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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.

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