Investigation of the Max Power Model and the Velocity Perturbation Model for Assessing Resistive and Propulsive Forces in Swimming

Josh C. White and Joel M. Stager
Human Performance Laboratory, Department of Kinesiology, Indiana University
INTRODUCTION

• The study of swimming has long centered upon the two determinants of swimming speed: the resistive forces experienced by the swimmer and the propulsive forces that the swimmer can generate.

• While much research has already been done into the factors that affect these two determinants, a single method to measure either of the two has yet to be widely accepted.
Current Methods

• Four primary categories of quantifying resistive and propulsive forces are prevalent in the literature
  – Extrapolation of oxygen consumption to resting values
  – Use of the MAD System
  – Video analysis
  – Swimming either with or against an external force (assisted or resisted swimming; ARS).
PURPOSE

• The goal of this study is twofold. First, a new method (the Max Power Model) for measuring resistive and propulsive forces using ARS will be created and refined.

• Second, the responses of the Max Power Model (MPM) and the EPM to a variety of known and unknown changes in resistive and propulsive forces during swimming will be examined in an effort to establish greater validity.