



Facts. Did You Know That...

- ✓ ...statistical analysis of body segments work can be done using our rowing biomechanics database. Currently, we measure trunk displacement only in small boats (singles, doubles and pairs), therefore number of samples included in analysis is less than total size of database (1430 out of 6000):

Number of samples in each rowers' group (n).

Men Scull	M.Light Scull	Men Sweep	M.Light Sweep	Women Scull	W.Light Scull	Women Sweep
180	136	335	105	121	100	453

- ✓ ...on average, each of three body segments contributes approximately one third of total length of the stroke arch (legs a bit more, trunk a bit less). Both male sculling groups have significantly lower percentage of the trunk displacement and correspondingly longer arms drive:

Displacement Shares (%)	Legs (%)	±SD	Trunk (%)	±SD	Arms (%)	±SD
Men Scull	35.1%	2.1%	28.0%	4.3%	36.9%	3.0%
M.Light Scull	34.1%	2.3%	28.6%	3.1%	37.3%	3.0%
Men Sweep	35.4%	1.9%	31.5%	4.4%	33.1%	4.5%
M.Light Sweep	36.7%	3.4%	31.5%	6.0%	31.7%	4.6%
Women Scull	34.6%	2.2%	32.9%	4.6%	32.5%	4.0%
W.Light Scull	34.1%	2.8%	33.5%	3.2%	32.4%	2.8%
Women Sweep	35.4%	2.8%	31.8%	4.5%	32.7%	4.4%
All rowers:	35.2%	2.6%	31.2%	4.6%	33.6%	4.4%

- ✓ ...legs execute their work during the first half of the drive, when the force exertion is maximal (1). Therefore, legs produce nearly half of rowing power; trunk produces nearly one third and arms a bit more than one fifth. Male scullers have nearly equal power produced by trunk and arms:

Power Shares (%)	Legs (%)	±SD	Trunk (%)	±SD	Arms (%)	±SD
Men Scull	45.7%	5.2%	28.2%	4.9%	26.1%	3.8%
M.Light Scull	46.9%	3.2%	27.7%	3.0%	25.4%	2.2%
Men Sweep	46.7%	4.5%	31.6%	5.0%	21.7%	5.9%
M.Light Sweep	49.7%	5.9%	31.3%	6.5%	19.0%	3.2%
Women Scull	45.2%	3.8%	32.3%	4.1%	22.6%	5.0%
W.Light Scull	44.6%	4.3%	33.1%	3.8%	22.3%	3.2%
Women Sweep	46.6%	4.2%	31.3%	4.8%	22.1%	4.6%
All rowers:	46.4%	4.5%	30.9%	5.2%	22.7%	5.2%

- ✓ ...the following table can be used for assessment of the percentage of the trunk power:

	Very Low	Low	Average	High	Very High
Trunk Power (%)	20.5%	25.7%	30.9%	36.1%	41.3%

- ✓ ...legs increase their percentage of power together with growths of the stroke rate. The following table can be used for assessment of the legs power share at various stroke rate:

Legs Power (%)	20	24	28	32	36	40
Very Low	35.7%	37.0%	38.1%	39.1%	39.9%	40.6%
Low	40.0%	41.3%	42.4%	43.4%	44.2%	44.9%
Average	44.3%	45.6%	46.7%	47.7%	48.5%	49.2%
High	48.6%	49.8%	51.0%	51.9%	52.8%	53.5%
Very High	52.9%	54.1%	55.2%	56.2%	57.1%	57.7%

- ✓ ...percentage of the arm power has opposite trend: it decreases when the stroke rate increases. You can use the following table for assessment of the arms power share at different stroke rate:

Arms Power (%)	20	24	28	32	36	40
Very Low	15.7%	15.0%	14.0%	12.9%	11.7%	10.2%
Low	20.0%	19.3%	18.3%	17.2%	16.0%	14.5%
Average	24.3%	23.5%	22.6%	21.5%	20.2%	18.8%
High	28.6%	27.8%	26.9%	25.8%	24.5%	23.1%
Very High	32.9%	32.1%	31.2%	30.1%	28.8%	27.4%

Ideas. What if...

- ? ...you increase percentage of the trunk power? It should bring you more rowing power and help you to achieve higher boat speed. We found that trunk muscles utilize only about 55% of their work capacity during the rowing. The same time the arms utilization is about 75% and the legs uses up to 95% of their power. These values were obtained during 7 minute tests on a rowing ergometer. Four tests were performed for each of 14 rowers: three for each body segment and one with full length rowing. Better rowers showed higher percentage of the trunk work capacity utilization.

News

- ☺ We can help you to assess body segments work of your rowers. Contact us for further details.

References

- 📖 1. Kleshnev V., 1991, Improvement of dynamical structure of the drive in rowing. Ph.D theses. Saint-Petersburg Institute of Sport, pp. 49.

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