



Motor and Self-Care Abilities

Movement and Participation in Life Activities of Young Children *Information for Families and Service Providers*

The Move & PLAY study.....in brief:

Who participated? 430 preschool (age 18 months to 5 years) children with [Cerebral Palsy](#) (CP) and their families were recruited from many regions of Canada and the USA; all children had CP or problems with motor activities, [muscle tone](#), and [balance](#).

What did we do? We focused on learning what helps children with CP progress in their ability to move around, take care of themselves ([self-care](#): feeding, dressing, bathing), and [play](#).

What was our goal? We wanted to find out what we can change about the way we help young children who need rehabilitation services, so we can focus on providing the services that are most beneficial.

How did we do this? We collected information about many characteristics of the child, the family, and the recreation and rehabilitation services they receive, during 3 sessions over a one-year period.

We recommend reading the “Conceptual Model” summary, found on the website listed at the bottom of this page. This summary provides the necessary background information for understanding the study results presented here.

Understanding factors contributing to motor and self-care abilities in young children with CP

- There are 2 summaries in this series describing the results of the main goal of the Move & PLAY study: **to determine which child, family, and service factors influence children’s motor, self-care, and play abilities**
- This summary describes how all these factors **together** could potentially **contribute to motor and self-care abilities**. A second summary reports on the determinants of participation and playfulness
- We used an analysis called [Structural Equation Modeling \(SEM\)](#).¹ This analysis allowed us to consider a large group of factors all at the same time and also explore how these factors relate to each other, as they influence an outcome of interest
- **Here is an example to help explain this analysis.** Imagine that you have had a “good day”. There may have been many things that happened to make your day go well (e.g. the sun was shining; you got a raise; the kids cleaned their rooms!and so on). Some of these things may have been more important than others in contributing to your good day, but it was the **combination** of everything that made you say, “I had a good day”. Whenever there are several factors combining to influence something, it is hard to know which are most important

This is the complex problem that researchers face. Using SEM, we are able to analyze many factors all together to determine the [relationships](#) among them and their relationships with outcomes.

Definitions for words highlighted in blue ink can be found in our [Glossary](#).

Other summaries reporting the results of this study are available on the [Move & Play Study page](#) at www.canchild.ca

Data collection

- Full details of all measures and assessments done are found in the Conceptual Model summary on the CanChild website (link on the first page)

Some information to help you understand these results

- Motor abilities were classified using the [Gross Motor Function Classification System²](#) (GMFCS). GMFCS has 5 levels of motor abilities; children in level I have the highest motor abilities, and children in level V the least motor abilities. For the purposes of this analysis, the children were placed into **2 groups according to their motor abilities** (the groups were: children in levels I & II combined and children in levels III, IV, & V combined)

What did we learn?

FACTORS CONTRIBUTING TO MOTOR ABILITY

Children in GMFCS levels I and II:

- Overall, the study's Conceptual Model of child, family, and service factors explained more than half of the variation in children's motor abilities
- The **factors related to motor abilities**, in order of importance, were:
 - [Primary impairments](#) had a strong relationship:
Better balance, fewer number of limbs and parts of the body involved, better quality of movement, and lower spasticity, were related to higher motor abilities
 - [Secondary impairments](#) had a modest relationship:
Higher strength, fewer range of motion limitations, and better endurance were related to higher motor abilities
 - Participation in recreation programs had a small relationship:
Greater participation in recreation programs was related to higher motor abilities
- Health conditions, [adaptive behaviour](#), and [family ecology](#) **were not related to** motor abilities in this group of children

Children in GMFCS levels III, IV, and V:

- Overall, the study's Conceptual Model of child, family, and service factors explained three quarters of the variation in children's motor abilities
- The **factors that were related to motor abilities**, in order of importance were:
 - Primary impairments had a strong relationship:
Better balance, fewer number of limbs and parts of the body involved, better quality of movement, and lower spasticity, were related to higher motor abilities
 - Secondary impairments had a modest relationship:
Higher strength, fewer range of motion limitations, and better endurance were related to higher motor abilities
 - Adaptive behaviour had a modest relationship:
More effective adaptive behaviour was related to higher motor abilities
- Health conditions, family ecology, and services **were not related to** motor abilities in this group of children

Comparisons of results between groups of children

- The Conceptual Model of child, family, and service factors provided greater explanation of factors related to motor abilities for children in GMFCS levels III, IV & V than for those in GMFCS levels I & II
- Only the influence of adaptive behavior was significantly different between the two groups. Adaptive behavior was related to motor abilities for children in GMFCS levels III, IV, and V, but not for children in levels I and II

FACTORS CONTRIBUTING TO SELF-CARE ABILITY

Children in GMFCS levels I and II:

- Overall, the study's Conceptual Model of child, family, and service factors explained two thirds of the variation in children's self-care abilities
- **Factors that were associated with self-care abilities**, in order of importance were:
 - **Gross motor ability** had a modest relationship
 - **Health conditions** had a modest relationship
 - **Adaptive behaviour** had a modest relationship
 - **Extent services met children's needs** had a small relationship

Higher motor abilities, better health, more effective adaptive behavior, and stronger perceptions that services met children's needs were related to higher self-care abilities

- Primary impairments and family ecology **were not related** to self-care abilities

Children in GMFCS levels III, IV, and V:

- Overall, the study's Conceptual Model of child, family, and service factors explained three quarters of the variation in children's self-care abilities
- **Factors that were associated with self-care abilities**, in order of importance were:
 - **Gross motor ability** had a modest relationship
 - **Primary impairments** had a modest relationship
 - **Health conditions** had a small relationship
 - **Adaptive behaviour** had a small relationship
 - **Family ecology** had a small relationship
 - **Family-centredness of services** had a small relationship

Higher motor abilities; less spasticity, better balance, better quality of movement, and fewer limbs and parts of the body involved; better health; more effective adaptive behavior; stronger attributes of families; and (surprisingly) weaker perceptions of family-centredness of services, were related to higher self-care abilities

Comparisons of results between groups of children

- The Conceptual Model of child, family, and service factors provided greater explanation of factors related to self-care abilities for children in GMFCS levels III, IV & V than for those in GMFCS levels I & II
- The influence of primary impairments was greater for children in GMFCS levels III, IV & V, whereas the influence of health conditions was greater for children in GMFCS levels I & II. The influence of parents' perceptions that services were meeting the child's needs was greater for children in GMFCS I & II

What does this mean?

Thoughts for families	Thoughts for service providers
Regarding motor abilities	
<ul style="list-style-type: none"> Ask your therapist about activities to improve balance and prevent secondary impairments with the goal of improving motor abilities 	<ul style="list-style-type: none"> Our combined results, and the existing literature,⁴ suggest that efforts to support the acquisition of basic motor abilities might include improving balance and preventing secondary impairments (through activity-based interventions)
<ul style="list-style-type: none"> For parents of children with greater motor challenges (GMFCS Levels III, IV & V), encourage and support your child's self-awareness, adaptability, motivation, and interactions with people in a variety of situations. These adaptive behaviors help to optimize motor abilities 	<ul style="list-style-type: none"> For children with greater motor challenges (GMFCS Levels III, IV & V), therapists should encourage and support self-awareness, adaptability, motivation, and interactions with people in a variety of situations. These adaptive behaviors help to optimize motor abilities
Regarding self-care abilities	
<ul style="list-style-type: none"> For all children with CP, motor function has a major impact on self-care ability; discuss with your therapist how best to use motor function to support emerging self-care abilities 	<ul style="list-style-type: none"> Children's gross motor abilities have the greatest contribution to self-care abilities for children across all motor abilities; suggesting that a focus on motor function in the context of self-care activities is important and consistent with activity-based interventions
<ul style="list-style-type: none"> Discuss what aspects of your child may facilitate or limit self-care abilities and collaborate with your therapist to tailor support for your child. Expect therapist to meet your needs in supporting your child's self-care abilities 	<ul style="list-style-type: none"> Child and service factors contribute to explaining self-care ability in young children with cerebral palsy across all motor abilities. It is important for therapists to be accountable to meeting the needs of families in supporting their children's self-care abilities
<ul style="list-style-type: none"> Discuss with your health care team how best to monitor and support your child's overall health and well-being to optimize their self-care abilities 	<ul style="list-style-type: none"> As health professionals who see children on a regular basis, therapists have an important role in monitoring and supporting children's health and well-being to optimize their self-care abilities
<ul style="list-style-type: none"> Supporting adaptive behavior from an early age, by encouraging motivation, persistence, problem-solving, and helping your child learn about him or herself promotes self-care abilities 	<ul style="list-style-type: none"> At an early age it is important for therapists to support the development of self-determination as these skills foster higher self-care abilities
<ul style="list-style-type: none"> For children with greater motor challenges, activities to improve balance promote higher self-care ability 	<ul style="list-style-type: none"> For children with greater motor challenges, activities to improve balance promote higher self-care ability; for this group especially, therapists need to acknowledge and support the family's role in optimizing self-care abilities

What do we still need to learn about children's motor and self-care abilities?

Future studies need to explore the influence of other child, family, service, and environmental factors on motor and self-care abilities.

References


1. Kline RB. *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press; 2005.
2. Palisano RJ, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B: Development and validation of a Gross Motor Function Classification System for children with cerebral palsy. *Developmental Medicine and Child Neurology* 1997;39:214-223.
3. Valvano J. Activity-focused motor interventions for children with neurological conditions. *Physical and Occupational Therapy in Pediatrics*. 2004;24(1/2):79-107.

FOR MORE INFORMATION, CONTACT: Doreen Bartlett djbartle@uwo.ca

For more details regarding Determinants of Motor and Self-care Abilities, please refer to our papers: - cited below



Understanding Determinants of Basic Motor Abilities, Self-care, and Play of Young Children with Cerebral Palsy

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Bartlett D, Chiarello L, McCoy S, Palisano R, Jeffries L, LaForme Fiss A, Wilk P. Determinants of self-care participation of young children with cerebral palsy. *Developmental Neurorehabilitation*. 2014; 17: 403-413.