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Predicting Dyslexia with Screening To Enhance Equitable Placement (STEEP)

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Predicting Dyslexia with Screening To Enhance Equitable Placement (STEEP)

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by

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Abstract

The purpose of this study was to predict whether students who achieved the mastery/instructional level in math and the frustrational level in reading with Screening to Enhance Equitable Placement (STEEP) were identified as being good candidates for a positive dyslexic evaluation based on the Dyslexia Screening Tool (DST).

Twenty-eight students in first through fifth grades from a rural elementary school in Southeast Ohio were selected based on the results of their initial STEEP screening and those selected students were administered the Dyslexia Screening Tool (DST). Results indicated that there was not a significant relationship between the selected STEEP results and DST results. Several limitations of this study are cited.

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Introduction to Review of Literature

According to a study released in January 2003 by the National Center for Learning Disabilities, an overwhelming majority of parents and teachers say schools in the United States take too long to identify students with learning disabilities. Current practices force struggling learners to fail for at least one year or more often two years, before receiving extra instruction and support. Almost three times more students with learning disabilities are receiving special education services at ages nine through eleven than at ages six through eight, despite knowledge that to be effective, interventions must be delivered by the end of the third grade (Preventing Early School Failure, 2003).

According to the most recent National Assessment of Educational Progress (NAEP) on reading, in the year 2000, only thirty-two percent of fourth graders could read at a proficient level and demonstrate solid academic achievement. Also, while scores for the highest performing students have improved overtime, those of Americas lowest performing students have decreased (Ed.Gov, n.d.). Educational reformers have called for schools to establish academic proficiency standards and to implement accountability measures to hold schools responsible for students' success in meeting those standards (Albrecht & Joles, 2003).

No Child Left Behind

No Child Left Behind is an education reform act designed to improve student achievement and change the culture of America's schools (Ed.Gov, n.d.). The No Child Left Behind Act mandates that all students must be included in accountability

assessments of educational progress. The Individuals with Disabilities Education Act (IDEA) is now paired with accountability requirements as outlined in the 1997 Amendments to IDEA and the 2001 No Child Left Behind Act (Albrecht and Joles, 2003). By holding all students accountable to proficiency standards, schools are encouraged to improve educational services for all students, including students with disabilities (Albrecht & Joles, 2003).

When all students are included in assessment procedures, key indicators of success, necessary policy, and curricular revisions can be obtained. Adjusting to policy and curriculum can be made utilizing the information obtained from the assessment. The educational needs of any regular or special education student cannot be minimized when the assessment scores of all students are included in the data used in measuring the improvement and ultimate success of the schools (Albrecht & Joles, 2003). Under No Child Left Behind, each state must measure ninety-five percent of every public schools' students' progress in reading and math in each of grades three through eight and at least once during grades ten through twelve (Ed.Gov, n.d.).

States and local school districts are receiving more federal funding than before for reading programs under No Child Left Behind. Title I grants are awarded to states and local education agencies to help states and school districts improve the education of disadvantaged students, turn around low performing schools, improve teacher quality, and increase choices for parents. Under No Child Left Behind low performing schools must use their federal funds to make needed improvement. In the event of a school's continued poor performance parents have options to ensure that their children receive the

high quality education to which they are entitled. That might mean that children can transfer to higher performing schools in the area or receive supplemental educational services in the community, such as tutoring, after school programs, or remedial classes (Ed.Gov, n.d.).

STEEP

Screening to Enhance Equitable Placement (STEEP) is an evidenced based model for improving services to at risk children, reducing over identification, and special education services. The STEEP process utilizes universal screening of all children for *early* identification of children who are at risk. Universal testing is recommended for all children by No Child Left Behind (NCLB) and several national panels. Children who are at-risk during screening are considered for class wide, small group, or individual intervention. Progress monitoring is used to determine if the intervention is meeting the child's needs. The STEEP process provides for integrated services between general and special education because, children who do not respond to intervention may be considered further for special education eligibility. The STEEP model is consistent with the response to intervention model and is used within many districts to individualize instruction (www.joewitt.org).

High Stakes Testing

With the accountability in schools in addition to the pressures on the students from teachers and parents, statewide assessments “become truly high stakes” when school quality, teacher competence, and individual student capability are judged by their results (Albrecht & Joles, 2003). Assessment of student progress is a vital component of

the educational process to measure student strengths and weaknesses and ultimately to identify and implement necessary interventions. STEEP screening in September provides a good indication of which children are likely to have poor performance on end of the year high stakes testing scores. STEEP provides an early warning system for children who are likely to perform poorly on those tests. At risk children can be best served when they receive targeted intervention to improve achievement (www.joewitt.org).

In contrast to high stakes tests, frequent curriculum-based assessments, such as STEEP, enable educators to monitor the effectiveness of their teaching strategies. Curriculum-based assessments are beneficial to assist educators in identifying specific students that need interventions to become successful. The curriculum-based assessments also provide educators with data that helps determine which students are progressing to achieve adequate yearly progress. When used as benchmarks, the results from curriculum-based assessment instruments such as STEEP can be used to evaluate individual student development as well as provide grade-level feedback on instructional practices.

Dyslexia

The term specific learning disability refers to severe handicaps in central processes that inhibit the child's normal development in such specific areas as talking, thinking, perceiving, reading, writing, and spelling. Severe reading disabilities have been labeled dyslexia (Kirk, 1972). The long standing formal definition of developmental dyslexia was stated by the World Federation of Neurology in 1968 as a disorder in children who despite conventional classroom experience, fail to attain the language skills

of reading, writing, and spelling commensurate with their intellectual abilities (Fawcett & Nicolson, 1996). Varying in degrees of severity, dyslexia is manifested by difficulties in receptive and expressive language, including phonological processing in reading, writing, spelling, handwriting, and sometimes in arithmetic (Fawcett & Nicolson, 1996). Three criterial difficulties of dyslexic children are for reading, writing, and spelling. Difficulties in reading include both slow speed of reading and problems in reading unfamiliar words. Difficulties in spelling are caused both by slow speed and poor quality of handwriting (Fawcett & Nicolson, 1996). Dyslexia is the most common and most carefully studied learning disability, affecting 80 percent of all individuals identified as learning disabled and 5-17 percent of all children and adults in the United Sates (Shaywitz and Shaywitz, 2004).

Neuropsychology of Reading

Samuel T. Orton, a neuropsychologist in the early 1900's, recognized that children's difficulty deciphering written language was out of proportion with the difficulty they encountered with nonverbal visual tasks. Orton believed that dyslexia was a form of a language disability (Child Neurology, 1982). Orton developed a theory that stated that deficient readers were thought to be the result of poor cerebral dominance and that the reversal of letters was a primary characteristic of this lack of hemispheric dominance (Feifer & De Fina, 2000). Orton believed that a student needed to be left-hemispheric dominant and thus strongly right handed to be a proficient reader (Feifer & De Fina, 2000).

In neuropsychology, the term cerebral dominance generally refers to the

lateralization of language functions, as nearly ninety-nine percent of right handed people and sixty seven percent of left handed people have virtually all language functions housed in the left hemisphere. Language functions tend to be more lateralized in males than in females. In males, most reading centers are located primarily in the left hemisphere. In females, reading centers seemed to be housed in both hemispheres, leaving the intact hemisphere to assume language functions when damage to one hemisphere occurs (Feifer & De Fina, 2000). There is a growing body of research that suggests that children who have not mastered the phonemic code by age ten, may never acquire the skill. This inability is due to reduced neural plasticity within an older child's brain, creating a situation in which the window of opportunity for learning critical elements of the reading process becomes substantially reduced and eventually lost (Feifer & De Fina, 2000).

Perhaps the most convincing evidence for a neurobiological basis of dyslexia comes from the rapidly accumulating and converging data from the use of a technique known as functional magnetic resonance imaging (fMRI) which enables researchers to measure changes in neural activity in specific brain areas (Shaywitz & Shaywitz, 2004). The fMRI is a non-invasive procedure and can be used with children. The fMRI has allowed researchers to determine the areas that are active while a person is reading. The studies using the fMRI have found that area's involved in reading are located in the left hemisphere (Shaywitz & Shaywitz, 2004). The Broca's area, located in the front of the brain, is involved in articulation and word analysis (Shaywitz & Shaywitz, 2004). Frontal lobes also play an important role in sustaining attention while reading (fluency) and

direct working memory which is a complex set of processes that allow for the transfer of information from short term to long term memory (comprehension). Two other areas situated in the posterior area of the brain are also involved in the neurology of reading. The two areas are the parieto-temporal region, involved in word analysis, and the occiptio-temporal region, involved in fluent reading (Shaywitz & Shaywitz, 2004). Dyslexic readers display under stimulated parieto-temporal and occipito-temporal regions and displayed over activated Broca's area (Shaywitz & Shaywitz, 2004).

Phonemic Awareness

Given the nature of written language, it follows that to learn to read, the beginning reader needs to decode the written words into speech units and then comprehend the words and sentences to derive meaning (Catts & Hogan, 1999). Reading reflects language and reading disabilities reflect a deficit within the language system (Shaywitz, 2004). Unless the reader can transform the printed characters on the page into the phonetic code, the letters remain just lines and circles with no meaning (Shaywitz, 2004).

The most distinguishing characteristic of children with learning disabilities in reading appears to be phonological processing deficits, especially evident on measures of phonological awareness (Shaywitz, 2004). Ideally, children have acquired phonological awareness before they begin formal schooling, but because many children do not, phonological instruction must begin as early as possible. Phonological awareness refers to the conscious understanding and knowledge that language is made up of sounds. Phonemic awareness, which is the insight that words consist of separate sounds or

phonemes and the ability to manipulate these individual sound units, is the most important step in phonological awareness (Coyne, 2001). The research shows that phonological awareness skills can and should be taught to all children, especially those who are at risk for reading difficulties. Intervention studies that included instruction in phonological awareness have consistently reported significant positive effects on both measures of phonologic skills and word -reading skills for students with specific learning disabilities (Coyne, 2001).

The consequences of failing to learn to read in the early grades are severe. Longitudinal studies find that disadvantaged third graders who have failed one or more grades and are reading below grade level are extremely unlikely to complete high school. Remedial programs have few, if any, effects on students above the third grade. Many children are referred to special education programs largely based on reading failure and then remain in special education for many years, often for entire school careers. Almost all children regardless of social class or other factors enter first grade full of enthusiasm, motivation, and self-confidence, fully expecting to succeed in school. By the end of the first grade many of these students have already discovered that their initial high expectations are not coming true and they have begun to see school as punishing and demeaning (Coyne, 2001). Trying to remediate reading failure late on is very difficult because students who have failed are likely to be unmotivated, with poor self-concepts as learners.

Purpose of Study

The purpose of this study is to predict whether students who achieved the

mastery/instructional level in math and frustrational level in reading with Screening to Enhance Equitable Placement (STEEP) were identified as being a good candidate for a positive dyslexic evaluation based on the Dyslexia Screening Tool (DST). The purpose was to consider STEEP as an appropriate screening instrument because it is cost efficient, time efficient, evaluates up to fifth grade, and contains a facet for screening math. The results of this study may encourage educators to use STEEP as a classroom screening tool to identify students who are at-risk for learning disabilities.

Hypothesis

It is hypothesized that the probability of the students who scored equal to or greater than one on the Dyslexia Screening Tool (DST) will have scored the mastery/instructional level in math and the frustrational level in reading with the STEEP system. This will suggest that STEEP is a valid measure for identifying students who are at-risk for learning disabilities.

Method

Procedure

The research was conducted at Northwest Elementary School in Ohio. Northwest Elementary chose to use STEEP as a screening instrument for kindergarten through fifth grade. The major professor consulted with Joe Witt to utilize the STEEP system. The STEEP results indicated which level (mastery, instructional, frustrational) the students earned. The students who achieved mastery/instructional in math and frustrational in reading were identified as possibly being at-risk for learning disabilities. Permission slips granting permission for the administration of the DST were sent home with all students

who scored mastery/instructional in math and frustrational in reading with the STEEP system. Permission was obtained for twenty-eight students. Fellow graduate students and myself administered the DST to all twenty-eight students.

Participants

Permission was granted from the principal in order to obtain students' scores from the first assessment of STEEP. Students were chosen based upon who completed the first assessment in STEEP and scored the mastery/instructional level in math and the frustrational level in reading.

Instruments

Evaluators were cross-trained by Dave Snyder, a practicing school psychologist who is experienced in the use of Dyslexia Screening Test.

Dyslexia Screening Test (DST)

The Dyslexia Screening Test (DST) is designed to be used as a screening instrument for children from 6years, 6months of age to 16years, 5months of age. The DST is intended to be used within a school by school professionals (teachers, special needs coordinators, school nurses) rather than by a school psychologist or clinical psychologist. The DST is intended to provide a valuable first step in deciding whether to request further testing, and to provide a profile of the strengths and weaknesses which can be used to guide the development of in-school support for a student. The DST consists of eleven subtests:

Test 1: Rapid Naming measures the time taken to name a page full of outline drawings and is based on the "Rapid Automatised Naming" test discovered by Denckla in the

1970's to be an indicator of dyslexia.

Test 2: Bead Threading finds out how many beads the child can thread in thirty seconds. This test measures fine-motor skill involving co-ordination of both hands and eye, which has been found to be significantly associated with dyslexia.

Test 3: One Minute Reading combines fluency and accuracy to determine the number of words that the child can read correctly in one minute.

Test 4: Postural Stability is specially developed to provide an accurate index of balance ability under the disturbance of a controlled push in the back. Postural stability difficulties are generally considered to reflect some abnormality of the cerebellum and research shows that dyslexic children suffer from difficulties in balance, especially when they are not concentrating on the balance task.

Test 5: Phonemic Segmentation assesses the ability to break down a word into its constituent sounds and to manipulate those sounds. The Phonemic Segmentation assesses both phonological skill and working memory.

Test 6: Two-Minute Spelling Test measures spelling fluency. The examiner reads out each word and the child writes down its spelling.

Test 7: Backwards Digit Span is a test of working memory.

Test 8: Nonsense Passage Reading assesses the child's ability with reading unfamiliar words. Specific difficulties reading nonsense words indicate difficulties in breaking the written word down into chunks that can be articulated.

Test 9: One Minute Writing is an index of speed of copying test and provides an indication of "pure" writing speed in the absence of the need for thought

Test 10 and 11: Verbal and Semantic Fluency: It has been suggested that a profile of good semantic fluency together with poor verbal fluency might be a characteristic of dyslexia (Fawcett and Nicolson, 1996). Scores of each of the subtests are combined to create an At-Risk Quotient (ARQ) for dyslexia. An ARQ score of 1 or greater indicates an at-risk indicator for dyslexia. All subtests (with the exception of Semantic Fluency, which is thought to be a relative strength of dyslexic children) are derived from tests on which it is established that dyslexic children have problems. Consequently, each of the subtests (excluding Semantic Fluency) has face validity as an index of dyslexia (Fawcett & Nicolson, 1996).

Results

The objective of this study was to investigate the probability of the students who scored equal to or greater than one on the DST will have scored mastery/instructional in math and frustrational in reading with the STEEP system. After gathering the STEEP data from Northwest Elementary School and administering the DST to each child who scored the mastery/instructional level in math and the frustrational level in reading with the STEEP system, the data was entered into the Comprehensive Statistical Software Program and a Non Parametric Runs test was used to explore the probability of the students who scored equal to or greater than one on the DST will have scored mastery/instructional in math and frustrational in reading with the STEEP system (See Figure 1).

Results of the study indicated that there is no significant relationship between STEEP and the DST (Z=.996) This result indicates that the probability of students who

scored mastery/instructional level in math and frustrational level in reading with the STEEP system will also score equal to or greater than one on the DST is not significant.

Discussion

This study examined the relationship between the Screening to Enhance Equitable Placement (STEEP) system and the Dyslexia Screening Test (DST). The hypothesis of this study is that the probability of the students who scored equal to or greater than one on the DST will have scored within the mastery/instructional level in math and within the frustrational level in reading with the STEEP system. The results of the study indicated that there is not a significant relationship between the STEEP results and the results of the DST (Z=.996). Only four out of the twenty-eight selected students met the criteria of the DST as dyslexic. Of the four who met the DST criteria for dyslexia, two students were already receiving special education services.

These results could be due to the small sample of students that was obtained. The lack of a STEEP control sample of students who obtained equal scores in math and reading to compare to the DST results may be another variable that affected the results of this study. Another variable that may have affected the results of this study is the seven month gap between the administration of STEEP and the administration of the DST. Many school-based interventions had been implemented by the time the DST was administered, which may have improved student performance and affected the results of this study. Also, comparing the results of the DST and STEEP to a full psychological evaluation would confirm whether or not the DST and STEEP are accurate measures of

identifying children with dyslexia.

It appears that either the DST or STEEP is not a good measure of dyslexia. Since there is evidence that the DST is a predictor of dyslexia, it would appear that mastery/instructional level in math and frustrational level in reading with the STEEP system is not a good predictor for the need of special education assessment. According to Shaywitz (2004), the most distinguishing characteristic of children with learning disabilities in reading appears to be phonological processing deficits, especially evident on measures of phonological awareness. The DST manual (p. 3) states that one of the most clearly established difficulties in dyslexia is in terms of phonological skill, however out of eleven tests on the DST, only one measures phonemic awareness. Given what we know about dyslexia it would appear that the DST does not adequately measure phonemic ability.

Recommendations

Although this study did not consider the variables mentioned above, this study can serve as a basis for future research to determine if STEEP is a valuable screening instrument for identifying students who are at-risk for learning disabilities. It is recommended that this study be redesigned including a STEEP control group, a larger sample, and a full psychological evaluation. A study that is redesigned utilizing these recommendations could provide information that would lead to identification of children with learning disabilities before the third grade, which would allow those children to receive services early enough to prevent failure in school and the negative views of school and self that emerge as a result of school failure.

Figure 1.

Runs Test

	dsi_n	DST
Test Value[a]	1.50	.300
Cases < Test Value	13	13
Cases >= Test Value	13	15
Total Cases	26	28
Number of Runs	14	18
Z	.000	.996
Asymp. Sig. (2-tailed)	1.000	.319

a. Median

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