

WWC Review of the Report “A Written Language Intervention for At-Risk Second Grade Students: A Randomized Controlled Trial of the Process Assessment of the Learner Lesson Plans in a Tier 2 Response-to-Intervention (Rti) Model”¹

The findings from this review do not reflect the full body of research evidence on *Process Assessment of the Learner*.

What is this study about?

The study examined the effects of *Process Assessment of the Learner (PAL)*, a writing expression curriculum. The program was tested with second-grade students in a suburban-rural school district in the southeastern United States. Three sections of *PAL* lessons were implemented in the district as a small-group curriculum supplement—Talking Letters, Spelling, and Handwriting and Composition.

Study authors randomly assigned two cohorts of at-risk students in seven schools to either an intervention group that received *PAL* (68 students) or a comparison group that did not receive *PAL* (70 students).² At-risk students were defined as students who scored at or below the 25th percentile for their grade on the Wechsler Individual Achievement Test-II (WIAT-II) Written Expression Subtest.

Students in the intervention group received *PAL* lessons taught by research associates and graduate students during second grade in small groups of three to six students in addition to their usual written language instruction. The small groups received a series of 24 sessions lasting 25 minutes each over 12 weeks. Students in the comparison group continued to receive the usual written language instruction in second grade, a statewide standard curriculum in which writing skills were embedded in daily classroom activities with little direct instruction. The

standard curriculum included ongoing development of alphabetic principles; using vocabulary in written communication; composing written sentences; planning and composing narrative texts; and capitalization, punctuation, syntax, and grammar.

The researchers examined the effects of *PAL* by comparing the performance of 66 students in the intervention group and 63 students in the comparison group (after attrition) on the WIAT-II Written Expression Subtest in the fall of third grade.³

In addition to the analysis that compared at-risk students in the intervention and comparison conditions, the authors also compared the intervention group (at-risk students who received *PAL*) to a sample of typical students (defined as scoring higher than the 25th percentile on the writing assessment) who were not included in the experiment and therefore did not receive *PAL*.

Features of *Process Assessment of the Learner (PAL)*

PAL is a writing expression curriculum that is available in three tiers of instructional intensity (classroom, small group, and individual student). Writing expression encompasses the ability to communicate and express thoughts in written form. The study delivered Reading and Writing Lesson Sets 4 and 7 over the course of 12 weeks, which included the following sections:

- In the subword level Talking Letters section, students used cards with visual cues of phonemes that they named in rapid succession.
- The word level Spelling section focused on eight words per instructional session, asking students to use their phoneme strategies to spell words orally and in written form.
- For the text level Handwriting and Composition section, students responded in writing to a prompt, using a series of six high-frequency words per session.
- Some lessons included handwriting instruction, in which students looked at a model and practiced the correct construction of each letter.

This study focuses on the effect of the small group implementation of *PAL*.

WWC Rating

The research described in this report meets WWC evidence standards without reservations

The analysis of the impact of *PAL* on the achievement of at-risk students is a well-executed randomized controlled trial with low attrition. However, the authors' non-experimental comparison of the performance of at-risk students receiving *PAL* to the performance of typical students did not meet WWC evidence standards because the groups were not equivalent at baseline.⁴

What did the study find?

The study authors found that the average written expression skills of the *PAL* intervention group were higher than those of the comparison group at the beginning of third grade, based on an analysis of growth trajectories. However, the WWC did not confirm that the observed effect of the *PAL* intervention on growth in written expression skills was statistically significant.⁵

Appendix A: Study details

Hooper, S. R., Costa, L. C., McBee, M., Anderson, K. L., Yerby, D. C., Childress, A., & Knuth, S. B. (2013). A written language intervention for at-risk second grade students: A randomized controlled trial of the process assessment of the learner lesson plans in a tier 2 response-to-intervention (RtI) model. *Annals of Dyslexia*, 66(1), 44–64.

Setting	The study was conducted in a single suburban-rural school district in the southeastern United States.
Study sample	<p>First-grade students in two cohorts in seven schools were assessed on written expression using the WIAT-II Written Expression Subtest. Students who scored at or below the 25th percentile on the WIAT-II were identified as at-risk students. Students who scored above the 25th percentile on the WIAT-II were labeled typical students.</p> <p>The at-risk students were randomly assigned to either the intervention or the comparison group. The analysis sample of at-risk students included 66 students in the intervention group and 63 students in the comparison group. A random sample of typical students (students scoring higher than the 25th percentile on the writing assessment), balanced across schools and classrooms, was used for a contrast (with at-risk students who received <i>PAL</i>) that did not meet WWC evidence standards because these students were not randomly assigned to experimental conditions and were not shown to be equivalent at baseline.</p>
Intervention group	Students in the intervention group in both cohorts received supplemental small group instruction in <i>PAL</i> during second grade in addition to their usual written language instruction. The small groups consisted of three to six students and one project-based interventionist who met for 24 sessions of 25 minutes each for 12 weeks. The <i>PAL</i> lessons focused on recognizing phonemes, spelling, composition, and handwriting instruction. Lessons were designed to be 35 to 40 minutes long, but were modified to meet the available time provided by the school system while still retaining the integrity of the original plans.
Comparison group	Students in the comparison group received the usual written language instruction during second grade following a statewide standard course of study. This curriculum included ongoing development of alphabetic principles; using vocabulary in written communication; composing written sentences; planning and composing narrative texts; and capitalization, punctuation, syntax, and grammar. These skills were embedded in daily classroom activities with little direct instruction for written expression.
Outcomes and measurement	The study authors examined scores from the WIAT-II Written Expression Subtest. Pretests were administered in the fall of second grade, and posttests were administered in the fall of third grade, following the end of the intervention at the end of second grade. For a more detailed description of this outcome measure, see Appendix B.
Support for implementation	Research associates and graduate students in education and school psychology administered the intervention. They were trained on the <i>PAL</i> lesson plans and how to record the reliability of each component. They also completed a lesson checklist on compliance with each intervention component after each <i>PAL</i> session. The lead interventionist worked with the project interventionists by discussing lesson plans prior to implementation, conducting random observations of sessions with follow-up, and holding weekly discussions.

**Reason for
review**

This study was identified for review by the WWC because it was supported by a grant to The Carolina Institute for Developmental Disabilities at the University of North Carolina School of Medicine (Principal Investigator: Stephen R. Hooper) from the National Center for Education Research (NCER) at the Institute of Education Sciences (IES).

Appendix B: Outcome measure for the written expression domain

Written expression

Wechsler Individual Achievement Test-II (WIAT-II) Written Expression Subtest

This measure consists of a series of cognitive and psychoeducational measures drawn from different normed and standardized assessments. At grades 1 and 2, the Written Expression Subtest consists of three tasks: timed alphabet writing, written word fluency, and sentence combining. At grade 3, the student is asked to write a paragraph in accordance with a specific writing prompt. The score analyzed is the raw score. Past reported inter-item reliability for this assessment ranged from 0.91–0.94.

Appendix C: Study findings for the written expression domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Written expression								
<i>Wechsler Individual Achievement Test-II (WIAT-II) Written Expression Subtest</i>	At-risk students	7 schools/129 students	13.55 (5.04)	12.40 (5.59)	1.15	0.22	+9	0.22
Domain average for written expression						0.22	+9	Not statistically significant

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention

Study Notes: The WWC calculated the program group mean using a difference-in-differences approach (see the WWC Handbook) by adding the impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttest means. Please see the WWC Procedures and Standards Handbook version 2.1 for more information. The authors’ analyses of the effects of PAL in the article examine rates of change in individual growth, and report model-based estimates of the differences across intervention and comparison groups at the beginning of third grade which are shown to be nonsignificant. The authors report that this difference is statistically significant when the model-based average at the beginning of third grade also subtracts out the difference in writing scores at the beginning of the treatment period (at the midway point of second grade). The WWC does not confirm this finding to be statistically significant, since this comparison effectively double counts the baseline difference across the groups (since the baseline scores are already included in the estimated growth trajectories). The p-values presented here were calculated by the WWC, based on information on sample sizes, group means, and standard deviations for the fall of second grade and fall of third grade assessments provided by the authors in a response to an email query. The study is characterized as having an indeterminate effect because the single effect is neither statistically significant nor substantively important. For more information, please refer to the WWC Standards and Procedures Handbook, version 2.1, page 96.

Endnotes

¹ Single study reviews examine evidence published in a study (supplemented, if necessary, by information obtained directly from the author[s]) to assess whether the study design meets WWC evidence standards. The review reports the WWC's assessment of whether the study meets WWC evidence standards and summarizes the study findings following WWC conventions for reporting evidence on effectiveness. This study was reviewed using the single study review protocol, version 2.0.

² The article indicates two different sample sizes for the intervention group ($n = 68$ and $n = 69$), but the authors confirmed that the total number of students randomly assigned to the intervention group was $n = 68$ in response to an email request for more information about the study.

³ Our description of the timing of the assessments is based on the authors' description in the text ("assessments were conducted in the fall of first, second, and third grade," p. 50) and not on the numbering system the authors used to denote the timing of the assessments in their growth models. The authors describe the fall assessments taking place at time periods 1.5, 2.0, and 3.5, and the second grade winter and spring assessments for the intervention group taking place at time periods 2.5 and 3.0, respectively. For the purposes of this WWC report, we focus on the fall assessment in second grade as the pretest and the fall assessment in third grade as the outcome periods of interest.

⁴ Because the two groups of students in this contrast were not randomly assigned to receive *PAL*, the WWC considers this analysis to be based on a quasi-experimental design that must demonstrate baseline equivalence to meet WWC evidence standards with reservations. The intervention and comparison groups in this contrast were not equivalent at baseline, so this portion of the study does not meet WWC evidence standards.

⁵ The authors' analyses of the effects of *PAL* in the article examine rates of change in individual growth, and report model-based estimates of the differences across intervention and comparison groups at the beginning of third grade which are shown to be nonsignificant. The authors report that this difference is statistically significant when the model-based average at the beginning of third grade also subtracts out the difference in writing scores at the beginning of the treatment period (at the midway point of second grade). The WWC did not confirm this finding to be statistically significant, since this comparison effectively double counts the baseline difference across the groups (since the baseline scores are already included in the estimated growth trajectories). The WWC confirmed the nonsignificant differences in the groups at the beginning of third grade based on information obtained from the authors in an email query. The authors also present moderator analyses that examine whether impacts vary according to baseline assessments of cognitive variables and underlying latent classes, but the study does not provide sufficient information to assess whether these analyses meet WWC standards, and therefore, we do not include details about them in this review.

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2014, February). *WWC review of the report: A written language intervention for at-risk second grade students: A randomized controlled trial of the process assessment of the learner lesson plans in a tier 2 response-to-intervention (Rtl) model*. Retrieved from <http://whatworks.ed.gov>

Glossary of Terms

Attrition	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
Clustering adjustment	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
Confounding factor	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
Design	The design of a study is the method by which intervention and comparison groups were assigned.
Domain	A domain is a group of closely related outcomes.
Effect size	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
Eligibility	A study is eligible for review if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
Equivalence	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
Improvement index	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
Multiple comparison adjustment	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
Quasi-experimental design (QED)	A quasi-experimental design (QED) is a research design in which subjects are assigned to intervention and comparison groups through a process that is not random.
Randomized controlled trial (RCT)	A randomized controlled trial (RCT) is an experiment in which investigators randomly assign eligible participants into intervention and comparison groups.
Single-case design (SCD)	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.
Standard deviation	The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample are spread out over a large range of values.
Statistical significance	Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ($p < 0.05$).
Substantively important	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the [WWC Procedures and Standards Handbook \(version 2.1\)](#) for additional details.