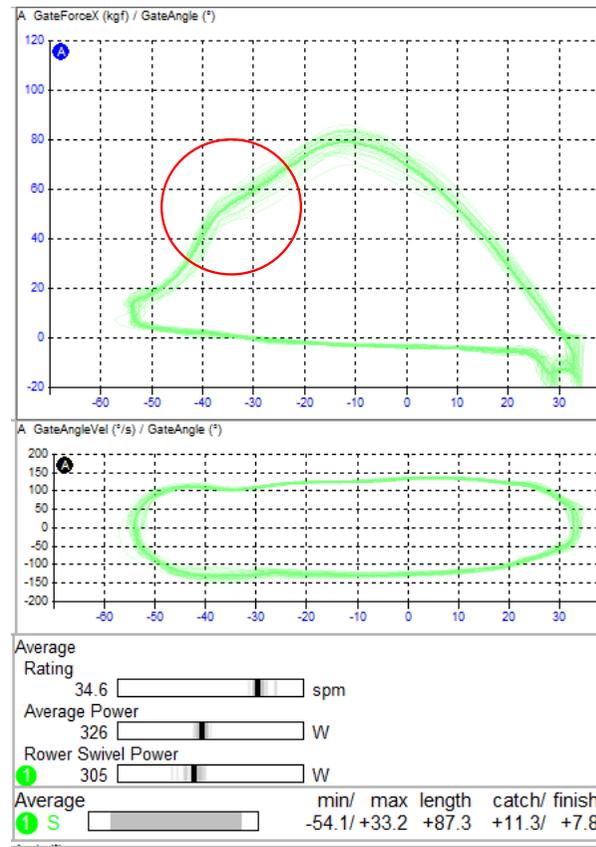
- Glutes off too early/over reliance on hip flexors
- Collapse at back end
- Over extension of upper Tx
- Forward head posture

Practical Part: Coaching analysis of biomechanical on-water data

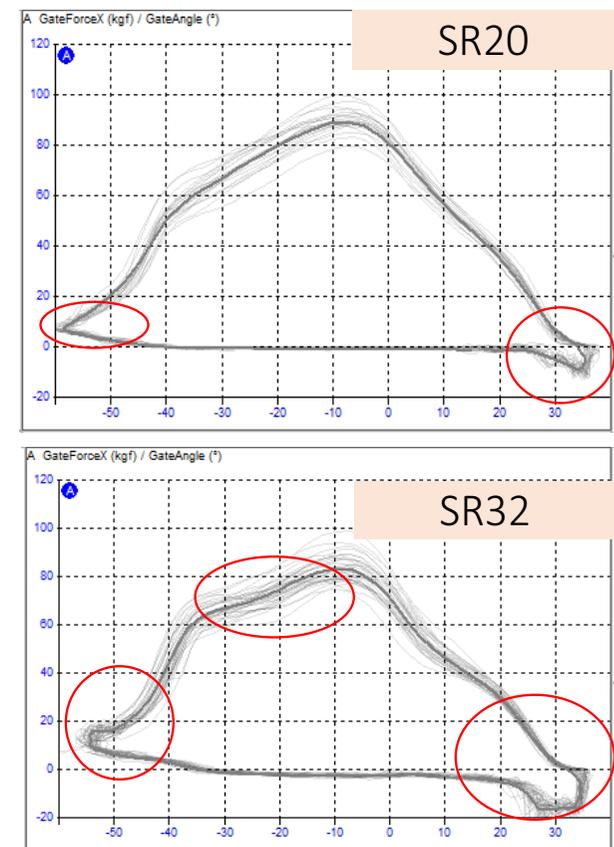
Example 1 – early body opening from the catch



Example 2 – connecting with arms



Example 3 – change in technique as SR increases

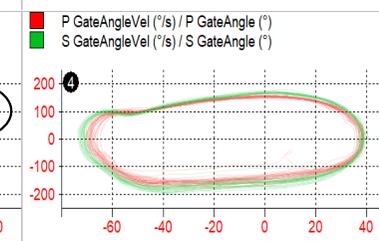
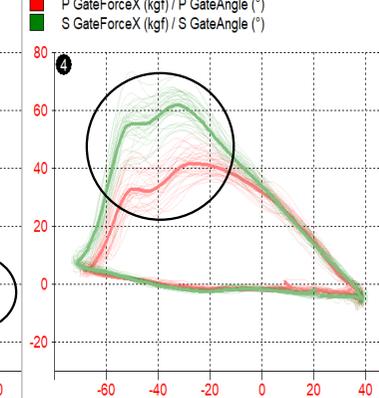
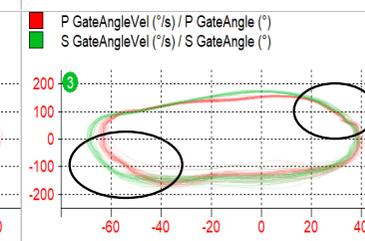
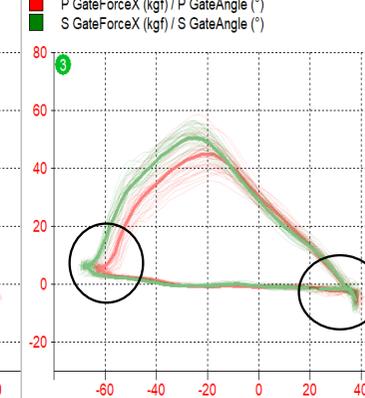
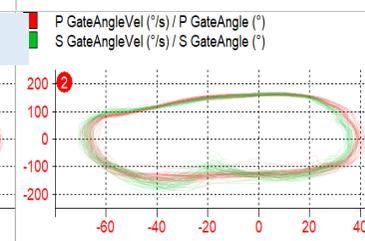
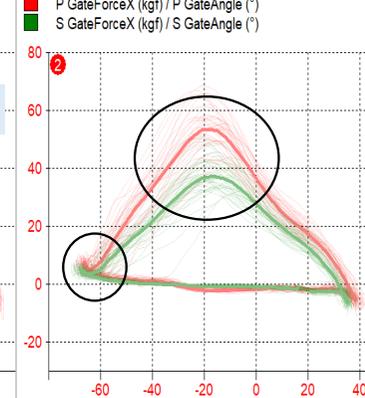
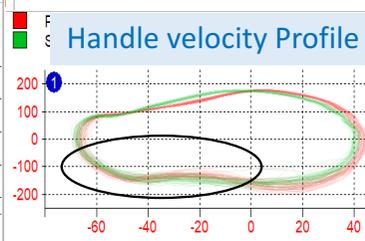
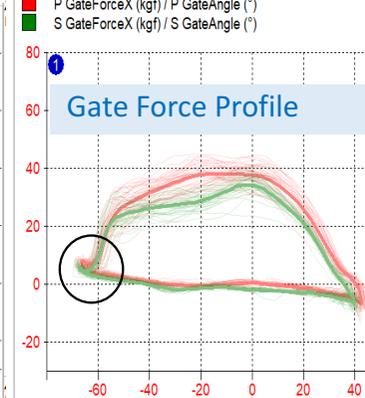
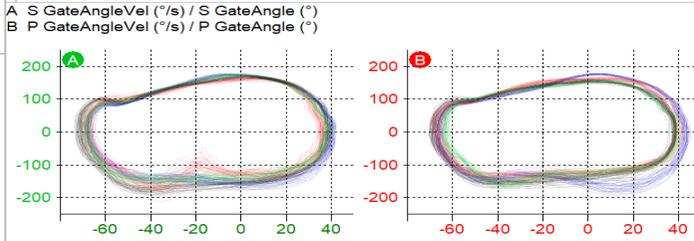
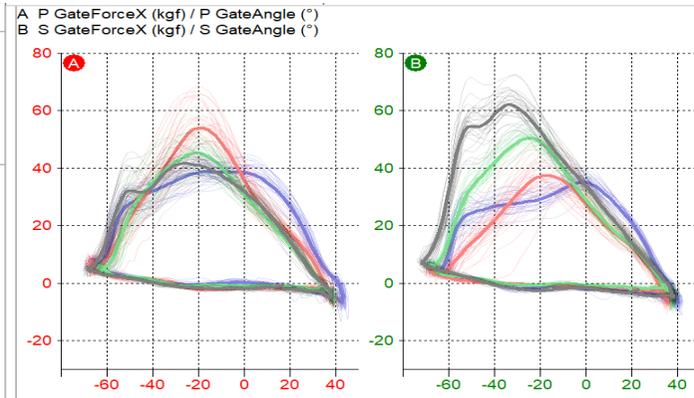
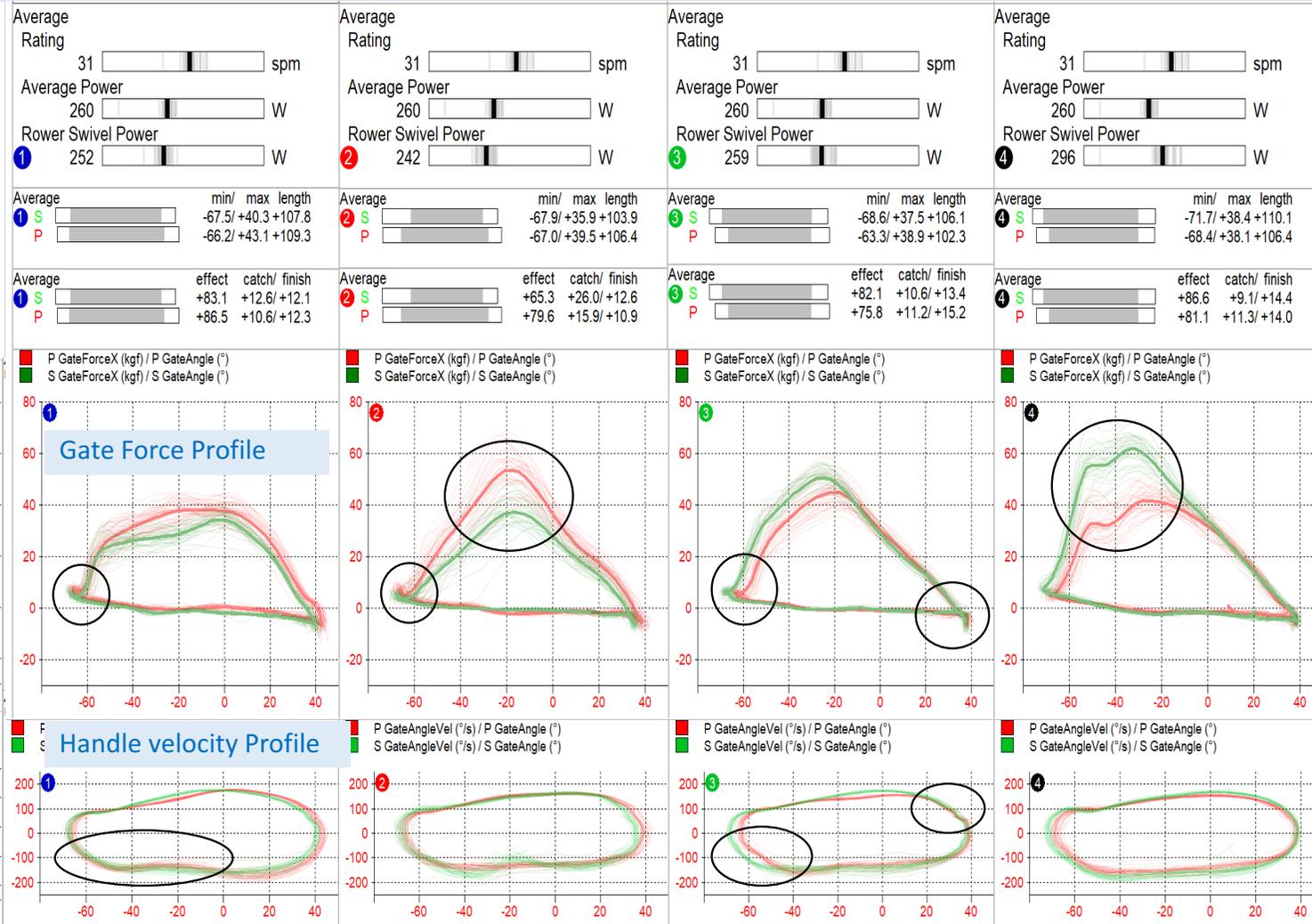


Example #1: Youth Rowing: JM4x+ (90s @ SR32)

Crew Overlay:

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

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

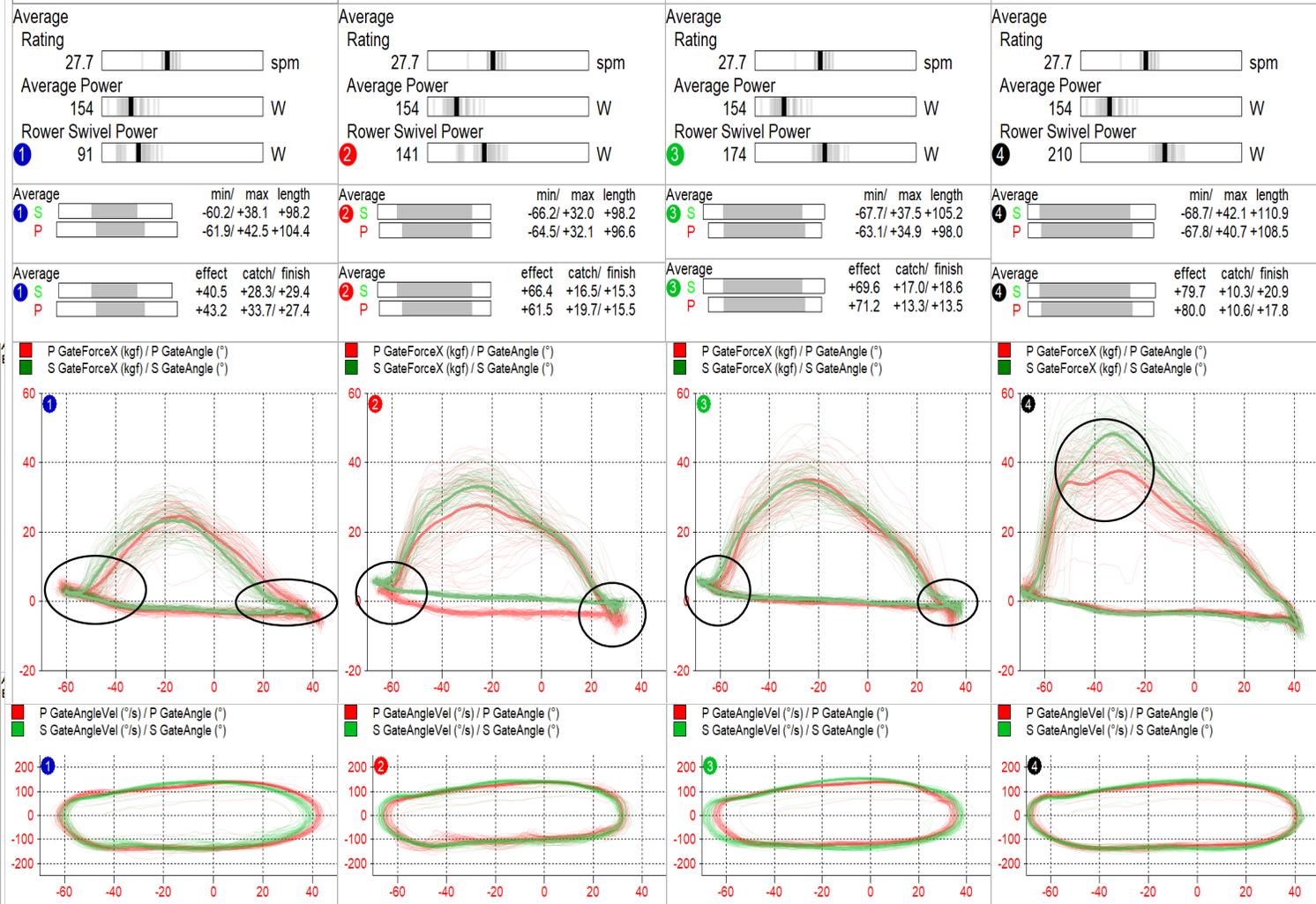


Example #2: Youth Rowing: JW4x+ (120s @ SR28)

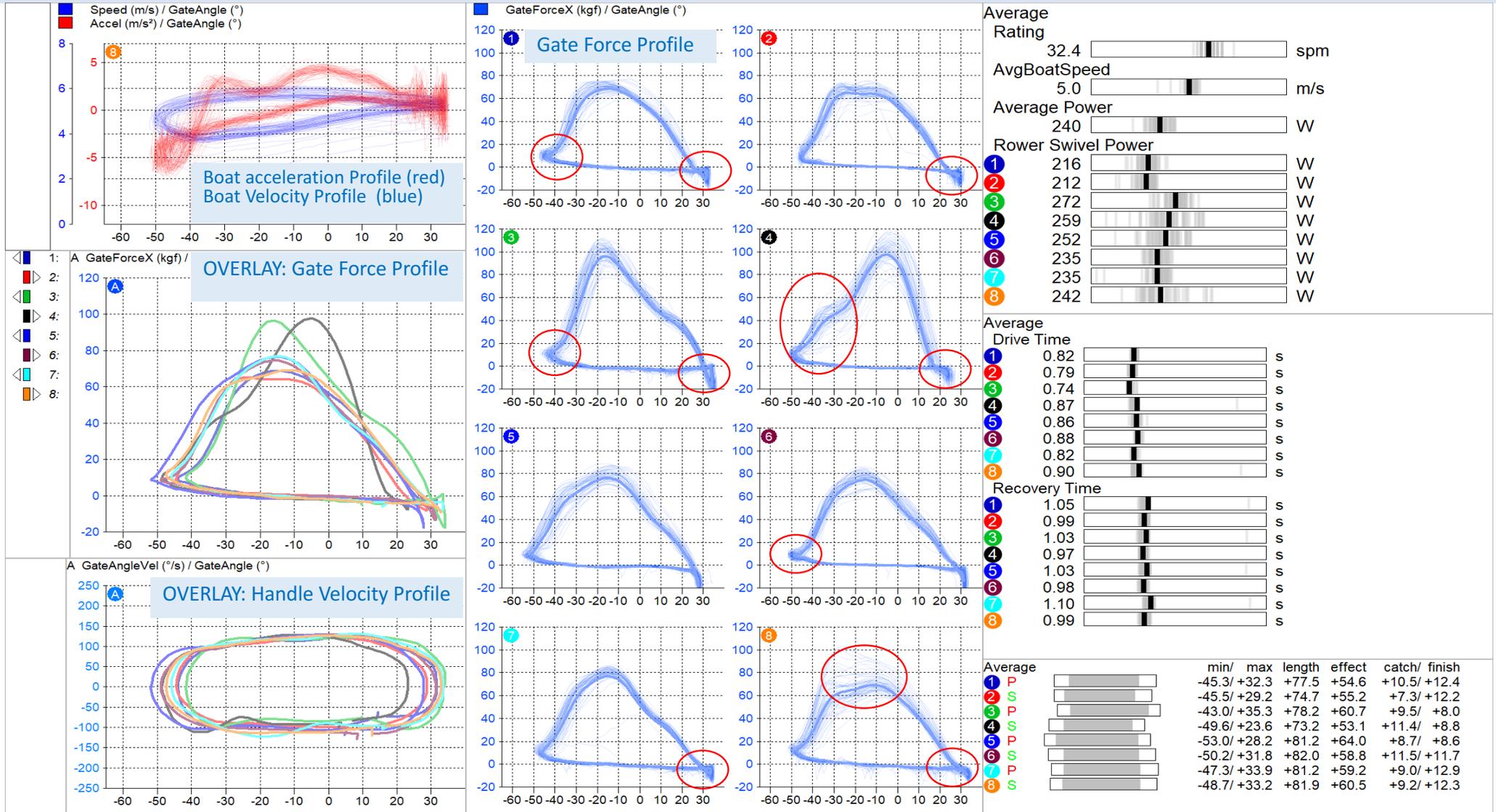
Crew Overlay:

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

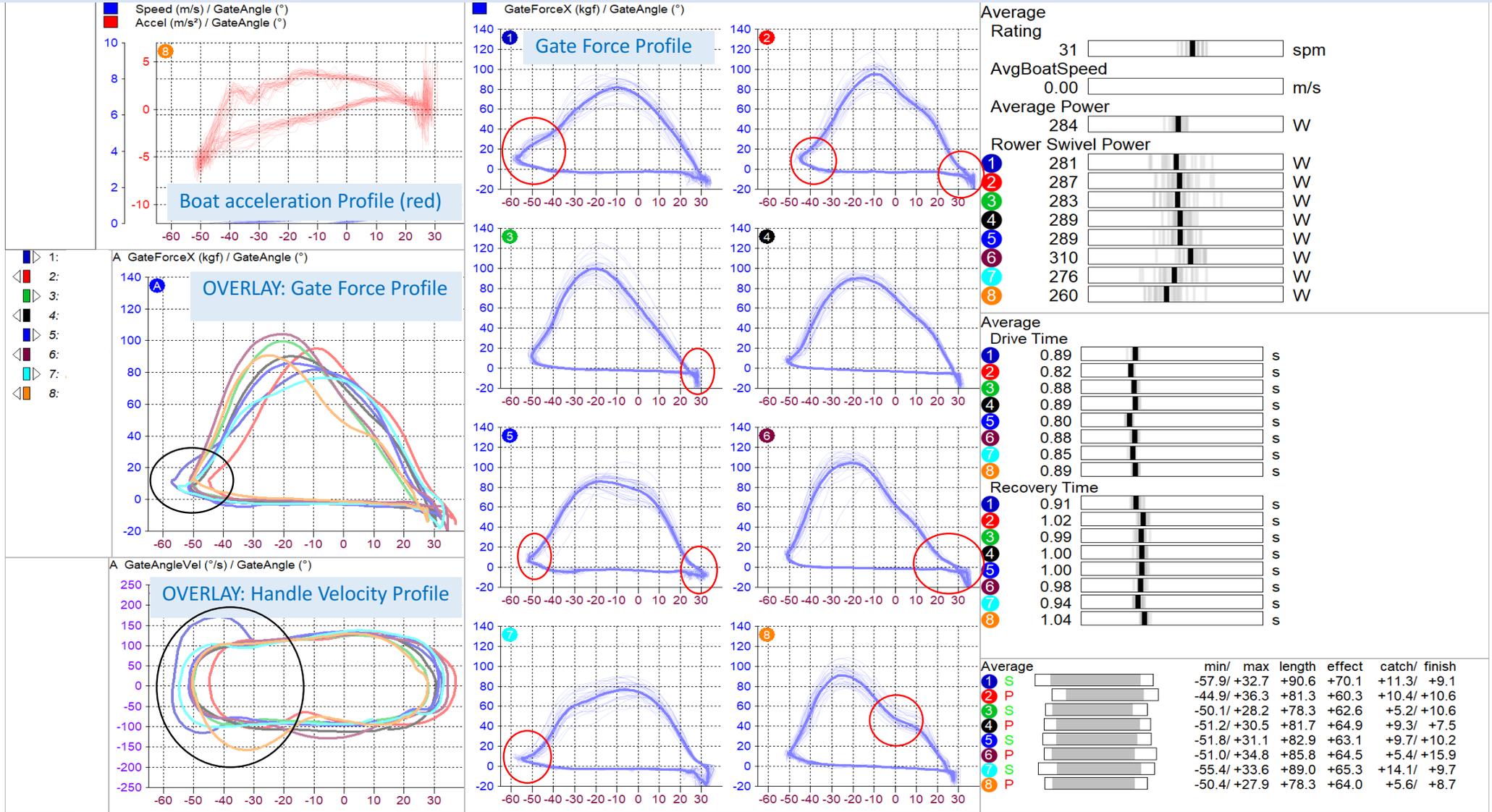
- Gate Force Profile (top)
- Handle velocity Profile (bottom)



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



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



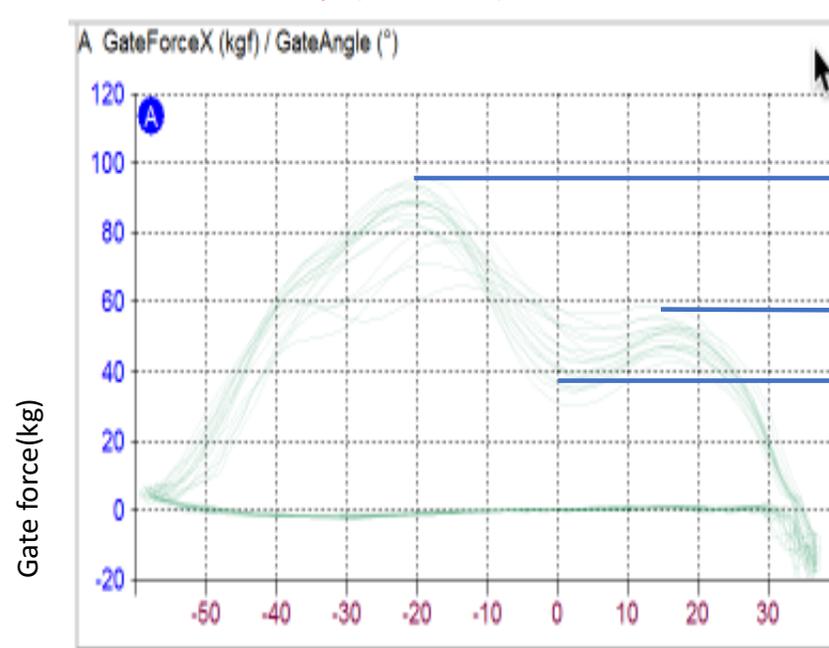
Example #5: Change of technique during a training session

Intercollegiate W8+; inexperienced novice female rower

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

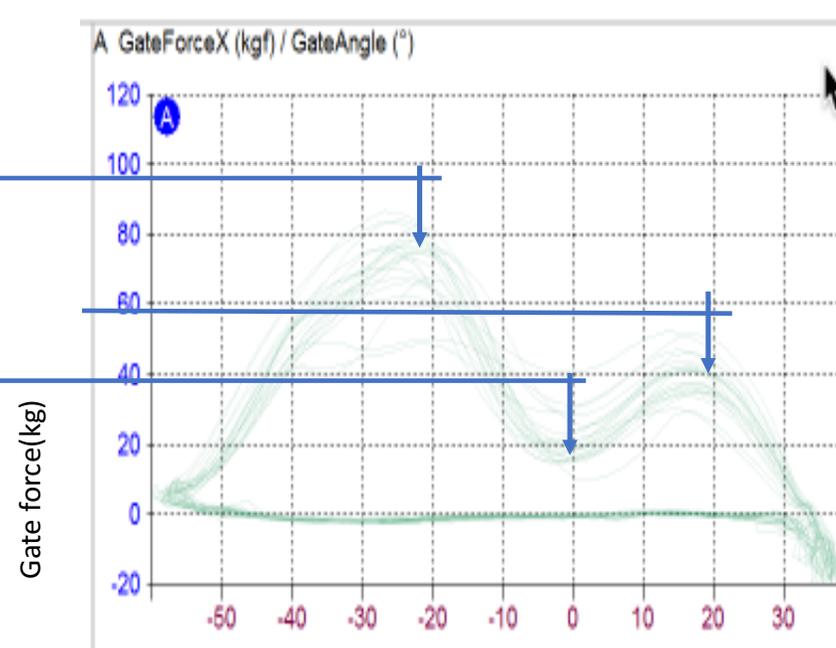
Comparison of the rowing technique & performance during a 70min on-water rowing session:

after warm-up (30+min)



Gate angle (deg)

after 60mins

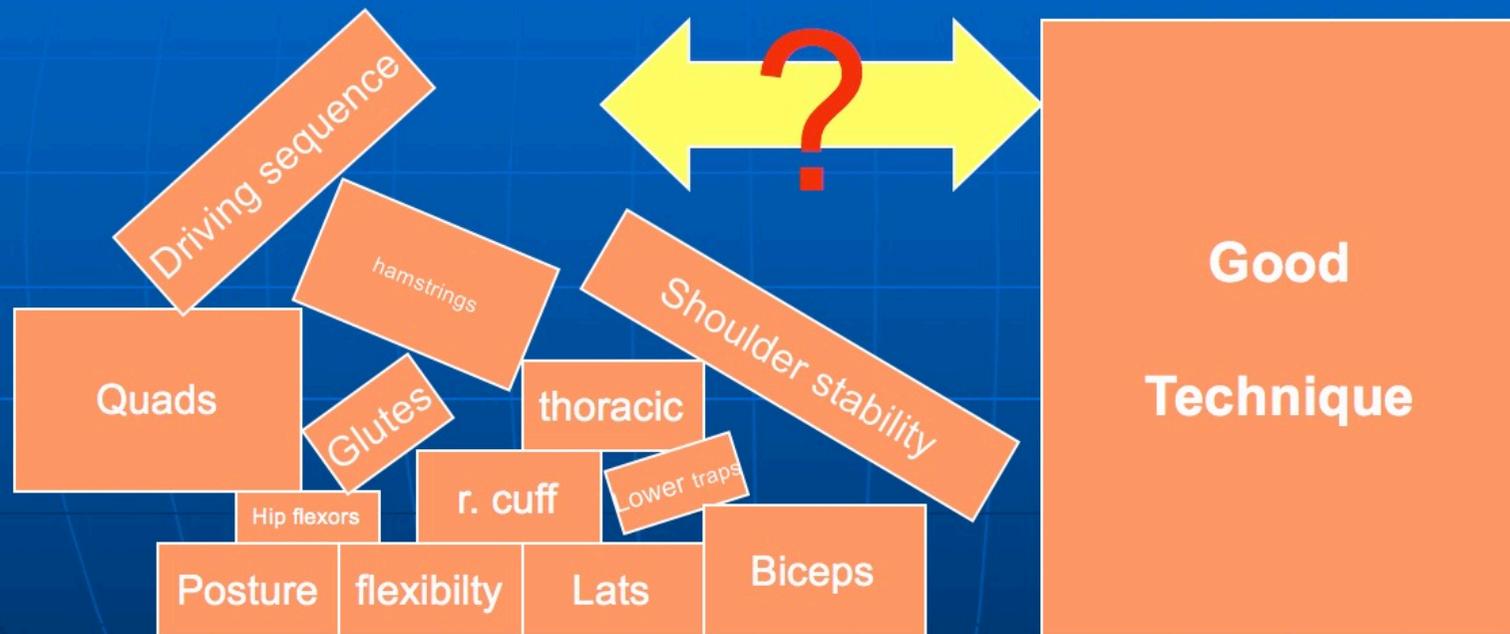


Gate angle (deg)

Data gathered & analysed with the Peach system

Developing H P Novices

- Make the bricks before the wall



SWOT ANALYSIS

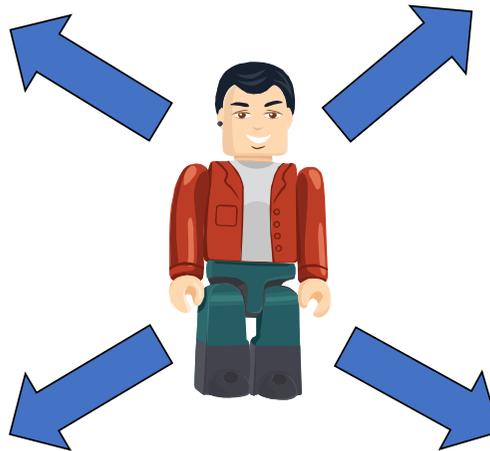
Strengths

- Well “balanced”
- Ambition grows with knowledge

- Will learn faster
- Fit into crews easily

Opportunities

Novice/ Junior rower



Weaknesses

- Lack of Power
- Limited Levers

- Limited possibilities

Threats

SWOT ANALYSIS

High Performance Novice



Strengths

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

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

Opportunities

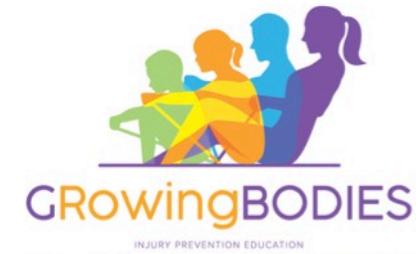
Weaknesses

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

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

Threats

HAMSTRING FLEXIBILITY & TRUNK STRENGTH



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Image credit : F Wilson 2016; Artist V Earle



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)



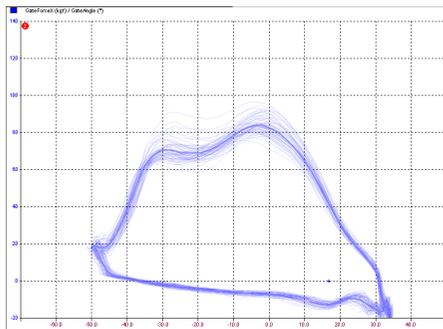
(J. Youngson, 2012 Aus Row Conf.)

Movement Before Muscles

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

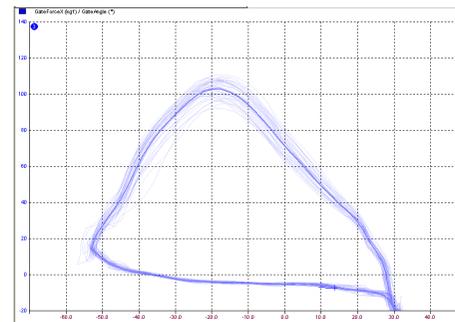
Structural-functional strengths & weaknesses

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.
- Guide to exercise progression: (3)
 - **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)

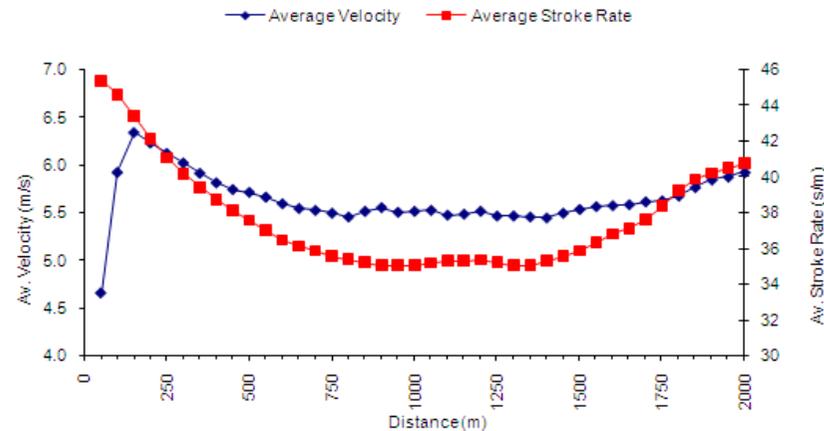
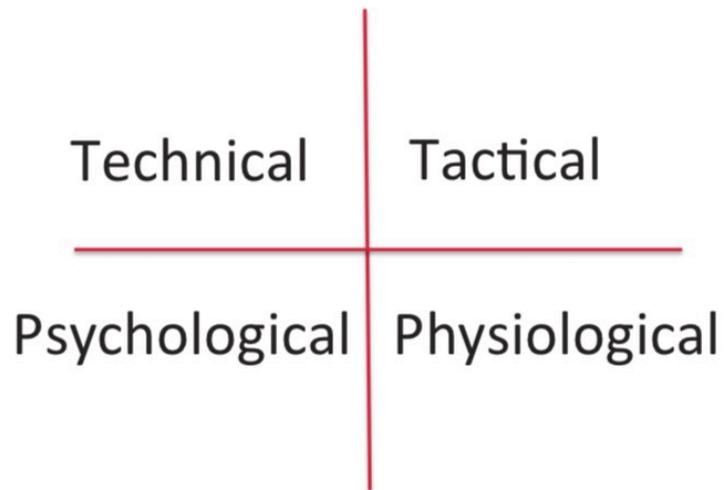


High Variability

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

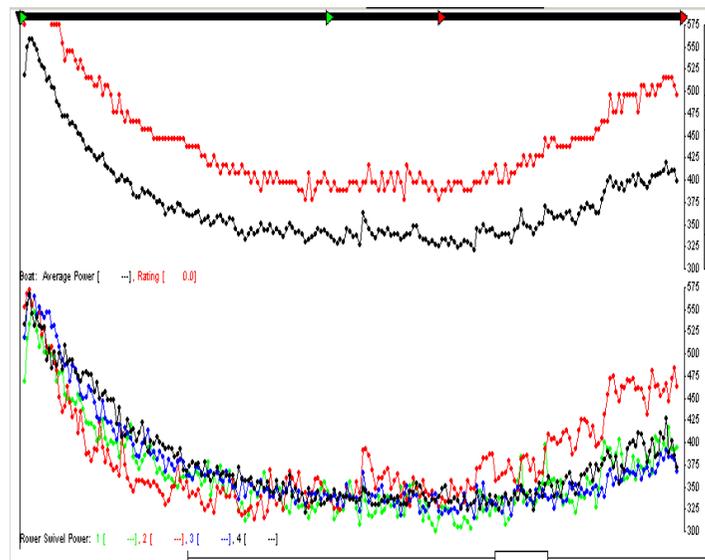
(Gorman, A 2012)

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



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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