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Motor adaptations to limb and object dynamics in human arm movements

Paul DiZio

Brandeis University
Volen Center for Complex Systems and Department of Psychology,
Ashton Graybiel Spatial Orientation Laboratory

ABSTRACT OF THE TALK

Dynamic motor learning involves acting in a predictive, adaptable manner and making adjustments that are appropriate for different situations. This talk will deal with how human subjects match predictions to the force background when reaching with the unencumbered arm or when manually transporting an object. Data will be presented indicating that 1) the CNS has the capacity for very complete contextualization of the acquisition and utilization of motor adaptations to limb and object dynamics; 2) such parcellated learning and recruitment of learning can occur under conditions where highly correlated, novel perturbations are simultaneously applied to the arm and to the object being wielded; 3) experience with both perturbations is necessary for context-specific dynamic self-calibration/object learning. A model of sensory-motor decomposition of these two contexts will be presented. Recent results show that context-specific self/object adaptation is a developmental achievement that depends upon experience with the taxonomy proposed by the model.