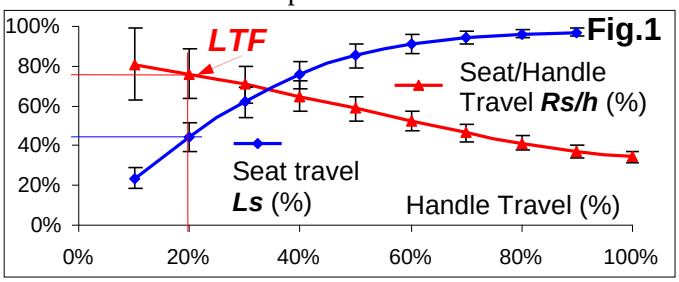
Rowing style indicator

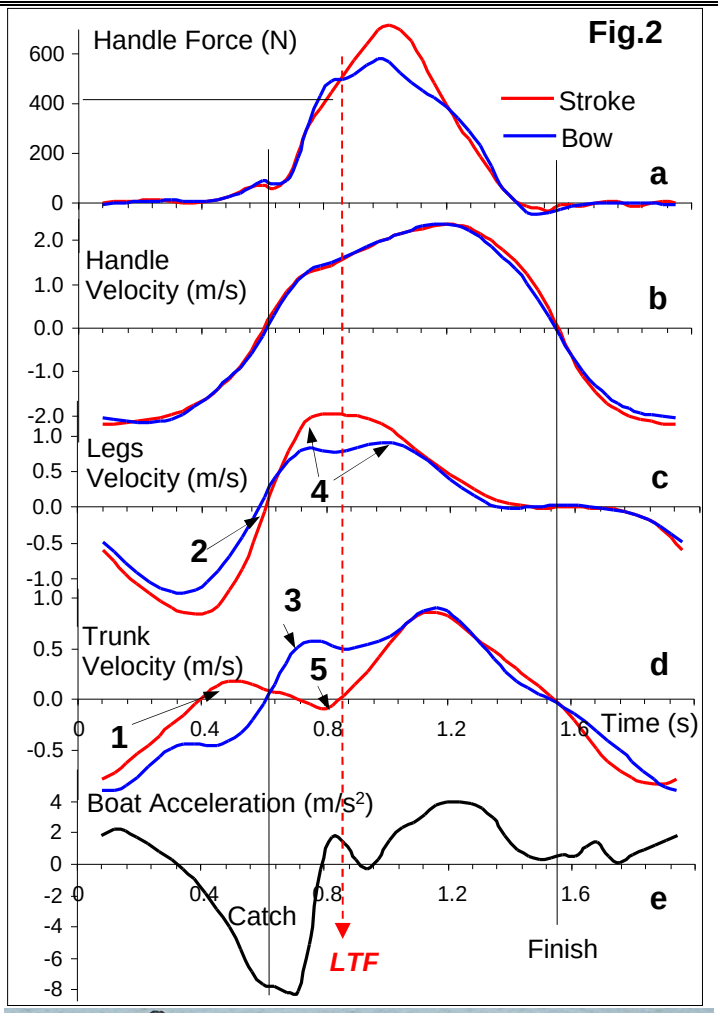
In the last newsletter, the Catch Timing Factor ***CTF*** was identified and now an indicator of leg and trunk coordination during the beginning of the drive will be defined, which is related to rowing style (RBN 2006/03).

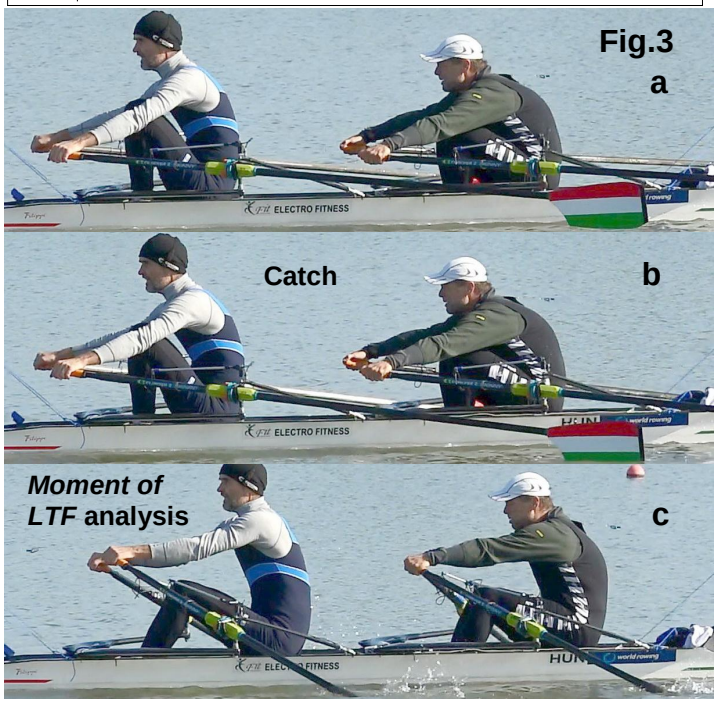
A travel length of the middle of the handle was derived from the measured horizontal oar angle and actual inboard length (RBN 2011/04). Then, the ratio ***Rs/h*** of the seat movement ***Ls*** to the handle travel ***Lh*** was found at 10 equally distributed points during the drive length (Fig.1, M±SD, n=21490). Also, portions of the total seat travel ***Ls***(%) were calculated, which shows how much the leg drive was utilised at each point.



It was decided that ***Rs/h*** at 20% of the handle travel is the best representative of the rowing style, so it was called Legs-Trunk Factor ***LTF***. At this point, the legs velocity usually achieves its maximum (Fig.2, c); the acceleration of the boat has just passed its first peak (e), which means the transition from the D3 micro-phase "Initial boat acceleration" to D4 micro-phase "Rower's acceleration" (RBN 2004/01, 2013/07); the heels are "landing" on the footboard and the knee angle is close to 90deg, which is the best position to start using the trunk (RBN 2008/07). When the value ***LTF*** is close to 100%, it means the seat and handles travelled the same distance (Rosenberg and Grinko styles); values ***LTF*** higher than 100% mean "slide shooting" – the seat has travelled further than the handle; the lower ***LTF*** value, the slower the legs and the more significant contribution of trunk and/or arms into the handle travel (Adam and DDR styles). The average ***LTF*** was found 76.0%±12.4%, and ***Ls20*** was 44.3%±7.0%. In the World's best rowers, the ***LTF*** was 85-95%, and ***Ls20*** was 44-48%, which means they use more legs and less trunk and arms than the average rowers' population.

CTF had a mild negative correlation with ***LTF*** (r=-0.33), which means an earlier change of direction of the seat at the catch (lower ***CTF***) helps to increase leg utilisation during the start of the drive (higher ***LTF***). However, it is not the same and an example below illustrates it (Fig.2 and 3, M2x at 32str/min). The stroke "opens his trunk" before the catch (Fig.2,1, Fig.3,a) and changes direction at the seat later than bow (2), who performs the "catch through the stretcher": his ***CTF*** was -34ms compared to only -3ms in the stroke sculler. Immediately after the catch (Fig.3,b), the bow activates the trunk (Fig.2,3, Fig.3,c), which slows down his legs, so his peak legs velocity is much lower and later than in the stroke (4). The stroke shows a negative trunk velocity, when the legs speed is maximal (5) – his seat moves faster than the handle, which is called "slide shooting", so his ***LTF*** was 101.9%. In bow, the ***LTF*** was 67.9%, which means he opens the trunk too early.





This example clearly shows that **"catching through the stretcher" and "slide shooting" are two different things**.

The best drill to develop the correct segments coordination is rowing "catches only": after a quick "catch through the stretcher", the drive should be cut at the position on Fig.3,c - at knee angle 90deg and handles located on top of the stretcher. The trunk should firmly hold the load and its angle should not be changed.

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