

Research Summary

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



Luke Waites Center for Dyslexia
and Learning Disorders

Executive Summary

Take Flight: A Comprehensive Intervention for Students with Dyslexia was written by the education staff of the Luke Waites Center for Dyslexia and Learning Disorders at the Texas Scottish Rite Hospital for Children (TSRHC). *Take Flight* builds on the success of previous dyslexia intervention programs developed by the staff of TSRHC. Recent reading intervention studies, including data collected at TSRHC, were the impetus for writing *Take Flight* and have contributed to its design. Teaching trials in the TSRHC Dyslexia Laboratory and with therapists in public schools also influenced curriculum development.

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 reading rate.
- Follow-up research on children who completed treatment indicated that students maintain the benefits of instruction on word reading skills and continued to improve in reading comprehension after one year.
- *Take Flight* is effective when used in schools by therapists with advanced training in treating learning disorders.
- Students with the lowest reading skills in schools show stronger gains from *Take Flight* instruction.

Overview

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 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 report of the National Reading Panel. *Take Flight*, 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 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 in *Take Flight* includes a systematic exploration of the articulation of phonemes and is fully integrated within decoding and spelling instruction.**
- **The phonics instruction of *Take Flight* was derived from the decoding component of the DTP. All phoneme-grapheme correspondence rules, however, are introduced at a faster pace in the lesson sequence. The lessons therefore allow more time for practice toward accuracy and automaticity in the application of phonic skills and for more guided reading practice with controlled and regular text. An expanded use of etymology is also added to the lesson for teaching word analysis strategies.**
- **Vocabulary is expanded and enriched by developing morphological knowledge, word relationships, figurative language, syntax and semantics by direct instruction and in the context of reading.**
- **Fluency instruction incorporates guided and timed repeated reading of decodable words, phrases and connected text. Incentives, concrete measures of progress and daily home practice are also important elements of fluency training.**
- **A combination of techniques that have the support of scientific evidence is used for instruction in reading comprehension. These strategies include cooperative learning, comprehension monitoring, question generation, story structure, summarizing and inferencing. Students also learn how to utilize graphic and semantic organizers when reading narrative and expository texts.**

The five components are integrated within each daily lesson and presented across the entire lesson sequence contained in the seven books of the curriculum. In the first 35 lessons (Books 1 and 2) of *Take Flight*, two new grapheme-phoneme rules are introduced each day. This program directly integrates grapheme introduction, phonemic awareness and spelling. Students apply their phonics knowledge reading single words and sentences that combine each lesson's new rules with previously learned material. Each lesson has additional opportunity for practice of the new phoneme during direct phonemic awareness and spelling exercises.

The lesson cycle takes on a new look with Book 3. On alternating days, the lessons continue new grapheme-phoneme introductions with additional practice of all learned decoding rules. The alternate lessons provide the opportunity to practice previous learning through timed, repeated rate practice to improve reading fluency. These lessons also include comprehension strategy instruction and 20 minutes of oral reading of connected text that provides necessary practice for newly learned strategies.

With *Take Flight*, students will learn all 44 phonemes of the English language, 96 grapheme-phoneme correspondence rules and 87 affixes. The students will also learn spelling rules for base words and derivatives. Practice opportunities are also provided that are designed to improve oral reading fluency. Finally, *Take Flight* introduces comprehension and vocabulary building strategies for both narrative and expository text in the context of oral reading exercises, preparing students for successful, independent reading.

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.
- Students participate in small group sessions for 90 minutes each day.
- Instruction at the laboratory is delivered by Certified Academic Language Therapists.
- Enrollment is 30 children each year.

Summary of Take Flight Treatment Effects

Data were collected from seven consecutive graduation groups at the Dyslexia Laboratory (n=113). Students were tested at baseline and when treatment concluded at the end of the second year. Figure 1 shows summary statistics of average skill levels at the beginning of treatment and observed gains in phonological awareness¹, word decoding², reading³, comprehension³, reading efficiency⁴, oral reading⁵ and math skills³.

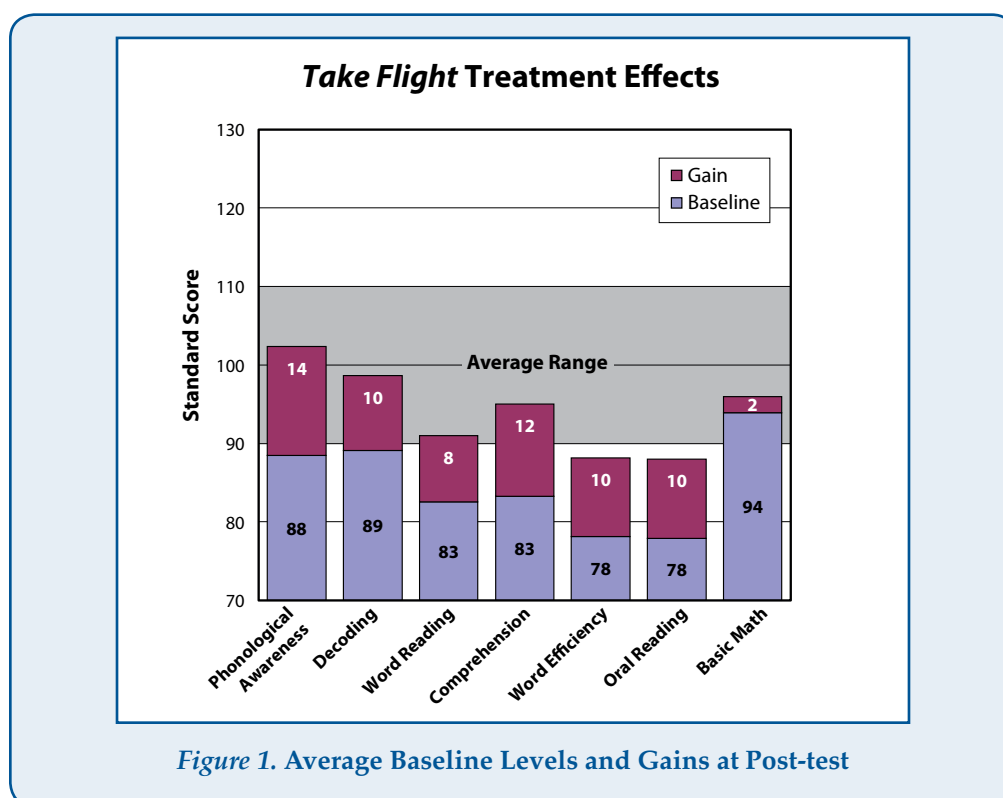
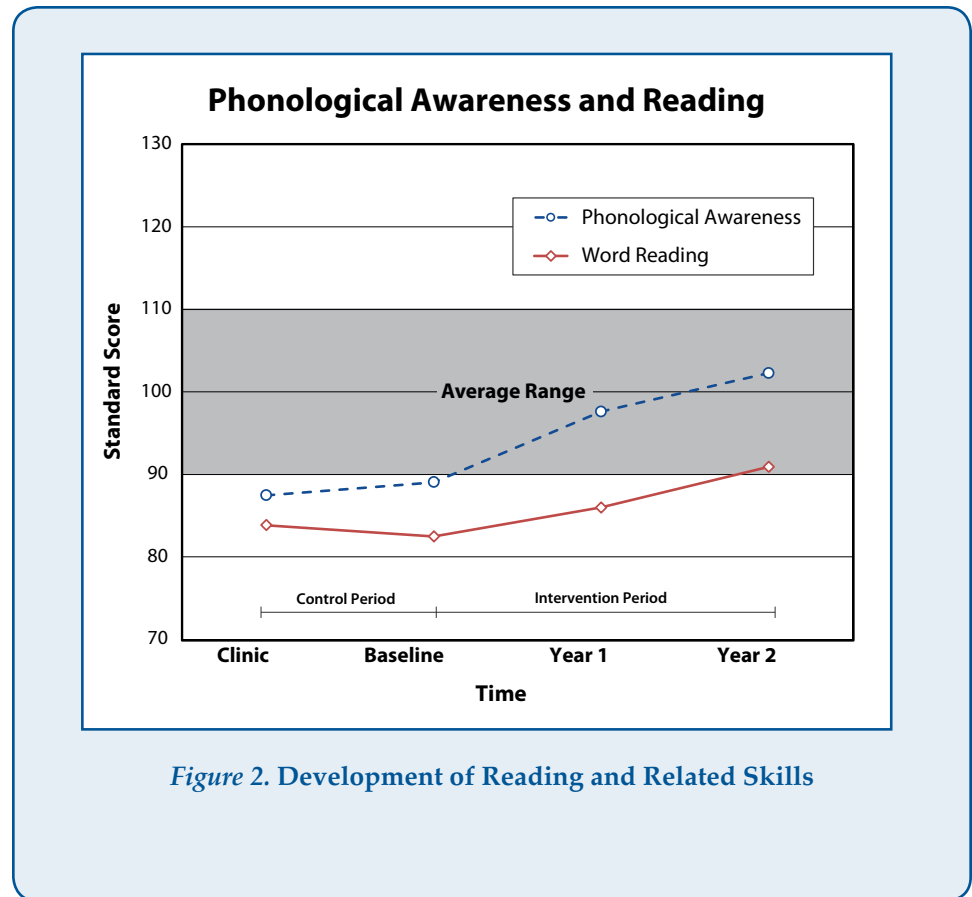


Figure 1. Average Baseline Levels and Gains at Post-test

- Baseline levels were below the average range in phonological processing and reading skills, particularly word and text reading efficiency.
- Significant gains were recorded after treatment in phonological awareness and all reading skills, bringing the sample within, or close to, the average range.
- The small gain in math skills suggests that observed treatment effects were specific to the domain of reading.

Summary of *Take Flight* Efficacy

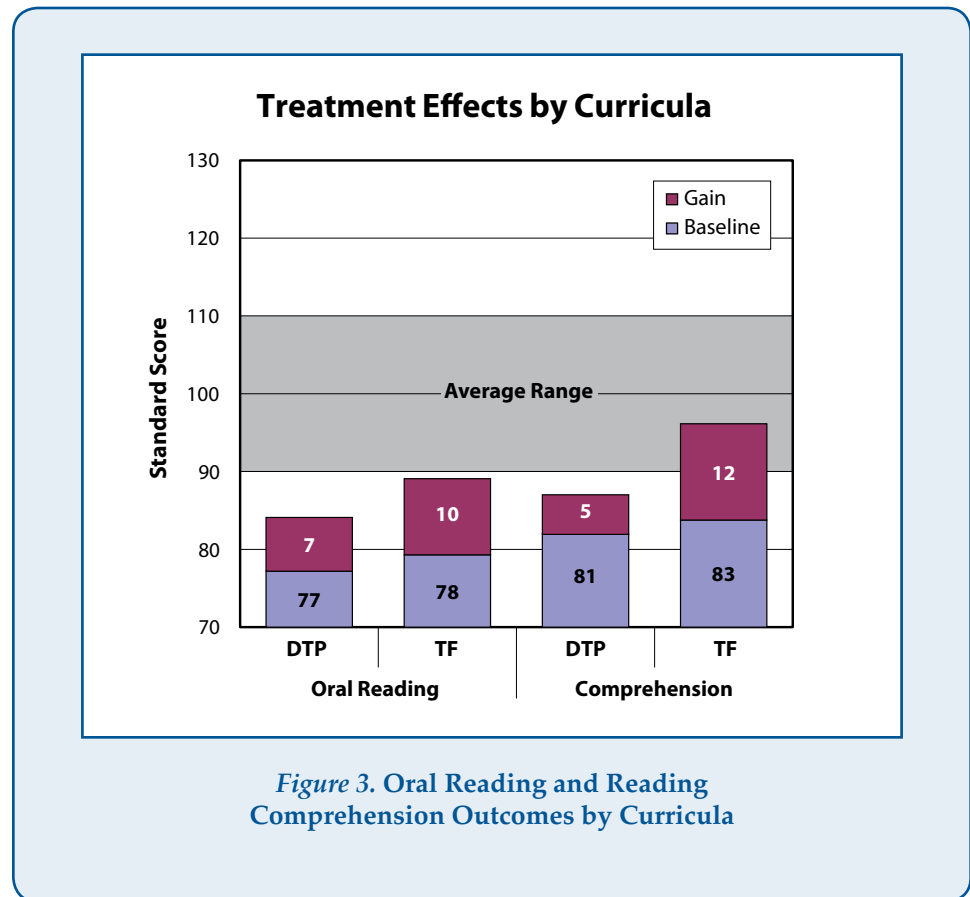
The efficacy of the *Take Flight* curriculum was evaluated by a comparison of reading-related development before intervention with effects during treatment. Patients in the Dyslexia Laboratory were evaluated by clinical staff of the TSRHC Center for Dyslexia and then referred for education services. The time between initial assessment and the beginning of *Take Flight* instruction, an average of 9 months, provided a contrast of differences observed in the growth of important reading-related skills between a pre-treatment 'control' period and the two-year intervention. Figure 2 shows average phonological awareness and word identification standard scores from the sample of students in the Dyslexia Lab.



- The baseline estimate data indicated little growth in reading and related skills before treatment.
- Significant improvements in reading skills were then observed with treatment
- Together, these results document the efficacy of *Take Flight* compared with no systematic intervention.

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 3 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 2000-2002⁶.



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

Summary of Long-Term Treatment Effects

Longitudinal data months or years post-treatment are needed to provide evidence that treatment outcomes are durable. Figure 4 presents word recognition and reading comprehension outcomes from 69 former students throughout the two-year intervention and at annual follow-up evaluations for four years after treatment.

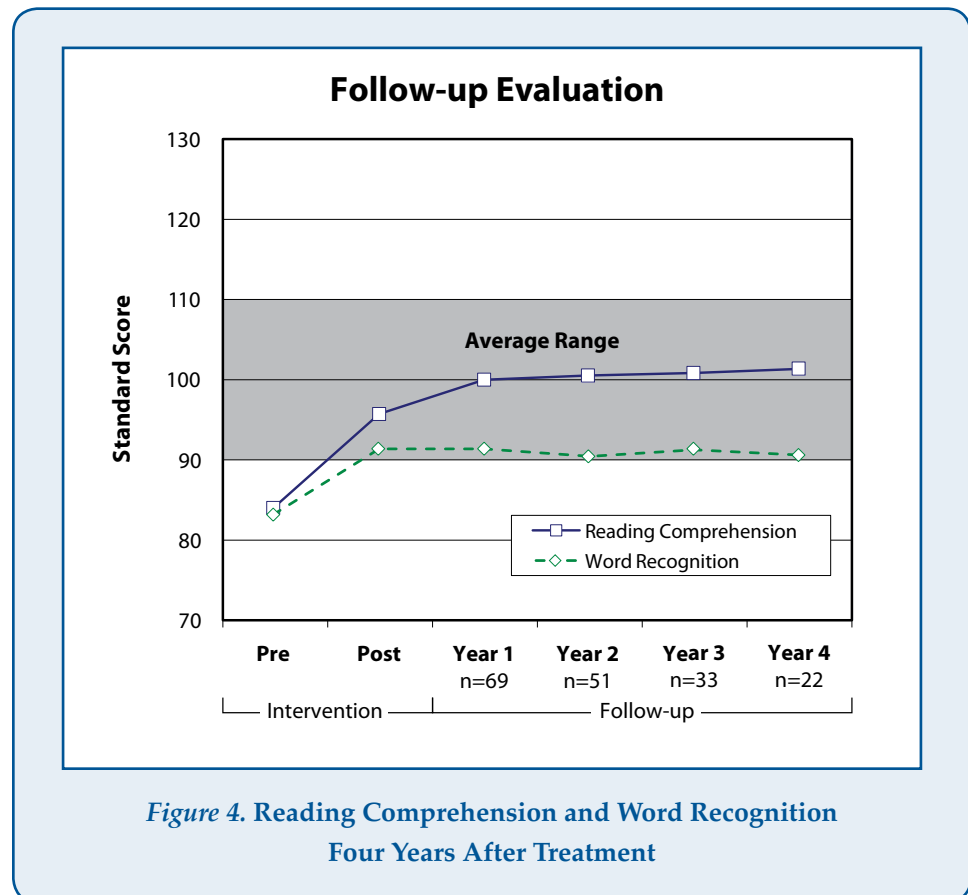


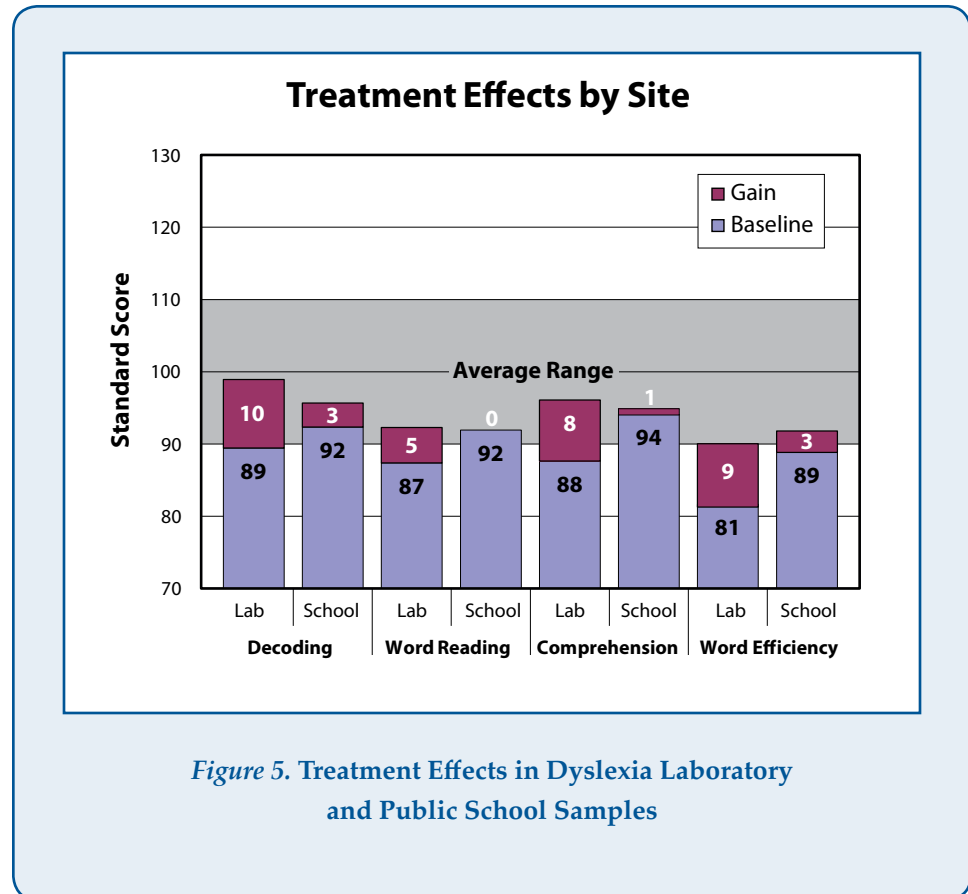
Figure 4. Reading Comprehension and Word Recognition Four Years After Treatment

- 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 at one year post-treatment but still developing at the same rate as other children of the same age.
- Treatment effects on reading comprehension and word recognition are stable up to four years after treatment.

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 5 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.
- Treatment effects in the schools were more modest compared to the Dyslexia Lab
- 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 6 illustrates the effect of individual differences on observed gains in passage comprehension. Data from the Dyslexia Lab is reported for comparison of treatment effects.

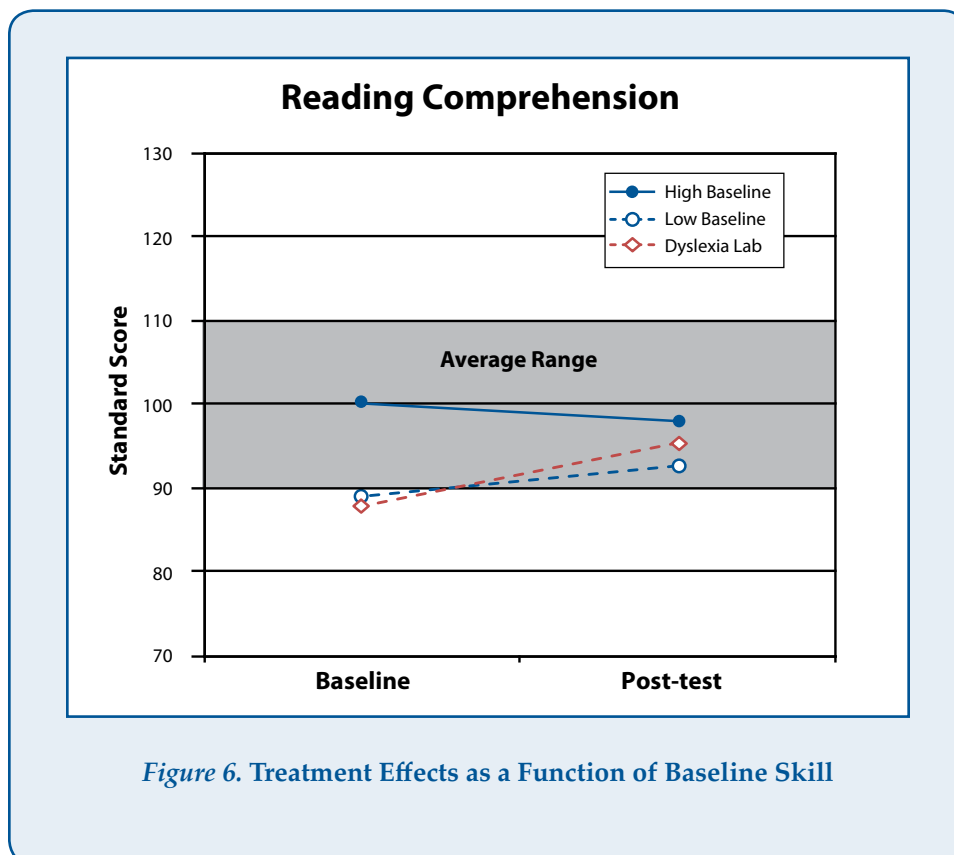


Figure 6. Treatment Effects as a Function of Baseline Skill

- Growth is modest in reading comprehension for students in the top half of the sample measured at baseline.
- In contrast, students in the lower half of the sample at baseline showed significantly stronger growth in reading skill.
- The gains of the lower half of the sample are similar to the Dyslexia Lab students on the same measure of comprehension.

End Notes

- 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.

LUKE WAITES CENTER FOR DYSLEXIA AND LEARNING DISORDERS

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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 scottishritehospital.org/care-and-treatment/dyslexia

Texas Scottish Rite Hospital for Children is one of the nation's leading pediatric centers for the treatment of orthopedic conditions, sports injuries and fractures, as well as certain related arthritic and neurological disorders and learning disorders, such as dyslexia. Patients receive treatment regardless of the family's ability to pay. For more information, to volunteer or to make a donation, please call 214-559-5000 or 800-421-1121 or visit scottishritehospital.org.

