

# QUALITY OF DINGHY HIKING: EFFECTS ON SPEED AND HEADING

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**INTRODUCTION:** Dinghy hiking uses the sailor's bodyweight to produce a 'righting moment' which counteracts the moment of force caused by the wind on the sail. However, hiking is a physically demanding activity and maintaining quality hiking technique throughout a race is essential in competitive sailing. A land-based hiking simulator has been used to assess hiking technique, but no data were available to relate simulator results to on-water performance. This project evaluated the effect of decreased quality hiking positions on actual on-water dinghy speed and heading.

**METHOD:** GPS data on boat speed and heading as well as video of hiking positions were collected from two international-level dinghy sailors. Each sailed upwind in an International Laser, demonstrating three levels of righting moment while hiking. Data were collected for two trials of approximately sixty seconds for each hiking position for each sailor.

GPS data were averaged for each trial and across subjects. Single images from the video for each hiking position were analysed to calculate the sailor's centre of mass using a 4-segment model and righting moment about the fore/aft centreline of the boat. These data were averaged across subjects and trials for each hiking position. Average changes in righting moment were then plotted against average changes in speed and heading.

**RESULTS:** Changes in speed with hiking position can be seen in Figure 1. Concurrent with speed decreases were changes in heading. An average decreased righting moment of 119 Nm from 'Hard' to 'Rest' positions resulted in a speed decrease of 0.6 km/h and sailing 2° further off the wind. The 'Bunny' position resulted in an average 178 Nm righting moment decrease and a consequent speed drop of 1.7 km/h and sailing 6° off the wind.

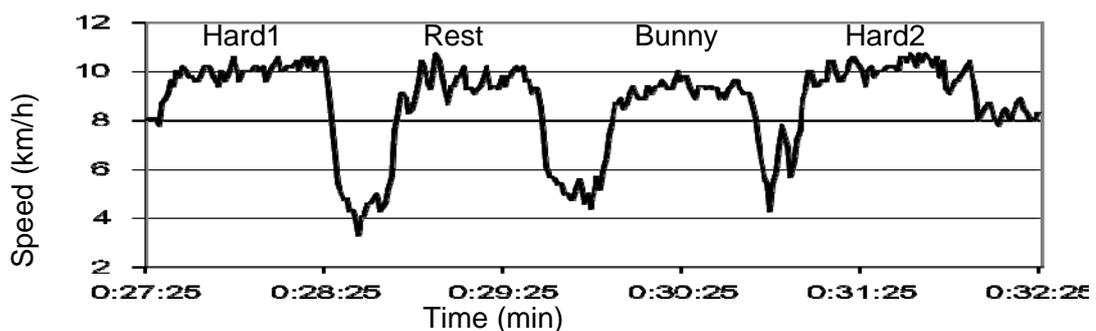


Figure 1 Speed vs hiking position

**DISCUSSION:** These preliminary data provide a guide to quantifying the effects of decreases in quality of hiking position which may be useful for both coaches and sailors. These data also permit calculation of the effects of speed and heading changes on the time it takes to sail a typical leg in a race. For example, sailing one half of a 3.3 km beat in the bunny position will take approximately 3 minutes and 20 seconds longer than sailing the entire leg in the fully extended ('Hard') position.

**CONCLUSION:** While coaches and sailors have known that poor hiking positions decrease boat speed and worsen sailing direction, this study provides data to quantify those effects in on-water sailing.