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Visual Motor Integration in Children with and without Reading Disabilities in Oman

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Abstract

This study investigated the differences in visual-motor integration (VMI) between children with and without reading disabilities (RDs) in the Sultanate of Oman by employing the Full Range Test of Visual Motor Integration (FRTVMI, Hammill, Pearson, Voress, & Reynolds, 2006). A total of 364 pupils from public elementary schools in Muscat, the capital of Oman, participated in the study; 171 pupils were already diagnosed as having RDs whereas 175 were normally achieving (NA) pupils. After examining internal consistency estimates of the FRTVMI on the sample a two-way analysis of variance (ANOVA) was conducted to examine the differences in VMI between the two pupil groups. Additionally, the effects of gender as well as the interaction between gender and pupil condition (RDs vs. ND) were examined. The results indicated that NA children scored higher on the FRTVMI than did the children with RDs. There were no significant differences in VMI between males and females in the two children groups. The interaction between gender and group condition (RDs vs. NA), however, showed that NA female pupils displayed the highest levels of VMI whereas female pupils with RDs displayed the lowest level of VMI. The results support the theoretical propositions that learning disabilities (LDs) in general and RDs in particular are strongly related to impairment in VMI and therefore assessment of such skill is important in diagnosing children who are suspected of being at risk for RDs in school settings.

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1. Introduction

In Oman, where there is a lack of occupational therapists, it is common for educational psychologists and/ or special educators to assess and evaluate visual motor integration (VMI) as part of their assessment of individuals

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with learning disabilities (LDs). The availability of instruments and those who are trained to administer them is, however, problematic. VMI is generally defined as the degree to which visual perception (information) and limb movement (finger–hand movements) are well coordinated and integrated together (Beery & Beery, 2006; Gabbard, Goncalves, & Santos, 2001). VMI dysfunction is the inability to use vision to perform motor-based tasks; hence, functional VMI enables a child to coordinate visual stimuli with the corresponding motor action in a timely and skillful manner (Schneck, 2010).

VMI and visual perceptual problems are common in children with reading disabilities which result from atypical brain functioning as well as atypical information processing (DSM-IV-TR, 2000; Beaton, 2004; Chinner, Brown, & Stagnitti, 2011). Indicators of VMI function may include legible handwriting, skillfully constructing objects with building blocks, and ability to complete most visual/motor activities at an adequate speed (Schneck, 2010; Cronin & Mandich, 2005). Indicators of VMI dysfunction may be seen in children whose handwriting is messy and who are unable to form letters legibly or copy letters; who have difficulty constructing objects with building blocks, doing puzzles, using fasteners in dressing, tying shoe laces; and who have decreased or slow speed at completing visual/motor tasks (Schneck, 2010). These characteristics are notable among children with RDs (Beaton, 2004). VMI and visual perceptual problems are often linked to difficulties in a number of school related tasks including handwriting; spelling; mathematics; self-care; participation in play, recreation, and/or leisure activities (Brown, Rodger, & Davis, 2003).

Amongst the VMI assessments that are currently available is the Full Range Test of Visual Motor Integration (FRTVMI; Hammill, Pearson, Voress, & Reynolds, 2006) which is a standardized, norm-referenced assessment. Standardized assessments are used in educational settings as they provide precise measurements of an individual's performance area compared to his age group members, describe the performance as a standard score that can quantify the educational psychologist's or special educator's assessment judgments, and provide evidence which can inform the intervention phase (Payne, 2002).

Two psychometric properties are important for accurate and meaningful indicators in standardized tests, namely reliability and validity. Reliability is the extent to which a measurement is constant and free from error and can be conceptualized as dependability, repeatability, or reproducibility (Portney & Watkins, 2009). In terms of assessment, validity refers to the extent to which a test's items are representative of the actual skills, abilities, or traits being evaluated and whether the test can allow accurate conclusions concerning achievement. In other words, validity is the extent to which a test measures what it claims to measure.

To the authors' knowledge the FRVMI has not been reported in any study on an Arabic sample in general and on an Arabic sample of children with RDs in particular. Thus evaluating its use on such samples is timely and needed.

2. The Current Study

The Sultanate of Oman is moving towards transferring public schools to be inclusive schools which provide special education services to pupils with special educational needs (SEN). Statistics of the Department of Special Education at the Ministry of Education (MoE) in Oman show that the number of pupils with LDs who receive special education services in inclusive schools has increased significantly in the last decade. The number of pupils with RDs represents 80% of the total number of pupils with LDs. In addition, schools have become incapable of providing special education services to more pupils with LDs in general and to pupils with RDs in particular due to lack of both human and learning resources. Since 2007 the MoE began to include children with LDs. By an Educational Mandate in 2007 which was issued in accordance with the Omani Children with Disabilities Care and Rehabilitation Act in 1996 that was reauthorized in 2008, children with LDs became eligible for receiving additional help through tasks that are given by the special education teachers who hold a specialized one year Higher Diploma in LDs, a program which is tailored by Sultan Qaboos University to fulfill the training needs of the Ministry of Education professionals in the Sultanate of Oman (Emam, 2012).

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