Evaluating normal children and those with learning problems using the Adult Dyslexic Test, Dyslexic Determination Test, Peabody Picture Vocabulary Test, Test of Auditory Analysis Skills, and Irlen Screening Test

Jodie J. Johnson  
Pacific University

James A. Woodmansee  
Pacific University

Recommended Citation
https://commons.pacificu.edu/opt/1149
Evaluating normal children and those with learning problems using the Adult Dyslexic Test, Dyslexic Determination Test, Peabody Picture Vocabulary Test, Test of Auditory Analysis Skills, and Irlen Screening Test

Abstract

Introduction: There has been a great deal of speculation over the years as to what causes reading problems. Irlen has suggested that a condition called Scotopic Sensitivity Syndrome is at fault in many cases. Others believe that a neurological problem called dyslexia (word blindness) is responsible for severe reading problems. Even though experts have been unable to agree on precisely what SSS dyslexia is, screening tests have become standardized and accepted as valid means of diagnosis. The tests have also become an acceptable means of classifying the type of dyslexia that a person may have. The goal of our study was to use standardized testing for dyslexia and compare the results with Irlen testing to determine if there is a significant relationship between dyslexia and Scotopic Sensitivity Syndrome.

Subjects: The subject population consisted of 29 individuals (22 males ranging in age from 8 to 27, and seven females ranging from the age of 8 to 39). Their grade levels ranged from the third grade through graduate level with the majority of the students being in the seventh grade.

Tests Used: The Test of Auditory Analysis Skills (TAAS) is a simple auditory perception test. The Peabody Picture Vocabulary Test (PPVT) is a quick screening test of the subject’s level of intelligence. It was administered to rule out any reading disabilities that may be associated with below average intelligence. The Dyslexia Determination Test (DDT) is to identify individuals up to age 17 who exhibit dyslexia. The Irlen Differential Perceptual Schedule (IOPS) is comprised of various symbols and shapes such as cubes, pumpkins, and closely spaced figures that are designed to elicit symptoms of Scotopic Sensitivity Syndrome.

Results: There was no statistical relationship between SSS and dyseidetic classifications. There was a statistical relationship between SSS and dysphonesia, however it was determined to not be a meaningful relationship.

Discussion: Levels of dyseidetic and dysphonetic dyslexia were compared to SSS levels. The lack of an association between dyslexia and SSS, and the fact that higher SSS classifications do not correspond to higher dyslexia readings in our test group, suggest that SSS and dyslexia are separate conditions.

Degree Type

Thesis

Rights

Terms of use for work posted in CommonKnowledge.

This thesis is available at CommonKnowledge: https://commons.pacificu.edu/opt/1149
Copyright and terms of use

If you have downloaded this document directly from the web or from CommonKnowledge, see the “Rights” section on the previous page for the terms of use.

If you have received this document through an interlibrary loan/document delivery service, the following terms of use apply:

Copyright in this work is held by the author(s). You may download or print any portion of this document for personal use only, or for any use that is allowed by fair use (Title 17, §107 U.S.C.). Except for personal or fair use, you or your borrowing library may not reproduce, remix, republish, post, transmit, or distribute this document, or any portion thereof, without the permission of the copyright owner. [Note: If this document is licensed under a Creative Commons license (see “Rights” on the previous page) which allows broader usage rights, your use is governed by the terms of that license.]

Inquiries regarding further use of these materials should be addressed to: CommonKnowledge Rights, Pacific University Library, 2043 College Way, Forest Grove, OR 97116, (503) 352-7209. Email inquiries may be directed to: copyright@pacificu.edu

This thesis is available at CommonKnowledge: https://commons.pacificu.edu/opt/1149
EVALUATING NORMAL CHILDREN AND THOSE WITH LEARNING PROBLEMS USING THE ADULT DYSLEXIC TEST, DYSLEXIC DETERMINATION TEST, PEABODY PICTURE VOCABULARY TEST, TEST OF AUDITORY ANALYSIS SKILLS, AND IRLEN SCREENING TEST

By

JODIE J. JOHNSON, BA
AND
JAMES A. WOODMANSEE, BS

A thesis submitted to the faculty of the College of Optometry Pacific University Forest Grove, Oregon for the degree of Doctor of Optometry May, 1996

Advisers:

Robert L. Yolton, OD, PhD
Hannu Laukkanen, OD MEd
Signature Page

JODIE J. JOHNSON

JAMES A. WOODMANSEE

ADVISORS:

ROBERT YOLTON, OD, PhD

HANNU LAUKKANEN, OD, MEd
Bio-page

Jodie J. Johnson

James A. Woodmansee
Born January 11, 1961. Graduated from St. Mary's Central High School, Bismarck, ND 1979. Graduated from University of Mary with a BS degree in Business 1983. Extensive work history from 1983 to 1990 including Floor Manager of an office supply store Bismarck ND 1983-1985, Regional Sales Manager central ND for 3M Microfilm Corporation 1985-1987, Owner/Manager Firm Results Body Toning Fargo ND 1987-1989, Federally licensed Financial Planner with IDS Financial Planning Services 1987-1990 (Commensurate with Firm Results Body Toning). Married Kari Lynn Mueller June 8, 1991. Proud owner of a Doberman Pinscher (Annie) and a German Shepard/Rotweiler mix (Keno). Presently enrolled as a fourth year optometry student at Pacific University College of Optometry with an expected graduation date of May 1996. Hobbies include gardening and most competitive sports as well as golf, shooting, and skiing. Special interests in this research project are due to personal reading difficulties as a child and also that I have a nephew who needlessly suffered the pains and humiliation of having dyslexia that was not diagnosed before he had completed several years of grammar school.
Abstract

Introduction: There has been a great deal of speculation over the years as to what causes reading problems. Irlen has suggested that a condition called Scotopic Sensitivity Syndrome is at fault in many cases. Others believe that a neurological problem called dyslexia (word blindness) is responsible for severe reading problems. Even though experts have been unable to agree on precisely what SSS dyslexia is, screening tests have become standardized and accepted as valid means of diagnosis. The tests have also become an acceptable means of classifying the type of dyslexia that a person may have. The goal of our study was to use standardized testing for dyslexia and compare the results with Irlen testing to determine if there is a significant relationship between dyslexia and Scotopic Sensitivity Syndrome.

Subjects: The subject population consisted of 29 individuals (22 males ranging in age from 8 to 27, and seven females ranging from the age of 8 to 39). Their grade levels ranged from the third grade through graduate level with the majority of the students being in the seventh grade.

Tests Used: The Test of Auditory Analysis Skills (TAAS) is a simple auditory perception test. The Peabody Picture Vocabulary Test (PPVT) is a quick screening test of the subject's level of intelligence. It was administered to rule out any reading disabilities that may be associated with below average intelligence. The Dyslexia Determination Test (DDT) is to identify individuals up to age 17 who exhibit dyslexia. The Irlen Differential Perceptual Schedule (IDPS) is comprised of various symbols and shapes such as
cubes, pumpkins, and closely spaced figures that are designed to elicit symptoms of Scotopic Sensitivity Syndrome.

**Results:** There was no statistical relationship between SSS and dyseidetic classifications. There was a statistical relationship between SSS and dysphonesia, however it was determined to not be a meaningful relationship.

**Discussion:** Levels of dyseidetic and dysphonetic dyslexia were compared to SSS levels. The lack of an association between dyslexia and SSS, and the fact that higher SSS classifications do not correspond to higher dyslexia readings in our test group, suggest that SSS and dyslexia are separate conditions.
Acknowledgments

 Portions of this work were supported by grants from Dr. Ronald C. Lindberg, Edmonton, Alberta, Canada and Dr. Larry L. Williams, Springfield IL. IDPS testing was performed by Dr. Kathleen Farber, Portland OR. These acknowledgments do not necessarily imply acceptance of or agreement with the results of this project.

 We would like to thank our families for their support, and our subjects for their time and cooperation.
INTRODUCTION

Learning disabilities have long been a problem for students as well as educators. It is difficult to determine if a child has a reading problem that may or may not be associated with dyslexia. Reading problems have been described as a combination of factors that might include low intelligence, educational deprivation, sociocultural deprivation, primary emotional problems, sensory and perceptual dysfunctions (visual, auditory etc.), poor motivation, and Attention Deficit Disorder.

Dyslexia is defined as word blindness, and people with dyslexia often have problems with word recognition even though their visual systems are normal and their intelligence is above normal. Recently, dyslexia has come to be regarded as a deficit in the ability to process the symbols of written language. This deficit might be caused by minimum brain dysfunction and or differential brain function (Griffin and Walton 1987).

There has been a great deal of speculation over the years as to what causes dyslexia. Even though experts have been unable to agree on a precisely what causes dyslexia, dyslexia screening tests have become standardized and accepted as a valid means to determine if a person has dyslexia. They have also become an acceptable means of classifying the type of dyslexia that a person may have.

Our evaluation included a population of normal readers and individuals with known reading difficulties. We tested them with intelligence, dyslexia, and scotopic sensitivity tests and evaluated the results in order to compare the tests to each other. The goal of our study was to use standardized testing for dyslexia and compare
the results with Irlen SSS testing to determine if there is a significant relationship between dyslexia and SSS.

SUBJECTS AND METHODS

Subject Population

The subject population consisted of 29 individuals. Some were normal readers and some had reading problems. The subjects were recruited by Pacific University College of Optometry's Vision Therapy Service and by word of mouth. The population consisted of 22 males ranging in age from 8 to 27, and seven females ranging in age from 8 to 39. The grade levels ranged from the third grade through graduate school with the majority of the students being in the seventh grade.

Tests Used

TAAS

The Test of Auditory Analysis Skills (TAAS) is a simple auditory perception test. The person giving the test starts with two demonstration items intended to show the subject what is expected. For example, "Say cowboy. The examiner then pauses and allows the subject to respond. Next the examiner says, "Now say it again and this time don't say boy." By repeating the word, the examiner knows whether or not the subject correctly heard the word that is being used to test their auditory ability. The subject next repeats the word omitting a part as in the example above. After the two trial runs, the subject is given 13 additional words for the actual test.

Because the TAAS is a test for children, the placement level does not go beyond third grade. The test is terminated if the subject makes two successive errors or reaches the thirteenth word without
any successive errors. Scoring is as follows: zero to one wrong equals third grade level performance, two to three wrong is second grade level, four to nine wrong is first grade level, and ten to thirteen wrong is a kindergarten grade level. The TAAS was administered to detect any subjects whose learning disabilities could be associated with hearing or auditory analysis problems.

PPVT

The PPVT is a quick screening test of the subject’s verbal intelligence. It was administered to rule out any learning disabilities that may be associated with below average intelligence. The test consists of pages that are divided into four separate quadrants. Each quadrant has a picture and a corresponding number. After the examiner says a word, from a list, the subject responds by pointing, or saying, the number of the picture that he or she believes depicts the test word. The test is age normed from 3 to 16 years.

For each word, the examiner records whether or not the subject gave a correct or an incorrect response. In order to accurately score the results, the subject must attain a basal level which is reached by getting eight successive correct answers. If the subject fails to get eight successive correct, the examiner must back up and use words that are below the subject’s chronological age. Once a basal level is achieved, the subject continues progressing through the examination until he or she reaches a ceiling that is determined by incorrectly identifying six out of eight consecutive words. The raw score is calculated by taking the ceiling number and subtracting the total of all the errors. A standard score
equivalent is found by taking the raw score and utilizing tables that correct for age. An additional table can be used to determine the percentile rank using the standard score.

DDT

The purpose of the test is to identify individuals who exhibit dyslexic patterns in the areas of reading, writing, and spelling. The DDT is normed for subjects up to age 17.

The first subtest of the DDT assesses decoding by requiring the subject to orally sight-read words exposed for two seconds each. The subject has only two seconds to read each word and correctly pronounce it aloud in order to get "eidetic" credit. There are ten words for each grade level. The subject must get five out of ten correct in order to proceed to the next level.

Upon reaching the highest grade level possible, the subject is then allowed to reattempt words previously missed, and is given more time, ten seconds, to phonetically sound out each previously "missed" word. If the subject correctly pronounces the word within the allotted ten seconds, she or he is given credit for these words under the category of "untimed-unknown". Words that are not read correctly within twelve seconds are classified as "unknown." The process continues until there is a total of ten unknown words.

To score the test, the examiner simply adds the total number of words in each of the three categories (eidetic, unknown, and untimed-unknown) for each grade level. The decoding level is determined by the highest grade at which at least 50% of the "sight words" (eidetic) were recognized; this is recorded as the DDT decoding grade level.
Next, the subject is asked to write out numbers from one to ten, and also to write out the letters of the alphabet in both capital and lower case. This is called Grapheme-Nemkinesia testing. Here the examiner tabulates errors and notes any motor overflow, reversals of numbers or letters as well as other difficulties the subject demonstrated. The degree of nemkinesia is determined by comparing the encoding number of errors made by the subject to a table.

For the eidesia, subtest, known or "sightwords", are read aloud by examiner and written by the subject. Odd numbered words that were recognized eidetically by the subject are called out until a total of ten correct words are read. The examiner then reviews words encoded by the subject and grades the number of correctly spelled words. Scoring is as follows: 100% = above normal, 80% = normal, 60% = borderline normal, 40% = mild dyseidesia, 20% = moderate dyseidesia and 0% = marked dyseidesia.

The last subtest involves phonics encoding. The examiner selects and calls out ten unknown words for the subject to spell "phonetically." The examiner judges if the subject's encoded words are phonetically correct, based upon standard rules of English pronunciation (i.e. s-o-r-d for the word sword). The number of correct responses are recorded, and the results are interpreted using the same table as the eidetic portion of the test.

ADT

The Adult Dyslexia Test (ADT) is used with subjects ages 17 and older. There are several areas where the ADT differs from the DDT. The ADT has only seven words per grade level. Because there
are only seven words per grade instead of ten, scoring the ADT yields different percentages. ADT has finer gradation than the DDT. With the ADT there are more levels of severity possible for dyslexia. Also the ADT does not have a Grapheme-Nemkinesia subtest (a test for reversals where the patient is asked to write out letters of the alphabet as well as numbers 1 through 10). Other than these differences, the remaining test protocol is essentially the same.

IDPS

The Irlen Differential Perceptual Schedule was given by an examiner who was certified by the Irlen Institute in California. The IDPS is comprised of various symbols and shapes such as cubes, pumpkins, and closely typed figures that are designed to elicit symptoms of Scotopic Sensitivity Syndrome.

The subjects' responses were used to determine the degree of SSS present. The test also included pages of closely spaced Dutch words that are used to help the examiner determine the precise color of an overlay preferred by the subject and the extent of benefit that was produced by the overlay tint.

At the completion of testing, the examiner classified each subject as having a low, moderate, or high degree of SSS. These determinations were made according to criteria from the Irlen Institute and involved summarizing the results from individual tests. The examiner also provided the color of each subject's preferred overlay and a rating (none, low, moderate, high) of the benefit that the overlay provided.

RESULTS
If a test subject had a Peabody score that was significantly below their actual age, or an abnormal TAAS score, she or he was dropped from the study. This was because of the possibility that the subject's reading problems were due to auditory processing problems or reduced intelligence rather than dyslexia or SSS. Following these criteria, three subjects were dropped.

Results from ADT/DDT and SSS testing are shown on Table 1.
TABLE 1. RELATIONSHIP BETWEEN SSS LEVELS FROM THE IDPS AND DYSLEXIA RATINGS FROM THE DDT/ADT

(RATINGS OF 1 TO 8 REPRESENT LOW TO SEVERE DYSEIDETIC AND DYSPHONETIC RATINGS, RESPECTIVELY. VALUES IN PARENTHESES ARE STANDARD DEVIATIONS.)

<table>
<thead>
<tr>
<th>NUMBER OF SUBJECTS</th>
<th>MEAN DYSEIDETIC RATING</th>
<th>MEAN DYSPHONETIC RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH SSS LEVEL</td>
<td>3</td>
<td>4.7 (3.5)</td>
</tr>
<tr>
<td>MODERATE SSS LEVEL</td>
<td>15</td>
<td>2.5 (1.3)</td>
</tr>
<tr>
<td>LOW SSS LEVEL</td>
<td>7</td>
<td>2.4 (1.8)</td>
</tr>
</tbody>
</table>

There is no statistical relationship between SSS and dyseidetic classifications (ANOVA). There is a statistical relationship between SSS and dysphonesia, however there is not a progression of dysphonesia scores with SSS levels. For this reason, the statistical relationship is judged to be not a meaningful one.

DISCUSSION

Irlen has maintained that SSS and dyslexia are separate conditions. We tested for dyseidetic and dysphonetic dyslexia and then compared those results with Irlen testing. Analyses of the data suggest that there is not a meaningful relationship between SSS and dyseidetic or dysphonetic dyslexia. This lack of a relationship suggests that SSS and dyslexia are separate conditions, just as Irlen has maintained.
Possible reasons for this apparent difference include the following: one or more of the tests might be invalid, the tests might not be reliable, or that the tests truly are measuring different factors.

If the DDT, ADT and IDPS tests are valid and reliable, then patients with reading problems should be tested for both dyslexia and SSS because the treatments for this conditions are different. The present treatment for SSS is to prescribe tinted lenses, whereas treatments for dyslexia include: remediation through educational training, use of auditory books and equipment, allowing patients to write through dictation, etc.
REFERENCES AND FURTHER READING


17. Adler L, Atwood M. Poor readers: what do they really see on the page? 1987; East San Gabriel Valley Regional Occupational Program. 1024 West Workman Ave. West Covina, CA 91790.


