

Establishing Normative Data for The Dyslexia Determination Test (DDT) in
Non-Dyslexic Second Grade Students

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Abstract

The purpose of this study is to evaluate the validity of the Dyslexia Determination Test (DDT). The researchers administered the DDT to 29 non-dyslexic students midway through their second grade educational year. According to the testing criteria of the DDT, 3 of the 29 students (10.2%) tested as having either mild, moderate, or marked dysnemkinesia. 18 students (62.0%) tested as having mild or moderate dyseidesia. 2 students (6.9%) tested as having mild or marked dysphonesia. Research concluded that the DDT is a useful tool for determining second grade students with dysphonesia and dysnemkinesia, but is likely not as sensitive at determining students with dyseidesia at such a young age. The DDT also revealed shortcomings in identifying children who omit letters or numbers when writing the a through z letter sequence, and 1 through 10 number sequence.

Key Words: dyslexia, nemkinesia, dysnemkinesia, phonesia, dysphonesia, eidesia, dyseidesia

Introduction

Dyslexia is a general term that is used to describe a number of different reading disabilities. Because it is thought that 2 to 8 percent of all children suffer from some form of dyslexic condition, it is important to have a sensitive diagnostic test. The Dyslexia Determination Test (DDT) is a commonly used instrument in the diagnosis of reading disabilities associated with dyslexia. The DDT however, has little normative data to support its test criteria standards and validity. This purpose of this study is to generate normative data to support or disprove the diagnostic validity of the DDT.

Methods

Participants

Second grade students enrolled in a local elementary school in Hillsdale, Michigan were selected as participants for this study, using the Dyslexia Developmental Test. The age of the students tested ranged from 6 to 8 years old. Permission slips discussing the intent of our study were distributed to all perspective subjects. Involvement in this study required signed permission from a participant's parent or guardian. Only students who returned parentally signed permission slips were allowed to participate in the study. A total of 30 second grade students from 2 separate classes were tested. 29 of the subjects were "non-dyslexic" and 1 student was previously diagnosed as being dyslexic. Only the results of the 29 "non-dyslexic" students were used for our calculations and evaluation of the DDT normative data.

Materials

Dyslexia Determination Test (DDT) (Griffin & Walton, 1980), including Decoding Word booklet, Examiner's Instruction Manual and scoring sheets, pencils, and a large desk.

Procedure

Each student was excused from class, one at a time, and taken to a separate testing room. The testing room contained a large desk for administration of the Dyslexia Determination Test (DDT). Scoring sheets, pencils, and the DDT Decoding Words booklet were organized on the table.

The first section of the DDT is the Grapheme-Nemkinesia Testing section. In this section the student was asked to write each of the numbers, one through ten, on a lined sheet of paper. Students were then asked to write each letter, A through Z, in upper and lower case, on separate lines.

The second section of the DDT test is the Dyseidesia section. In this segment, students are asked to read from lists of words. The words on these lists are vocabulary words representative of different grade levels ranging from pre-school to college. A student's reading grade levels, for the purpose of this test, is determined by the highest grade level reading list in which the student sight word recognition is 50% or greater. Students are then asked to spell 10 correctly identified eidetic (or sight-known) words from the previous reading list.

The final section of the DDT is the Dysphonesia section. Students are asked to spell 10 unknown words from the reading list phonetically as part of the dysphonesia section of the DDT. The score of this section is based on the correctness of spelling by how the phonetic equivalent of word is written.

After one student completed the testing battery, that student was returned to their classroom and the next student was excused from class and tested.

Scoring

The score of the Grapheme-Nemkinesia Testing section of the DDT is based on the number of reversals of A to Z (the printing of capital letters) or a-z (the printing of lower case letters), whichever is maximal. The total number of numeric reversals is added to the maximal number of letter reversals (upper or lower case) and compared to the current pass/fail criteria for the DDT. At the second grade level, a total of seven reversals is permitted to meet the passing criterion for the Nemkinesia section of the DDT.

The score of the Dyseidesia section of the DDT is based on the number of eidetic, or sight-read, words that were spelled correctly from a list of 10. 9-10 out of 10 correctly spelled is above average, 7-8 out of 10 is normal, 5-6 out of 10 is borderline normal, 3-4 out of 10 indicates mild dyseidesia, 1-2 out of 10 indicates moderate dyseidesia, and 0 out of 10 indicates marked dyseidesia.

The score of the Dysphonesia section of the DDT is based on the number of unknown words that are spelled by their phonetic equivalent. 9-10 out of 10 spelled correct phonetically is above average, 7-8 out of 10 is normal, 5-6 out of 10 is borderline normal, 3-4 out of 10 indicates mild dysphonesia, 1-2 out of 10 indicates moderate dysphonesia, 0 out of 10 indicates marked dysphonesia.

Results:

Of the 29 students tested, the average number of reversals was 0.793 per student. The majority of the students, 22 out of 29 made no reversal errors. The largest number of reversals made by any single student was six. 24% of the students (7 of the 29) also made omissions, which are not considered in the grading of the examination, in either the number sequence or

letter sequence writing.

Of the 29 students tested, 3.4% (1 out of 29) could not correctly sight read 50% of the pre-primer word list. This correlates with marked dysnemkinesia according to the DDT grading scale. 3.4% (1 out of 29) tested at the primer reading level, which correlates with moderate dysnemkinesia. 3.4% (1 out of 29) tested at the first grade level, which correlates to mild dysnemkinesia. 10.3% (3 out of 29) tested at the second grade level, 55% (16 out of 29) tested at the third grade level, 6.9% (2 out of 29) tested at the fourth grade level, 3.4% (1 out of 29) tested at the fifth grade level, 6.9% (2 out of 29) tested at the sixth grade level, 3.4% (1 out of 29) tested at the seventh-eighth grade level, 3.4% (1 out of 29) tested at the ninth through twelfth grade level (figure 1).

When asked to spell eidetic, or sight-known, words from the reading list, 3.4% (1 of the 29) of the students scored above normal (able to correctly spell 9-10 out of 10 correctly of the eidetic words). 6.9% (2 out of 29) of the students tested at the normal level (7-8 words correct out of 10), 20.9% (6 out of 29) of the students tested borderline normal (5-6 correct out of 10). 24.1% (7 out of 29) of the students tested as mildly dyseidetic (3-4 correct out of 10). 37.9% (11 out of 29) of the students tested as moderately dyseidetic (1-2 correct out of 10). None of the 29 students tested as marked dyseidetic. 3.4% (1 out of 29) of the students was uncooperative and unwilling to participate in any spelling testing. 3.4% (1 out of 29) of the students was unwilling to participate due to perceived inability to spell (figure 2).

When asked to spell unknown words phonetically, 13.8% (4 out of 29) of the students tested above normal (9-10 spelled phonetically correct out of 10). 44.8% of the students (13 out of 29) scored as normal (7-8 out of 10 correct). 31.3% of the students (9 out of 29) scored as

borderline normal (5-6 out of 10 correct). 3.4% of the students (1 out of 29) scored as mild dysphonetic (3-4 out of 10 correct). None of the students scored as moderate dysphonetic and 3.4% of the students (1 out of 29) scored as marked dysphonetic (0 out of 10 correct). Again, 3.4% of the students (1 out of 29) was uncooperative, and 3.4% of the students (1 out of 29) was unwilling to participate due to perceived inability to spell (figure 3).

Discussion

Dyslexia is a widely-used, general, and often oversimplified term. Dyslexia is actually a very complex and misunderstood condition, and its exact definition is not agreed upon, even by professionals in the field of child development. Dyslexia is generally understood as a severe reading disorder of neurological origin in an individual with average or above average intelligence, and no other explanation for the reading impairment (Kalat, 1998). Dyslexia and similar reading disabilities can be found in approximately 70% to 80% of students in special education classrooms (International Dyslexia Association, 2003); and it is estimated that 2% to 8% of all children have some form of dyslexic condition (Davidson, 1996).

Dyslexia can be divided into subcategories, including dysnemkinesia, dyseidesia and dysphonesia. Dysnemkinesia is a dysfunction that involves memory and motor movement. Individuals with this dysfunction tend to be distinguished by their abnormally high frequency of letter reversals. Dyseidesia is an inability to perceive words as a whole functional unit. Individuals that are dyseidetic are unable to spell words that they are able to recognize by sight. Dysphonesia is the inability to identify words or letters by their phonetic sounds.

Even though many children are labeled dyslexic, there are few standardized tests used for

diagnosing dyslexia. Because the Dyslexia Determination Test is one of the most frequently used tests to help diagnose dyslexia, it is important to have normative data to support or disprove its diagnostic abilities.

Students in our subject pool performed well in the nemkinesia testing section of the DDT. None of the 29 students made 7 or more reversal errors, which is the DDT test criterion for dysnemkinesia. Letter reversals are normal in younger children, but should not be seen in normally developed children by age 7 (Griffin, 1981). All of the students in this study ranged from seven to nine years of age, and therefore it would be expected that few reversal errors would be found during the nemkinesia testing. This study revealed that the testing criterion for the nemkinesia section of the DDT correlated well with the data that was obtained.

Even though omissions are not addressed in the grading of nemkinesia testing section, several students (7 of 29) made at least one omission during number and letter sequence writing. Because omissions seemed to be a common mistake among our sample population, omissions should potentially be considered in the grading of nemkinesia testing section of the DDT and adjustments in the grading criteria should be made accordingly.

The 29 students that were tested also scored well in the phonetic section of the DDT examination. The data obtained in this study correlated well with the grading standards of the DDT. Phonetic spelling requires little or no previous exposure to the words that are being tested and several interpretations and spelling combinations are acceptable. Knowing the phonetics of the entire alphabet is not necessary to excel at this form of testing. Since several letters or combinations of letters can be used to create the same phonetic equivalent, several combinations

could be potentially considered correct for the phonetic spelling of the same word. As long as an individual being tested knows most of the phonics of the alphabet, he or she should be able to spell almost any word phonetically and score well on this section.

The same 29 students did not score as well in the eidetic section of the DDT test. The results from this study revealed that the grading criteria for the eidetic section of the DDT did not correlate well with the data that was obtained. Spelling in the eidetic section was most likely a more difficult task because there is only one correct answer for each word's spelling. Because these students are young, they have had relatively little exposure to eidetic spelling testing and have likely experienced more phonics based learning (Kaplan, 1991). With little experience spelling words eidetically, the subjects are less likely to perform well in this section.

The findings of this study are limited, due to the fact that all of the students tested were from one elementary school curriculum and of similar socio-economic background. Future testing involving the Dyslexia Determination Test should include subjects from different grade levels and subjects from different school districts. Consideration should also be given to school districts in different locations, which could provide normative data from different socio-economic areas. Studies have also suggested that dyslexia is more prevalent in males than females. Further studies should also be done regarding the DDT to determine if its findings are consistent with the predicted gender differences.

Dyslexia and related reading disabilities should be of particular interest for optometrists, since much of our sensory development depends on visual input. An optometric educational background enables optometrists to help in a multi-disciplinary intervention program by maximizing visual function in children with these difficulties. Students with dyslexia and related

reading disabilities can be greatly helped by the implementation of alternative teaching and learning strategies (Davison, 1996). It is important to have tools which can aid in the identification of individuals with dyslexic conditions so these strategies can be implemented at an early age. If children are not identified with learning disabilities early, they are likely to be labeled as lazy or developmentally disabled, when they actually have normal intelligence. As a child develops these labels, prejudices may result in low motivation, distractibility, low self-confidence, and organizational difficulty which could persist indefinitely. Because of the long-term consequences of reading disabilities, it is extremely important to have a valid and sensitive test battery which can help identify these children at an early age. The DDT is a useful test, but more research should be done in younger elementary school children to help ascertain its validity.

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Figure 1

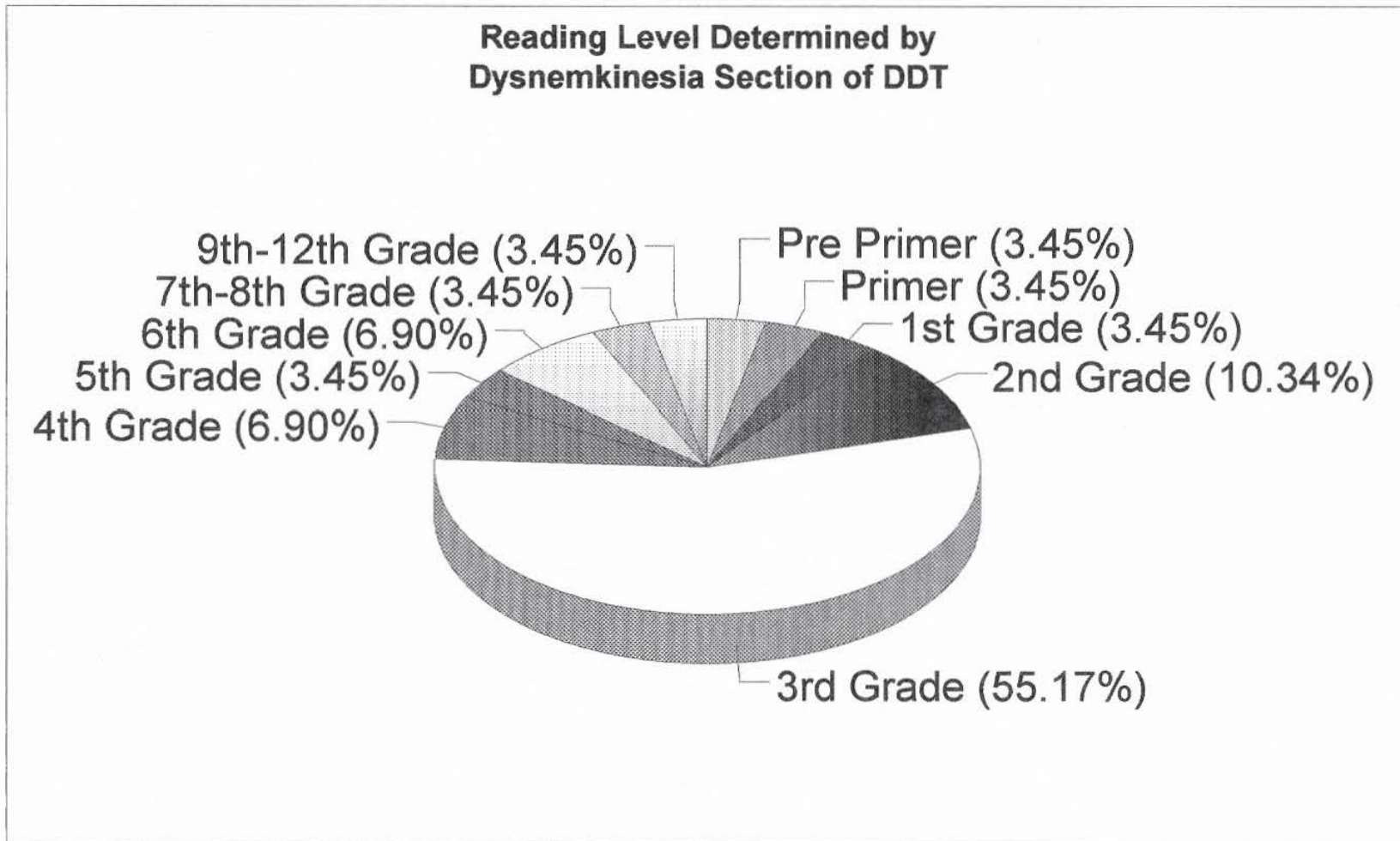


Figure 2

Results of Dyseidetic Testing Section of the DDT

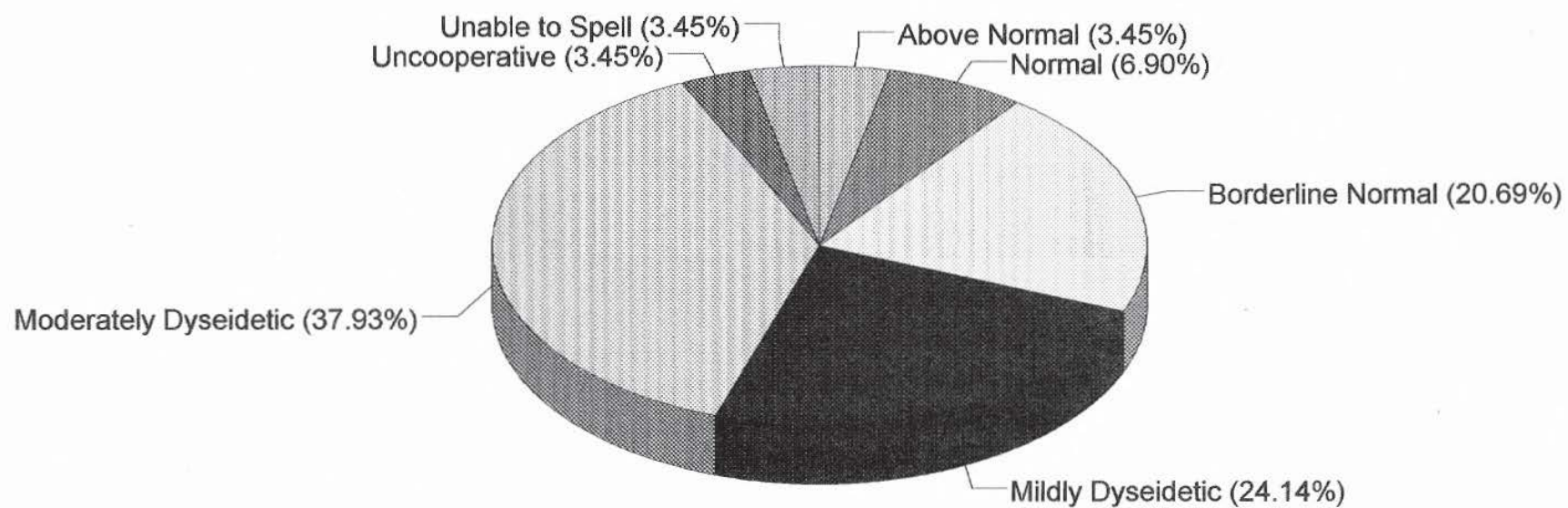


Figure 3

