

What Works Clearinghouse



Ladders to Literacy

Program Description¹

Ladders to Literacy is a supplemental early literacy curriculum composed of more than 70 activities designed to develop children's print/book awareness, metalinguistic awareness, and oral language skills. The curriculum, published in the book *Ladders to Literacy: A Preschool Activity Book, Second Edition*, can be used in a variety of early childhood settings and provides guidance on

how teachers can adapt the activities for children with special needs. The activities are intended as models or suggestions that teachers can adopt within an existing curriculum. Although a *Ladders to Literacy* curriculum is also available for kindergarten students (*Ladders to Literacy: A Kindergarten Activity Book*), this intervention report focuses on the preschool curriculum.

Research²

One study of *Ladders to Literacy* that falls within the scope of the Early Childhood Education review protocol meets What Works Clearinghouse (WWC) evidence standards, and one study meets WWC evidence standards with reservations. The two studies included 139 preschool children from 26 preschool classrooms in southern New Hampshire.³

Based on these two studies, the WWC considers the extent of evidence for *Ladders to Literacy* on preschool children to be medium to large for oral language and small for print knowledge, phonological processing, and math. No studies that meet WWC evidence standards with or without reservations examined the effectiveness of *Ladders to Literacy* on preschool children in the early reading/writing or cognition domains.

1. The descriptive information for this program was obtained from a publicly available source: the program's website (<http://www.brookespublishing.com/store/books/notari-69131/index.htm>, downloaded February 2009). The WWC requests developers to review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review. The literature search reflects documents publicly available by November 2008.
2. The studies in this report were reviewed using WWC Evidence Standards, Version 2.0 (see the WWC Procedures and Standards Handbook, Chapter III), as described in protocol Version 2.0.
3. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

Effectiveness *Ladders to Literacy* was found to have potentially negative effects on oral language and no discernible effects on print knowledge, phonological processing, and math for preschool children.

| | <i>Oral language</i> | <i>Print knowledge</i> | <i>Phonological processing</i> | <i>Early reading/writing</i> | <i>Cognition</i> | <i>Math</i> |
|--------------------------------------|------------------------------------|-------------------------------------|--------------------------------|------------------------------|------------------|-----------------------------------|
| Rating of effectiveness | Potentially negative effects | No discernible effects | No discernible effects | na | na | No discernible effects |
| Improvement index⁴ | Average: -7 percentile points | Average: -2 percentile points | -6 percentile points | na | na | Average: +1 percentile point |
| | Range: -15 to +2 percentile points | Range: -12 to +12 percentile points | na | na | na | Range: -6 to +7 percentile points |

na = not applicable

Absence of conflict of interest

The PCER Consortium (2008) study summarized in this intervention report had numerous contributors, including staff of Mathematica Policy Research. Because the principal investigator for the WWC Early Childhood Education review is also a Mathematica

staff member, the study was rated by Chesapeake Research Associates, which also prepared the intervention report. The report was then reviewed by the principal investigator, a WWC Quality Assurance reviewer, and an external peer reviewer.

Additional program information

Developer and contact

Developed by Angela Notari-Syverson, Rollanda E. O’Connor, and Patricia F. Vadasy, *Ladders to Literacy* is distributed by Brookes Publishing Company. Address: P.O. Box 10624, Baltimore, MD 21285-0624. Email: custserv@brookespublishing.com. Web: <http://www.brookespublishing.com>. Telephone: (800) 638-3775. For professional development training, see <http://www.brookespublishing.com/onlocation>.

Scope of use

According to the developers, *Ladders to Literacy* has been field-tested in a variety of preschool settings with children from a range of cultural and socioeconomic backgrounds. These include sites that serve young children with disabilities in inclusive and special education settings.

Teaching

Ladders to Literacy is a supplemental early childhood curriculum that is published in the book *Ladders to Literacy: A Preschool Activity Book, Second Edition*, which focuses on developing early language and literacy skills. *Ladders to Literacy* addresses three components of literacy development: print/book awareness, metalinguistic awareness, and oral language skills. The print/book awareness section includes activities such as drawing pictures, pretending to write, and creating graphic representations. Metalinguistic awareness activities focus on the identification of sounds, phonemes, and rhymes through lessons such as Clap the Syllables and First Sound Song. The oral language component includes activities designed to enhance children’s vocabulary development and to engage children in conversations in which they respond to open-ended questions and reconstruct

4. These numbers show the average and range of student-level improvement indices for all findings across the studies.

Additional program information
(continued)

past experiences. There are approximately 20 activities in each of the three sections. For each lesson, the authors describe the activity; list the necessary materials; and explain the rationale for the activity, the lesson's overall goal, and the targeted skills. The book provides guidance on how to individualize the activity for children with varying skill levels and how to adapt the lesson for children with special needs. The book also provides an overview of the theoretical framework underlying the curriculum. An appendix provides a variety of activities that parents and

children can do together at home to reinforce skills being taught in the classroom. The curriculum also includes a literacy checklist to help teachers monitor children's progress.

Cost

The *Ladders to Literacy: A Preschool Activity Book, Second Edition*, costs \$49.95. Professional development for *Ladders to Literacy* is available for an extra cost and consists of a one- or two-day onsite seminar on how to use the curriculum.

Research

Eight studies reviewed by the WWC investigated the effects of *Ladders to Literacy* on preschool children. One study (Russell, 2005) is a randomized controlled trial that meets WWC evidence standards. One study (PCER Consortium, 2008) is a randomized controlled trial that meets WWC evidence standards with reservations. The remaining six studies do not meet either WWC evidence standards or eligibility screens.

Meets evidence standards

Russell (2005) conducted a randomized controlled trial of 5-year-old children from 12 Head Start classrooms in southern New Hampshire. The 12 classrooms were recruited for the pilot year of the national evaluation conducted by the PCER Consortium (2008) study described below. Because of delays in study implementation, Russell (2005) used a posttest-only design to investigate effects on oral language skills during the 2002–03 school year (one year before the PCER Consortium, 2008, study). Thirty-four children participated in the study; 18 were in the treatment classrooms that received *Creative Curriculum*[®] supplemented with *Ladders to Literacy*, and 16 were in the comparison classrooms that received *Creative Curriculum*[®] only. At baseline, the children in the study averaged 4.7 years of age, and none of the children were identified as having a disability.

Meets evidence standards with reservations

A study by the PCER Consortium (2008) assessed the effectiveness of *Ladders to Literacy* as part of the Preschool Curriculum Evaluation Research (PCER) effort.⁵ The PCER Consortium (2008) used a randomized controlled trial design in which 14 Head Start preschool classrooms from southern New Hampshire were randomly assigned to implement *Ladders to Literacy* as a supplement to the *Creative Curriculum*[®] or to a control group that implemented the *Creative Curriculum*[®] without the *Ladders to Literacy* supplement. Eleven of the 14 classrooms were randomly assigned the previous year for the pilot, described above (Russell, 2005); three other classrooms were added to the sample. Pretest and posttest data, collected in the fall and spring of the 2003–04 school year, were obtained for 105 children (54 *Ladders to Literacy* and 51 control). Baseline equivalence on pretests was established for the treatment and control children. The study investigated effects on oral language, print knowledge, phonological processing, and math. Outcomes were assessed at two time points: end of preschool and end of kindergarten. At baseline, children in the study averaged 4.6 years of age, and 25% were identified as having a disability. Although the WWC used only the results at the end of the preschool year to determine the intervention rating, information on the kindergarten findings can be found in Appendices A4.1–A4.4.

5. The PCER Consortium (2008) evaluated a total of 14 preschool curricula, including *Ladders to Literacy*, in comparison to respective control conditions.

Research (continued) **Extent of evidence**

The WWC categorizes the extent of evidence in each domain as small or medium to large (see the WWC Procedures and Standards Handbook, Appendix G). The extent of evidence takes into account the number of studies and the total sample size across the studies that meet WWC evidence standards with or without reservations.⁶

The WWC considers the extent of evidence for *Ladders to Literacy* to be medium to large for oral language and small for print knowledge, phonological processing, and math for pre-school children. No studies that meet WWC evidence standards with or without reservations examined the effectiveness of *Ladders to Literacy* in the early reading/writing or cognition domains for preschool children.

Effectiveness **Findings**

The WWC review of interventions for Early Childhood Education addresses student outcomes in six domains: oral language, print knowledge, phonological processing, early reading/writing, cognition, and math. The studies included in this report cover four domains: oral language, print knowledge, phonological processing, and math. The findings below present the authors' estimates and WWC-calculated estimates of the size and statistical significance of the effects of *Ladders to Literacy* on preschool children.⁷

Oral language. Russell (2005) analyzed the effectiveness of *Ladders to Literacy* on oral language using two measures: mean length of utterance (MLU) and type token ratio (TTR). The author did not find statistically significant effects of *Ladders to Literacy* on either measure, and the effects were not large enough to be considered substantively important according to WWC criteria (that is, an effect size of at least 0.25). According to WWC criteria, this study shows indeterminate effects on oral language.

The PCER Consortium (2008) analyzed the effectiveness of *Ladders to Literacy* on oral language using the Peabody Picture Vocabulary Test—Third Edition (PPVT-III) and the Test of Oral Language Development—Primary III (TOLD-P:3) Grammatic

Understanding subtest. The authors show that differences between the *Ladders to Literacy* group and the control group are not statistically significant on the TOLD-P:3 Grammatic Understanding subtest and are not large enough to be considered substantively important according to WWC criteria. However, there was a substantively important (but not statistically significant) negative effect of -0.38 on the PPVT-III. According to WWC criteria, this study shows potentially negative effects on oral language.

Print knowledge. The PCER Consortium (2008) analyzed the effectiveness of *Ladders to Literacy* on print knowledge using the Test of Early Reading Ability—III (TERA-3), the Woodcock-Johnson III (WJ-III) Letter-Word Identification subtest, and the WJ-III Spelling subtest. The authors report that differences between the *Ladders to Literacy* group and the control group are not statistically significant on any of these measures, although, according to WWC criteria, there is a substantively important negative effect of -0.30 on the TERA-3 and a substantively important positive effect of $+0.30$ on the WJ-III Spelling subtest. According to WWC criteria, this study shows indeterminate effects on print knowledge.

6. The extent of evidence categorization was developed to tell readers how much evidence was used to determine the intervention rating, focusing on the number and size of studies. Additional factors associated with a related concept—external validity, such as the students' demographics and the types of settings in which studies took place—are not taken into account for the categorization. Information about how the extent of evidence rating was determined for *Ladders to Literacy* is in Appendix A6.
7. The level of statistical significance was reported by the study authors or, when necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For the formulas the WWC used to calculate the statistical significance, see WWC Procedures and Standards Handbook, Appendix C for clustering and WWC Procedures and Standards Handbook, Appendix D for multiple comparisons. In the case of Russell (2005), a correction for clustering was needed, so the significance levels may differ from those reported in the original study. In the case of PCER Consortium (2008), no corrections for clustering or multiple comparisons were needed.

Effectiveness (continued)

Phonological processing. The PCER Consortium (2008) analyzed the effectiveness of *Ladders to Literacy* on phonological processing using the Preschool Comprehensive Test of Phonological and Print Processing (Pre-CTOPPP) Elision subtest. The authors report that the difference between the *Ladders to Literacy* group and the control group is not statistically significant and, according to WWC criteria, is not large enough to be substantively important. According to WWC criteria, this study shows indeterminate effects on phonological processing.

Math. The PCER Consortium (2008) analyzed the effectiveness of *Ladders to Literacy* on math using the WJ-III Applied Problems subtest, the Child Math Assessment–Abbreviated (CMA-A), and the Building Blocks Shape Composition task. The authors report that differences between the *Ladders to Literacy*

group and the control group are not statistically significant and, according to WWC criteria, are not large enough to be considered substantively important. According to WWC criteria, this study shows indeterminate effects on math.

Rating of effectiveness

The WWC rates the effects of an intervention in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings, the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the WWC Procedures and Standards Handbook, Appendix E).

The WWC found *Ladders to Literacy* to have potentially negative effects on oral language and no discernible effects on print knowledge, phonological processing, and math for preschool children

Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see WWC Procedures and Standards Handbook, Appendix F). The improvement index represents the difference between the percentile rank of the average student in the intervention condition and the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is entirely based on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analysis. The improvement index can take on values between –50 and +50, with positive numbers denoting favorable results for the intervention group.

Based on two studies, the average improvement index for *Ladders to Literacy* on oral language is –7 percentile points with a range of –15 to +2 percentile points across findings. Based on

one study, the average improvement index on print knowledge is –2 percentile points, with a range of –12 to +12 percentile points across findings; the improvement index on phonological processing is –6 percentile points for a single finding from one study; and the average improvement index on math is +1 percentile point with a range of –6 to +7 percentile points across findings.

Summary

The WWC reviewed eight studies on *Ladders to Literacy* for preschool children. One of these studies meets WWC evidence standards; one study meets WWC evidence standards with reservations; and the remaining six studies do not meet either WWC evidence standards or eligibility screens. Based on the two studies, the WWC found potentially negative effects on oral language and no discernible effects on print knowledge, phonological processing, and math for preschool children. The conclusions presented in this report may change as new research emerges.

References **Meets WWC evidence standards**

Russell, J. (2005). *An investigation of preschool oral language improvements through Ladders to Literacy*. Unpublished master's thesis, University of New Hampshire, Durham. (62329791).

Meets WWC evidence standards with reservations

Preschool Curriculum Evaluation Research (PCER) Consortium. (2008). *Creative Curriculum with Ladders to Literacy*: University of New Hampshire. In *Effects of preschool curriculum programs on school readiness* (pp. 65–73). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education.

Studies that fall outside the Early Childhood Education review protocol or do not meet WWC evidence standards

Coston, J. H. (1997). *The effects of a comprehensive curriculum on literacy development*. Unpublished master's thesis, Valdosta State University, GA. The study is ineligible for review because it does not examine an intervention implemented in a way that falls within the scope of the review.

Good, J. L. (2003). *Developing early literacy skills in young children with symptoms of inattention and hyperactivity* (Doctoral dissertation, University of Minnesota). *Dissertation Abstracts International*, 64(06A), 106–1966. The study does not meet WWC evidence standards because the measures of effectiveness cannot be attributed solely to the intervention—there was only one unit assigned to one or both conditions.

McKnight, C., Lee, S., & Schowengerdt, R. (2001). *Effects of specific strategy training on phonemic awareness and reading aloud with preschoolers: A comparison study*. Retrieved from ERIC database (ED452518). The study is ineligible for review

because it does not examine an intervention implemented in a way that falls within the scope of the review.

Notari-Syverson, A. (1999). *Supporting early literacy development in young children with disabilities: A comprehensive interactive emergent literacy curriculum for preschoolers* (Final report to the U.S. Department of Education). Seattle, WA: Washington Research Institute. The study does not meet WWC evidence standards because it uses a quasi-experimental design in which the analytic intervention and comparison groups are not shown to be equivalent.

Additional source:

Notari-Syverson, A., O'Connor, R. E. & Vadasy, P. F. (1996). *Facilitating language and literacy development in preschool children: To each according to their needs*. Paper presented at the American Educational Research Association Meeting, New York. (ERIC Document ED395692).

Notari-Syverson, A. (2005). *Ladders to Literacy Outreach Project. Final grant performance report*. (Submitted to the U.S. Department of Education No. H324R000008). Seattle, WA: Washington Research Institute. The study is ineligible for review because it does not use a comparison group.

Notari-Syverson, A. (2007). *Model demonstration project for children with disabilities: Final grant performance report* (Submitted to the U.S. Department of Education No. H324M020084). Seattle, WA: Washington Research Institute. The study is ineligible for review because it does not examine an intervention implemented in a way that falls within the scope of the review.