*SWACSM Abstract*

# Assessing the Validity of a Performance Prediction Model for Use with Gait Retraining

CHRISTIAN FALTAS[1], ROBERT MUSCI[2], & JENEVIEVE ROPER[2]

[1]Department of Biology; Loyola Marymount University; Los Angeles, CA
[2]Department of Health & Human Sciences; Loyola Marymount University; Los Angeles, CA

*Category: Undergraduate*

*Advisor / Mentor: Roper, Jenevieve (Jenevieve.roper@lmu.edu)*

ABSTRACT

A common strategy that athletic trainers and high-performance athletes use to manage and treat running-related injuries is gait retraining. However, the research is equivocal on how gait retraining can affect running economy and subsequent running performance in distance runners. A new prediction model was developed that predicts running performance based on oxygen consumption changes, however, it is unclear if this model is valid and can accurately be used to predict running performance as a result of gait retraining. **PURPOSE**: The goal of the study was to determine the validity of the performance prediction model, particularly when applied to gait retraining. **METHODS**: Sixteen male (n = 5) and female (n = 11) long-distance runners were recruited to participate in the study. Participants' oxygen consumption ($VO_2$) and carbon dioxide ($VCO_2$) were measured by a metabolic cart using a face mask. Oxygen consumption was measured at baseline, immediately post-, and 4 weeks post-retraining. The prediction model applied used $VO_2$ changes after retraining resulting in a predicted velocity, which was then compared to the actual velocity measured at the running trials. **RESULTS**: It was determined that there was a significant correlation between the observed and predicted velocities post-retraining ($r = 0.90$; $P < 0.001$) and at follow-up ($r = 0.72$; $P = 0.002$). Additionally, the differences in observed and predicted velocities was not significantly associated with body surface area ($P > 0.05$) and the model did not demonstrate any systemic bias when predicting velocity. **CONCLUSION**: It appears that the prediction model has no systematic bias and that model variability was not associated with body surface area. This model appears to be valid when predicting velocity (performance) under gait retraining conditions.