Title: Quantify and compare trajectories of problem-solving skills in common childhood toys

INTRO:
• Young children use toys to acquire and express understanding of problem-solving
• Clinicians use toys to teach and quantify problem-solving
• BUT it is unclear how different toys afford opportunities for advancing problem-solving skills of varying difficulty
• Purpose: Quantify the trajectory of problem-solving skills within and between toys in children with motor delays

METHODS
• Population: 134 infants with motor delays
  - Mild Motor Delay: Mean baseline age = 9.82
  - Significant Motor Delay: Mean baseline age = 11.69
• Assessment: All infants were assessed with the Assessment of Problem-Solving in Play up to 5 times across 12 months
• Children were given three toys, each for 2 minutes.
• Three problem-solving skills were scored for each toy:
  1. Simple Explore: exploring toys for perceptual input
     - Popup: banging or fingering the buttons; Cups: mouthing or throwing; Tower & Balls: shaking or rotating balls
  2. Complex Explore: trying unsuccessfully to execute a function of the toy
     - Popup: trying to push an animal down; Cups: stacking a larger cup on a smaller cup; Tower & Balls: taking balls out of the tower
  3. Function: playing with the toy as it is designed
     - Popup: popping up/pushing down one animal; Cups: nesting/stacking cups; Tower & Balls: putting a ball in the tower or using the lever to remove ball from tower
• Analysis: Linear mixed modeling with random effects compared rate of simple explores, complex explores, and functions overtime within and between each toy stratified by motor severity.

RESULTS Within toys:

Conclusions & Clinical Relevance:
• Different toys elicit different problem-solving skills, possibly due to the motor and cognitive demands inherent to each toy
• Using multiple toys to assess and track problem-solving may provide a more accurate reflection of children’s repertoire of problem-solving skills
• Comparison of problem-solving should not be made among children or across time when there is a lack of consistency in the toys used

References:

Rebecca M Molinini, PT, Ketaki Inamdar, MPT, Regina T Harbourne, PT, PhD, Michele A Lobo, PT, PhD, Sarah W McCoy, PT, PhD, James A Bovard, PhD, Stacey C Dusing, PT, PhD

VCU Motor Development Lab

Organization of Attention in Infancy. Advances in Child Development and Behavior, 54, 45-86.

Different toys elicit different problem-solving skills in young children with motor delays

Christmas Toys

Simple Explores

Complex Explores

Functions

Table 1. Differences Between Toys: Mean ± SD

Nestling Cups

Nestling Cups

Tower & Balls

Tower & Balls

Popup Toy

Popup Toy

Children with Mild Motor Delay

Children with Significant Motor Delay

* = difference between Popup and Cups on (α<.05)
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Tabular Data

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