



# Relationship of sitting and reaching to playfulness, participation, and adaptive behavior in young children with cerebral palsy



S Westcott McCoy<sup>1</sup>, A Fritz<sup>1</sup>, L Chiarello<sup>2</sup>

1. Department of Rehabilitation Medicine, University of Washington, Seattle, WA; 2. Programs in Physical Therapy and Rehabilitation Sciences, Drexel University, Philadelphia, PA

## Relevance and Objective

The ability to sit and reach are important motor skills to maximize children's ability to explore and learn.<sup>1,2</sup> Physical therapists and families therefore often focus on improving the ability to sit and reach in young children with cerebral palsy (CP). The objective of this study was to examine the relationship between sitting & reaching to playfulness, participation, and adaptive behavior in young children with CP. We hypothesized that increased sit and reach ability would be moderately related to greater playfulness, participation, and more effective adaptive behavior.

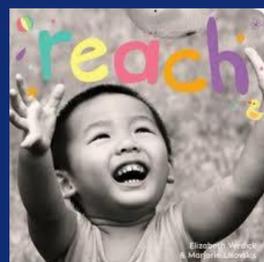
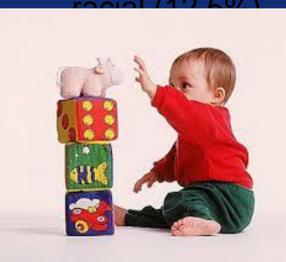
## Participants

### Parents' Demographics: n=64

- 62 reports were from the child's mother
- Mean age = 33.5 years (SD=8.7)
- 41 reporters (61%) were college graduates or higher in education level

### Children's Demographics: n=64

- 39 males, 25 females
- 18-24 months of age
- Mean age = 20.4 months (SD=1.9)
- Motor ability varied across Gross Motor Function Classification System<sup>3</sup> (GMFCS) levels: I=16, II=15, III=8, IV=13, V=12
- Children's race varied: Caucasian (71.9%), Black (9.4%), Hispanic (3.1%), Native American (3.1%) & Bilingual (12.5%)



## Methods

As a part of the larger Move & PLAY study<sup>4</sup>, trained physical or occupational therapists collected a variety data with valid and reliable measures about the participants within their homes or clinics, and parents completed questionnaires.

For this analysis we utilized results from several **therapist-administered** tests and measures:

- GMFCS<sup>3</sup>; Test of Playfulness<sup>5</sup>; Gross Motor Function Measure (GMFM Basal and Ceiling method)<sup>6</sup>

As well as information from **parent-reported** questionnaires:

- Child Engagement in Daily Life (CEDL)<sup>7</sup>; Early Coping Inventory<sup>8</sup>

To determine scores to describe the child's ability to sit and reach, the sum of specific GMFM items related to reaching (3 items) and sitting (5 items) was calculated. Spearman correlation coefficients were calculated between the GMFM scores related to sitting and reaching, and the playfulness, participation and adaptive behavior scores (Test of Playfulness, CEDL-Participation Self-Care activities and CEDL-Participation family/recreational activities, and Early Coping Inventory).

## Results

Reaching and sitting scores were highly related ( $r_s = 0.83, p < .001$ ). Playfulness and adaptive behavior scores were moderately related ( $r_s = 0.61, p < .001$ ). Participation was moderately related to adaptive behavior and playfulness ( $r_s = 0.49, p < .001$  and  $r_s = 0.40, p = .001$ , respectively).

### Spearman correlations for Reach and Sit ability, respectively to:

Playfulness:  $r_s = 0.45 (p < .001)$ ,  $0.50 (p < .001)$  (Figure 1: Reach reflected in blue, Sit in red); Participation in self-care:  $r_s = 0.62 (p < .001)$ ,  $0.61 (p < .001)$  (Figure 2); Participation in leisure/recreation:  $r_s = 0.24 (p = .06)$ ,  $0.27 (p = .03)$  (Figure 3); Adaptive behavior:  $r_s = 0.42 (p < .001)$ ,  $0.37 (p = .003)$  (Figure 4)

Figure 1

Reach/Sit GMFM item sum to Playfulness

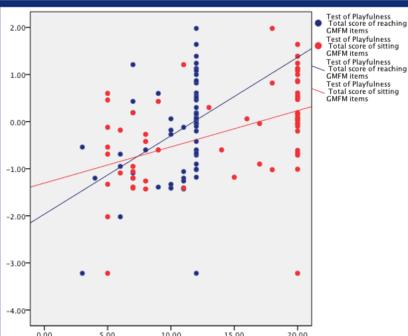


Figure 2

Reach/Sit GMFM item sum to Participation self-care

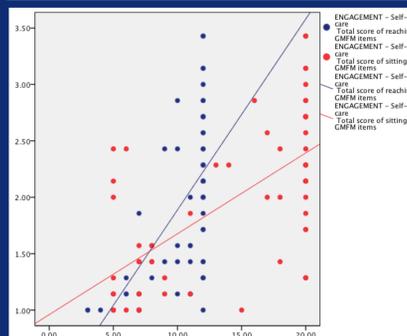


Figure 3

Reach/Sit GMFM item sum to Participation leisure/recreation

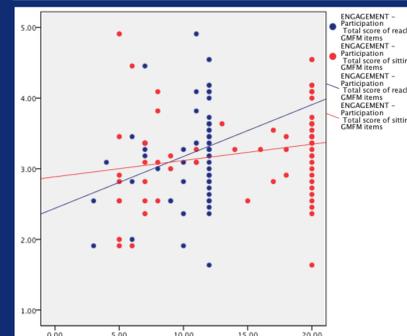
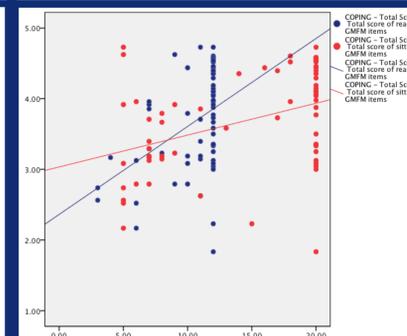


Figure 4

Reach/Sit GMFM item sum to Adaptive behavior



## Conclusions

- Reaching & sitting ability account for a significant amount of variance in participation in self-care activities ( $r^2 = .38$  and  $.37$ ) and a small amount of variance in playfulness ( $r^2 = .20$  and  $.25$ ) and adaptive behavior ( $r^2 = .18$  and  $.14$ ) in our sample.
- Improving reaching & sitting ability may assist with improving young children with CP's self-care, playfulness, and adaptive behavior ability and vice versa.
- Participation in leisure activities is a complex construct which was not as highly related to ability to sit & reach in this sample ( $r^2 = .06$  and  $.07$ ).
- Improvements in participation will require focus on aspects other than just motor activities. Further exploration is warranted.
- Limitations: Our sample may not represent of all families/children with CP.

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