

Discrimination Evidence for Examining Fourth Grade Students' Learning Disability Problems

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Abstract

This study investigated the ability of discriminate variables (perceptual-motor, hyperactivity disorder, neurological and psychological skills) to distinguish between normal ($n = 68$) and students with learning disabilities ($n = 72$) in fourth grade. Three instruments were developed: perceptual-motor scale, hyperactivity disorder scale, skills test neuropsychiatric. Eight schools were purposely chosen for their collaboration with the College of Education at Sultan Qaboos University. The sample consists of 140 students (68 students with learning disabilities and 73 normal students; 73 males). The results demonstrated a positive significant correlation between perceptual-motor and neurological and psychological skills. In addition, a negative significant correlation was found between hyperactivity disorder, perceptual-motor and neurological and psychological skills. Using discriminate analysis, the study shows that the three developed measurements can discriminate between normal students and students with learning disabilities. We recommend using the three scales on students with learning disabilities for the purpose of early examination. There is a need to conduct a similar study, with other scales, for better examinations.

Keywords: learning disability, perceptual-motor, hyperactivity disorder, neurological and psychological skills

1. Introduction

Individual differences among learners across all stages of learning have clearly revealed the presence of recreation, innovation, and giftedness among learners. Moreover, a large amount of evidence indicates dysfunction and disabilities among learners in different grades. The learners with learning disabilities become one of the groups receiving the most attention, particularly after including students not suffering from clear disabilities such as blindness, deafness, or any other mental or physical disability (Barratt, 2008). Additionally, the number of learners classified with disabilities is increasing continuously, making them the most representative class of learners with special needs (Heward, 2006).

This gradual increase is supported by statistics presented in 2006 by the USA Department of Education indicating that 2.9 million children in the USA received special education and have been typically classified as learning disabled. According to the statistics published by the National Center for Special Education in 2006, more than 38.7% of children with learning disabilities do not reach high school, compared to 11% of the general public. Emerson et al. (2010) stated that "learners with learning disabilities may increase in England to reach 1,198,000 people have learning disabilities. This includes 298,000 children age 0-17; 900,000 adults aged 18+, of whom 191,000 (21%) are known to learning disabilities services" (p. 6).

It is undeniable that the increase in the number of children with learning disabilities is a threat to the educational system as it endangers the effectiveness of current educational efforts. Therefore, this necessitates the importance of early diagnosis of children with learning disabilities, working on treating them, and immersing them in normal classrooms. Researchers have stressed the need to provide appropriate diagnostic techniques for children with learning disabilities from the early stages of life and to offer effective treatment programs (Morrow, 2005).

The appropriate techniques for diagnosing children with learning disabilities are controversial to the degree that a number of diagnostic approaches have to be taken into consideration (McLeskey & Waldron, 2011). As a result of this controversy, researchers have dedicated their interests to assessing diagnostic techniques used to discover

children with learning disabilities. A great body of psychological and educational research has discussed a number of techniques to diagnose those learners through study and analysis (e.g., Westendrop, Hartman, Houwen, Smith, & Visscher 2011; Womack, 2011). Some of these techniques included tracing and diagnosing academic characteristics by using a variety of methods to provide appropriate treatment (Jop, 2011; Womack, 2011). For example, Jop (2012) noted that all previous studies indicated low academic achievement for this class of learners thus recommending the importance of applying a number of diverse criteria to diagnose and identify students with learning disabilities so that their academic performance is predicted more precisely.

Students with learning disabilities show discrepancy between their actual performance in one or more academic field(s) and their expected performance. The academic learning disabilities are obviously observed not only in students' inability to perform learning tasks, but also in experiencing difficulty following the teacher's directions. In contrast, developmental disabilities (attention, memory, and awareness) resulted in lowering students' motivation in class (Bender, 2002).

Westendrop, Hartman, Houwen, Smith and Visscher (2011) affirmed that the expected performance (developmental characteristics) predicts the link between psychomotor academic performance among students with learning disabilities. The sample included 104 students, aged between 7-12 years, who completed the Psychomotor Skill Test and Academic Skills Scale (Reading, Writing, and Math). Results showed a significant positive relationship between low psychomotor skills and low academic achievement. It is important to note that this correlation between developmental and academic characteristics was interpreted by a number of researchers (e.g., Cullata & Tompkins, 2003; Jop, 2012). Cullata and Tompkins found that perceptual-motor abilities among students with learning disabilities result from their inability to explain and interpret environmental stimuli received by the senses. Learners, therefore, cannot reach the indications and meanings of those stimuli, particularly if the rhythm or flow of stimuli is rapid and does not match their processing and preparation levels, which is reflected in their low academic achievement. Zhang and Zhang (2003) confirmed this relationship and found that 85% of a sample of children with learning disabilities had weakness in their perceptual-motor abilities, 59% had weakness in balancing abilities, and 59% had weakness in movement coordination. The study recommended the significance of conducting studies and designing programs to treat these perceptual-motor abilities for children between (4-10) years.

In contrast, a number of researchers believe that the roots of learning disabilities stem from neuro-psychological issues, such as hyper activity (Mayes & Calholl, 2007; Katerina & Efthymois, 2010). This approach is supported by Exner (2010) who found that ADHD is the core cause of learning disabilities across all school stages up to university level. The Diagnostic and Statistical Manual of Mental Disorders (DSM IV-R, 2000) indicates that ADHD is significantly widespread among school students to reach about 3-7% of children in schools. These children show attention deficit and hyper activity inconsistent with situation demands in which they are present (Barkley & Murphy, 2006). It is significant to note that scientific and organized study of ADHD started in 1960 finding that basic indicators include attention deficit, impulsivity, hyper activity, which are widespread among children with learning disabilities (Herbert, 1999). This disorder is considered a chronic biological syndrome related to the nervous system that is not attributed to poverty or inappropriate educational and social environment. Given that, the diagnosis should be based on neuro-psychological scales (Exner, 2010). Hyper activity is seen as a major neuro-psychological disorder among children that needs to be addressed by specialists through neuro-psychological diagnosis scales (DeMarie, Denk, & Emsthausen, 2003; Medwid, 2002).

The diagnosis of ADD (Attention Deficit Disorder) is a highly important and precise process that requires the collaborative efforts of many individuals, including the child's family (Kelly, 2009). Some studies stress the need to scrutinize the challenging criteria when diagnosing ADHD among students (O'Connel & Casale, 2004). Indeed, diagnosing those students needs to be as early as possible using precise diagnostic techniques to provide them with appropriate treatments (Lerner, 2000). Although ADD is important when diagnosing students with learning disabilities, others believe that sequential hearing memory is a major contributor in diagnosis. They contend that those children cannot remember items sequentially such as letters, numbers, words, and sounds (Bender, 2001; Zarghi, Mehrinjad, Zail, & Remezankin, 2012). In fact, short term memory is one of the highest contributing factors for low academic achievement among students with learning disabilities, as well as predicting student's reading comprehension and word recognition (Alloway & Passolunghi, 2006; Ashbaker, 2000; Ashbaker & Swanson, 1996; Jerman, 2007; Swanson & Claudia, 2009).

Memory disorders are correlated with ADD and awareness process disorders. Thus, an individual's attention span, ability to pay attention selectively, awareness processes, and interpretation of stimuli are all basic input elements in memory processes (Coulet, Leclercg, Morni, & Azouvi, 2002; Levine, 2002). Supporting this

correlation is the medical point of view that indicates learning disability as a disorder in some of the nervous system functions therefore affecting the individual's ability to read, write, spell, receive stimuli, remember and organize information, and make calculations (Lerner, 2000). This view is similar to the findings of some research that attributed low academic achievement among students with learning disabilities to a simple defect in brain cells. Research stresses the importance of neuro-psychological analysis by which these disabilities are discovered (Anzelmo-Skelton, 2006; Lord-Meas & Obzurt, 1996; Mazzocco, 2005). Therefore, any damage or defect in the central nervous system with the student can be reflected in behavior such as a deficit or disorder in senses, cognition, achievement, and motor skills.

One of the most outstanding approaches for interpreting learning disabilities is the neuro-psychological approach that focuses on mental processes. This approach is observed by psychologists to understand sensing, cognitive, and learning abilities and processes used by the individual. Willams and McGee (1996) investigated the developmental learning disabilities (attention, awareness, memory) in children between 9-10 years old. The study found that students with learning disabilities have weaknesses in perceptual-motor abilities and ADD. These findings were replicated by Waldron and Saphire (1992). Based on these studies, it appears that the concept of learning disabilities comprises the incomplete ability to pay attention, remember, or do calculations. Most of the children with learning disabilities suffer from awareness disabilities that may lead to a mild dysfunction in brain processes related to the child's learning (Liddel & Rasmussen, 2005; Mazzocco, 2005; Smith, 2004).

Researchers in the field of assessment tools are motivated to diagnose developmental disabilities consistent with scale designing criteria, obtaining data related to the child's behavior at school, and his/her achievement (Kelly, 2009). For instance, when measuring the perceptual-motor abilities, some criteria must be followed. The first criterion is taking into account the organized observations of children when diagnosing those with learning disabilities, those late at school, and normal achieving children in the early stages of school. This diagnosis aims to discover any deficits in perceptual-motor abilities development, locating areas of motor-awareness problems, and noticing dysfunctions in motor-awareness behavior in a series of performances. As most children with learning disabilities suffer from a nervous disorder, the second criterion focuses on perceptual-motor abilities that cause the child's inability to learn. This concept was garnered by a number of theories presented in this area (e.g., Barsch, 1967; Delacato & Doman, 1966; Frostig, 1964; Getman, 1964; Hasan, 2009; Kephart, 1971, 1972). The third criterion includes the application of known assessment tools that have psychometric properties to measure motor-awareness abilities according to the aforementioned motor-awareness theories. One important assessment tool is the testing battery designed by Jean Ayers (known as Southern California Perception Motor Tests), Frostig's Marian Frostig Development of Visual Perception, Diton's scale of motor-sensing awareness, and The Purdue Perceptual-Motor Survey constructed in the USA by Eugene G. Roach and Newell C. Kephart (Bader & Sayyed, 2001; Hassan, 2009; Rubi, 1991).

Relating to the diagnosis of children with ADHD, the American Academy of Pediatrics has placed a number of criteria that must be taken into consideration when diagnosing children with ADHD between the ages of 6 to 12 years. The first criterion includes ADHD, school problems, low achievement, problems with teachers and family members, problems with other people, and any other family issue. The second criterion includes directing questions to parents or through surveys concentrating on school environment and behavior problems that might cause symptoms of this disorder. The third criterion concerns the use of the criteria listed in the (DSM IV-R, 2000). As indicated, symptoms of this disorder appear in two different classes and these symptoms impact the child's socialization and leads to under-achievement, particularly if it lasts for more than 6 months. The fourth criterion focuses on recruiting data available on ADHD symptoms in different cases, start of the symptoms and their extent, and the range of academic and social deficits. The fifth criterion includes the importance of diagnosing other disorders along with ADHD. The last criterion asserts that the specialist should be aware of any resembling symptoms between some normal children and children with ADHD which are in fact not attributable to ADHD (Monastra, 2008; Rief, 2008; Turkington & Harris, 2006).

In relation to the criteria of diagnosing mental processes related to different types of memory that have nervous system roots (sequential memory, sequential-term memory, ability to differentiate, and audio visual integration), scientists assert precision diagnosis. Scientists contend that these mental processes can indicate level of proficiency in visual and psychological processes needed by the child before school until the age of 9 even though these diagnoses may not have a direct relationship with learning, reading, and writing. It is significant, though, to bear in mind that being late in developing these two types of memory (SM & STM) leads to lateness in comprehension and learning with the child. A great body of research has supported this claim, one of which indicates that children with diverse achievement abilities may have various styles in the use of these memories,

although the relationship between different memories is intertwined (Buckner & Wheeler, 2001; Rohi & Pratt, 1995; Swanson, 1994).

Neuro-psychological diagnoses are various, one of which is neuron-screening diagnosis. Gerstmann (1924), as the pioneer of this diagnosis, mentioned that the neuron-screening occurs with minor injuries in the left hemisphere of the brain and include four symptoms: finger agnosia, dysgraphia, dyscalculia, and right-left disorientation. A number of researchers have advocated this conceptualization in their research of children with learning disabilities including Fabian and Jacobs, (1981) who applied the Bender Gestalt Test 1976 and Quick Neurological Screening Test (QNST) in 1974 to diagnose children with learning disabilities between 8 to 12 years old. On the other hand, Beaton, Edwards, and Pegg (2006) used Castles and Coltheart's (1976) test to diagnose children with reading disabilities from age 6 or older.

After reviewing the previous literature, there is a need to provide assessment tools that target differentiating abilities for early diagnosis of children with learning disabilities in the first cycle of school. This tool focuses on perceptual-motor abilities, ADHD, dysfunction in mental processes, such as attention, memory and awareness. This research aims to answer the following questions: first, what is the differentiating evidence for scores of students with learning disabilities in the first cycle of school (1-4) on the Perceptual-Motor abilities Scale, ADHD Scale, and psychological and IQ Skills Scale according to their learning disability classification? Second, what is the differentiating evidence for scores of students with learning disabilities in the first cycle of school (1-4) on the Perceptual-Motor abilities Scale, ADHD Scale, and psychological and IQ Skills Scale according to gender?

2. Methodology

2.1 Sample

The population for the current study is fourth grade students, both normal and learning disabled, from basic education schools in Muscat/Oman during the academic year of 2012-2013. Eight schools were purposely chosen for their collaboration with the College of Education at Sultan Qaboos University. The sample consists of 140 students (68 students with learning disabilities and 73 normal students; 73 males). It is important to note that these students with learning disabilities were examined using the *Otis-Lennon Test* to measure their IQ, codified on the Omani environment and through achievement tests in reading and math subjects created by the Ministry of Education in the Sultanate of Oman.

2.2 Instruments

Perceptual—Motor Survey. Screening Bordeaux Scale for perceptual- motor survey developed by Newell Kephart and Eugene Roche and known as The Purdue Perceptual Motor Survey was used in this study. The scale terms have been designed on the basis of notes from children with learning difficulties, low achievers and normal academic achievers, in elementary classes. This aims to uncover some dysfunction regarding their perceptual-motor growth, to identify the perceptual-motor problems areas among low achievers, and to provide an opportunity to observe the perceptual-motor behaviors in a chain of performances. Consequently, we can classify the problems that need special treatment.

The scale consists of 31 items; 11 items represent sub-tests distributed on five different fields. (1) Balance and posture covers walking board test and jumping test measuring control, body perception and kinetic rhythm. (2) Body image and differentiation involves identification of body, imitation of movements, obstacle course, angles in the snow, and Kraus-Weber. (3) Perceptual—Motor Match Domain contains two tests: Chalkboard Test and Rhythmic Writing. (4) Ocular Control Domain. (5) Form Perception Domain.

This test consists of geometric shapes drawn on separate cards. The child is required to draw these shapes on a sheet of white paper. These shapes are square, triangle, rhomboid horizontal, rhomboid vertical oblong divided by cross lines, and two crossing lines. Evaluation of this test comprises shape and the arrangement. Children aged between 5- 5.11 months are tested with shapes 1 to 4 while children aged 6 to 6.11 months are tested with shapes 1 to 5. Children 7 years and above are tested with all the shapes. The estimations of 1,2,3,4 ranges for each capacity of the five domains. This measure has high reliability and validity and was first assessed in Oman in 2009 using various techniques such as Content Validity, Criterion Validity, Construction Validity, Discrimination Validity as well as Cronbach's Alpha and test-retest method. Regarding reliability, this study had acceptable internal consistency (Cronbach's Alpha) with a reliability coefficient of 0.83.

Measure for attention deficit, hyperactivity and impulsivity. This measure was finalized with reference to the DSM IV-R (2000) and NICHQ Vanderbilt Assessment Scale (Wolraich, 2002). Accordingly, the measure consists of 22 statements answered by the teacher, chosen because (Kindle, 2009) the writings and behaviors of teachers are

considered the best sources for data. The questionnaire is distributed over three factors (attention deficit, hyperactivity, and impulsivity). Respondents respond to each item by choosing one of four possible alternatives (Always, Often, Sometime, and Rarely) which were assigned scores 1,2,3 and 4 respectively. The validity of the questionnaire was examined using the strategy of panel validity. Also, construct validity was examined using exploratory factor analysis with principle components and orthogonal rotation which revealed two factors, both with an eigenvalue greater than 1. The two factors explained 52.388% of the total variance extracted. The first factor included 11 items with an eigenvalue of 8.879 and 30.402% of the total variance extracted. The second factor included 9 items with an eigenvalue of 2.639 and 21.986 of the total variance extracted. Appendix 1 shows the matrix of extracted factors and their item loadings after orthogonal rotation.

Neurological and psychological test. This study depends on neurological and psychological tests created for the Arab environment (Al Sharbati, 1985). These tests involve groups of neurological tests for 15-20 minutes, and are differentiated by their efficiency and their great affinity in distinguishing between children who are more vulnerable to learning disabilities than other normal children. These tests have five types, each characterized by its assessment of 1,2,3,4,5, explained as follows:

Finger Agnosia Test. The child's performance in this test will imply if a child has affinity for distinguishing the sequence of his/her fingers and in recalling numbers correctly. Hence, the child's performance will show if there is an attention deficiency.

Finger Discrimination Test. During this test, a child does not use his/her verbal abilities as in the Finger Agnosia Test. This test is conducted by pointing fingers and children with poor performance have a problem in fundamental cognitive functions, such as selective attention, vigilance attention and the many other types of memory.

Graphiesthesia Test. This tests a child's verbal abilities without a need for the child to know how to write numbers. In this test, it is possible to use the technique of drawing some shapes on the child's palm. Poor performance in this test means weak attention and weak comprehension and lack of awareness of body parts.

Sequential Organization Test. This test is used in investigating the sequential organization and successive memory as both are major components of the education process and of learning reading and writing in the early stages of school.

Finger Apraxia Test. This test is used to measure a child's ability for writing and pencil-holding assessing attention deficiency, concentration and short-term memory.

Test validity was obtained through a number of specialists' referees, while the reliability coefficient (0.76) was obtained through test-retest with a two week duration between.

3. Results

Discriminate analyses were used to answer the two questions for this study. In order to investigate the relationship between the three scales, a correlation matrix is depicted in Table 1:

Table 1. Matrix of correlation coefficients between the three scales

Scale	Perceptual–Motor Abilities	Neurological-Psychological Skills	Attention Deficit, Hyperactivity and Impulsivity
Perceptual–Motor Abilities	1.00	0.650**	-0.373**
Neurological Psychological Skills		1.00	-0.479**
Attention Deficit, Hyperactivity and Impulsivity			1.00

Note. ** level of significance ($p < 0.05$ a).

The correlation coefficients reveal a positive relationship between perceptual-motor abilities and neurological psychological skills. Also, there is a negative correlation between cognitive-kinetic abilities, neurological-psychological skills and attention deficiency, hyperactivity and impulsivity.

To answer the first question, it is important to examine differences in the grade averages of normal students and the students with learning disabilities across the three scales. First, using means and standard deviations, we

examined the grades of the children by the three scales. Each sample was examined: the whole sample, the sample of students with learning disabilities and the sample of normal students, as shown in Table 2.

Table 2. Means and standard deviations for the participants by sample across the three scales

Sample	Scales	Perceptual-Motor Abilities		Neurological Psychological Skills		Attention Deficit, Hyperactivity and Impulsivity	
		M	SD	M	SD	M	SD
Learning Difficulties		2.521	0.438	2.579	0.495	3.491	0.638
Normal		3.407	0.412	4.256	0.426	2.710	0.558
All		2.977	0.614	3.441	0.958	3.089	0.713

Then, we computed a discriminate analysis of the students with learning disabilities and normal students on the three scales, using SPSS as shown in Table (3).

Table 3. Discriminate analysis results for the three scales

Scales	Test Grade Wilks Lamda	F Value	p
Perceptual -Motor Abilities	0.475	152.301	0.000
Neurological-Psychological Skills	0.237	462.610	0.000
Attention Deficit, Hyperactivity and Impulsivity	0.698	59.595	0.000

Table 3 shows that there are statistical differences for all three scales indicating they are capable of distinguishing between normal students and students with learning disabilities.

To answer the second question, it is important to examine the differences in the grade averages of normal students and the students with learning disabilities on the three scales, with regard to gender. Using means and standard deviations, we examined the grades of students with learning disabilities on the three scales, as shown in Table 4.

Table 4. Means and standard deviations of the grades for students with learning disabilities on the three scales

Scale	Sample	Males (36)		Females (32)		All (68)	
		M	SD	M	SD	M	SD
Perceptual – Motor Abilities		2.490	.397	2.553	.484	2.521	0.438
Neurological Psychological Skills		2.752	.490	2.588	.508	2.579	0.495
Attention Deficit, Hyperactivity and Impulsivity		3.560	.688	3.688	.563	3.491	0.638

To check if the average grades of the participants on the three scales can distinguish students with learning disabilities according to gender, distinguished results of their grades have been examined by the three scales as illustrated in Table 5.

Table 5. Distinguished results of grades examined by three scales

Scales	Test Value Wilks Lamda	F Value	p
Perceptual-motor abilities	.995	.016	0.567
Neurological Psychological Skills	1.000	.082	0.900
Attention Deficit, Hyperactivity and Impulsivity	.967	2.277	0.136

Table 5 shows that there is no statistical difference in the three scales indicating they are incapable of distinguishing between normal students and students with learning disabilities by gender.

4. Discussion

Returning to our research questions, we first sought to examine the differentiating evidence for scores of students with learning disabilities in the first cycle of school (1-4) on the Perceptual-Motor abilities Scale, ADHD Scale, and psychological and IQ Skills Scale according to their learning disability classification. According to discriminant analysis, the results show that there is a negative significant correlation among students' attention deficit followed by hyperactivity, impulsivity and students' perceptual-motor abilities and their neurological skills. This indicates that when participants' grades increase on perceptual-motor abilities and a neurological-psychological test, their attention improves and their hyperactivity and impulsivity decrease. Hence, the children who have not received orientation programs in cycle one (which enhances their perceptual-motor abilities and their neurological-psychological skills) might lead to a child with learning disabilities. Indeed, the educational process, reading and writing in particular, requires students to have perceptual-motor abilities that develop within him/her continually through time intervals. When a child is behind his/her normal peers in all the above skills and abilities for either physiological reasons or sickness, the child falls behind in his/her learning processes and understanding abilities.

In addition, there are some theories to explain the relationship between growth of children's perceptual-motor abilities and their process of learning during childhood. These theories state that there is a considerable percentage of children suffering disabilities related to learning in school, such as difficulty in reading and writing. They may also have difficulty while performing some school skills or may suffer reduction in their Dyslexia. Thus, it becomes apparent that like those children have deficiency in the growth of their perceptual-motor abilities. In most cases, these children are either low-achievers or suffering from learning disabilities.

Lerner (2000) affirms that perceptual-motor abilities problems are mostly concerned with students suffering learning disabilities. Moreover, children suffering from problems related to their serious and light motor activities also face academic and non-academic challenges. Lowenthal's (2002) study supports Lerner's and lays out the fact that students who suffer learning problems are characterized with attention deficiency negatively related to their cognitive abilities.

Another interpretation could be that children's academic cognitive inability, who suffer from hyper activity, have a neurological disorder (Cantwell & Baker, 1991; DeMarie et al., 2002). According to this, other researchers have shed light on the importance of investigating developmental abilities and neurological functions (Lowenthal, 2002; Mazzocco, 2005). They found that children who suffer learning disabilities are characterized with attention and memory deficiency and weakness in their kinetic-sensory comprehension.

In the current study, it becomes clear that the three scales were able to distinguish between normal students and students with learning difficulties. These scales work in correspondence with the theoretical lexis and the previous studies which confirm the statistical differences between normal students and students with learning difficulties. Hence, we can benefit from these results to diagnose these children in early stages, to decrease the rate in higher stages of education and to introduce suitable strategies for treatment. The results mentioned above are in parallel with other studies with regard to inability to control attention (Leung & Conitolly, 1994; Martinussen, Tannock, McInnes, & Chaban, 2006; Mayes & Calholl, 2007), with short-term memory skills (Swanson, Xinhua, & Jerman, 2009), and low-achievement (Bender, 2002; Jerry, 2000). Furthermore, Fabian and Jacobs' study (1981) found statistical differences between students with learning disabilities suffering from

dyslexia and normal students when they had a counting test using fingers. Normal students were better in cognitive processes.

The second research question of the current study concerned differentiating evidence for learning disabilities students' scores in the first cycle of school (1-4) on the Perceptual-Motor abilities Scale, ADHD Scale, and psychological and IQ Skills Scale according to gender. The results indicate that the three scales used in this study were unable to distinguish between students with learning disabilities according to gender. One interpretation of this result could be that students who suffer attention deficiency, hyperactivity and dispersion tendency to external stimulants are prominent features of those students. Regardless of their gender, they do not distinguish between stimuli and children and quickly get distracted from watching the same stimulus continuously. Usually, it does not exceed a few minutes. They automatically and easily tend to enjoy external stimuli, like looking through a class window or keeping an eye on other children's movements. Generally, we find these children face challenges in concentrating on tasks and in finding a way to achieve the task. Thus, it becomes difficult for them to learn new skills (Mayes, Calhoun, & Crowell, 2000).

The results of this study agree with other Arab studies in this area. For example, Alnajdawi (1993) found no statistical differences in students with learning disabilities, in relation to attention, motor skills, cognition, and memory, regardless of their gender. In addition, the results of the current study are similar to Demonet, Tayler and Chaix's (2004) study. Their study found that students with learning difficulties, with dyslexia, have deficiency in their cortical processing, when compared with their normal peers. However, the absence of a difference between students with learning difficulties with regard to gender is related to psychological and neurological tests.

In addition, our study confirms the results of Anzelmo-Skelton (2006) and Moore et al. (1996). These researchers assumed that the absence of statistical difference between these students may be due to the fact that the three scales used in this study did not take into consideration gender difference. Thus, the outcomes of the participants' answers correspond with its main purpose.

5. Conclusion

There is a need to conduct more research to check the capability of the three scales; future research can be conducted using other samples to examine the ability to distinguish between normal students and students with learning disabilities. We recommend using the three scales on students with learning disabilities for early examination. There is a need to conduct a similar study, with other scales, for better examinations.

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