

EFFECTS OF NATIONAL INSTITUTE FOR LEARNING DEVELOPMENT EDUCATIONAL THERAPY FOR
STUDENTS WITH LEARNING DIFFICULTIES

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This research project was undertaken in partial fulfillment of a Doctor of Education degree at Regent University in Virginia Beach. Only limited information from the study is presented in this article. To access the complete study, including a full literature review, complete presentations of group demographics and statistical procedures as well as findings regarding written expression, please contact NILD.

The National Institute for Learning Development (NILD) is a nonprofit organization dedicated to training educators to work with children and adults with learning difficulties through an individualized program of educational therapy. NILD defines educational therapy as an intervention that first determines a student's patterns of learning strengths and weaknesses and then provides intense instruction in a one-to-one setting to remediate the identified educational weaknesses. NILD Educational Therapy[®] focuses primarily on basic academic skills such as reading, spelling, written expression, and mathematics. Improved skills are developed to achieve grade-level academic proficiency using a combination of direct instruction (Carnine, Silbert, & Kameenui, 1997) and mediated-learning strategies (Feuerstein, 1980). NILD educational therapists are professionals who create a supportive learning environment and offer an intensive intervention to students with learning challenges based on the appraisal of information received from parents, classroom teachers, and psychoeducational evaluations.

NILD Educational Therapy is intended for students in grades 2-12 and is adapted to appropriate instructional levels for each student. The program includes 24 different techniques from which the educational therapist chooses specific techniques that will most appropriately meet the academic and cognitive processing needs of individual students. A typical NILD Educational Therapy session usually includes 8-12 techniques. Several core techniques that encourage strategy development, self-

questioning, and oral language proficiency within the framework of learning basic skills in primary academics have been found to be the most useful (Hopkins, 1996). The core techniques include *Blue Book*, *Dictation and Copy*, *Buzzer*, *Math Block*, and *Rhythmic Writing*. Most NILD Educational Therapy sessions routinely include these five core techniques.

Although the use of NILD Educational Therapy has grown substantially since its inception more than 25 years ago, the organization has not yet established program efficacy. Neither of the studies previously completed (Benson & Scott, 2005; Hopkins, 1996) gained professional recognition, which has created a problem for NILD. Because these studies, as well as accumulated anecdotal evidence, appear to suggest efficacy for the NILD program, the organization would like to continue to move beyond private schools and offer programs in public school and community-based settings. The current educational environment, however, increasingly demands validated, empirical research. Not having an empirical research base has made it difficult to find entrance into the public arena, suggesting the necessity for the NILD program to have a comprehensive, well-designed study that attempts to establish the efficacy of the intervention.

The NILD program has traditionally focused on students with a specific learning disability (SLD) who were usually identified with an ability-achievement discrepancy. Because the program has been located principally in private schools, the SLD population identified often displayed average to above average ability but rarely exhibited significantly below average achievement because many of the schools exclude such students. Public schools, however, rarely identify a student as SLD unless they are presenting below average achievement. Consequently, it was necessary for this study to be directed at establishing the efficacy of the NILD program for students who meet the more typically accepted characteristics of SLD that often includes both an ability-achievement discrepancy **and** below average achievement.

Given the limitations of previous research, four areas emerged as focal points for the current effort: (a) overall effectiveness of the NILD program for students demonstrating below average academic achievement, (b) effectiveness for students whose profiles are discrepant compared with those who are not discrepant, (c) effectiveness with younger versus older students, and (d) which specific skills are most impacted. From these concerns four research questions were developed. Each question only considered the skills of reading (decoding, fluency, and comprehension) and written language (spelling and sentence writing) because most students with SLD demonstrate significant problems in these areas. The four research questions follow:

1. Does NILD Educational Therapy help students who are below average in reading and written language achievement improve their reading and written language skills?
2. How do students enrolled in NILD Educational Therapy with ability-achievement discrepancies [underachievers (UA)] whose achievement is below average in reading and written language skills differ in improvement of reading and written language skills from students whose achievement is also below average but who do not display ability-achievement discrepancies [low-achievers (LA)]?
3. Do students enrolled in elementary grades whose achievement is below average in reading and written language skills respond to NILD Educational Therapy differently from students enrolled in middle school whose achievement is also below average in reading and written language skills?
4. On which specific reading and written language skills as measured by five subtests on the WJ III ACH (*Spelling, Writing Samples, Word Identification, Word Attack, Reading Fluency, and Passage Comprehension*) do students with below-average achievement make the most progress as a result of NILD Educational Therapy?

Only currently enrolled students with below average achievement scores were eligible for the study. Data for each student was collected at three points: (a) prior to enrollment in NILD Educational Therapy, (b) after 1 academic year or approximately 60 sessions of NILD Educational Therapy, and (c) after 2 academic years or approximately 120 sessions of NILD Educational Therapy. Information was gathered from the standard battery of the *Woodcock-Johnson III Tests of Achievement* [WJ III ACH] (Woodcock, McGrew, & Mather, 2001), classroom standardized testing scores, teacher checklists, and classroom grades. The scores for 172 newly enrolled students were originally received with 68 (40%) of those profiles meeting the stipulated parameters. Upon completion of the study, 39 students remained in the sample. Ninety percent of the students were Caucasian and 92% were enrolled in private schools. The sample of students obtained only allows generalization of the findings to private schools. Sixty-nine percent of the students were male and 31% were female. Further descriptive statistics are presented in Table 1.

Table 1

Descriptive Statistics for Full Sample (n = 39)

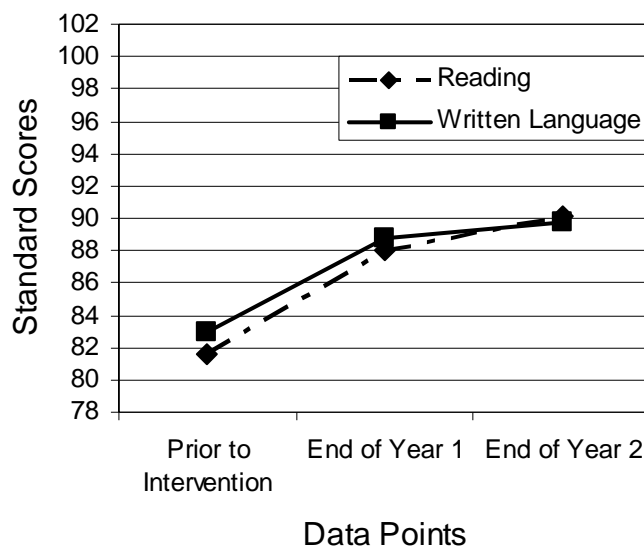
	Mean	SD
IQ	96.05	8.18
Grade Level	5.05	2.52
Age	10-9	2.69

Summary of Findings

Overall, students in the study with below average achievement in reading significantly increased their skills by 8.5 standard score points (from an average of 81.6 to an average of 90.10) or 2.5 grade

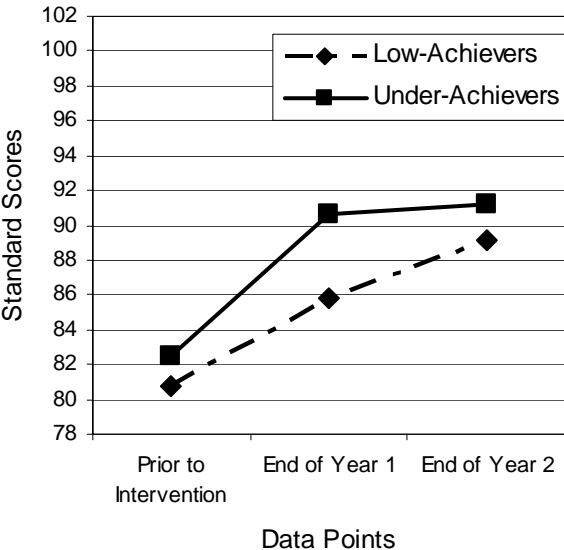
levels over the 120 sessions or 2 academic years of NILD Educational Therapy applied in tandem with the standard general education curriculum. Not only did the students demonstrate yearly gains as would be expected within general education alone, their progress exceeded average gains and began to close the achievement gap between them and their peers. The same students improved their skills in written expression by 7 standard score points or nearly two grade levels, representing a significant improvement that allowed them to keep pace with the average achievement of their peers. Results are graphically depicted in Figure 1.

Figure 1. Linear effects for both reading and written language skills for full sample.



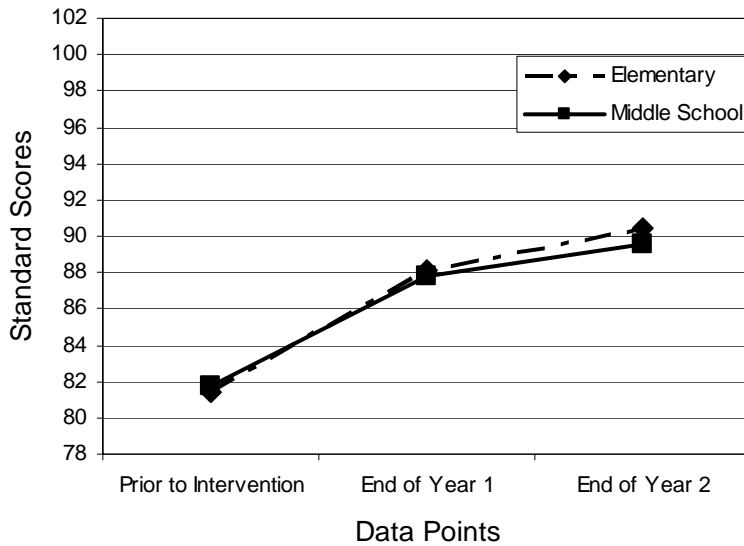
When the sample was divided into two groups (LA and UA) on the basis of the presence of an ability-achievement discrepancy, the findings in overall reading for each group mirrored the results for the group as a whole. It may have been expected that students with a stronger ability as measured on a standard intelligence test (UA group) would have progressed at a greater rate and suggests that NILD Educational Therapy can be a successful intervention to complement the general curriculum for both underachieving and low achieving students. Results are presented in Figure 2.

Figure 2. Linear effects for reading for both achievement groups.



The full sample was also divided into two grade-level groups with students beginning the program in grades 2-5 being assigned to the elementary group and those beginning the program in grades 6-9 assigned to the middle school group. Once again, the findings for improvement in both overall reading and written language skills for each group were not significantly different from each other and mirrored the results from the whole sample, suggesting that NILD Educational Therapy can effectively be implemented alongside the general education curriculum for the reading remediation needs of both elementary and middle school students. Results are shown in Figure 3.

Figure 3 . Linear effects for reading for both grade-level groups.



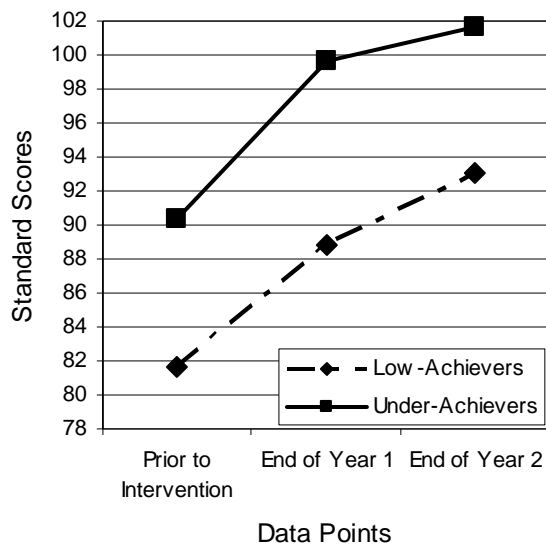
Most surprising was the trend in both reading and written expression toward substantial improvements in just 1 year of NILD Educational Therapy. Student progress in overall reading and written language skills tended to increase for the entire sample during the first year (60 sessions) but leveled off during the second year. When separately evaluating the UA and LA groups in both reading and written expression, the LA group demonstrated a more linear trend suggesting that their progress was steady over the 2 years. The UA group, on the other hand, showed remarkable progress during the first year but limited change during the second academic year.

Significant growth was also realized for each of the subskills of reading and written expression for the full sample with the NILD intervention being similarly effective for both the LA and UA groups when used alongside their general education studies. For both groups, most growth was achieved in reading comprehension, representing an important outcome since reading comprehension is considered the most important skill leading to eventual success in content reading. The positive outcome was further substantiated by an average 10.5 percentile increase in the reading comprehension subtest

score over the 2-year period for 14 of the students whose classroom standardized testing scores were available.

For the LA group, growth of 2.3 grade levels (11.5 standard score points) was realized over the 2-year period and brought them from below average performance in reading comprehension to solidly in the average range. The UA group improved their reading comprehension scores by 3.5 grade levels (11.2 standard score points) over the 2 years improving from the lowest end of the average to the midlevel of the average range. Since more than 2 years of growth was experienced by each group, these students were able to begin closing the achievement gap between them and their peers. Results are displayed in Figure 4.

Figure 4. Linear effects for reading comprehension for both achievement groups.



Need for Further Research

Certainly further research is needed to definitively determine the effectiveness of NILD Educational Therapy. Follow-up research to this study should be conducted to determine if significant

progress is once again made by those students in this study who continued to a third year of intervention. Should third-year scores in overall reading and specific skill areas reveal upward trends, the need for 3 years of educational therapy could be validated. Additionally, substantial gains would increase the likelihood that students could independently manage necessary content reading and written assignments in the future, a primary goal for all NILD Educational Therapy students.

Another follow-up study should be completed in 2 to 3 years to determine if gains made as a result of combining 2 or 3 years of NILD Educational Therapy with a general education program were maintained or even improved. Sustained gains are the ultimate goal of any educational intervention and should be substantiated following a study such as this one. Additionally, another study that replicates the parameters of this study would further substantiate the present findings.

Most important to the future of NILD programs is the opportunity to establish effectiveness in a more widespread, controlled study that includes random sampling and greater ethnic and social diversity among participating students with deficiencies in reading and written expression. It is hoped that the present study will serve to establish NILD Educational Therapy as an intervention that holds great promise for struggling students and that the provision for a more extensive study will be realized in the near future.

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NILD and Descubre (Mexico) cooperatively began this research project in 2001. Both agencies were aware of the need for statistical evidence to support the program of NILD Educational Therapy®. The initial impetus was provided by Mr. and Mrs. Ricardo Jiminez who envisioned this project and generously contributed startup funds. Descubre's board of directors, backed by Manuel Villarreal and Mr. & Mrs. Jiminez, cooperatively conceived and directed the research design that NILD implemented, overseeing progress and financially supporting the project to its completion. NILD gratefully acknowledges this collaboration.

**Data Analysis to Determine the Effectiveness
of NILD Educational Therapy® for Students with Learning Disabilities:**

A collaborative study by NILD and Descubre

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Abstract

Initial research to examine the effectiveness of a model of educational therapy developed by the National Institute for Learning Disabilities (NILD) was completed and published in 1996 as a doctoral dissertation by Kathleen R. Hopkins, Ed.D., for the College of William and Mary. Subsequently, archived data reported from 1992-2002 for 120 students with diagnosed learning disabilities enrolled in NILD Educational Therapy™ in accredited schools were analyzed to see if gains were made between pre and posttest scores on the WISC-III, WRAT-3, and Woodcock /Johnson Tests of Achievement-R. The results show gains on all measures to be significant using the statistical procedure known as treatment effect size, confirming results of the original study.

Introduction

The program of educational therapy developed by the National Institute for Learning Disabilities (NILD Educational Therapy®) is based on a cognitive language-processing model designed to improve academic skills as well as to develop cognitive efficiency. The theoretical concept of the zone of proximal development (Vygotsky, 1962; 1978), self-directed inner language, teacher as mediator, and cognitive modifiability (Feuerstein, 1980; Feuerstein, Rand, Jensen, Kaniel, & Tzururiel, 1987) are integral to NILD Educational Therapy®. Instructional methodology incorporates an explicit and systematic approach, especially in the initial stages of intervention, to facilitate information processing and strategy development (Gersten, 1998; Vaughn, Gersten, & Chard, 2000). The program is designed to improve cognitive processing and academic skills of students with learning disabilities in one-on-one sessions implementing the constructs of interactive language, strategic thinking, and mediated learning (Feuerstein, Rand, Jensen, Kaniel, & Tzururiel, 1987; Vygotsky, 1978) to enable students diagnosed with specific learning disabilities (LD) to become independent learners. To establish and develop independent learning, the techniques used are designed to strengthen the domain of executive functioning, as well, which regulates, integrates, and coordinates various cognitive processes (e.g., attention, working memory, problem-solving) (Barkley, 1997; Denckla, 1994). Efficient executive functioning allows the students to self-regulate behavior by setting realistic goals, monitoring progress toward goals, and evaluating when goals are achieved (Watson & Westby, 2003; Westby, in press; Westby & Watson, 2003).

Prior research to examine the effectiveness NILD Educational Therapy®, *A Study of the Effect of Interactive Language in the Stimulation of Cognitive Functioning for Students with Learning Disabilities* was initiated and published in 1996 as a doctoral dissertation by Kathleen R. Hopkins, Ed.D., for the College of William and Mary. Students in this study demonstrated statistically significant gains over time in cognition and achievement on standardized measures (Table 1).

(Table 1)

<i>A Study of the Effect of Interactive Language in the Stimulation of Cognitive Functioning for Students with Learning Disabilities (Hopkins, 1996)</i>			
PSYCHO-EDUCATIONAL ASSESSMENT	PRE	POST	EFFECT SIZE
ABILITY – <i>Detroit Test of Learning Aptitude</i>			
Verbal IQ	96.85	106.31	.63
Performance IQ	96.74	105.89	.61
General IQ	97.34	106.78	.63
READING			
<i>Wide Range Achievement Test, Revised (WRAT-R)</i>	92.11	103.02	.73
MATHEMATICS			
<i>WRAT-R</i>	89.91	98.21	.55
SPELLING			
<i>WRAT-R</i>	89.21	97.10	.53

To determine longitudinal effectiveness of NILD Educational Therapy®, psycho-educational data collected between 1992 and 2004 from NILD accredited programs was analyzed in a four-phase research design completed by NILD’s research department in collaboration with *DESCUBRE*, Mexico City, Mexico. Research design and implementation and complete funding was provided by Mr. and Mrs. Manuel Villarreal and Mr. and Mrs. Ricardo Jiminez and the board of *DESCUBRE*. The education and psychology departments of Regent University provided consultation, as well.

Research Design

Phase I: *Organize, record, and analyze pre-test and post-test testing data from archival records of students having completed a program of NILD Educational Therapy®.* This phase identified an experimental treatment group of 114 students. Archival data used in Phase I was limited to records that were complete, thus it was not possible to randomly assign students to either the experimental treatment group or to the control group.

Phase II: *Compare data from Phase I experimental group with data of students tested and determined eligible for NILD Educational Therapy® but never enrolled in a program.* This phase identified a sample of 27 students.

Phase III: *Determine retention of psycho-educational gains of students having completed NILD Educational Therapy®.* Locate and retest a representative sample of students from the Phase I experimental group three years after completion of the program. In addition, qualitative data were gathered, referencing classroom independence and success, high school graduation as well as college and career activities. Fifty-five students were included in the sample.

Phase IV: *Examine Phase I experimental group data relative to students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD).* Data from Phase I from students who were diagnosed with ADHD was isolated and evaluated. Twenty-two students from Phase I were included in the sample.

Demographics

Student data was collected from 22 NILD accredited programs. Schools were organized by time zone to illustrate distribution. Eastern: 73%; Central: 14%; Pacific: 9%;

Europe: 5%. Among these schools, 64% were located in suburban areas, 27% in metropolitan areas, and 9% in rural areas. Population of the areas in which schools were located ranged from 8,000 to 1,500,000 with an average population of 260,904. Fifty-seven percent of the families with students enrolled in NILD Education Therapy® had an average annual income range of \$30,000-\$50,000. Forty-three percent were in the \$50,000-\$100,000 range. The racial composition was 88% white, 6% black, 2% Hispanic, 2% Asian, and 2% other.

Psycho-Educational Assessment

All students completed a full psycho-educational battery of tests to determine the existence discrepancies between ability and actual academic achievement. The Wechsler Intelligence Scales are the most commonly used psychological tests for measuring intelligence quotients (IQ) in education today. A well-administered intelligence test can be interpreted in several different ways to provide a foundation for understanding and helping a student who is having difficulty in school.

The *Wechsler Intelligence Scale for Children, Third Revision* (WISC-III) includes verbal and performance scales. The verbal subtests require auditory input and verbal output, while the performance subtests require visual input and verbal or motoric output.

Verbal IQ is assessed by 6 subtests which measure verbal knowledge and understanding obtained through formal and informal education: abstract and concrete reasoning, associative thinking, concentration and auditory attention, arithmetic reasoning, expressive language, social judgment, common-sense reasoning, and working memory, as well as long-term memory. Comprehensively, the Verbal Scale measures language

expression, comprehension, listening, and the ability to apply these skills in problem solving.

Performance IQ is determined by 6 subtests which measure nonverbal ability to interpret and organize visually presented tasks within time limits. Skills include visual problem-solving, visual-motor coordination and spatial relationships, non-verbal abstract reasoning, attention to visual detail and processing speed in tasks that include puzzles, picture interpretation, duplicating designs with blocks, and copying. Comprehensively, the Performance Scale assesses nonverbal problem solving, perceptual organization, speed, and visual-motor proficiency.

Full Scale IQ is a scaled score representing overall ability in both verbal and performance subtest measures.

The *Wide Range Achievement Test, Third Revision, (WRAT-III)* includes 3 subtests that measure basic school codes, excluding all measures of comprehension. The reading subtest measures decoding skills in which the student recognizes and names letters and pronounces words in isolation. The math subtest measures mathematical calculation, in which the student counts, reads numbers, identifies number symbols, solves oral problems and performs written computation within a time limit. The spelling subtest measures written spelling in which the student writes letters and words from dictation.

The *Woodcock-Johnson Tests of Achievement, Revised (WJ-R)* measure academic performance in mathematics, reading, and written expression:

Mathematics: The Calculation subtest measures skills in performing mathematical computation. Addition, subtraction, multiplication, division and combinations of these basic operations, as well as some geometric, trigonometric, logarithmic, and calculus

operations are included. The Applied Problems subtest measures skill in analyzing and solving practical problems in mathematics. Students must recognize the procedure to be followed then perform necessary calculations. Because many of the problems include extraneous information, students must decide not only appropriate mathematical operations to use but also which data to include in the calculation.

Reading: Letter/Word Recognition measures ability to read isolated letters and words. Passage Comprehension measures skill in reading a short passage and identifying a missing key word which requires the student to state a word that would be appropriate in the context of the passage.

Writing: Dictation measures prewriting skills such as drawing lines and copying letters and continues to present more advanced problems that measure skill in providing written responses to a variety of questions requiring knowledge of spelling, punctuation, capitalization and word usage. The Writing Samples subtest measures ability in writing responses to a variety of tasks. The student must phrase and present written sentences that are evaluated with respect to the quality of expression while not being penalized for errors in the basic mechanics of spelling and punctuation.

Statistical Analysis

Data analysis consisted of a group pre-test/post-test design with comparison made between scores earned at the beginning and end of intervention using the statistical procedure of Treatment-Effect Size or Effect Size (ES) (Cohen, 1988). The ES is based on the amount of change associated with intervention taking into account the standard deviation of the measures being used. The actual value obtained indicates a standardized change score. Cohen provides rough guidelines for estimating significance of ES: 0.2 –

small; 0.5 – medium; 0.8 – large. The Institute of Education’s Joint Dissemination Review Panel stated that an ES above 0.33 can be regarded as indication that significant educational change has occurred (Tallmadge, 1977). However, ES as small as 0.1 may be of important practical significance if the intervention that produced the improvement is relatively inexpensive compared to other competing options; the effect is achieved across all groups of students; and the effect accumulates over time (Glass, 1988). Historically, students with learning disabilities tend to exhibit regression in language-based standardized assessments (Spren, 1988).

RESULTS

Phase I: Experimental Group (Table 2)

Mean scores for all measures of the experimental group increased. The indication that there was no digression of any score is notable for students with learning disabilities. In education, as noted above, if it can be shown that an intervention can raise academic achievement by an ES of even 0.1, then this could be a very effective intervention (Glass, 1988). Educational achievement standard scores indicated significant improvements on the *WRAT-III* as well as all *Woodcock-Johnson-R* subtests, with the exception of *Dictation*. The strongest treatment effect of NILD Educational Therapy® was noted on the *Writing Samples* subtest.

Table 2

PHASE I – Experimental Group			
PSYCHO-EDUCATIONAL ASSESSMENT	PRE	POST	EFFECT SIZE
ABILITY - WISC-III			
Verbal IQ	104.19	108.61	.29
Performance IQ	101.16	110.14	.60
Full Scale IQ	102.97	110.15	.48
READING			
<i>WRAT-III</i> - Reading	95.37	106.07	.71
<i>WJ-R</i> – Letter/Word Identification	99.12	107.00	.53
<i>WJ-R</i> – Passage Comprehension	101.65	111.43	.65
MATHEMATICS			

<i>WRAT-III</i> - Math	95.80	108.99	.87
<i>WJ-R</i> - Calculation	100.22	109.66	.63
<i>WJ-R</i> - Applied Problems	105.69	110.60	.33
WRITTEN EXPRESSION			
<i>WRAT-III</i> - Spelling	93.53	104.00	.71
<i>WJ-R</i> – Dictation	90.10	92.64	.17
<i>WJ-R</i> – Writing Samples	97.59	114.48	1.13

Phase II: Control Group (Table 3)

The test results of the control group were more in keeping with what longitudinal research has indicated historically relative to students with learning disabilities. Scores tend to regress in language-related standardized assessments (Spren, 1988). All intelligence quotients indicate regression for this subgroup.

Non-significant gains were indicated on the *WRAT-III* reading and spelling subtests. *Math* regressed slightly. Scores on the *Woodcock-Johnson-R* regressed for *Passage Comprehension*, *Calculation*, *Applied Problems*, and *Dictation*. Non-significant gains occurred in *Writing Samples* and *Spelling*. The *Letter/Word Identification* subtest indicated a significant gain.

Table 3

PHASE II – Control Group in Isolation			
PSYCHO-EDUCATIONAL ASSESSMENT	PRE	POST	EFFECT SIZE
ABILITY – WISC-III			
Verbal IQ	105.44	103.48	- 0.13
Performance IQ	105.13	101.19	- 0.27
Full Scale IQ	105.67	102.37	- 0.22
READING			
<i>WRAT-III</i> - Reading	101.19	102.89	0.11
<i>WJ-R</i> – Letter/Word Identification	99.59	105.04	0.36
<i>WJ-R</i> – Passage Comprehension	102.63	100.11	- 0.17
MATHEMATICS			
<i>WRAT-III</i> - Math	102.63	100.11	- 0.17
<i>WJ-R</i> - Calculation	104.81	99.15	- 0.38
<i>WJ-R</i> - Applied Problems	108.04	101.44	- 0.44
WRITTEN EXPRESSION			
<i>WRAT-III</i> - Spelling	96.44	99.89	0.23
<i>WJ-R</i> – Dictation	91.78	89.44	- 0.16
<i>WJ-R</i> – Writing Samples	103.19	103.63	0.03

Phase III: Retention of Psycho-Educational Gains (Table 4)

In Phase III, retention of academic gains in a sample of 55 students from the Phase I treatment group was analyzed. This subgroup was retested at least 3 years after completion of NILD Educational Therapy®. It is noteworthy that Verbal, Performance and Full Scale IQ scores continued to increase after the post test administered at completion of NILD Educational Therapy®. Achievement test scores indicated maintenance of gains; however a non-significant regression on two *Woodcock-Johnson* subtests was noted. All other subtests indicated gains over pretest measures. *Writing Samples* indicated the strongest treatment effect overall.

Table 4

PHASE III – RETENTION of PSYCHO-EDUCATIONAL GAINS			
PSYCHO-EDUCATIONAL ASSESSMENT	PRE/POST	RETEST	EFFECT SIZE
ABILITY – WISC-III			
Verbal IQ	103.95/107.75	109.31	0.36
Performance IQ	100.35/109.93	112.38	0.80
Full Scale IQ	102.58/109.44	111.38	0.59
READING			
<i>WRAT-III</i> - Reading	97.07/106.22	105.29	0.55
<i>WJ-R</i> – Letter/Word Identification	99.15/105.07	103.96	0.32
<i>WJ-R</i> – Passage Comprehension	102.2/112.91	106.09	0.26
MATHEMATICS			
<i>WRAT-III</i> - Math	97.25/111.16	100.33	0.21
<i>WJ-R</i> - Calculation	99.78/110.69	101.55	0.12
<i>WJ-R</i> - Applied Problems	106.4/112.46	103.98	0.16
WRITTEN EXPRESSION			
<i>WRAT-III</i> - Spelling	95.67/103.24	100.29	0.31
<i>WJ-R</i> – Dictation	91.09/93.24	89.29	-0.12
<i>WJ-R</i> – Writing Samples	97.58/116.51	109.84	0.82

Phase IV – Students diagnosed with ADHD (Table 5)

Test scores of students diagnosed with ADHD were analyzed separately from the Phase I treatment group to determine specific outcomes. Initial FSIQ scores were lower for this group as a whole; however, consistent gains were noted across all cognitive and educational achievement measures.

Table 5

PHASE IV – STUDENTS DIAGNOSED with ADHD			
PSYCHO-EDUCATIONAL ASSESSMENT	PRE	POST	EFFECT SIZE
ABILITY – Wechsler Intelligence Scale for Children, Third Revision (WISC-III)			
Verbal IQ	106.84	109.84	0.23
Performance IQ	99.56	106.40	0.46
Full Scale IQ	103.72	108.84	0.34
READING			
WRAT-III - Reading	95.68	105.96	0.69
WJ-R – Letter/Word Identification	99.96	107.16	0.48
WJ-R – Passage Comprehension	100.72	110.60	0.66
MATHEMATICS			
WRAT-III - Math	92.56	108.92	1.09
WJ-R - Calculation	96.92	108.76	0.79
WJ-R - Applied Problems	103.12	109.60	0.43
WRITTEN EXPRESSION			
WRAT-III - Spelling	92.56	103.84	0.75
WJ-R – Dictation	89.64	91.88	0.15
WJ-R – Writing Samples	94.64	114.92	1.35

Discussion

Analysis of testing data appears to indicate an overall increase in mean standard scores for students who completed a program of NILD Educational Therapy®. Gains were sustained and even showed further improvement over time in *WISC-III* measures. In comparing Phase I with Phase II, FSIQ for Phase I is greater than Phase II participants, replicating the pattern of regression for students left untreated. Although it cannot be confirmed by one test alone, it appears that the comprehensive intervention delivered in

NILD Educational Therapy® improves specific levels of perceptual and cognitive functioning for students with learning disabilities.

Phase III achievement test measures indicate significant academic improvement, although, the gains measured at the time of program completion were not sustained at the same level over time in all measures. Significant gains were observed over time in all tests except Applied Problems and Dictation subtests of the *Woodcock Johnson-R*. Similar results were not indicated in the control group, however, since these scores more closely represented the trend for students with LD by regressing in 8 of the 12 measures, made the gains demonstrated by the experimental group that much more impressive. Interestingly, the tests in which the highest gains were made by the experimental group (I) showed the widest variance of ES within the control group (II), as noted in the Performance IQ above. The subtest with the highest overall gain was Writing Samples of the *WJ-R*. Writing Samples requires a student to employ reasoning, sequencing, description (detail), as well as to express thoughts in complete sentences. Spelling and punctuation are not evaluated except in the earliest examples. This is important to note because improvement in this subtest seems to indicate most directly that thinking and planning skills are being strengthened. Though some regression was noted for the experimental group, gains on this subtest remained statistically significant.

The *WRAT-3* tests spelling, reading words in isolation, and math calculation. Scores on the reading section for the experimental group were significantly higher than those of the control group. In comparing this to the *Woodcock Johnson* Letter/Word subtest, which measures a similar skill, more improvement is noted in the control group than indicated on the *WRAT*, but still less than the experimental group. When comparing

the effect size to the component of reading comprehension the difference is more dramatic.

The *WRAT* Math subtest and *WJ-R* Calculation subtest scores indicated the greatest discrepancy between groups, with the experimental group demonstrating very strong gains and the control group demonstrating significant regression. Analysis of the *WJ-R* Applied Problems subtest indicates the same pattern for both groups.

WRAT Spelling scores improved for both groups, however, scores for the experimental group were significantly higher than those of the control group. Dictation subtest scoring on the *WJ-R* includes spelling, but also evaluates usage, punctuation and capitalization without students always knowing how they are being graded. This subtest indicated the least improvement for the experimental group. Regression for the control group was noted.

Summary

Statistical analysis of archival psycho-educational testing data from 1992 through 2004 submitted to the National Institute for Learning Disabilities from NILD accredited programs indicates that NILD Educational Therapy® appears to enable students diagnosed with learning disabilities to make and maintain statistically significant gains in measures of cognitive functioning as well as academic achievement in the areas of reading, mathematics, and written expression. This quantitative study closely parallels the initial research published in *A Study of the Effect of Interactive Language in the Stimulation of Cognitive Functioning for Students with Learning Disabilities*, by Kathleen R. Hopkins, College of William and Mary, 1996. In addition, the examination of testing

data for students identified with Attention Deficit Hyperactivity Disorder (ADHD) indicates similar statistically significant gains and parallels.

In contrast, students diagnosed with learning disabilities and determined to be eligible for NILD Educational Therapy®, but not enrolled, did not demonstrate significant gains in cognitive functioning nor the broad areas of academic achievement that were measured. A significant gain was noted on the *WJ-R* Letter/Word Identification subtest. Generally, this skill, even though important for decoding written language, did not appear to have an impact on comprehension, which is the ultimate goal of reading. Regression in ability and academic achievement was evidenced, which seems to add credibility to the research indicating that students with learning disabilities tend to exhibit regression in language-based standardized assessments (Spren, 1988).

Follow-up studies on students with learning disabilities are important in determining permanent effects of the applied intervention. Tutoring studies indicate short-term student gains at best. Quality intervention should make an impact on life-long learning in enabling the individual to become an independent learner. This is a primary distinctive of NILD Educational Therapy®. The follow-up phase of this particular study indicates encouraging results. Students who completed a program of NILD Educational Therapy® did not demonstrate regression in the broad areas of achievement after being retested at least three years after completion of the program. Furthermore, it is noteworthy that on measures of cognitive ability (*WISC-III*), Verbal, Performance and Full Scale IQ measures indicated that these students continued to improve in their cognitive abilities.

Finally, students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) appear to benefit academically from NILD Educational Therapy®. Even though formal behavioral measures were not included in this study, it is believed by some theorists that improving cognitive processing will produce the outcome of improved behavior as the result of improved executive function (Feuerstein, 1980).

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