

RESEARCH PRESENTATIONS

COGNITIVE

Hyosub Kim

Michele Lobo

Jared Medina

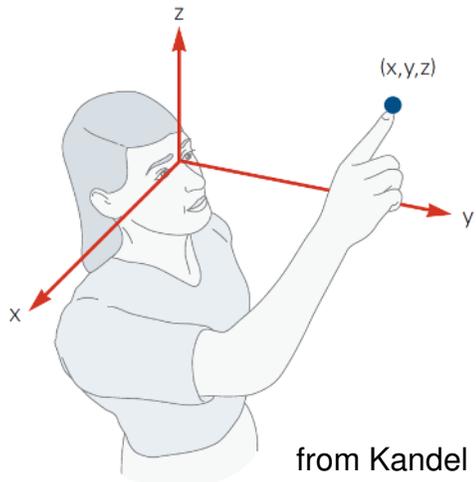
Sensorimotor Learning Lab (P.I.: Hyosub Kim)

Studying the cognitive processes supporting skilled action



Research interests:

- Interactions between adaptation and reward learning
- How practice affects motor planning
- How the brain combines multiple sources of information

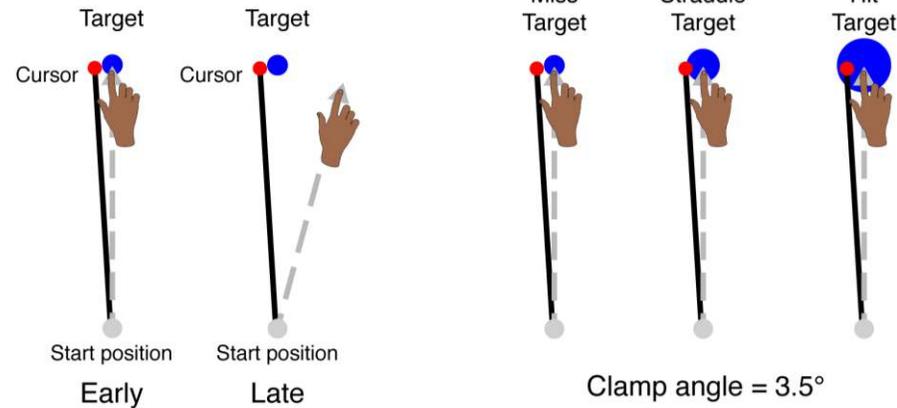


from Kandel 2012

Methods:

Motor psychophysics

Clamped visual feedback



Computational modeling

$$x^{(n+1)} = A \cdot x^{(n)} + U(e^{(n)})$$

$$y^{(n)} = (1 - V_l^{(n)}) \cdot x_n + V_l^{(n)} \cdot V_d^n$$

$$x^{(n+1)} = \gamma_A \cdot A \cdot x^{(n)} + \gamma_U \cdot U(e^{(n)})$$

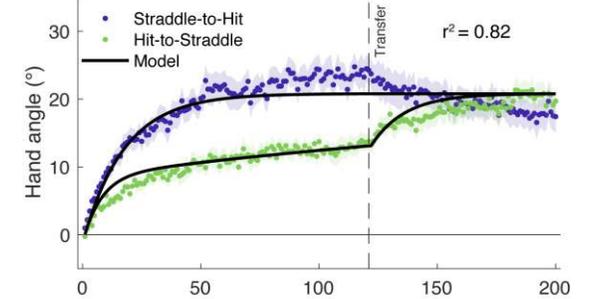
$$x_{SPE}^{(n+1)} = A_{SPE} \cdot x_{SPE}^{(n)} + U_{SPE}(e_{SPE}^{(n)})$$

$$x_{TE}^{(n+1)} = A_{TE} \cdot x_{TE}^{(n)} + U_{TE}(e_{TE}^{(n)})$$

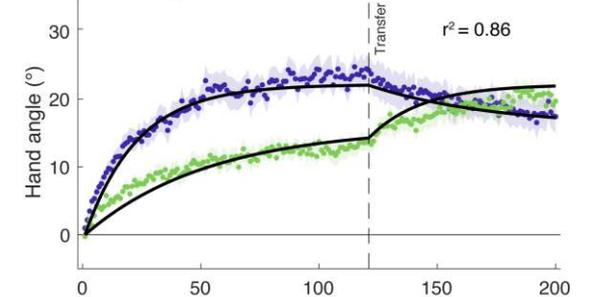
$$x_{Total}^{(n)} = x_{SPE}^{(n)} + x_{TE}^{(n)}$$

Recent results:

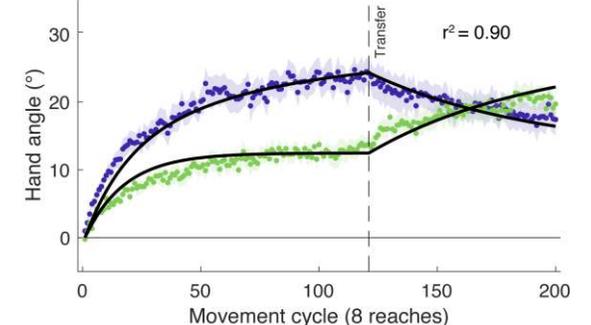
Movement Reinforcement model



Adaptation Modulation model



Dual Error model



Population Vector

Gain Modulation

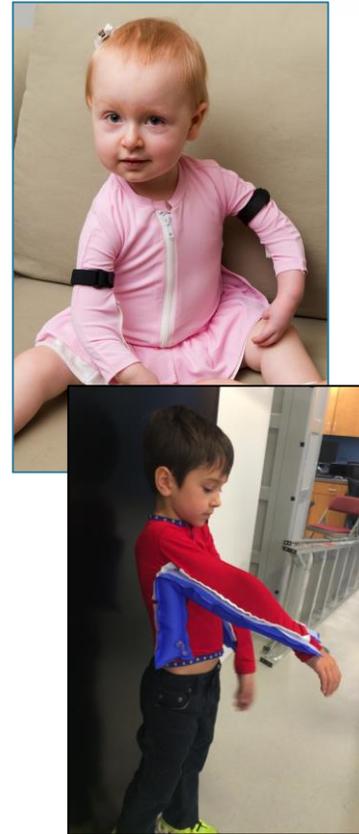
Dual Error

Activities to Promote Movement & Cognition



- Parent-child interaction
- Handling
- Positioning
- Play with objects
- Motor & cognitive outcomes (language, social-emotional)

Tools for (Re)habilitation



- Exoskeletal garments
 - Playskin Lift™
 - Playskin Air™
 - Hug n' Move
 - Ankle support
- Assistive & rehabilitative effects

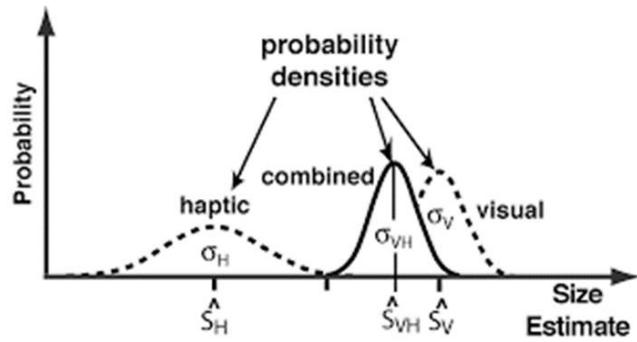
MOVE 2 LEARN
INNOVATION LAB

Activity- & Technology-Based Pediatric (Re)habilitation

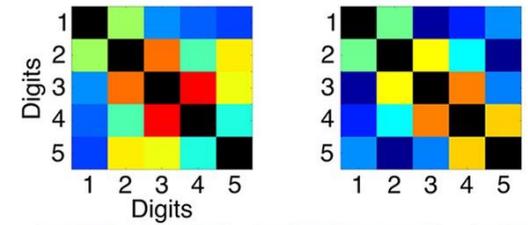
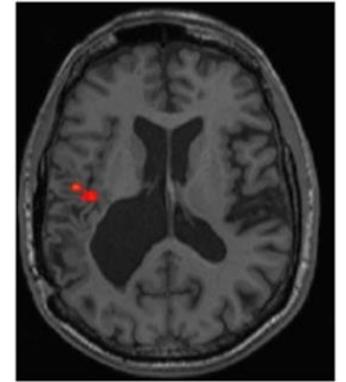
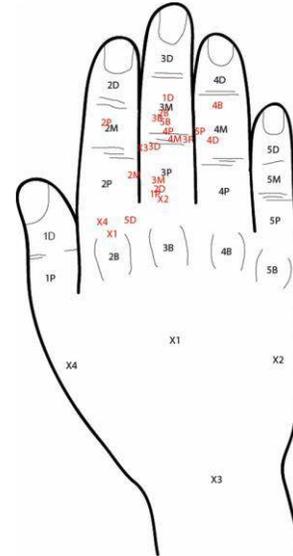
Michele A. Lobo, PT, PhD - Move To Learn Innovation Lab, Super Suits
FUNctional Fashion & Wearable Technology



Multisensory Integration



Plasticity



Jared Medina – Associate Professor

Psychological and Brain Sciences

