RASCH ANALYSIS OF THE FINE MOTOR SCALE OF THE PEABODY DEVELOPMENTAL MOTOR SCALES-SECOND EDITION IN TAIWANESE CHILDREN

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Background: The purpose of this research was to confirm the dimensional structures of the fine motor scale within the Peabody Developmental Motor Scales-Second Edition (PDMS-FM). A Rasch analysis was performed to examine whether the Grasping and Visual-Motor Integration subtests of the PDMS-FM scale may justify two single unidimensional constructs and/or whether these two subtests may be combined to represent fine motor ability. Additionally, the three-point rating scales employed by the PDMS-FM were examined for their utility in discriminating various levels of fine motor development.

Methods: A total of 419 Taiwanese children aged from 2 to 77 months (including 342 normal children and 77 children with motor ability deficits) were assessed with the PDMS-FM scale in Taiwan.

Results: Sixty-nine of 98 PDMS-FM items exhibited problematic three-point rating scales, and thus these items were collapsed to allow only dichotomous responses. The Grasping and Visual-Motor Integration subtests were found to fit the Rasch model expectations well, after two and eight items were removed due to misfit. Subsequently, the unidimensionality of the PDMS-FM scale was supported when combining the two individual subtests following the removal of 13 items that did not contribute the fine motor construct. In addition, although the PDMS-FM scale had a significant ceiling effect, it encompassed a broad range of items from easy to difficult.

Conclusion: The dimensionality of the PDMS-FM, after replacing the three-point scales with dichotomous ones and reducing the misfitting items, has been validated with the Rasch model to facilitate its clinical use in Taiwanese children. However, further work is needed to improve the ceiling effect by adding more difficult items.