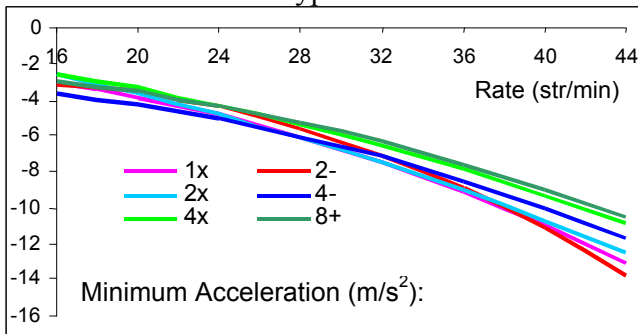## News

☺ Very detailed research measurements were conducted in Canberra during the last month. 25 parameters were measured in a single scull. The purpose of this study was optimization of the gearing ratio.

Facts. Did You Know That…

? …the peak of negative boat acceleration at the catch depends on the stroke rate ($r = -0.79$)? Here are trends in different boat types:


Note that all trends are very close to each other at low rates, but at high rates negative acceleration is more significant in small boats.

? …negative boat acceleration at the catch is more significant in better crews? Here are trends in pairs of national and world champions:
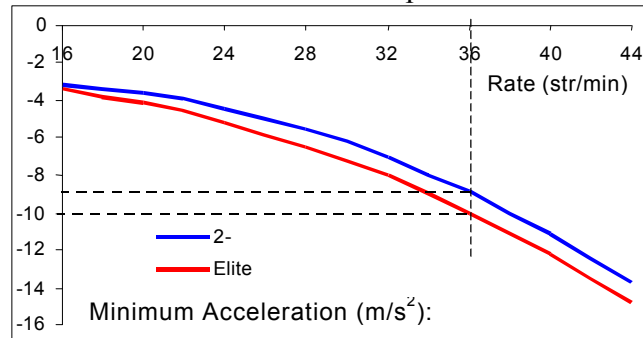

Note that at racing rate the magnitude of the negative acceleration is about $1m/s^2$ more significant in elite crews, but its duration was shorter (RBN 6/2002).

? …the peak of positive boat acceleration also increases with the stroke rate, but not as significantly as peak negative acceleration ($r = 0.33$)? Below are trends in different boat types. They are also very close in different boats at low rating, but their variation is very significant at higher stroke rates. There was no difference found between peak positive acceleration in elite and national level rowers, but the duration of the positive acceleration was longer in elite rowers.
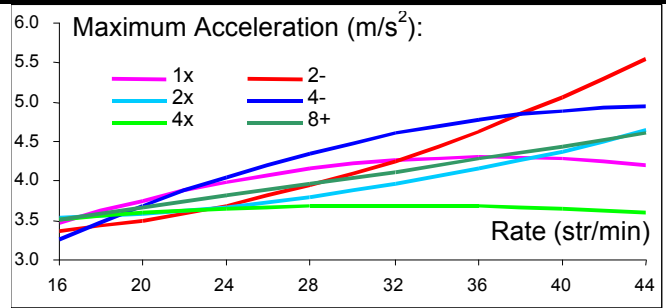
Ideas. What if…

? …you provide immediate feedback on boat acceleration? You can use a simple device consisting of a ball 1, a slope 2 (inclined tray) and circular return tray 3. Kid's toy "marble" can be used for this gadget.
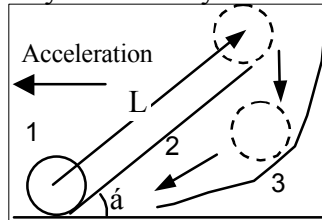
The ball climbs the slope and hits the return tray only if the average boat acceleration, over a certain period of time, exceeds the defined value. The table below gives you angles of the slope α corresponding to the average boat acceleration and the length of the slope L, which defines the time period.

Boat Acceleration (m/s^2)	Slope Angle (deg)	Time period (s)				
		0.1	0.2	0.3	0.4	0.5
		Length of the slope (cm)				
3.0	17.0	1.4	5.7	12.9	23.0	35.9
4.0	22.2	1.9	7.4	16.7	29.6	46.3
5.0	27.0	2.2	8.9	20.0	35.6	55.7
6.0	31.5	2.6	10.2	23.0	40.9	64.0
7.0	35.5	2.8	11.4	25.6	45.6	71.2
8.0	39.2	3.1	12.4	27.9	49.6	77.5
9.0	42.5	3.3	13.3	29.8	53.1	82.9
10.0	45.5	3.5	14.0	31.5	56.0	87.5
11.0	48.3	3.7	14.6	32.9	58.6	91.5
12.0	50.7	3.8	15.2	34.2	60.8	94.9

E.g.: If the ball climbs the slope of the angle 27° and the length 20cm, this means that the average boat acceleration was higher than $5.0m/s^2$ during 0.3s.

The gadget can be used for two purposes: 1) shortening of the time of negative acceleration at catch (step angle, short slope, the ball must NOT hit the return tray); 2) increasing of the magnitude and duration of the positive acceleration during the drive (flatter angle, longer slope, the ball MUST complete the climb). Try it!

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