ACADEMIC RESEARCH IN EDUCATIONAL SCIENCES VOLUME 2 | ISSUE 6 | 2021
ISSN: 2181-1385
Scientific Journal Impact Factor (SJIF) 2021: 5.723
DOI: 10.24412/2181-1385-2021-6-1442-1450

STARTING ACTIONS OF ROWERS ON KAYAK AND CANOE

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ABSTRACT

In our studies, we have established a reliable relationship between the maximum speed developed at the start and the final result at a 500-meter distance in all groups of kayakers (men and women) and canoeists.

Keywords: start, maximum speed, rowers, analysis, pace, effort.

INTRODUCTION

In rowing and canoeing, the role of the start is very significant. In our studies, we have established a reliable relationship between the maximum speed developed at the start and the final result at a 500-meter distance in all groups of canoeists (men and women) and canoes. In some cases, the effectiveness of the start is more than 50% determining the final result. There was also revealed the dependence of the results of passing the competitive distance of 500 or 1000 m on the value of the indicators of working activity, recorded at the start. Thus, the starting speed, mechanical power, strength and tempo parameters largely determine the overall performance, as evidenced by the reliable values of the correlation coefficients of these parameters with the distance covered.

The specificity of work activity in certain types of kayaking or canoeing is manifested in a complex influence on the final result for men on kayaks - starting pace and efforts, for men on a canoe - strength parameters, for women on kayaks - a high pace. From the above it follows that increasing the start efficiency will improve the result over the entire competitive distance. At the same time, it is important not only to quickly accelerate the boat and win a leading position, but also to switch to distance rowing in a timely manner, since too long a starting segment, passed with maximum intensity, causes a significant accumulation of lactic acid (lactate) in muscles and blood. In the future, closer to the finish line, this will inevitably lead to a decrease in performance. In this publication, we characterize the starting activity of kayak and canoe rowers, clarify the optimal duration of individual components and

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the start in general, and also offer a number of recommendations to improve the effectiveness of the start.

MATERIALS AND METHODS

The start consists of components that have fundamental features and differences between themselves and with work activities for the rest of the distance. The first component, the starting reaction, is divided into two parts: the time from the moment of the start signal to the start of the oar movement and the time from the start of the oar movement to the start of the boat movement. In connection with the change in the rules of the competition, which regulated the interval of 2 s from the "Attention" command to the start signal, the long-term presence of the athlete in a state of readiness for start is excluded. The effectiveness of the second part of the starting reaction depends on the correct starting position and maximum mobilization. The second component of the start is the starting (initial) acceleration, ending with the achievement of maximum speed. Finally, the third component defines the period of relative speed stabilization, which is sometimes not quite accurately called the starting acceleration, since in this case no acceleration occurs.

The rower's work at the start has a number of fundamental features associated with a sharp transition from the state of relative rest to the work of maximum intensity, the great inertia of the rower-boat system during acceleration and the need to reach the highest speed as soon as possible. In our observations, including the examination of competitive activity, modeling of the start and multiparametric registration of working activity throughout the entire competitive distance, it was possible to determine the characteristic features of the starting activity of rowers. At the same time, there was no significant difference between the starting activity at distances of 500 and 1000 m. This factor allows us to apply a single method of increasing the effectiveness of the start at both distances.

RESULTS AND DISCUSSION

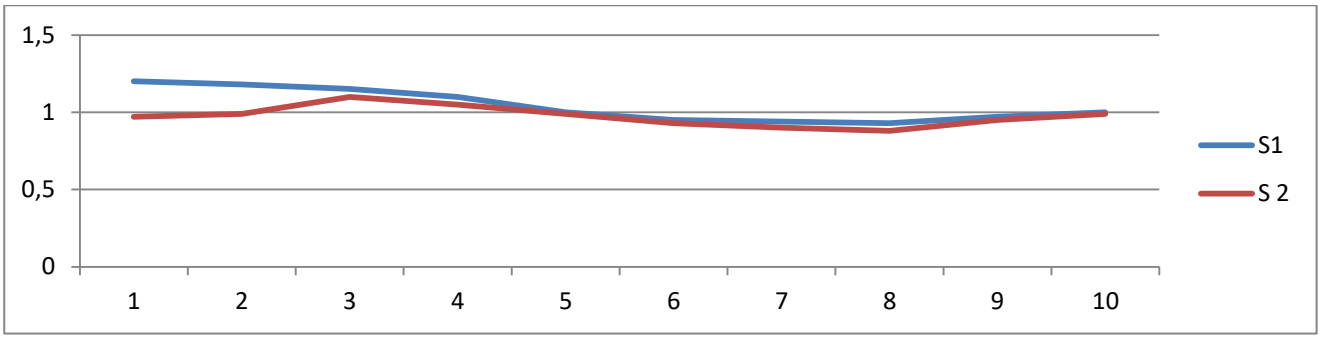
It was found that the rower's technique indicators at the start exceed the average distance at a 500-meter distance: by pace - by at least 10%, maximum and average efforts by 19 and 25%, respectively, by a gradient of increasing efforts - by 16% or more, by speed - by by 8 - 10%, in terms of capacity by almost 40%. The length of the entire starting segment ranges from 70 to 110 m, and in time - from 15 to 25 s. The starting acceleration for kayak rowers, both for men and women, averages 14 strokes. Athletes walk about 25 m and develop maximum speed. In a

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canoe, it takes 10 strokes to reach maximum speed, and rowers travel approximately 30 m.

On the first strokes after the start signal, the greatest unevenness of the boat movement in the cycle was noted, amounting to 20-30% in a kayak and up to 80% in a canoe. This situation is explained by the significant inertia at the start of the boat-rower system, which has a serious effect on maintaining speed in the cycle, especially in its unsupported period. It should be noted that the unevenness of movement at a distance is about 10% in a kayak and 40% in a canoe.

The absolute value of the forces on the paddle blades during the starting acceleration in some cases reaches 32 kg in a canoe, and in a kayak for men over 27 kg. This means that the force of the canoe's pulling arm can exceed 65 kg, and that of the kayaker - 40 kg.



Dynamics of the cycle time when using the basic start options (average data of the starting acceleration).

The amplitude of the body turn in kayak rowers gradually increases from 75 ° during the first cycle to 112 - 115 ° by the end of the acceleration. The period of relative stabilization of speed begins after reaching its maximum and continues until the transition to the distance mode of rowing with significant individual deviations in time and distance (from 45 to 80 m). At this time, the indicators of speed, efforts, mechanical power and amplitude characteristics are stabilized. The main task of the rower here is to maintain the speed achieved as a result of the starting acceleration.

In modern practice, we have recorded the two most common start options. The first is characterized by a relatively low rate - 90 - 100 rpm and a high amount of effort during acceleration. The dynamics of the cycle time at the start at distances of 500 and 1000 m in rowing and canoeing shows a gradual decrease in the cycle time until the moment the maximum speed is reached (figure). The second option is characterized by a higher rate - 120 - 130 rpm and slightly lower forces on the paddle blade. The dynamics of the cycle time in the second variant of the start shows that rowers using this variant spend less time performing the first 7 - 8 cycles. As a result, the set of maximum speed in either case occurs after 7 - 8 cycles, but in the second

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variant, this work takes less time. With the second variant of the start and after the end of the starting acceleration, a higher rate is observed (see figure).

In a men's kayak, where the so-called swing rowing technique is adopted, its use at the start is undesirable. To increase the power accent of the stroke movement, the athlete is slightly inclined forward, the amplitude of the trunk turn is relatively small, the stroke at the beginning of the starting acceleration is shortened. It is obvious that it is advisable to position the oar blade and create support as close as possible to the longitudinal axis of movement and to the side of the boat. Despite the power and speed of movement, the paddle blade should not pierce the water, since in this case support will be lost, to which the boat should be actively pulled. During the first stroke, water breakthrough is avoided due to the fact that the blade at the starting position of the rower almost touches the water or is partially submerged in it.

If at the beginning of the starting acceleration a high rate of movement can be achieved only with a shortened stroke, with an increase in speed, the maximum rate of rowing is accompanied by the maximum amplitude of the trunk turn and paddle movement. The technique of movements changes and approaches the swing version, the body straightens. Particular attention is paid to the capture of water by the paddle blade as close to the side of the boat as possible. Coordination of movements in the first strokes is facilitated by the high rowing frequency and the shortened unsupported period.

Later, after reaching the maximum speed, the athlete, continuing to walk at the maximum pace, at the same time gradually begins to prepare for the transition to the distance rowing mode, corresponding to distances of 500 or 1000 m.To do this, he synchronizes his breathing with the rhythm of the stroke, inhaling under one and exhaling under the other hand, determining the power accent of the stroke, while simultaneously slightly increasing the unsupported period; tries to maintain a high speed due to more accurate paddle work, increasing the uniformity of the boat. Having well felt the work of the muscles of the arms and trunk, the course of the boat, the rower switches to the usual, previously worked out distance rowing mode.

Another variant of the start is also possible, when the first strokes (4 - 6) are performed with full amplitude and maximum effort. A high level of special strength and good coordination abilities allow in this case to effectively carry out the starting acceleration without losing to competitors. Subsequent strokes are performed at the maximum pace. This starting option is still not the best.

The complexity of the starting actions of the rower-kayaker is explained not only by the need to maintain balance, the difficulty of transferring efforts from the

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support through the arms, trunk, pelvis and legs of the rower, the presence of freedom of movement of the paddle, arms, trunk. The point is that the choice of the oar blade area is determined based on its operation under the conditions of boat movement, when the rapid movement of the blade when capturing water in an arc ("comma") creates a support sufficient to perform a stroke and move the boat past this support.
In conditions when the movement of the boat is insignificant or it is stationary, such a movement of the oar blade when catching often causes a shock, the blade breaks through the water, not providing sufficient support. But even with a successful grip, the large effort required to overcome the inertia of the rower-boat system causes a significant displacement of the oar blade into the water, that is, the oar blade largely drives the water back, and does not provide support to which the boat is pulled. Visually, this can be traced by the large amount of splashes, the tension of the muscles of the arms, trunk, shoulder girdle, the relatively slow movement of body links, corresponding to the movement of the paddle blade.

Single canoe rowing has its own specificity of starting, due, in particular, to rowing with a single-bladed oar. At the moment of start, the canoeist places the boat at an angle of 20 - 30 ° to the direction of movement towards the inner side. This is done so that, due to the first powerful strokes, without resorting to taxiing, not only accelerate the boat, but also bring it on course. The effort in the first strokes is accentuated in the first third of the reference period. With an increase in speed, the emphasis of force shifts back a little, providing an increase in the uniformity of the boat. At the same time, the amplitude of movement of the paddle and body links increases. As in the kayak, the transition to distance rowing occurs gradually, after the rowing technique has stabilized and the starting segment is completed.

The effectiveness of the launch in command boats essentially depends on the coordination of the actions of the crew members. In case of good technical compatibility, the starting acceleration time is practically equal to that recorded in single boats. The length of the starting acceleration and starting segment in command boats is 10 - 20% longer than in solo boats, since their maximum and distance speeds are higher.

The bulk of work to improve the start efficiency is carried out in the competitive period, but a number of measures to create the prerequisites for improving the start quality must be carried out in the base period. These activities include:
- regular passage of short 10 - 20-second segments on the move during exercise to develop aerobic mechanisms of energy supply;

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- increasing special strength with the help of exercises on land (simulators, barbell) and on the water (starts, rowing with a hydraulic brake);
- the use of exercises on land and on the water to improve coordination abilities (passing short sections on the move and from the start, including in adverse weather conditions - in the presence of wind and excitement; gymnastic exercises, etc.).

The complex of methodological techniques and special exercises for use in the competitive period takes into account the inclusion in the work plans of a number of microcycles of special classes (up to 3 - 4 in a microcycle), aimed at increasing the effectiveness of the start. The total volume of speed rowing with maximum intensity (short sections and starts) is planned within 15% of the entire speed rowing in a microcycle. The length of the segments is from 50 to 100 m, and in time - from 10 to 25 s.

CONCLUSION

Considering that the start is a work of a speed-power nature, the impact on the power component is carried out through the use of additional weights of 5-10 kg (individually) and passing the segments exclusively from the start with full motivation and mobilization. To increase the effectiveness of the start, it is preferable to schedule classes in the morning or afternoon hours.

Some of the short stretches and starts are included in classes aimed at improving special competitive endurance. In this case, short sections pass not only at the beginning of the lesson, but also at the end, if the load in the lesson was not significant. The rest intervals between the segments exceed the working time by 6 - 8 times, and between the series are 5 - 10 minutes.

The number of 10 - 15-second segments and starts when using the alternating and repeated method in a training session is maximum 30 - 35%.

To control the quality of the launch, the models of the rational launch option are defined, presented in the table. Some of the indicators (efforts, power, amplitude) can only be controlled using instrumental research methods, but the control of others is available to any coach.

At the same time, the effectiveness of the starting acceleration can also be monitored by the result shown on 25 or 50-meter sections from a standstill, and the maximum speed - according to the time of passage of these sections on the move.

Table

Rational start models (adults and boys)

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Rowing type	Parameters									
	Time in segm. 75ms	Start accel. time. s	Length of start segm. м.	Max. Pace str/min	Vmax, m/s	Fmaxm/s	Fav kg	N, kg m/s	Dist. per cycle m.	Amp. torso turn gradus.
K-1 men	15,0	9,0	90	145	5,5	26	18	62	4,5 - 5,0	110
K-1 MJ	16,0	9,5	80	140	5,3	23	16	55	4,5 - 5,0	110
C-1 men	16,5	8,5	85	80	5,2	31	20	56	4,0 - 4,5	—
C-1 MJ	17,5	9,0	80	78	5,0	28	18	50	4,0 - 4,5	—
K-1 women	17,0	8,5	85	137	5,0	18	12	36	4,3 - 4,7	110
K-1 WJ	18,0	9,0	75	132	4,8	15	11	30	4,2 - 4,6	110

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