

STROKE VARIATION

BY PATRICK DEVINE

In 2008, I wrote an article with the same title. Following the Olympics is an appropriate time to edit the topic with updated observations.

There are many variations in swimming technique not just between swimmers but your individual stroke will vary from sprints to distance and from pool to open water. Freestyle will be the focus. There are 5 Olympic distances. With the form strokes only two distances in each discipline, exist at Olympic competition but variation is pronounced particularly to suit individual body types.

There are some wonderful videos on YouTube of some of the very best swimmers. This time it was difficult to locate recent video of some major swimmers. There has been an explosion of less useful footage. The earlier article featured Phelps, Eamon Sullivan, Grant Hackett, and Libby Trickett etc. Now the roll call is evolving. James Magnussen, Alicia Coutts, Cate Campbell, Corey Jones, Nathan Adrian, Yannick Agnel, Alison Schmitt and Sun Yang are swimmers of today who feature in underwater footage of major races. Analysing some of their strokes is beneficial to our swimming and please search for the others. There is significant variation of stroke for different distances. Michael Phelps remains master of his particular style of swimming with great underwater work following the dive and turn, substantial hip rotation, asymmetrical catch up with a long glide on the left hand while breathing on the right side. His body is almost "totally immersed" by contrast to the 50 metre sprinters. His stroke has an incredible efficiency but requires the application of great strength for each stroke. His body is suited to that stroke. Yannick Agnel is the 2012 Olympic 200m freestyle champion with a very different stroke. The catch-up and body rotation are reduced. His hand timing is that of a sprinter with one hand always producing power. They are almost 180° apart. His first lap took 28 strokes. His flowing stroke makes many of the opposition look ponderous. Videos of Michael Phelps four years earlier, for the same distance required 23 strokes for the first lap and a substantial catch up. Phelps kicks with power on the upbeat as well as the downbeat. A pioneer of this technique was George Haines' squad in 1964. Possibly the swimming world has become obsessed with the Michael Phelps swimming stroke while many top swimmers of today have moved on and found swimming strokes that suit their bodies. Many swimmers are not physically equipped to copy Phelps but can find other role models.

In the 50 metre freestyle sprint, the swimmers sacrifice stroke efficiency to expend their power over the short distance. The sprinters come up from their dive very quickly, swim very flat with little hip rotation and have a very fast stroke tempo. In setting one of his world records, Eamon Sullivan took 44 strokes for the distance. The sprinters appear to time their hands so that one hand is entering the water as the opposite is exiting. The "catch" is almost at hand entry. The body balance is precise. I am told that Libby Trickett practices freestyle balanced on two kick boards under her chest. The kick is shallow and has incredible speed and power. All sprinters use a six beat kick. While most top swimmers would use that technique up to 400metres, many masters swimmers would use a 2 beat kick for much of the 400 metres. Callum Jones finished second in the 50 metres freestyle in London. His body balance and strength are superb. His stroke features immediate catch, rotation of the shoulders but not the hips and 39 strokes per 50 metres. His head is completely steady. Breathing does not disrupt his stroke as he doesn't take a breath.

The catch-up, front `quadrant stroke is very efficient but slower. Few on the successful swimmers at London used this technique. Sun Yang's stroke features a comparatively long glide of the front hand on entry but because the propelling hand holds the water and takes a longer time through the stroke, the catch-up is less than three quarters.

Not every swimmer copies James Magnussen's stroke for the 100 metres freestyle. He is very strong. While many swimmers feel "going down-hill" with the head and chest, James' body is at a slight incline with head higher. After entry his hands and shoulders extend forward. The catch has a down movement before pulling back. This lifts the shoulders and head. The hand move deeper than most other swimmers and the pull through features a comparatively straight arm. The hips are steady but with significant shoulder rotation. He takes 29 strokes on the

first lap and 36 on the second lap. It is a stroke that reminds me of our 1968 Olympic champion, Michael Wendon. Where did James lose 0.01 seconds to Nathan Adrian? He lifted his head slightly at the turn to have a look. In the 50 metres, Magnussen takes 35 strokes.

How does Sun Yang get so much run in his swimming stroke? He holds the water incredibly well, uses his front hand much like a breastroker has a glide, floats and streamlines with great balance. At the turns he saves energy by only kicking one beat as he comes to the surface. He uses a light four beat kick. Each lap takes 26-27 strokes. While Perkins, Hackett and Meloulli had efficient strokes, his is even better. Grant took 33 strokes a lap with variation between 2, 4 and 6 beat kick. The 1500m is an efficiency swim. Because the muscles for the kick are a long way from the heart, the Oxygen delivery takes longer than to the core and shoulders. A distance swimmer must balance speed against energy in a distance race. Keeping the hands nearer the body in the pull is a more efficient use of energy but it may not deliver sufficient power in shorter races. When pushing off after turns the distance swimmers conserve energy and do not use a series of underwater kicks.

Cate Campbell's 50m freestyle reminds me very much of James Magnussen's stroke. She has great balance, catches as the front hand enters the water and pulls deep. In a 50m she takes 37 strokes per lap. Her arm action is deeper than that of her sister Bronte. Bronte is slighter in build and has a stroke that is shallower but pushes back further with her hands.

There are a few videos on YouTube of the swim meets leading up to the 2012 Olympics. Rebecca Soni and Leisel Jones swim breaststroke in a manner that differs from many of their competitors. Both have a narrow kick that does not substantially reduce their streamlining. Neither as a high shoulder lift or dives substantially under water. In the 200 metres, Rebecca's hand action is almost a scull out and a scull in. Liesel's arm action is slightly larger. Both have much smaller arm actions than most of the other competitors. How many swimmers try for maximum arm action and body undulation and a very wide kick? The stroke must be tuned to suit the individual.

Michael Phelps butterfly action has a similar characteristic. There is little body undulation and a very steady hip position. As mentioned before, his shallow amplitude kick involves both a down beat and an up-beat. An article on this topic will follow as I claim a part in its development during the early 1960s.

The purpose of this article is to suggest that you not only learn to swim a stroke but there are variations in technique depending on the distance. In following established techniques, realize there is a place for your own individual stroke development. My articles are based on personal experience (50 years and 40,000Km+). I invite readers to be critical either with regard to standard references or their own ideas.