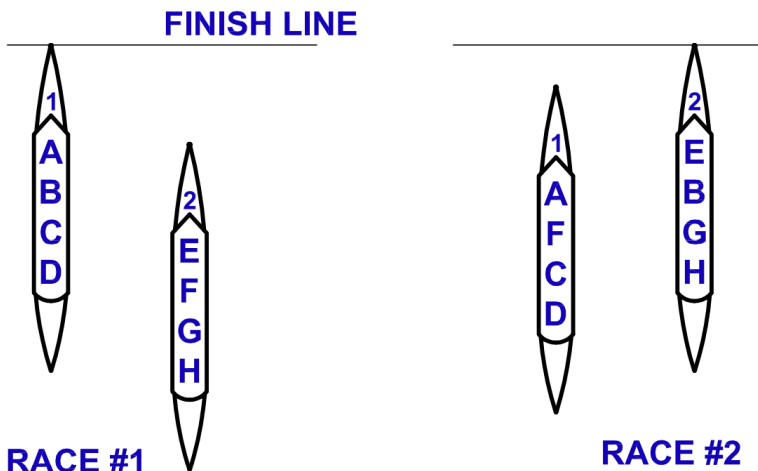


4.5 SEAT RACING *by: Mike Purcer*

Seat racing is a term used to describe evaluating athletes by racing them within inter-squad crews. Seat racing involves comparing athletes by switching crews and measuring the difference between the finish times of the races. The difference in the finish times reflects the athlete's boat-moving ability, as better athletes will contribute to faster times. Seat racing is a highly acceptable method of evaluating the athletes' racing abilities.

A simple example of seat racing is shown in Figure 4.5a. In this example, in Race #1, Boat 1 finishes ahead of Boat 2 by 2.28 seconds and the difference is recorded. Following Race #1, athletes B and F switched boats. The second race is held over the same distance with the boats in the same lanes. In the second race, Boat 2 finished ahead of Boat 1 by 1.15 seconds.

Figure 4.5a Seat Racing



The results of the two races allow a comparison of athletes B and F. The first race set the initial comparison for the crews, with boat 1 being 2.28 seconds faster than

boat 2. Following the first race, athletes B and F switched seats, and boat 2 was 1.15 seconds faster. The difference between the two boats over the two races reveals that Boat 2 went 3.43 seconds faster when athlete B was switched into the crew, as the only difference was the two athletes, B and F, switching crews. The seat race result is that athlete B is 3.43 seconds faster than athlete F. Seat racing when switching athletes, assumes that all other variables, including steering and the performance of other athletes in the boats, have been consistent between the two races.

There are numerous methods of switching athletes within boats to compare results. A more comprehensive form of seat racing involves multiple athletes changing crews over several races. The matrix of changes must provide that athletes race with and against the other athletes an equal number of times. Again, this method offers objective and quantifiable total time values that measure the athletes' boat-moving ability.

4.5.1 Seat Race Matrix

A seat racing matrix is a complex method of switching multiple athletes between crews simultaneously over a set number of races. The switches must provide that athletes being compared race with and against the other athletes an equal number of times. In sweep rowing, port and starboard athletes do not race against each other the same number of times and are not typically compared. The athletes should rotate between boats to minimize any boat inconsistencies that may affect times.

Athletes receive finish times for every race, and the sum of their finish times allows a comparison to other athletes. The matrix system also allows different athlete combinations to be evaluated by comparing the finish

times of the crews in all races, provided the conditions remain consistent.

4.5.2 Equipment Setup

The equipment used for seat racing must be the same, with identical boats and oars. The boats must be rigged and checked prior to starting the seat racing. Oars should be set standard length and inboard. However, some consideration can be given to individual athletes with unique stroke lengths. Athletes with noticeably longer or shorter lengths can use a clip-on load adjustment mechanism (CLAM) or have an oar with inboard/outboard settings that they use throughout the racing. This allows athletes to match outboard stroke lengths with others in the crew and maximize performance.

If seat racing in coxed boats, the coxswains must be the same weight to maximize the similarity of the shells, and lighter coxswains can carry weights as needed. Rigging and rowing the shells in workouts prior to the day of seat racing will provide the opportunity to ensure the boats are in good racing order.

4.5.3 Racing Format

By distance: As in regular racing, seat racing can be completed with crews side-by-side or head-style racing. The races should be held on the course in the same lanes and must be over the same distance. The race distance can vary but is typically between 1000m to 1500m in length. The race distance depends on the number of races per day because athlete fitness should not affect the results.

Athletes that experience greater fatigue in the last few seat races may negatively affect the crew's finish time. Others racing with fatigued athletes will be adversely affected and may receive unreliable times, reducing the

accuracy of the comparison. Seat racing by distance provides a time comparison of the athletes boat-moving ability.

By time: Another method of seat racing is by timed pieces. For example, the two crews will row beside each other. The crews will build to race rate, and the timer will start the watch when the bows are even. After a set time interval, such as four minutes, the timer will determine which crew is ahead and by how much. One crew may be ahead by a deck, a deck and a seat, half a length, half boat open or the best distance estimate. The crews stop, and two athletes switch boats. The boats begin again and row beside each other for a second piece. Similar to the first piece, the crews build the rate and when even race for the same amount of time as the first piece. At the end of time, the difference one boat is ahead is again estimated. The difference in distance between the first piece and the second piece reflects the boat-moving ability of the two athletes that switched crews. It is important not to share which athletes are switching crews, and athletes must believe there is another scheduled race to keep them motivated, thinking that they might be switched next and their performance tested.

4.5.4 Race Setup

Before seat racing, if a matrix is used, designate athletes with numbers or letters or both if sweep rowing and record their name on the race sheet. Allowing athletes to select their own number or letter will show the boat changes are not pre-determined and demonstrate the coach is not biased and the fairness of the matrix.

Seat racing with controlled stroke rates can limit athlete fatigue if many races are scheduled. However, open stroke rates are more common. Coaches have also allowed athletes to select the seating arrangement in the

shell within an assigned crew. Typically seat races are started with running starts and crews rowing through the start line at race rate and speed.

Before the first race, the warm-up must be thorough and include rowing at the race pace. The following is an example outline of the seat race format:

- 1) The coaches at the start and finish will start their watches together before racing begins.
- 2) The seat racing distance of 1500m or 1000m is common, depending on conditions and the time available.
- 3) Races will start at the 500m or 1000m mark, with both crews rowing through the start line together at race speed.
- 4) Start times for crews if not even (one boat ahead) will be recorded, and overall finish times will be adjusted accordingly.
- 5) A maximum rate of **32 spm** is allowed. This will control fatigue and limit the stroke man's control of the rhythm.
- 6) The coxie will only provide the stroke rate and not count or motivate the crew.
- 7) Time penalties may be assessed for interference or crews rowing above maximum stroke rates.
- 8) Any unordinary situations during the race will be recorded on the race sheets; athletes should talk to the coaches after each race to voice their concerns.
- 9) Crews will dock at the finish line dock at the end of each seat race. Race times will not be available until the completion of seat racing.
- 10) All races will run similarly to the first as above.

11) There will be six races.

12) The boats will be in their same lanes for all races.

The coach must ensure fairness in all races. Coaches must check all boatings are correct prior to launching for the next race.

4.5.5 Athlete Preparation

Athlete preparation is critical to allow ideal performance, and athletes should be provided support in preparing for seat racing. Athletes must bring water and snacks if racing continues for extended periods. Seat racing can be highly stressful for athletes who feel their future in the crew depends on their performance.

Athletes should know days in advance of the scheduled seat racing as well as the format and the number of races. Prior to the seat races, coaches should hold a pre-brief with the group to outline the setup and answer questions. At the end of the day's racing, a debrief with the athletes will provide an opportunity for athlete feedback. The debrief is not a good time to speculate on future plans if the next steps depend on the results. Results should not be shared until they have been checked, and coaches may need to have individual meetings.

4.5.6 Race Record Sheets

Coaches should use predesigned Race Record Sheets to record race-related times and notes. The times transcribed from the watch to the sheet must be clearly legible and checked. Typically the lead timer records the time on the sheet, and the backup timer checks the transcribed numbers against the backup watch.

The race record sheets must indicate shell names and the athlete seat assigned in the boat, start and finish

times, overall times, and any events that should be noted that may have affected the race times. The weather and water conditions should be recorded for all races.

The record sheets must be kept for future reference in case of appeals. Pictures of the sheets can be used as a backup of the document.

The results of seat racing provide a comparison between the athletes.

4.5.7 Analysis

A spreadsheet that allows inputs for start and finish times for each crew and race will reduce the possibility of calculation errors. The spreadsheet calculates the time for each race and should calculate the total overall time for each athlete. The athletes' overall times provide the comparison, and lower times reflect a faster boat-moving ability as more highly skilled athletes will contribute to faster boats and lower overall finish times.

A seat racing matrix provides a number of crew combinations. Reviewing the finish time for each crew may show the fastest athlete combination, provided the conditions remain the same for all races.

The seat racing data can provide additional in-depth analysis using athlete times, crew combinations, and assigned boats. The overall time for each athlete divided by the number of races will provide their average time. Combining the average times for a crew of athletes in a specific race will provide a theoretical time. Comparing two crews' theoretical times to their actual race times will determine the consistency of the athletes' performance. A spreadsheet can provide an "under" or "over" projected time for each crew and the actual difference (projected to actual). The "under" notes that the crew has rowed faster than their projected time when compared to the other crew. If a crew is "under" their projected by a substantial

amount (4+ seconds) it could mean any of a number of factors including:

- 1) This is a strong combination.
- 2) The other crew is a weak combination.
- 3) Some extraneous factors, timing, bad strokes...

Further analysis of large under/over times is required, and the coach should check the race sheet to see if there are other factors or comments. The coach should review the times and check that the race did not cause a shift in athlete ranking. The projected to actual race time comparison should be integrated into the spreadsheet.

The similarity of the shells used in seat racing is often a concern, and the data related to projected times and actual times can be used for review. Shell times that are consistently "over" or "under" projected times should be analyzed to determine if one shell has an advantage over the other. For this reason, it is important the athletes race in all boats the same number of times.

4.5.8 Athlete Debrief

Selection is a highly stressful time for athletes who will be very concerned about the seat racing results. Coaches deselecting athletes based on seat racing results may wish to meet with the athlete individually before the team debrief. Results can be shared with individuals by removing the names and identifying the individual's time and ranking. Review *Section 4.4 Selection* for related information.

4.5.9.1 Traditional Seat Racing

A traditional seat racing example was shared at the beginning of this section and involves racing two crews together and switching two athletes between boats before the next race. The athletes that are switched are judged based on the finish time of the race in comparison to the

previous race. Following each race, two athletes will switch crews to continue the comparisons.

It is important that athletes do not know who will be switched or if there will be further racing to keep them motivated to perform at their maximum. Seat racing using this method can be done on any boat class (eights, fours, doubles...).

4.5.9.2 Fours Matrix

The Fours Matrix rotates eight athletes through the two shells over six races, as shown in Figure 4.5.9.2a. Through the rotation, starboard and port side athletes race with other athletes an equal number of times. Every athlete races twice, with athletes rowing on the same side of the boat and three times with athletes on the opposite side of the boat. Figure 4.5.9.2a details the matrix rotation of athletes through the seat races.

Figure 4.5.9.2a

Fours Matrix

Race 1		Race 2		Race 3	
Boat 1	Boat 2	Boat 1	Boat 2	Boat 1	Boat 2
2	3	4	1	2	1
B	C	A	D	B	A
1	4	2	3	3	4
A	D	C	B	C	D

Race 4		Race 5		Race 6	
Boat 1	Boat 2	Boat 1	Boat 2	Boat 1	Boat 2
1	3	4	3	2	4
C	A	D	C	D	B
2	4	2	1	3	1
D	B	B	A	A	C

The Seat Race Matrix outlined above in Figure 4.5.9.2a designates each athlete as a letter or number. Reading the table down from bow to stroke shows

athletes A, B, C and D on the port side in a standard rigged boat. Reading the table down from stroke to bow designates A, B, C and D as starboard side athletes. Some coaches allow athletes to decide the crew's seating arrangement, while others assign seats.

As shown above, the athletes designated with letters row in both boats an equal number of times. Athletes that are designated with numbers row in one boat four times and the other boat twice, except for athlete number 2. Athlete 2 will row in the same shell for all six races while 1, 3 and 4 row in the other boat for four races and in athlete 2's boat twice. For this reason, it is important to use boats of the same size and rigging. If the boats are not exactly the same, a straight comparison can be made between athletes 1, 3 and 4, while further analysis of the results should be made to review athlete number 2. A spreadsheet to calculate results is available on the purcherance.ca website.

4.5.9.3 Pair Matrix

This Pair Matrix rotates six athletes using three pairs over three races, as shown in Figure 4.5.9.3a. Typically the athletes steering the shells do not switch boats, as adjusting the footstops may interfere with the rudder alignment. Every effort must be made to have similar shells in quality, size and rigging.

Figure 4.5.9.3a Pair Matrix

Race 1		
BOAT	BOAT	BOAT
1	2	3
A	B	C

Race 2		
BOAT	BOAT	BOAT
3	1	2
A	B	C

Race 3		
BOAT	BOAT	BOAT
2	3	1
A	B	C

As in other matrix racing, the total times allow a comparison between athletes on each side of the boat. As

all pair combinations have an opportunity to row together, the fastest time over the three races may show the best combinations, provided the conditions do not change.

4.5.9.4 Doubles Matrix

The Doubles Matrix allows all athletes to race with and against each other the same number of times. It is also advisable that athletes switch boats and seats to mitigate any shell advantage. Figure 4.5.9.4a rotates four athletes (sculling) through two double shells over three races, as shown in Figure 4.5.9.4a. The results will be the total time for each athlete and allow a comparison with the lowest time representing the fastest boat-mover.

Figure 4.5.9.4a Doubles Matrix (four athletes)

Race 1		Race 2		Race 3	
Boat 1	Boat 2	Boat 1	Boat 2	Boat 1	Boat 2
A	C	A	B	D	B
B	D	C	D	A	C

Figure 4.5.9.4b Doubles Race Matrix shows six athletes rotating through three boats over five races.

Figure 4.5.9.4b Doubles Matrix (six athletes)

Race 1			Race 2			Race 3		
BOAT	BOAT	BOAT	BOAT	BOAT	BOAT	BOAT	BOAT	BOAT
A	C	E	B	F	D	C	A	B
B	D	F	C	A	E	E	D	F

Race 4			Race 5		
BOAT	BOAT	BOAT	BOAT	BOAT	BOAT
E	F	D	F	B	C
A	C	B	D	E	A

The results of the matrix are the total times for each athlete and can be compared to determine the fastest boat-mover.

Seat racing is a highly acceptable form of comparing athletes during selection. Minor differences in the athlete's total times should not be considered conclusive for crew selection, and additional criteria or more seat racing should be considered.