

Research Summary

*Take Flight: A Comprehensive Intervention
for Students with Dyslexia*



Luke Waites Center for Dyslexia
and Learning Disorders

Background

Dyslexia, the most common specific learning disability, causes difficulties with reading and spelling in approximately 10 to 15 percent of school age children. The definition of dyslexia has been modified with advances in research since the first consensus definition was formulated by the World Federation of Neurology at Texas Scottish Rite Hospital for Children (TSRHC) in 1968. The current definition specifies that children can be identified with dyslexia when they have problems accurately and efficiently sounding out (decoding) single words associated with difficulties processing the sound (phonological) structure of language. Slow, inaccurate word reading leads to poor reading comprehension and is unexpected because most other cognitive and academic abilities are intact. The spelling problems of dyslexia contribute to difficulty acquiring proficiency in writing.

TSRHC staff began developing programs to help children with dyslexia improve their reading-related skills with the creation of Alphabetic Phonics (AP) in the mid-1960s. The central feature of AP and other phonologically based programs is the systematic approach that is taken to establish a link between the alphabet and the language sounds (phonemes) it represents. In response to the 1985 state requirement for intensive instruction for students with dyslexia, TSRHC staff created the Dyslexia Training Program (DTP), an adaptation of AP, using a video format to provide intensive phonics instruction to children who may not have access to trained dyslexia teachers. A study of the effectiveness of the DTP met the scientific standards necessary to be included in the National Reading Panel report. *Take Flight: A Comprehensive Intervention for Students with Dyslexia*, published in 2006, builds on the success of the DTP for teaching phonics skills, and has been modified to enable children with dyslexia to read more accurately, efficiently and with better understanding.

The report of the National Reading Panel identified the research-proven components of effective reading instruction to be phonemic awareness, phonics, fluency, vocabulary and reading comprehension. *Take Flight* was designed using the scientific evidence that supports the importance of each of these five components. **Phonemic awareness** training in *Take Flight* follows established procedures for explicitly teaching the relationships between speech-sound production and spelling-sound patterns. The **phonics** of *Take Flight* was derived from the decoding component of the DTP. *Take Flight* **fluency** instruction uses research-proven directed practice in repeated reading with modifications to help students read newly encountered words more fluently. **Vocabulary** instruction in *Take Flight* features multiple word learning strategies (definitional, structural, contextual) and explicit teaching techniques with application in text shown to promote reading comprehension. *Take Flight* employs a multifaceted strategy for **reading comprehension** instruction that combines methods that have the support of scientific evidence (i.e., cooperative learning, graphic organizers, story structure, question generation and answering, summarization and comprehension monitoring).

Executive Summary

Key Findings

- Students that completed *Take Flight* instruction show significant growth in all areas of reading skill.
- Changes to the curriculum in *Take Flight* achieved goals of improved reading comprehension and rate.
- Follow-up research on children who completed treatment indicates that students maintain the benefits of instruction on word reading skills and continue to improve in reading comprehension after one year.
- *Take Flight* is effective when used in schools by teachers with advanced training in treating learning disorders.
- Students with the lowest reading skills acquired stronger gains from *Take Flight* instruction.

Take Flight Treatment Effects Descriptive Results

Before publishing *Take Flight*, researchers evaluated the effect the curriculum had on students attending the TSRHC Dyslexia Laboratory and dyslexia programs in public schools. Major findings are described and summarized below.

Details of the TSRHC Dyslexia Laboratory

- Students come to the hospital for class four days per week for two academic years.
- Instruction at the laboratory is delivered by Certified Academic Language Therapists.
- Students participate in small group sessions for 90 minutes each day.
- Enrollment is 40 children each year.

Summary of *Take Flight* Treatment Effects

Participants: Data were collected from three consecutive graduation groups at the Dyslexia Laboratory (n=51). Students were tested at baseline and when treatment concluded at the end of the second year.

Results: Figure 1 shows summary statistics of mean skill levels at the beginning of treatment and observed gains in phonological awareness¹, word decoding², reading³, comprehension³, reading efficiency⁴, oral reading⁵ and math skills³.

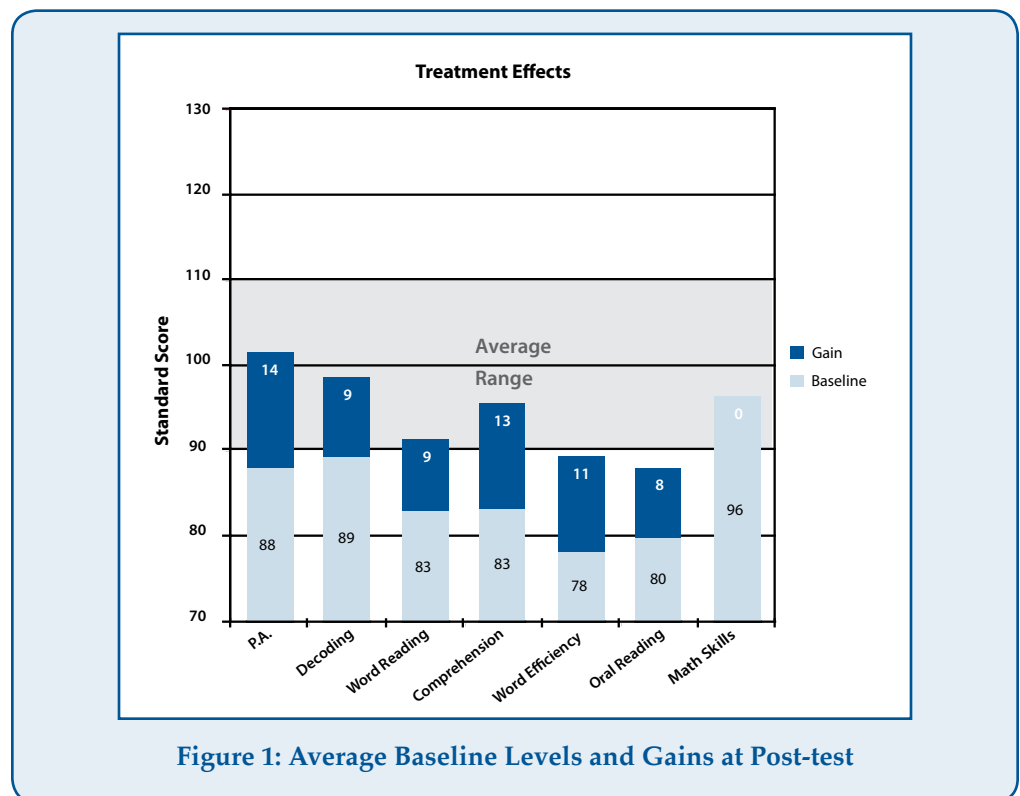
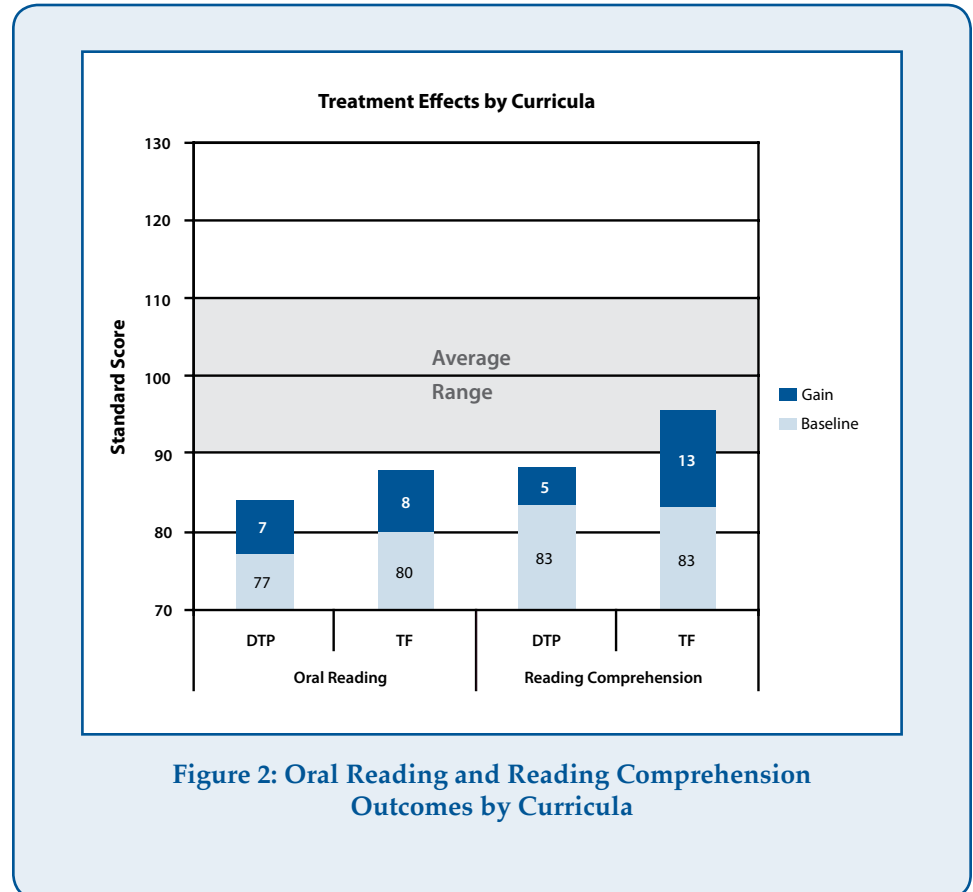


Figure 1: Average Baseline Levels and Gains at Post-test

- Baseline levels were below the average range (i.e., 90-109 SS) in phonological processing and reading skills, particularly word and text reading efficiency, but showed average math skills.
- Significant gains were recorded after treatment in phonological awareness and all reading skills, bringing the sample within, or close to, the average range.
- Small gain in math skills suggests that observed treatment effects were specific to the domain of reading.

Summary of Comparative Treatment Effects: *Take Flight* and the Dyslexia Training Program

Take Flight differs from previous curricula at TSRHC with specific instruction to develop reading fluency and comprehension. Figure 2 shows data from standardized measures of oral reading⁵ and reading comprehension³. The figure compares data from the *Take Flight* sample to that of a historical control sample (n=25) that received the DTP treatment in the laboratory from 2000-2002.



- Both samples show significant improvements in both text reading fluency and reading comprehension.
- *Take Flight* sample shows significantly larger growth in reading comprehension relative to students who received DTP instruction.

Summary of Longitudinal Treatment Effects

Longitudinal data months or years post-treatment are needed to provide evidence that treatment outcomes are durable. Figure 3 presents word recognition and reading comprehension outcomes from 38 former students throughout the two-year intervention and at one year follow-up evaluation.

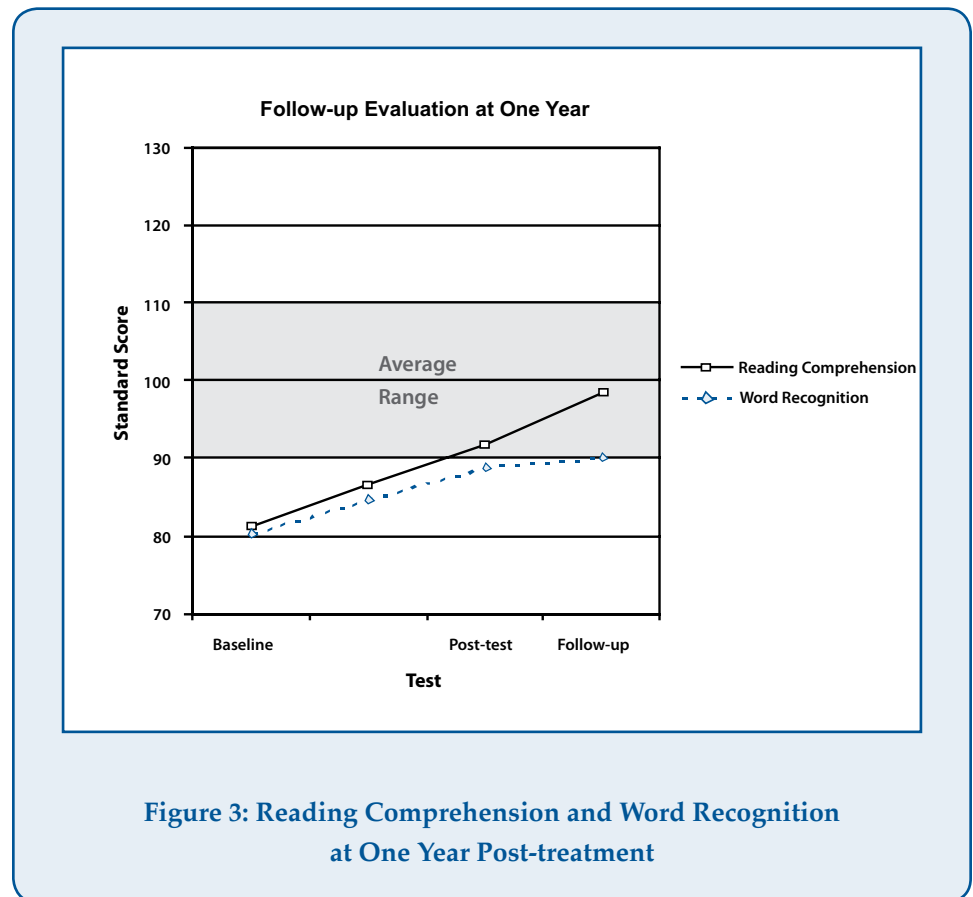


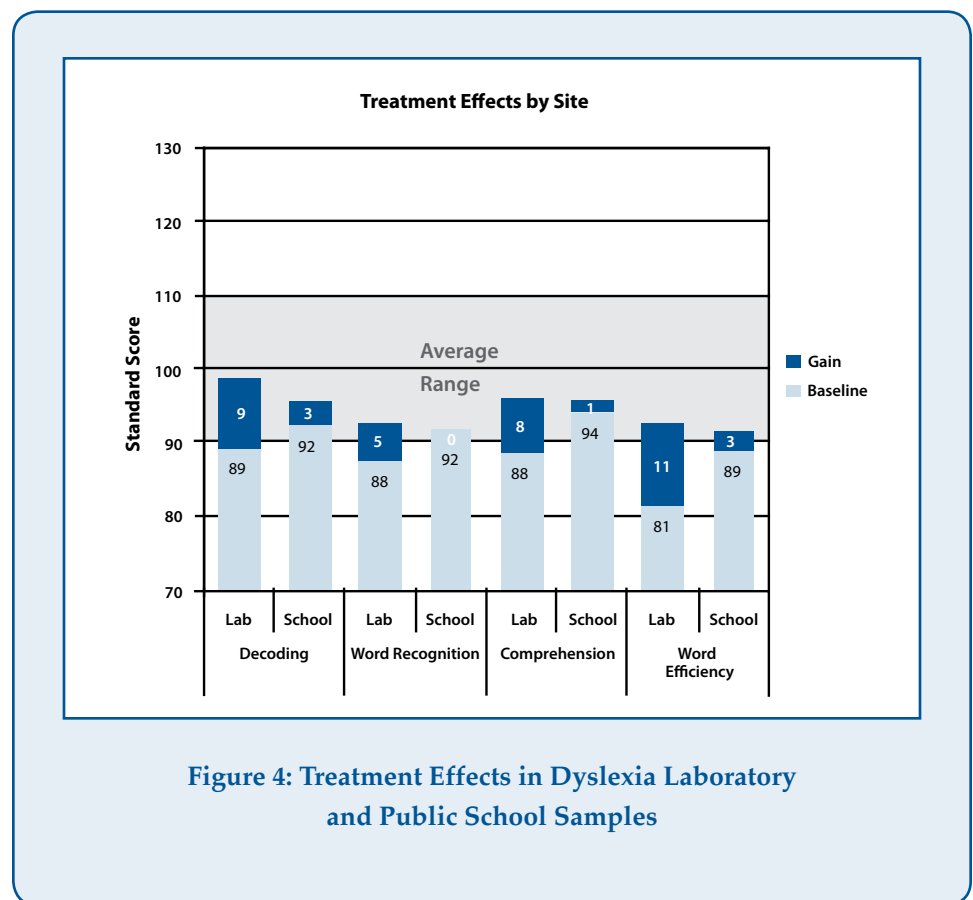
Figure 3: Reading Comprehension and Word Recognition at One Year Post-treatment

- The rate of growth in reading comprehension continues post-treatment, and the group average is approaching the population average of 100 at follow-up.
- Word recognition growth in standard scores is slower one year post-treatment but still developing at the same rate as other children of the same age.

Summary of Field Evaluation of *Take Flight* in Public Schools

- Descriptive data of *Take Flight* treatment effects were collected from dyslexia programs in several Texas school districts.
- Fifty-nine public school students in grades 3 through 5 were enrolled in the study.
- All students were identified for dyslexia services by the school districts.
- Instruction was delivered for two academic years by school districts' dyslexia therapists.

Figure 4 shows baseline levels and treatment gains after two years of instruction. Data from the Dyslexia Laboratory sample are added for comparison.



- School sample average at baseline was significantly higher compared to the Dyslexia Laboratory sample on measures of decoding², word recognition², comprehension² and word reading efficiency⁴.
- Because the scores reported are standard scores, the data suggest the reading skills of the school sample after treatment were progressing at the same rate or, in some cases, faster than their same age peers.

Summary of Individual Differences

There was significant variation in baseline levels and treatment effects in the school sample. Growth curves for each individual suggested students with lower scores at baseline showed larger gains during treatment. Figure 5 illustrates the effect of individual differences.

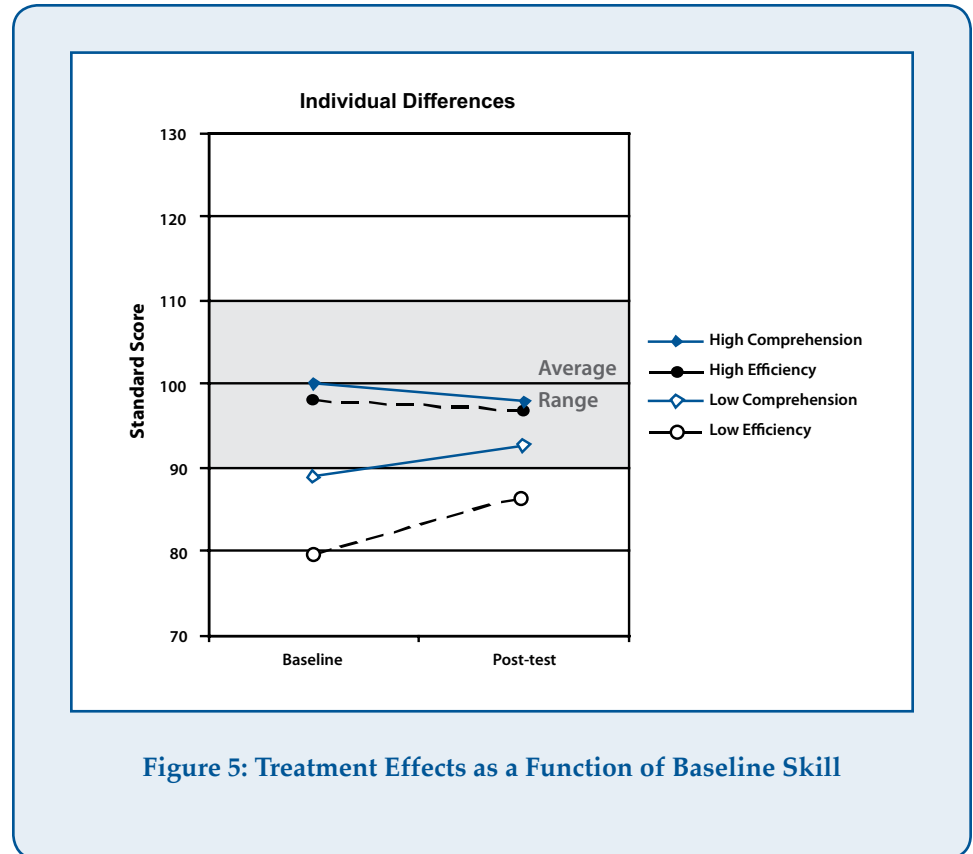


Figure 5: Treatment Effects as a Function of Baseline Skill

- Growth is modest for both reading comprehension and word reading efficiency for students in the top half of the sample at baseline.
- Students in the lower half of the sample experience significantly stronger growth in each reading skill.

¹ Comprehensive Test of Phonological Processing (ProEd, Inc.)

² Woodcock Reading Mastery Test (American Guidance Services)

³ Wechsler Individual Achievement Test (PsychCorp).

⁴ Test of Word Reading Efficiency (ProEd, Inc.)

⁵ Gray Oral Reading Test (ProEd, Inc.) Oral Reading Quotient

⁶ DTP sample with oral reading data is 10 of 25 possible participants.

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The Luke Waites Center for Dyslexia and Learning Disorders at Texas Scottish Rite Hospital for Children provides one of the most comprehensive programs for childhood learning disorders in the nation. Founded by Dr. Lucius Waites in 1965, the center is dedicated to serving children through innovative evaluation, treatment and education, as well as extensive outreach, educator and physician training programs and research. For more information, please call (214) 559-7816 or (800) 421-1121, ext. 7816 or visit www.tsrhc.org.

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