

Masaryk University

Faculty of Sports Studies

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2d and 3d Motion Analysis

Comparison and Analysis between Grab Start and Track Start

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1) ANALYSIS AND COMPARISON BETWEEN GRAB START AND TRACK START

We are going to evaluate both types of swimming start used nowadays: grab start and track start. The last one is now more common due to use of the new omega platform in London 2012. The new advice installed on the back platform (backstroke) makes easier the track start for swimmers. But our work is focused in guess which one of these starts is better in a common or antique platform.



2) MOTION ANALYSIS

For the evaluation of these techniques, I analyzed several characteristics that could help me, these are three different angles of three joints: knee (the left one), hip and shoulder in two different moments of the start: initial position, departure phase reaction and also I measured the distance reached by the athlete in both cases. With these data I compared both starts to get assess which one could be better.

2.1. Grab start



1.1) Initial Position



1.2) Departure Phase



1.3) Distance reached by the athlete

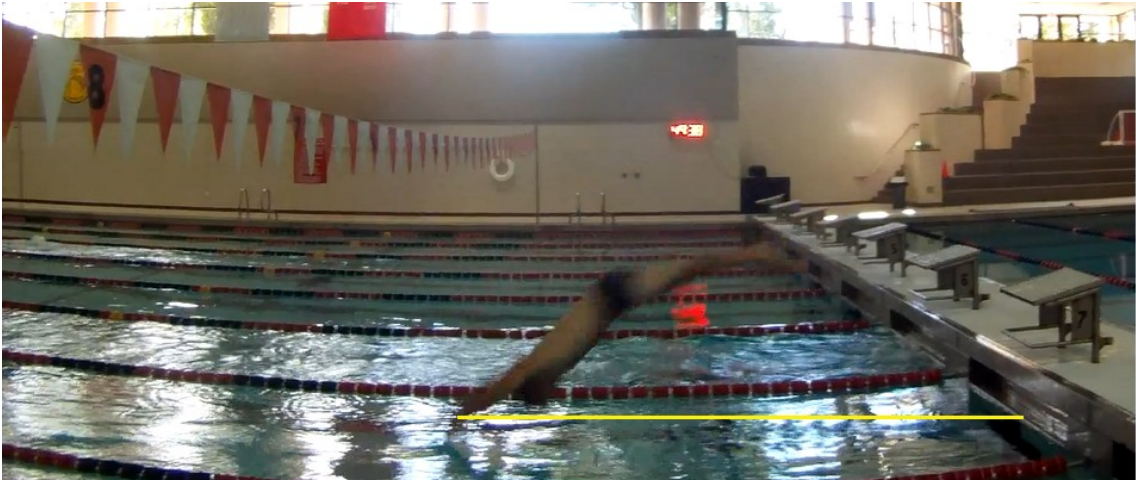
2.2. Track start



2.1) Initial Position



2.2) Departure Phase



2.3) Distance reached by the athlete

3) DATA ANALYSIS

Angles of different joints measured in both starts (by use of paint we obtain the coordinates of joint points and then with excel using determinates formula we find out the degrees of joint angles):

	1.1	2.1	1.2	2.1
Knee	135,36°	112,58°	178,21°	178,75°
Hip	19,06°	28,27°	167,20°	158,94°
Shoulder	113,00°	125,17°	126,56°	16,93°

Distance reached by the athlete in both starts (we can figure out drawing a line from banners to water, this point is 5 meters, so after that we can measure in centimeters in both picture the distance reached by athlete and then make a cross-multiplication):

1.3	2.3
3,03 m	3,45 m

Speed reached by the athlete till entry into water:

Distance: 3,03m (pictures 1.3), 3,45m (pictures 2.3)

Time: 1s (picture 1.3), 1s (picture 2.3)

Speed: 3,03 m/s grab start, 3,45 m/s track start

4) CONCLUSION

In the preparation phase the athlete has the lower and upper limbs bent in both types of start, while in the departure phase we see more or less the same extension movement at lower limbs (though in track start the legs aren't at the same level, so for this one leg extend first than the other). Despite of that the main difference of extension movement is at arms, at grab start this movement is going up and down in forward direction and at track start is going up and down as well but in backward direction, this is the justification of big difference between angle of shoulder in the departure phase: $126,56^\circ$ (grab start) front $16,93^\circ$ (track start).

About distance and speed reached by athlete, both of them are higher at track start, so with these data we can say that in antique platform track start is more efficient. But we have to concrete that is better in the initial part of start, because we didn't analyze diving phase and it seems that's more efficient grab start, there are many researches that certify this sentence.