Predictors Of Proficient Power Mobility In Young Children With Severe Motor Impairments

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Disclaimers

- This work was completed in partial fulfillment of my Doctor of Science degree in Rehabilitation Science from The University of Oklahoma Health Sciences Center.

- The contents of this presentation were developed under grants from the U.S. Department of Education, #H325K08335, #R305T010757 & #H3287A080006. However, the contents do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government. Project Officers, Julia Martin-Eile and Carmen Sanchez.

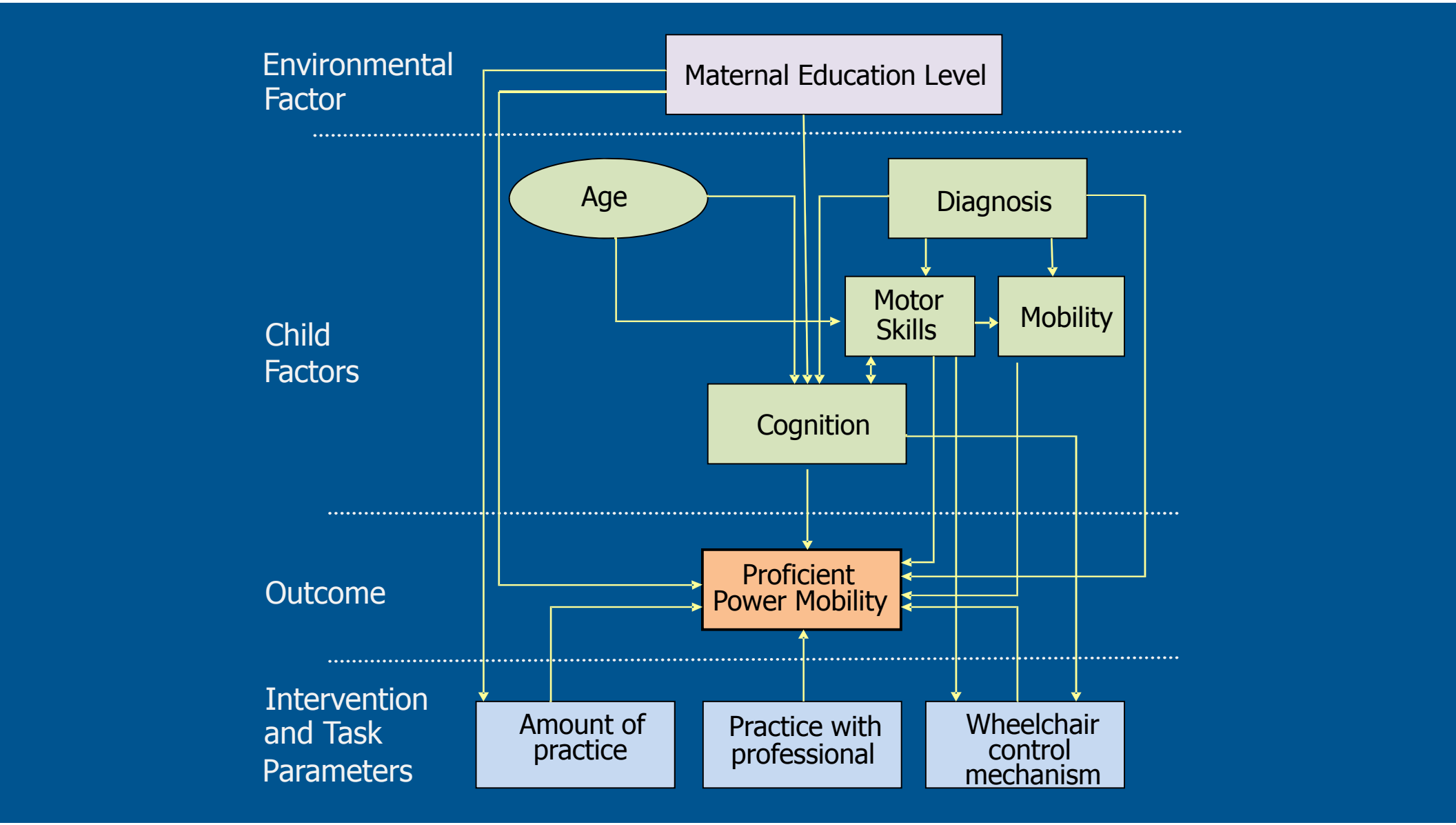
Background

- Proficiency might be associated with:
  - age (Furumasu, Guerette, & Tefft, 1996)
  - cognition (Furumasu, Guerette, & Tefft, 2004; Tefft, Guerette, & Furumasu, 1999)
  - amount of practice (Bottos et al., 2001; Nilsson, 2010)
  - practice with a professional (Nilsson, 2010)
- Lack of consensus regarding proficiency

Purpose

1) Determine if one or more factors are associated with or predict proficient power mobility in young children with severe motor impairments, aged 14-30 months

2) Determine if performance on the Wheelchair Skills Checklist (WSC; Butler et al., 1984) is associated with performance on the Powered Mobility Program (PMP; Furumasu et al., 1996)


Environmental Factor
Maternal Education Level
Age
Diagnosis
Child Factors
Motor Skills
Mobility
Cognition
Outcome
Proficient Power Mobility
Intervention and Task Parameters
Amount of practice
Practice with professional
Wheelchair control mechanism

Participants

	RCT 1 (Jones et al., 2012)	RCT 2 (Jones et al., 2013)	Combined
Participants, n	11	20	31
Proficient, n	4	10	14
Mean age in months (SD); min-max	22.2 (5.7) 14.3-30.3	22.6 (4.8) 15.3-31.2	22.4 (5.1) 14.3–31.2

Participants

	RCT 1	RCT 2	Combined
Diagnosis, n			
Involving brain	7	14	21
Not involving brain	4	6	10
Wheelchair control, n			
Joystick	7	17	24
Non-proportional	4	3	7
Baseline cognition AE; mean (SD)	10.9 (4.32)	11.6 (2.93)	11.4 (3.43)
Baseline gross motor AE; mean (SD)	4.5 (1.75)	4.9 (2.01)	4.8 (1.90)

Intervention

- Power wheelchairs provided x 12 months

- RCT 1 (Jones et al., 2012)
  - Parent-supervised practice
- RCT 2 (Jones et al., 2013)
  - Addition of researcher-directed practice
    - Frequency 3x/week → 1x/month
    - Structured and unstructured practice

Data Analysis

- Proficiency = 7 skills on WSC
- a priori α-level = 0.10

- Associations: Bivariate analysis
- Predictors: Multivariate logistic regression
- WSC and PMP Agreement: Percent agreement

Variables Associated with Proficiency

- The following variables were associated with proficiency in bivariate comparisons
  - Cognition (p= <0.01 to 0.03)
  - Wheelchair control mechanism (p=0.09)
  - Fine motor skills (p=0.02)

Predictors

	Adjusted Odds Ratio (95% CI)	p-value
Diagnosis[a]	**1.89** (1.29, 2.76)	0.002
Cognition	**1.07** (1.01, 1.13)	0.017
Wheelchair Control Mechanism[b]	**0.65** (0.45, 0.94)	0.024
Age	0.98 (0.95, 1.01)	0.327
PEDI Mobility Standard Score	0.98 (0.97, 1.01)	0.166
PEDI Mobility Scaled Score	1.00 (0.98, 1.03)	0.619

[a]Diagnosis involving the brain was the reference. [b]Joystick use was the reference.

Proficiency Measures

- Significant association between performance on WSC and PMP ($p < 0.001$)

- Percent agreement = 94.7%
  - Same conclusion for 18 of 19 children

Limitations

- Small sample size (n=31)

- Limitations in assessing cognition
  - Tools dependent on motor and speech abilities beyond the ability of the participants (Jones et al., 2012)
  - Tools might not identify differences between children

Conclusions

- Cognition, wheelchair control mechanism, and diagnosis might predict power mobility proficiency in young children with severe motor impairments

- These factors, however, should not be used to determine whether a child is offered the opportunity to participate in a trial or training program

Acknowledgements

- Advanced Practice Project Committee

  Irene McEwen, PT, DPT, PhD, FAPTA (Chair)

  Maria Jones, PT, PhD

  Lorraine Sylvester, PT, PhD

- The authors thank the children and their families who participated, the therapists who referred children to the study, Invacare, and Adaptive Switch Labs.

University of Iowa Children's Hospital
Center for Disabilities and Development

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