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**USING THE RASCH MODEL TO VALIDATE
THE PEABODY DEVELOPMENTAL MOTOR SCALES-SECOND EDITION
IN INFANTS AND PRESCHOOL CHILDREN**

**Thesis submitted by
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in January 2007**

**for the degree of Master of Education with Honours
in the School of Education
James Cook University**

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STATEMENT OF THE CONTRIBUTION OF OTHERS

This study was financially supported by the student stipend supports and the Internal Research Award from the School of Education, the Graduate Research Scheme fund from the Faculty of Arts, Education and Social Science, and the Graduate Research International Travel Award from the Graduate Research School, at the James Cook University.

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ABSTRACT

The current research utilized the Rasch model analysis to examine the dimensional structure of the Peabody Developmental Motor Scales-Second Edition (PDMS-2). Furthermore, the three-point rating scales, differential item functioning (DIF), and hierarchical structures of the PDMS-2 items were examined for their utility in discriminating various levels of motor development, for items' function stability across gender and disease entity, and for positioning in a valid hierarchy of difficulty.

The study tested a total of 419 children in Taiwan (including 342 normal children and 77 children with motor delays or difficulties) using the PDMS-2. The three-point rating scales of 180 PDMS-2 items exhibited problems (such as infrequently used categories and disordering step calibration), and thus the rating scales for these items were collapsed to allow only dichotomous responses. Each of the six PDMS-2 subtests formed a unidimensional scale after 21 misfitting items were removed. Additionally, the gross motor, fine motor, and overall motor ability were constructed by combining certain subtests, supporting the theorized dimensionality of the PDMS-2. Fifty-eight items within the subtests demonstrated DIF between children with/out motor problems, while only 35 items demonstrated DIF across gender. The hierarchical order of the PDMS-2 items established using Rasch model showed considerable similarity to the original hierarchy that was ranked by age. The PDMS-2 items had wide coverage but inadequate targeting of the children in the study.

The findings from the research indicated that the reduced PDMS-2 test encompassing dichotomous rating scales in the particular items, is a valid measure of motor development in infants and preschool children. However, further work is needed to improve the inadequate targeting by adding more suitable items.

TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION AND STATEMENT OF THE PROBLEM

1.1	Context of the present study	1
1.2	The current problems	3

CHAPTER TWO

LITERATURE REVIEW

2.1	Importance of assessing motor development in children.....	5
2.2	Considerations for selecting appropriate motor development tests	7
2.3	Peabody Developmental Motor Scales-Second Edition (PDMS-2)	9
2.3.1	Clinical merits of the PDMS-2	11
2.3.2	Psychometric properties of the PDMS-2	11
2.4	Item response theory: the Rasch model	12
2.5	Drawbacks of the PDMS-2	16
2.5.1	Structure of the PDMS-2	17
2.5.2	Ordinal scales.....	17
2.5.3	Item hierarchy	18
2.5.4	Appropriateness of the three-point rating scales.....	19
2.6	Research questions.....	19
2.6.1	Main questions.....	20
2.6.2	Additional questions	20

CHAPTER THREE

METHODOLOGY

3.1	Subjects.....	21
3.2	Instruments.....	22
3.3	Procedure	23
3.4	Data analysis	24
	3.4.1 Appropriateness of the three-point rating scales.....	26
	3.4.2 Unidimensionality.....	27
	3.4.3 Person fit	29
	3.4.4 Differential item functioning	30
	3.4.5 Item and person reliability	30
	3.4.6 Item hierarchy and targeting.....	31

CHAPTER FOUR

RESULTS

4.1	Subjects.....	33
4.2	Appropriateness of the three-point rating scales.....	35
4.3	Person fit.....	38
4.4	Dimensionality.....	39
	4.4.1 Unidimensionality of the six individual subtests.....	39
	4.4.2 Unidimensionality of the combined gross motor scale.....	45
	4.4.3 Unidimensionality of the combined fine motor scale.....	47
	4.4.4 Unidimensionality of the entire PDMS-2 scale	49

4.5	Differential item functioning	52
4.5.1	Disease entity	53
4.5.2	Gender.....	57
4.6	Item and person reliability	58
4.7	Targeting	59
4.8	Item hierarchy	67
4.9	Additional validity examination	71

CHAPTER FIVE

DISCUSSION

5.1	Question 1	73
5.2	Question 2	74
5.3	Question 3	80
5.4	Question 4	84
5.5	Question 5	85
5.6	Question 6	87
5.7	Question 7	88
5.8	Limitations	89
5.9	Implications of the study.....	90

BIBLIOGRAPHY	92
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APPENDICES

Appendix 1: Rating scale analysis for the 8-item Reflex subtest	102
Appendix 2: Rating scale analysis for the 30-item Stationary subtest.....	103

Appendix 3: Rating scale analysis for the 89-item Locomotion subtest	106
Appendix 4: Rating scale analysis for the 24-item Object Manipulation subtest.	113
Appendix 5: Rating scale analysis for the 26-item Grasping subtest	115
Appendix 6: Rating scale analysis for the 72-item Visual-Motor Integration subtest	117
Appendix 7: The WINSTEPS control file for dimensionality examination of the Reflex, Stationary, and Locomotion subtests.....	123
Appendix 8: The WINSTEPS control file for dimensionality examination of the Object Manipulation, Grasping, and Visual-Motor Integration subtests.....	124
Appendix 9: Raw score, Rasch-transformed score, and standard error of the Reflex and Stationary subtests	125
Appendix 10: Raw score, Rasch-transformed score, and standard error of the Object Manipulation and Grasping subtests	126
Appendix 11: Raw score, Rasch-transformed score, and standard error of the Locomotion subtest.....	127
Appendix 12: Raw score, Rasch-transformed score, and standard error of the Visual-Motor Integration subtest	128

LIST OF TABLES

Table 1: Demographical characteristics of the normative and clinical samples	34
Table 2: Items with category problems across three different rating scale versions	37
Table 3: Misfitting items in the Rasch analysis of the 8-item Reflex subtest.....	40
Table 4: Misfitting items in the Rasch analyses of the 30-item Stationary subtest	40
Table 5: Misfitting items in the Rasch analysis of the 89-item Locomotion subtest.....	41
Table 6: Misfitting items in the Rasch analysis of the 24-item Object Manipulation subtest	42
Table 7: Misfitting items in the Rasch analysis of the 26-item Grasping subtest.....	43
Table 8: Misfitting items in the Rasch analysis of the 72-item Visual-Motor Integration subtest.....	44
Table 9: Misfitting items in the Rasch analysis of the 151-item combined GM scale ...	46
Table 10: Misfitting items in the Rasch analysis of the 98-item FM subscale	48
Table 11: Misfitting items in the Rasch analysis of the 249-item PDMS-2 scale	50
Table 12: The items showing DIF across disease entity in six PDMS-2 subtests	56
Table 13: The items showing DIF across gender in six PDMS-2 subtests	57
Table 14: Item and person reliability statistics	58
Table 15: Item and step measures for the items in the Reflex, Stationary, and Object Manipulation subtests	68
Table 16: Item and step measures for the items in the Locomotion subtest	69
Table 17: Item and step measures for the items in the Grasping and Visual-Motor Integration subtests	70

LIST OF FIGURES

Figure 1: The decision process of selecting the most appropriate Rasch model for the current study.....	25
Figure 2: DIF between normal children and children with motor delays or difficulties in the Reflex, Stationary, and Locomotion subtests.....	54
Figure 3: DIF between normal children and children with motor delays or difficulties in the Object Manipulation, Grasping, and Visual-Motor Integration subtests.....	55
Figure 4: Item-person maps of the Reflex and Stationary subtests.	61
Figure 5: Item-person map of the Locomotion subtest.....	62
Figure 6: Item-person maps of the Object Manipulation and Grasping subtests.....	63
Figure 7: Item-person map of the Visual-Motor Integration subtest	64
Figure 8: Item-person map of the GM scale	65
Figure 9: Item-person map of the FM scale.....	66
Figure 10: Relationship between the GM construct and the four individual constructs	78
Figure 11: Relationship between the FM construct and the two individual constructs..	79
Figure 12: Relationship between raw scores and Rasch-transformed scores for the Locomotion subtest.....	83
Figure 13: Relationship between raw scores and Rasch-transformed scores for the Stationary subtest.....	84