



Practice is Not Equal to Competition: Finding Differences in Rowing Style Using Video Analysis



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INTRODUCTION

- The role of the coach is to optimize each athlete's technique and physiology through training to maximize their motive force and endurance.
- Training should therefore replicate the conditions of competition so that each athlete is prepared for the technical and physiological tasks demanded during the race.
- Different stroke rates are used in training sessions to achieve different goals. The majority of training is performed at 'low' stroke rates (18-22 strokes per minute) to improve endurance and technique (Harrison et al., 2000).
- A smaller portion of training sessions are performed at 'high' stroke rates (32-40 strokes per minute). These stroke rate are analogous to race conditions and are used for race familiarization and evaluation of athletic performance (Harrison et al., 2000).

•The question raised is; when the coach performs video analysis at low rates, is the technique captured an accurate portrayal of how the athlete performs during competition?

METHODS

Participants:

- 28 Canadian National Rowing Team members.
- Previously qualified for the 2004 Olympic Games.

Protocol:

- 5 sequential strokes were recorded via digital camera (Sony DCR-TRV33) at both high and low stroke rate.
- Recording took place from a motorboat traveling parallel at approximately 25m separation.



Figure 1. Athlete in mid drive during data collection with digitized points.

Data Analysis:

- Joint centres and two stationary points on each boat were digitized.
- Digitization repeatability and error were calculated to be 7.5±1.4mm and 4.2±0.7mm respectively.
- Stroke cycle was normalized to 100%, beginning and ending at the 'catches', with the drive phase occurring first and recovery second.
- A practical biomechanical application was used as a guide in the selection of variables which included: vertical displacement of the centre of gravity (CG), horizontal stroke length, trunk angle displacement, and recovery/drive ratios of total kinetic energy (TKE).
- High and low stroke rates were then compared.

RESULTS

- Athletes studied displayed less vertical displacement of the CG, less horizontal stroke length, and less trunk angle displacement (p<.05) at high rates than at low rates which indicate differences in styles employed by the rower.
- TKE ratios were higher at high stroke rates for all segments, sexes, and boat classes.

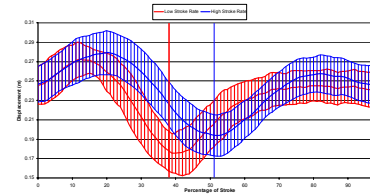


Figure 2. Mean Vertical displacement of CG and standard deviation with drive recovery transition point.

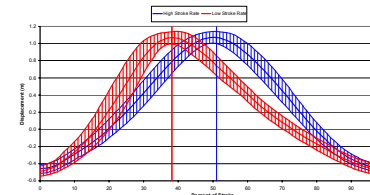


Figure 3. Mean horizontal stroke length and standard deviation.

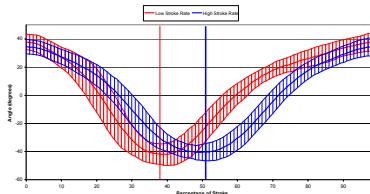


Figure 4. Mean trunk angle displacement and standard deviation.

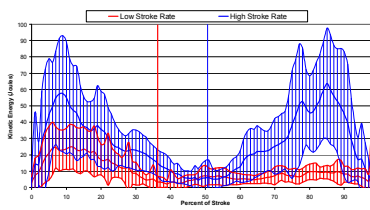


Figure 5. Mean TKE and standard deviation with drive - recovery transition point.

IMPLICATIONS FOR BETTER COACHING

- This study gives kinematic and kinetic evidence that suggests what is observed at low rates may not be what occurs at high rates.
- The results of this study raise specific questions regarding coaching techniques. Level 2 NCCP technical manuals are the first mention of video analysis in the sport of rowing. It states: "videotaping an actual competition is usually more useful as a record than for any technical merit due to the distance involved. However, if an appropriate location can be found, then some data may be productive." This study suggests that it is more than productive, it's essential.
- To be most effective when collecting video footage, coaches should observe their athletes in an environment mimicking race situations. This will ensure a more accurate portrayal of what occurs in competition.
- Coaches should also pay special attention to technique employed by athletes during non propulsive phases. These concepts are important to coaches in any sport where large portions of time are invested in low frequency training. Failure to do so could result in technical errors and possible injury.

REFERENCES

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