

WWC Review of the Report

“Increasing Young Children’s Contact with Print During Shared Reading: Longitudinal Effects on Literacy Achievement”¹

The findings from this review do not reflect the full body of research evidence on *Project STAR*.

What is this study about?

The study examined the impact of the *Project STAR* (*Sit Together and Read*) reading program on the literacy skills of preschool students.

Researchers randomly assigned 85 preschool classrooms in Ohio to one of three study groups at the start of the 2004–05 or 2005–06 school years:

- A high-dose intervention group, in which teachers used *Project STAR* techniques with their students in four reading sessions per week, for 30 weeks;
- A low-dose intervention group, in which teachers used *Project STAR* techniques with their students in two reading sessions per week, for 30 weeks; or
- A comparison group, in which teachers used their regular instructional techniques in four reading sessions per week, for 30 weeks.

Teachers in each group were provided the same set of 30 books and asked to read one book per week aloud to the whole class. All classrooms were read the books in the same order.

The study analyzed four measures of literacy skills—reading, spelling, comprehension, and vocabulary—for up to 366 students from the three study groups one and two years after the intervention.

WWC Rating

The research described in this report meets WWC evidence standards with reservations

Strengths: The study is a randomized controlled trial.

Cautions: The study does not meet the WWC standards for student attrition in a randomized controlled trial. The authors were able to demonstrate baseline equivalence for the analytic samples of low-dose *Project STAR* students and comparison students for three outcomes measured one year after the intervention. The authors also demonstrated the baseline equivalence of the analytic samples of high-dose *Project STAR* students and comparison students for one outcome measured two years after the intervention. These four comparisons of study groups meet WWC evidence standards with reservations. The other 20 comparisons do not meet WWC evidence standards.²

At each follow-up period, the authors compared the literacy skills of students in the high-dose group to those in low-dose group; students in the high-dose group to those in the comparison group; and students in the low-dose group to those in the comparison group. This study contains a total of 24 unique tests of the impact of *Project STAR* (three groups compared against each other on four outcomes at two different time points).

What did the study find?

For the four comparisons that meet WWC evidence standards with reservations, the study found that students in the low-dose intervention group were not significantly different from students in the comparison group on vocabulary, reading, and spelling outcomes at the one-year follow-up. Students in the high-dose intervention group had significantly higher spelling skills than those in the comparison group at the two-year follow-up.

Features of *Project STAR*

Project STAR is a reading program in which teachers read books aloud to their students and use instructional techniques designed to encourage children to pay attention to print within storybooks. These instructional techniques for referencing print include asking students directly about print or using a finger to track the words being read aloud.

Appendix A: Study details

Piasta, S., Justice, L., McGinty, A., & Kaderavek, J. (2012). Increasing young children's contact with print during shared reading: Longitudinal effects on literacy achievement. *Child Development, 83*(3), 810–820.

Setting The study was conducted in 85 preschool classrooms in Ohio.³

Study sample Eighty-five preschool classrooms that prioritize enrollment for socio-economically disadvantaged students were randomly assigned to one of three study groups at the start of the 2004–05 or 2005–06 school year: a high-dose intervention group, in which teachers used *Project STAR* techniques with their students in 120 reading sessions over 30 weeks; a low-dose intervention group, in which teachers used *Project STAR* techniques with their students in 60 reading sessions over 30 weeks; or a comparison group, in which teachers used their usual instructional techniques in 120 reading sessions over 30 weeks. All conditions received a 30-week reading program in which each teacher was provided with 30 children's books and a schedule to read one book per week.

After the randomization, parental consent forms were given to all of the children in these classrooms. An average of six students who returned consent forms were randomly selected to take the pretest and the assessments following the intervention. In total, 550 students were randomly sampled to be in the study. As many as 356 students with pretest scores were tested one year after the intervention, and as many as 366 students with pretest scores were tested two years after the intervention (the actual number of students assessed differed depending on the outcome). The analysis samples consist of as many as 135 students in the high-dose intervention group, 116 students in the low-dose intervention group, and 118 students in the comparison group (the actual numbers differed depending on the outcome and the timing of assessment). About 42% of the students were White; 57% of the students had a reported a household income under \$25,000.

Intervention group Two intervention groups implemented *Project STAR* for 30 weeks. *Project STAR* aims to increase literacy skills through the use of explicit print references during reading. The high-dose *Project STAR* classrooms were asked to read one book each week in four whole-class shared-reading sessions. Teachers in the low-dose *Project STAR* classrooms were asked to read one book each week in two whole-class shared-reading sessions. Teachers in both intervention groups were given information on four domains of print references: print meaning, book and print organization, letters, and words. Teachers were also encouraged to address two print domains per book. To help support the use of print references, inserts were placed into each of the books with suggestions for teachers about how to conduct a print reference with that book.

Comparison group Teachers in the comparison classrooms were asked to read one book per week in four whole-class shared-reading sessions over the same 30-week period. They read the same books in the same order as in the intervention classrooms. Teachers in the comparison group applied their usual instructional practices during the shared-reading sessions.

Outcomes and measurement

The study examined scores on three subtests from the Woodcock-Johnson III Tests of Achievement (Letter-Word Identification, Spelling, and Passage Comprehension) and the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4). Scores on these assessments were measured one and two years after the intervention. Students were also assessed on the PPVT-4 in the fall and spring of the intervention year. The study did not present results for the PPVT-4 outcome in the spring of the intervention year, so it is excluded from this review. For a more detailed description of these outcome measures, see Appendix B.

Support for implementation

Teachers in the intervention conditions participated in an 8-hour workshop in the fall and a 3-hour workshop in the winter that focused on the instructional techniques used in *Project STAR*. The winter workshop served as a refresher of the fall workshop. Twice a month, teachers in the intervention groups recorded and submitted videos of their reading sessions. Based on the videos, the project staff provided two letters to teachers with feedback on the use of *Project STAR* techniques. The teachers in the comparison condition also received 11 total hours of training and two letters with feedback. Instead of teaching specific techniques, however, their training emphasized the importance of high-quality reading practices and reading aloud to students.

Reason for review

This study was identified for review by receiving media attention.

Appendix B: Outcome measures for each domain

Oral language

Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4)

This assessment measures vocabulary skills by asking students to identify the picture that corresponds to a word that is read aloud to them. This outcome was measured in the fall of the intervention year and one and two years after the intervention.

Print knowledge

Woodcock-Johnson III (WJ III) Tests of Achievement, Letter-Word Identification subtest

In this assessment, students name letters and read words aloud from a list. This outcome was measured one and two years after the intervention.

WJ III, Spelling subtest

In this assessment, students write letters and spell words that are read aloud to them. This outcome was measured one and two years after the intervention.

Table Notes: The study also assessed student performance on the Passage Comprehension subtest of the WJ III. None of the contrasts between groups on this outcome met WWC evidence standards, and therefore, they are not included in this report. In addition, the PPVT-4 was measured in the spring of the intervention year, but the results were not presented in the study and are therefore excluded from this report.

Appendix C: Study findings for each 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	
Oral language								
<i>Peabody Picture Vocabulary Test, Fourth Edition</i>	Low-dose STAR vs. comparison (one year after intervention)	58 classrooms/ 246 students	97.22 (10.50)	97.84 (13.70)	-0.62	-0.05	-2	> 0.30
Domain average for oral language						-0.05	-2	Not statistically significant
Print knowledge								
<i>Letter-Word Identification</i>	Low-dose STAR vs. comparison (one year after intervention)	50 classrooms/ 221 students	20.76 (7.17)	19.32 (5.24)	1.44	0.23	9	0.06
<i>Spelling</i>	Low-dose STAR vs. comparison (one year after intervention)	50 classrooms/ 221 students	15.30 (3.29)	14.58 (2.95)	0.72	0.23	9	0.06
<i>Spelling</i>	High-dose STAR vs. comparison (two years after intervention)	58 classrooms/ 249 students	21.82 (5.02)	19.99 (4.62)	1.83	0.38	15	0.00
Domain average for print knowledge						0.28	+11	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 change (measured in standard deviations) in an average student's outcome that can be expected if the student is given the intervention. 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. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study's domain average was determined by the WWC; the study is characterized as having no discernible effects on oral language because none of the outcomes examined were statistically significant or substantively important. Similarly, the study is characterized as having no discernible effects on print knowledge because only one of the twelve outcomes in this domain was derived from an analysis that met WWC standards and was statistically significant.

Study Notes: A correction for multiple comparisons was needed but did not affect significance levels. The p-values presented here were reported in the original study. The comparison group mean and both intervention and comparison group standard deviations reported here were obtained through an email request to the authors. The WWC calculated the intervention group mean by adding the reported hierarchical linear modeling beta coefficient indicating the average impact of the program to the unadjusted comparison group posttest means. Please see the *WWC Handbook* for more information.

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 Early Childhood Education review protocol, version 2.0. A quick review of this study was released on May 10, 2012, and this report is the follow-up review that replaces that initial assessment. The WWC rating applies only to the results that were eligible under this topic area and met WWC standards without reservations or met WWC standards with reservations, and not necessarily to all results presented in the study.

² Specifically, the following comparisons do not meet WWC evidence standards: all comparisons of the high-dose intervention group to the low-dose intervention group at both the one- and two-year follow-ups (eight in total); all comparisons of the high-dose intervention group to the comparison group at the one-year follow-up (four comparisons); the comparison of the high-dose intervention group to the comparison group at the two-year follow-up on reading, comprehension, and oral language outcomes (three comparisons); the comparison of the low-dose group to the comparison group at the one-year follow-up on the comprehension outcome (one comparison); and all comparisons of the low-dose intervention group to the comparison group at the two-year follow-up (four comparisons).

³ This information was available from the IES website describing the grant that funded the study (<http://ies.ed.gov/funding/grantsearch/details.asp?ID=619>).

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2012, October). *WWC review of the report: Increasing young children's contact with print during shared reading: Longitudinal effects on literacy achievement*. 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 tend to be 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.