Hierarichical Control in Hand-Foot Coordination

Robert Kohl
Department of Kinesiology and Health Sciences, The College of William and Mary

Raymond McCoy
Department of Kinesiology and Health Sciences, The College of William and Mary

Kimberly Mount
Department of Kinesiology and Health Sciences, The College of William and Mary

Abstract: There is much evidence to indicate that inter-hand coordination is temporally/spatially linked during maximal speed conditions. This linkage was examined across all limbs. In two experiments participants moved two limbs at maximal speed the same target distance (28 cm) while one limb negotiated a 20 cm vertical barrier. Experiment 1 demonstrated that the effects of a barrier hand on a non-barrier hand and the effects of a barrier foot on a non-barrier foot produced a similar pattern of results on movement time, peak velocity, time to peak, and peak height. Experiment 2 demonstrated that a barrier foot had greater impact on a non-barrier hand compared to the influence of a barrier hand on a non-barrier foot across dependent variables. This hierarchical relationship, where foot-control is weakly linked to hand-control but hand-control is strongly linked to foot-control, is cogent with the decoupling hypothesis for the origin of hominin bipedalism (Sylvester, 2006).