ISSN: 2710-0588

Technical and Tactical Analysis of Men's Dragon Boat Sprint Racing

Tao Liu[1, a]

[1]Physical Education Department, Shanghai Maritime University, Shanghai, 201306, China

[a]taoliu@shmtu.edu.cn

Abstract

This study analyzes the 200-meter race of the university dragon boat championship using methods such as questionnaires, interviews, literature review, and observation. Through statistical analysis of the techniques and tactics of the top three teams in the 200-meter race, the results indicate that the technical structure is characterized by fast starts, quick stroke frequency, and effective water catching. Furthermore, the organic combination of physical fitness and technique, along with the adoption of a "preemptive" tactic, is undoubtedly a crucial guarantee for achieving victory in dragon boat competitions.

Keywords

Dragon Boat; Stroke Frequency; Techniques and Tactics.

1. Introduction

China's ethnic traditional sport—dragon boat racing, is a water sport that not only entertains and strengthens the body but also promotes patriotism and the spirit of collectivism. Since the late 1980s, dragon boat racing has become popular internationally. Dragon boat competitions were officially included as a sporting event in the 2010 Guangzhou Asian Games. Modern competitive dragon boat racing has become a global sport, with the level of various dragon boat events continuously improving, competitions becoming more intense, and the margins of victory becoming smaller. This article employs methods such as surveys, video analysis, and literature review to conduct a statistical analysis of the technical characteristics and tactical applications of the top three teams in the 200-meter race of the university dragon boat championship, aiming to explore new trends in the development of techniques and tactics.

2. Sail Technical Characteristics

A good start represents half of the success in a race. Each competition sees the starting point as the area where issues are most likely to arise. Therefore, the starting technique in dragon boat racing is particularly important, especially in the short-distance 200-meter races. If an advantage can be gained at the start, it boosts the entire team's belief in winning and elevates morale, providing a significant psychological advantage, enabling paddlers to put in even more effort. Conversely, a poor start can easily lead to a psychological setback, diminishing morale and causing paddlers to lose their energy. The success of the start depends on the coordination of the entire team's technique and racing experience.

The advantages gained from taking the lead in dragon boat racing are manifold, and this has been repeatedly proven in competitive dragon boat practice. When both teams are closely matched in strength, the dragon boat that gains an early lead at the start often maintains this advantage until the finish line. Thus, achieving an early lead after the start is particularly crucial. The start of the dragon boat race—transitioning from a stationary state to reaching a high speed

ISSN: 2710-0588

in a short time—relies on excellent starting techniques to ensure that the boat can immediately take the lead. A poor start will undoubtedly place the dragon boat in a disadvantaged position. The general requirements for starting are punctuality and speed, and there are various methods for starting, each with different requirements.

Fixed starting involves having a referee boat positioned behind the starting line in each lane, which immediately releases the competing dragon boats upon hearing the starting gun signal. The requirements for the dragon boat's fixed start are for athletes to begin rowing promptly, quickly transitioning from a stationary state to high-speed movement. To achieve this, all paddlers must be: precise, powerful, fast, and synchronized.

1) Precise — Timeliness is key. After the dragon boat enters the lane, before the starting signal is issued, the steersman or drummer commands all paddlers to concentrate fully, positioning the dragon boat in the center of the starting line, with the bow aligned with it. With 20 seconds left to the starting signal, all paddlers should perform uniform preparatory actions. The Shanghai Maritime University dragon boat team employs a submerged paddle start technique; before the starting signal, paddles are already placed in the water. As soon as the starting gun fires, all paddlers swiftly pull the water, saving time from preparation to paddle entry, which provides a preemptive advantage and ensures that the dragon boat takes the lead immediately after the start.

2) Powerful — Once the paddle blade enters the water, the arms should pull the paddle with 100% strength while ensuring the angle between the paddle blade and the water surface is maintained at less than 90 degrees.

3) Fast — Quick paddling should achieve a stroke frequency of 80-110 strokes per minute. The stroke arc should be short; after quickly paddling 15-25 times to gain initial speed, the paddlers should gradually increase the stroke arc and begin paddling with a larger arc.

4) Synchronized — In the brief seconds of the start, with a fast stroke frequency and short arc, if paddlers do not synchronize their movements while exerting maximum effort, the dragon boat cannot attain a unified force point instantly and cannot quickly transition from a stationary state to high-speed forward movement. Therefore, paddlers must ensure uniform depth of paddle entry, angle of entry, and speed of action while paddling at high speed. Additionally, during the return stroke, paddlers should remember to rotate the paddle blades to reduce air resistance.

Table 1. Statistics of Starting Speeds for the Top Three Men's 200-Meter Teams in the 3rd World University Dragon Boat Championship

	Shanghai Maritime University	Northeast Electric Power University	Beihua University
Number of Strokes	20	19	18
Completion Time (seconds)	14.45	14.76	14.96
Starting Distance	50 meters	50 meters	50 meters
Rank	1	2	3

Among the top three teams in the men's 200-meter dragon boat sprint at the 3rd World University Dragon Boat Championship, the team with the most distinctive starting technique is the Shanghai Maritime University Dragon Boat Team. This team employs a submerged paddle start technique, achieving a total of 20 strokes at the start. Beihua University team utilizes a traditional preparation position with the paddle held aloft for the start, while Northeast Electric Power University also uses the traditional preparation stance with the paddle held aloft, but

ISSN: 2710-0588

with a high stroke frequency to initiate the race. Each of the top three teams displays different characteristics in their starting techniques.

From the data statistics in Table 1, it can be observed that at the same starting distance of 50 meters, the number of strokes differs among the top three teams. The faster the stroke frequency, the quicker the starting speed. The Shanghai Maritime University Dragon Boat Team completed 20 strokes over the 50-meter starting distance, finishing in 14.45 seconds, which is the highest frequency among the top three teams. By adopting the submerged paddle start technique, they saved time from preparation to paddle entry, gaining a preemptive advantage that ensured they achieved the lead immediately after the start, resulting in noticeable paddle effectiveness, allowing them to seize the initiative and maintain a leading advantage.

The Beihua University team completed 18 strokes while seated over the same 50-meter starting distance, resulting in a speed that placed them third. The Northeast Electric Power University team completed 19 strokes over the same distance, finishing in second place. This indicates that the use of the submerged paddle start technique improves stroke frequency. With the stroke distance unchanged, a higher stroke frequency allows for greater distance covered in the same amount of time; or for the same distance, less time is required to complete it. Theoretically, from a kinematic perspective, both stroke frequency and stroke distance are equally important in dragon boat starting technique. It is crucial not to emphasize one aspect while neglecting the other. A precise understanding of the athlete's height, arm length, specific attributes, and the effectiveness of their strokes, combined with the appropriate coordination of stroke frequency and stroke length, will maximize speed. The results of the competition indicate that the excellent performance of the Shanghai Maritime University Dragon Boat Team is closely linked to the rational combination of their stroke frequency and stroke length.

3. Mid-Race Technique

After the dragon boat's start is completed, due to the increased speed resulting in greater inertia, energy metabolism characteristics, and tactical requirements, the stroke frequency should generally be reduced or maintained while making the maximum effort to increase the stroke distance. The mid-race speeds of the three teams are shown in Table 2.

Table 2. Statistics of Mid-Race Speeds for the Top Three Men's 200-Meter Teams in the 3rd World University Dragon Boat Championship

	Shanghai Maritime University	Northeast Electric Power University	Beihua University
Number of Strokes	40	39	38
Completion Time (seconds)	26.4	27.02	27.42
Racing Distance	100 meters	100 meters	100 meters
Rank	1	2	3

From the data statistics in Table 2, it can be observed that the mid-race stroke frequency of the Shanghai Maritime University Dragon Boat Team not only did not drop below their starting stroke frequency but was slightly higher than their starting frequency. This consideration was made by the Shanghai Maritime University Dragon Boat Team because the 200-meter sprint is a very short distance. If the stroke frequency were to decrease, there would be a risk of other teams catching up, thereby losing the advantage gained at the start. Therefore, the team members maintained or slightly increased their stroke frequency to pressure their opponents and deny them any chance to recover. This technique and tactic are closely tied to regular

ISSN: 2710-0588

training, requiring all team members to understand the coach's intentions and continuously adjust to each other. During the initial phase of training for this technique and tactic, many paddlers had difficulty keeping up with the required frequency, necessitating repeated training. Additionally, physical training must not be neglected, especially land-based 400-meter running drills. The 400-meter event is characterized as a "long-distance" short sprint, which is primarily anaerobic with a smaller aerobic component. The energy expenditure methods, timing of exertion, and characteristics of the 400-meter event exhibit certain similarities to the 200-meter dragon boat sprint.

4. Sprinting Technique

Sprinting is the most critical phase in dragon boat racing. In the men's 200-meter event at the 3rd World University Dragon Boat Championship, the top three teams had sprinting distances of about 50 meters, all employing a high stroke frequency. For high-level athletes, the effectiveness of the entire stroke cycle is at its peak when they maximize their forward reach during the stroke. The entire process of paddling is highly dynamic, from paddle insertion, pulling water, lifting the paddle, to returning the paddle. The athletes' trunk and core engage in powerful movements much like elite breaststroke swimmers who utilize their torso and core to create whip-like motions. Analysis of the competition footage clearly shows that the paddlers of the Shanghai Maritime University team appear relaxed when returning the paddle, with the low hand, trunk, and core fully extended. During the paddle insertion and water pull phase, the low hand and torso rapidly contract and bend. Upon completing the water pull and paddle lift, the low hand, torso, and core quickly thrust forward and extend. The entire paddling motion is very fluid with a strong sense of rhythm. Because the paddlers of the Shanghai Maritime University team can effectively utilize the short moments of relaxation between paddle insertion, water pull, paddle lift, and return during the sprinting phase, they effectively delay the onset of fatigue, allowing them to maintain better physical condition and achieve excellent results.

Table 3. Statistics of Sprinting Speeds for the Top Three Men's 200-Meter Teams in the 3rd World University Dragon Boat Championship

	Shanghai Maritime University	Northeast Electric Power University	Beihua University
Number of Strokes	18	17	17
Completion Time (seconds)	12.98	13.26	13.49
Sprint Distance	50meters	50 meters	50 meters
Rank	1	2	3

From Table 3, it can be seen that during the final sprint phase, Beihua University team had a stroke frequency of 75.61 strokes per minute, taking the longest time of 13.49 seconds; Northeast Electric Power University team had a stroke frequency of 76.92 strokes per minute, finishing second with a time of 13.26 seconds; while the Shanghai Maritime University Dragon Boat Team had the highest stroke frequency of 83.2 strokes per minute and the shortest time of 12.98 seconds, achieving the best paddling performance during the sprint phase.

5. Conclusions

In conclusion, the 200-meter dragon boat sprint is a competition that demands high speed and endurance. Regardless of the tactical approach employed, consideration must be given to one's

ISSN: 2710-0588

own speed, endurance levels, and the situation of opponents to develop effective energy distribution plans and determine the timing for changes in stroke frequency to optimize competitive performance and achieve the best race results.

The tactical strategy in dragon boat racing is realized through control of rhythm (stroke frequency) and proper allocation of physical effort during the phases of the start, mid-race, and sprint. Typically, high-level teams adopt a preemptive strategy, meaning they aim to take an early lead with speed that exceeds all competitors at the start of the race. This creates a psychological advantage, disrupting the rhythm of opponents while striving to maintain their own advantage throughout the competition, pushing to the finish to ultimately secure victory.

References

[1] Liu Huatian, Zheng Jiarun. Dragon Boat Techniques and Training [M]. Beijing: Beijing Sport University Press, 2002.

[2] Ni Yike, Sun Hui. The Social Character of Chinese Dragon Boat Culture [J]. Journal of Chengdu Sport University, 1998(3).

[3] Ma Yong, He Zhaoze. An Analysis of the Development and Characteristics of "Dragon Boat Racing" [J]. Journal of Jilin Sport University, 2006(1).

[4] Liu Jingnan, Xu Bo. Dragon Boat Racing in the 21st Century [J]. Journal of Beijing Sport University, 2001(12).

[5] Yin Lingling. Technical and Tactical Analysis of World-Class Men's Short-Distance Freestyle Swimmers at the 27th Olympic Games [J]. China Sports Science and Technology, 2001(10).