An unprecedented number of 3- to 5-year-old children currently attend publicly funded preschool and pre-kindergarten (pre-K) programs (National Institute for Early Education Research, 2004). Many of these children exhibit elevated risks for later reading problems due to poverty and its well-established impact on developmental precursors to reading achievement. Consequently, increased attention is being directed toward ensuring that children who attend publicly funded preschool programs have adequate opportunities to develop such critical reading precursors as vocabulary knowledge, narrative ability, phonological awareness, and print knowledge (see Barnett, 2001; Dickinson & Brady, 2006; Justice & Kaderavek, 2004). Early Reading First provides an apt example: This federally funded program was designed to create preschool “centers of excellence” in language and emergent literacy throughout the United States to serve as model instructional programs (Institute of Education Sciences, 2007). The potential

ABSTRACT: **Purpose:** The potential benefit that a low-cost scripted language and literacy curriculum supplement titled “Read It Again!” (RIA; L. M. Justice, A. S. McGinty, A. R. Beckman, & C. R. Kilday, 2006) may have on preschool-age children’s skills was explored. RIA was developed to meet the needs of preschool educators who may not have access to current commercially available high-cost language and literacy curricula, which often require ongoing intensive professional development. RIA involves implementing 60 large-group lessons over a 30-week period that feature repeated use of 15 commercial storybooks.  **Method:** Using a quasi-experimental pre–post research design, 11 preschool teachers implemented RIA in their classrooms for an academic year, and 9 teachers working in comparable preschool programs served as comparisons. Language and literacy measures were collected in the fall and spring of the year.  **Results:** Children whose teachers implemented RIA had higher scores in the spring on measures of language (i.e., grammar and vocabulary) and measures of literacy (i.e., rhyme, alliteration, and print). Effect-size estimates were consistent with medium- to large-size effects.  **Conclusions:** RIA may be a viable means of enhancing the language and literacy instruction that is delivered within preschool classrooms and, therefore, a means of enhancing children’s language and literacy learning. Future directions for continued evaluation of RIA are discussed.

KEY WORDS: emergent literacy, preschool programs, at-risk children, curriculum
for such large-scale prevention-focused initiatives to reduce disparities in reading achievement between children with economic disadvantages and their more advantaged peers is the key catalyst behind such initiatives. Toward this goal, the current study investigated the pilot effects of a classroom-based, prevention-focused language and emergent literacy curriculum supplement on the language and emergent literacy skills of preschoolers who qualify for targeted publicly funded preschool programs based on family income and, in some cases, additional demographic risk factors (e.g., family instability).

Designing early childhood programs that are centers of excellence for promoting young children’s language and literacy development is a complex endeavor that likely involves efforts at many layers within the system of early childhood education. There is a wide range of options currently being considered for how to best build classroom-based support for children’s language and literacy development, ranging from preservice teacher training to ongoing professional development and support (see Justice & Vukelich, 2008; Zaslow & Martinez-Beck, 2006). Specifically, the use of scientifically validated language and literacy curricular tools is regarded as an important mechanism for ensuring that children receive high-quality language and emergent literacy instruction in the classroom (Christie, Vukelich, & Enz, 2007). In fact, the federal government recently made a significant investment in evaluating 14 promising preschool curricula involving language and literacy skills (as well as mathematical skills) through the Preschool Curriculum Evaluation Research Initiative (Preschool Curriculum Evaluation Research Consortium, 2008). Further, the federal government is actively compiling reviews of the evidentiary basis for specific early childhood language and literacy curricula.1 The goal of these efforts is to enhance the ability of early childhood practitioners to use evidence-based curricular tools to enhance their classroom instructional practices.

Findings regarding the benefits of preschool language and literacy curricula, however, are mixed and raise questions regarding the effectiveness of existing curricular tools for promoting high-quality classroom language and literacy instruction. For example, many targeted interventions conducted within preschool classrooms have had notably large effects on young children’s language and emergent literacy skills (e.g., Justice & Ezell, 2004; van Kleeck, Vander Woude, & Hammett, 2006; Whitehurst et al., 1994). Further, there are a number of efficacy and effectiveness studies providing empirical support for the positive impacts of language and literacy curricula within preschool classroom settings (e.g., Assel, Landry, Swank, & Gunnewig, 2007; DeBaryshe & Gorecki, 2007; Fischel et al., 2007). DeBaryshe and Gorecki (2007), for instance, evaluated child outcomes for the “Learning Connections” (LC) curriculum, a curriculum that was designed by the authors to improve teacher instruction in oral language, phonological and phonemic awareness, alphabet knowledge and print conventions, and emergent writing. Children who received LC showed greater end-of-year outcomes on measures of phonemic awareness and emergent writing relative to children who received the prevailing curriculum, although LC did not accelerate children’s growth in vocabulary or emergent reading. Similarly, Assel et al. (2007) evaluated child outcomes for two commercial curricula, both of which provide teachers with an explicit scope, sequence, and instructional activities focused on alphabet knowledge, phonological awareness, and oral language. In general, children who received either of the experimental curricula showed improved outcomes on measures of prereading, vocabulary, and listening comprehension relative to children in control classrooms in which no specified curricular scope and sequence was used. However, it is important to note that effects of these curricula were also moderated by program type, where the strongest effects were seen in Head Start classrooms, as opposed to Title I and state-funded pre-K.

In contrast to these positive findings, however, the federal preschool curriculum evaluation showed that only one of the 14 curricula demonstrated significant effects on both children’s language and emergent literacy skills (effect sizes ranged from .38 to .68 across all curricula). Interestingly, the federal initiative failed to find significant effects for the two curricula that were found to benefit children’s skill development in an independent evaluation by Assel et al. (2007). The variability in findings regarding the benefit of preschool language and literacy curricula suggests that curricula effects, even when evident, may not be stable across samples or implementation efforts. The divergent findings regarding language and literacy curriculum effects suggest that more needs to be learned regarding how to best design and implement curricula so they can effectively support young children’s skills development.

One possible drawback to many available language and literacy curricula is that they do not appear to be easily implemented well by teachers, which may reduce the benefit of such tools when they are considered at scale (Assel et al., 2007; Justice, Mashburn, Hamre, & Pianta, 2008; Pence, Justice, & Wiggins, 2008; Wasik, Bond, & Hindman, 2006). For example, teachers implementing structured language and literacy curricula may show immediate fidelity to structural aspects of the curricula (e.g., using specified materials, following lesson plans), but their implementation of more process-oriented elements of the curricula is typically much more variable (e.g., using recasts and expansions during conversations; see Justice et al., 2008; Pence et al., 2008). In fact, evidence suggests that many teachers require sustained, distributed support if they are to use many of the prevailing language and literacy curricula (Assel et al., 2007; Wasik et al., 2006; for a discussion, see Dickinson & Brady, 2006). As such, research-based implementation efforts often require intensive and ongoing professional development provided by university-led experts and teams to ensure efficacious implementation of language and literacy programs (e.g., DeBaryshe & Gorecki, 2007; Jackson et al., 2006; Wasik et al., 2006). Drawing from an earlier example, DeBaryshe and Gorecki (2007) reported providing teachers with two 1.5-hr in-service workshops across the year, weekly coaching by a research assistant, and meetings every third week with the lead researcher to assist teachers in planning and implementation. Similarly, Assel et al. (2007) reported providing teachers with a 4-day institute focused on the curricula to which they were assigned and twice-monthly in-class mentorship over the course of the year to support implementation. Other studies report similarly intensive models of professional development, including specially designed credit-bearing college or university courses and distributed learning models using distance technologies (Dickinson & Brady, 2006).

Although sustained professional development efforts can be effective in supporting teacher implementation of language and emergent literacy curricula (Fukkink & Lont, 2007), these coaching models can be expensive, time consuming, and difficult to access, if not prohibitive, for many preschool programs. Thus, a gap exists between the conditions under which many language and literacy curricula are shown to be efficacious or effective in research studies and the conditions under which preschool programs can readily
adopt language and literacy curricula in “business-as-usual” conditions. Indeed, outside of a research study context, some preschool programs do not have the resources—both money and personnel—to provide preschool educators with the necessary intensive supports they might need to implement evidence-based language and literacy techniques and curriculum. Plagued with systemic challenges such as teacher turnover rates five times that of the K–12 school system (Barnett, 2003; Bellam, Burton, Whitebook, Broatch, & Young, 2002) and state-per-pupil spending falling below that of the K–12 system in 80% of states (Bryant et al., 2002), preschools need access to empirically validated tools and programs that can be easily used by large numbers of professionals at relatively low costs.

The present study examined the feasibility of implementing a language and literacy curriculum supplement, “Read It Again!” (RIA; Justice, McGinty, Beckman, & Kilday, 2006), that can be used to effectively enhance young children’s language and emergent literacy skills but requires minimal material costs or ongoing professional development supports. RIA was developed in collaboration with the West Virginia Department of Education for the purpose of providing early childhood programs across the state with a scientifically based supplement that (a) could be used effectively by educators with little training, (b) was compatible with a variety of program structures and curricula, and (c) could be implemented relatively inexpensively. As is occurring in many states across the nation, West Virginia is moving toward universal access to preschool education; specifically, Policy 2525 (Universal Access to a Quality Early Education System, 2002) stipulates that all 4-year-olds in the state will have access to preschool by 2012–2013. The policy emphasizes not only access, but also quality and consistency of the education offered to children within a variety of program typologies (e.g., Head Start, public pre-K).

RIA was designed to provide early childhood educators with a curriculum supplement that may be layered into existing classroom instruction to explicitly address language and literacy goals within their programs. RIA was developed in a 3-year collaborative process that featured an iterative, interactive design process whereby researchers designing the tool actively sought practice-oriented feedback from end users, including teachers, speech-language pathologists, teaching assistants, and administrators. The 3-year collaborative process featured (a) a series of planning and design meetings to identify key characteristics of an effective supplement, to include an initial draft of the tool (Year 1); (b) a 15-week pilot implementation involving 18 early childhood educators and their school-based colleagues in two counties to study feasibility of use by professionals working in a variety of settings (Year 2); and (c) a 30-week effectiveness study involving 20 teachers, 11 of whom implemented RIA for an entire academic year (Year 3). This “bidirectional model of reciprocal influence (i.e., research ↔ practice)” provides a potentially important solution to closing the research-to-practice gap (Schaughency & Ervin, 2006, p. 159).

A particularly important feature of RIA’s development was its adherence to a priori design principles dually focused on using available scientific knowledge of language and literacy instruction for young children and maximizing ease of implementation for teachers. The first design principle was systematicity; whereby RIA systematically addresses a predefined scope and sequence of language and literacy learning targets that are critically linked to early and later reading achievement. Although research findings have supported the efficacy or effectiveness of a range of intervention techniques and targets to bring about developmental change, a commonality among approaches is explicit goal setting within a systematic scope and sequence of language and literacy instruction (e.g., DeBaryshe & Gorecki, 2007; O’Connor, Notari-Syverson, & Vadas, 1996; van Kleeck, Gillam, & McFadden, 1998). The development team researched a range of materials to develop a scope and sequence, to include the meta-analyses of the National Early Literacy Panel (2004), Hammill (2004), and Scarborough (1998); a comprehensive synthesis of states’ early reading and writing standards (Bodrova, Leong, Paynter, & Semenov, 2000); prevailing preschool language and literacy curricula (e.g., Bunce, 1995; O’Connor, Notari-Syverson, & Vadas, 2005); and research articles examining predictive relations between early achievements in language and literacy and children’s later reading outcomes (e.g., Conn, Morrison, & Slemomisky, 2006; Lomax & McGee, 1987; Storch & Whitehurst, 2002). The eventual scope encompassed two domains of language (vocabulary and narrative) and two domains of literacy (print knowledge and phonological awareness); a total of 24 objectives aligned to these four domains comprised the sequence of instruction, with approximately six specific objectives per domain, as presented in Appendix A.

The second design principle was applicability, whereby RIA was designed for widespread use (a) in a variety of programs (e.g., Head Start, private preschools, public pre-K, home-based child care) and (b) by a wide range of professionals with diverse levels of background knowledge and experience. In early childhood settings, program structure and workforce heterogeneity is substantial. Programs may be full or part time and may be located in widely different spaces (e.g., homes, elementary schools; Brandon & Martinez-Beck, 2006). Layered on this setting-level variability are early childhood professionals whose qualifications can range from a high school diploma to a master’s degree in early childhood education (Administration for Children and Families, 2006; Bellam et al., 2002). In the design of the RIA curriculum, we needed to contend with the heterogeneity at the setting and user levels, as these can have marked implications for the effectiveness of instruction (see Schaughency & Ervin, 2006).

For the setting-level variability, we organized the curriculum to provide two brief lessons each week, requiring an estimated 40 min of instructional time per week; thus, we made RIA accessible to programs serving children only 2 days a week and those that operate on a half-day schedule. Given user-level (e.g., teacher-level) heterogeneity and our recognition that some users may have little if any formal knowledge of language and literacy instruction, RIA features a relatively scripted design, consisting of 60 lesson plans with explicit objectives, materials, activity sequences, and even suggested language for instruction (see Appendix B). Curricula can range from codified frameworks that specify philosophies of learning to highly scripted manuals that specify session-by-session activities (Lonigan, Elbert, & Johnson, 1998). In scripted approaches, the pace, sequence, and activities are governed by the curriculum itself rather than by the professional. The use of scripted versus individualized lessons is controversial (e.g., MacGillivray, Ardell, Curwen, & Palma, 2004), and some researchers have suggested that scripted instruction is less effective than nonscripted instruction (Moustafa & Land, 2002). Yet, studies have shown comprehensive scripted instruction to increase children’s academic achievement (Borman et al., 2005a, 2005b), and manualized lesson plans have been associated with efficacious preschool language and literacy instruction.
(e.g., Byrne & Fielding-Barnsley, 1993; Justice, Chow, Capellini, Flanigan, & Colton, 2003; O’Connor, Jenkins, Leicester, & Slocom, 1993; van Kleeck et al., 2006). Further, sequencing of instructional objectives is aligned with best practice, as it serves to makes the instructional path transparent to both children and teachers (Scott-Little, Kagan, & Frelow, 2003; Wixson & Dutro, 1999) and provides teachers with a level of specificity regarding what children should know and be able to do (Roskos, Rosemary, & Varner, 2006; Scott-Little et al., 2003).

The RIA program was also designed to be applicable to children in early childhood education classrooms regardless of their heterogeneous skill levels and/or potentially wide range of risk factors (e.g., poverty, developmental difficulties). One particular area of child heterogeneity, namely, incoming language skills, may be an especially important consideration in relation to RIA effects. Research has suggested that children’s developmental language characteristics may moderate the benefit that a particular language or literacy experience or intervention offers (e.g., Justice et al., 2003, Penno, Wilkinson, & Moore, 2002; Torgesen et al., 1999; van Kleeck et al., 1998; Vellutino et al., 1996). Thus, a particular intervention may show group mean benefits but may also be highly variable in its effect on individual children or groups of children based on their skill in language (as well as other relevant developmental areas; e.g., Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008). RIA is designed to provide a balance of instructional approaches to address the potentially varied learning needs of young children with a range of language skills. For example, RIA instructional techniques such as teacher-directed instruction and explicit skills focus have demonstrated importance for increasing language and emergent literacy learning for children with low language or literacy abilities (e.g., Connor et al., 2006; Penno et al., 2002; Ukrainetz, Cooney, Dyer, Kysar, & Harris, 2000). Additionally, RIA allows for significant skills practice, repetition of material, and integration across skills, which are also considered important components of learning for children with low language abilities (Coyne, Kame’emui, & Carmine, 2007; Fazio, 1997). Yet, a central component of RIA is an interactive book reading instructional approach, where teachers actively involve children through questions. This type of interactive book reading session has been shown to benefit the language and literacy skills of a variety of children, including children whose language abilities are already in the average range (e.g., van Kleeck, Gillam, Hamilton, & McGrath, 1997; Whitehurst et al., 1994). Understanding how a curricular tool such as RIA may vary in its benefit as a function of children’s language skill is informative in considering the applicability of this program to meet children’s heterogeneous learning needs. This study directly addresses this point by considering not only whether RIA appears to benefit children’s language and literacy development, but also whether RIA is more or less beneficial to children based on their initial language skill.

The third design principle was feasibility, whereby RIA was designed for ready implementation with relatively few material resources, costs, or ongoing professional development required of its users. Although a number of well-designed and empirically validated early language and literacy curricula are available for use by the early childhood community, their use may be prohibitive to educators or administrators with limited resources. The material costs associated with one popular early language and literacy curriculum involve not only the cost of the curriculum kit, but also the cost of a boxed set of several hundred manipulatives and materials that need to be purchased separately. A center seeking to implement this curriculum in six classrooms would need to spend approximately $20,000 to do so, which does not include professional development of its teachers. RIA was designed as an alternative to those programs or curricula. Consequently, in the design of RIA, the development team worked within a set of constraints requiring the final product to be a self-contained manual that could be placed on the Internet free of charge. Additionally, the team’s intent was for required supplementary materials to cost no more than $100 to $200, to be easily accessible (i.e., not obscure items), and to be high yield (i.e., to be functional for other purposes). With these goals in mind, the development team opted for the use of storybooks as a relatively inexpensive, accessible, and high-yield material that should be heavily featured in the curriculum. A set of 20 storybooks (estimated cost $100) was selected for repeated use in the 60 RIA lessons; the storybooks are used as a way to both organize instruction using a before reading, during reading, and after reading sequence, and embed code- and meaning-based instruction in a context that is familiar to both teachers and children. The sample lesson presented in Appendix B illustrates the lesson format.

In terms of professional development, RIA was created to be minimally dependent on ongoing professional development or coaching. In this study, participating teachers had had a semester of practice with some of the RIA lessons before this study and also received training in language and literacy (1 day) and training on the RIA program (4 hr) before the study. At the study’s inception, teachers received an additional half-day of refresher training on the RIA program, which included a discussion of the changes that had been made to the program. In total, professional development for this curriculum supplement involved approximately 16 hr of workshop training delivered at two points during teachers’ participation, as well as weekly use of the materials for 45 weeks (30 weeks during this study and 15 weeks of “practice” before implementation). It is important to note, however, that during the teachers’ use of the program, there was a minimal amount of discussion with the research team and almost no feedback on implementation. Thus, the RIA model is specifically designed for feasibility, where professional development is in the form of workshops (a format that is familiar and is widely used by many districts and early childhood programs) and where materials are designed to be easily and independently accessible to teachers, requiring minimal ongoing feedback or coaching regarding their use.

In the present article, we report findings from a study that was designed to explore the feasibility of implementing a language and literacy supplement that is beneficial to children and easily implemented by teachers. Campbell et al. (2000) illustrated a model of progressive, cyclical research as a means of determining how to design and implement effective interventions, especially “complex” interventions involving many pieces and personnel. In such a cyclical approach, parameters of an intervention (e.g., intensity) may be explored and rigorously tested. Yet, additional exploratory and efficacy studies may be needed to determine which design features and model of implementation may be most beneficial to the most people. Although the field of early education has explored instructional parameters of language and literacy curricula in relation to children’s skills (e.g., different teaching techniques, different instructional targets), less attention has been given to designing interventions that are cost effective and accessible to the end user (e.g., teachers). This feasibility study directly explores this research-to-practice parameter of early language and literacy curricular interventions by considering the potential benefit that RIA may provide to accelerating
children’s language and literacy development during their pre-K year when it is implemented with minimal coaching or ongoing professional support.

The current study was exploratory in nature and, consistent with pilot- or feasibility-study designs, represents a precursor to more rigorously designed, randomized controlled trials that seek to establish the causal effects of a given intervention. Feasibility studies are an especially important initial step when conducting classroom-based research (van Teijlingen & Hundley, 2001). That is, when conducting research on interventions that are implemented to groups of children clustered in classrooms, randomization should occur at the level of the classroom or teacher, resulting in a significant investment of resources to recruit and retain the number of classrooms needed for a sufficiently powerful design. Feasibility research outcomes, such as that reported here, inform the planning of later studies as they can provide details on the number of clusters required in larger scale trials, including presumed effect sizes and intraclass correlations (Campbell, Mollison, & Grimshaw, 2001). As a feasibility study, the proposed study has several key design limitations, including use of a quasi-experimental research design, that preclude us from making definitive statements regarding causal impacts of the intervention. Nonetheless, our intent was to consider whether RIA appears to exhibit promise as a curricular tool, thus suggesting the need to further consider RIA as a potentially effective, low-cost, and accessible language and literacy curricular tool. The study involved two research questions:

- Do children who receive RIA for a 30-week period in their preschool classrooms exhibit better language and literacy skills in the spring of the year relative to children in comparison classrooms? The careful design of RIA focuses on targets and teaching techniques supported by empirical research; therefore, we hypothesized that children who were enrolled in classrooms in which teachers implemented RIA would exhibit better language and literacy skills at the end of the academic year relative to children in classrooms in which teachers maintained business-as-usual instruction.

- To what extent is the effect of RIA on children’s outcomes moderated by children’s language ability at the start of the preschool year? We hypothesized that RIA would have equal impacts for children, regardless of their initial language ability. Our rationale for this hypothesis is based on the careful design of the RIA curriculum, as discussed earlier, and its inclusion of a variety of instructional approaches that may be amenable to children of varying language skill levels. As such, we expect RIA to meet the diverse learning needs of children with varying linguistic ability levels.

### METHOD

#### Participants

Twenty preschool teachers and 137 children attending 14 schools in four districts participated in this program evaluation. Of the 20 teachers, 11 teachers served as an experimental group who implemented the preschool curriculum supplement, RIA, and 9 teachers served as a control group who used their standard educational practices. All classrooms were designated as full-day, full-time preschool programs (i.e., 5–8 hr of instruction per day, meeting 4 or 5 days per week), and all classrooms received public funding to prioritize enrollment of economically and/or instructionally at-risk children. All 20 classrooms were located within eight rural, largely Appalachian counties in two contiguous states. The 11 RIA classrooms were located in two counties in which the median household incomes were $27,743 and $29,323, according to the 2004 U.S. Census, and the percentage of persons living below the poverty line was 19% and 18%, respectively. The 9 control/comparison classrooms were located in two different counties where the median household incomes were $25,549 and $26,900 and the percentage of persons living below the poverty line was 21% and 20%, respectively. Demographically, the contexts in which the two sets of classrooms were located were highly similar.

#### Teachers

Experimental teachers (n = 11) in two districts were informed about the planned assessment of the RIA program by their administrators and were provided the opportunity to participate if they so desired. The 11 experimental teachers in this study were part of the pool of 18 teachers who had implemented and evaluated draft RIA materials in the previous year. All 18 of these teachers provided informed consent to participate in the current 30-week study of RIA; however, project resources mandated that child data could be collected from only 11 classrooms. The 11 experimental teachers included in the study were, therefore, randomly selected from the 18 teachers who were implementing and evaluating the draft RIA materials during the year prior to this current study.

The 11 experimental teachers were Caucasian, non-Hispanic females ranging in age from 35 to 61 years (M = 47.5 years, SD = 8.02) and had, on average, 14–15 years of teaching experience (range = 5–27 years; SD = 5.56). Approximately half of the teachers had an associate’s degree as their highest educational degree, and 54% had higher education degrees. All teachers reported implementing “The Creative Curriculum for Preschoolers” (Creative Curriculum; Dodge, Colker, & Heroman, 2002) as their prevailing instructional approach. The experimental teachers provided informed consent to participate, and each agreed to implement RIA for a 30-week period as a supplement to Creative Curriculum.

The 9 comparison teachers were enrolled in a separate study that involved examining preschool teachers’ classroom practices and their effects on children. The 9 teachers were among those who had been assigned to a comparison group as part of a separate study and, as a result, were asked to maintain their established instructional methods for the length of their involvement in the study. The 9 teachers represented all of those in the comparison group who taught in two counties that were identified as highly similar to those of the RIA teachers.

The 9 comparison teachers were female and ranged in age from 37 to 59 years (M = 48.5 years, SD = 7.89). The majority of these teachers were Caucasian (63%), although other race/ethnicities were represented (1 teacher was African American, 1 was Native American, and 1 was multiracial). All had an associate’s degree as their highest educational level, had an average of 13–14 years of teaching experience (range = 8–18 years, SD = 3.73), and reported using Creative Curriculum as their prevailing instructional approach.

In comparing the two groups of teachers, there were some similarities between the experimental and comparison groups as well as some differences. In terms of similarities, all teachers in both groups had at least an associate’s degree, and the two groups were
statistically similar in their average age and their average years of teaching experience \( (p > .10) \). The two groups of teachers were different in terms of race/ethnicity, with the comparison group demonstrating statistically higher numbers of teachers who were African American, Native American, and multiracial \( (p < .001) \). Further, more of the teachers in the experimental group had educational experience beyond an associate’s degree \( (p < .001) \).

**Students**

Of the 137 children participating in the study, 66 participated in experimental classrooms and 71 participated in comparison classrooms. These children represented a subset of children who were enrolled in these classrooms; that is, rather than testing all of the children in each classroom to estimate intervention effects, a small sample was selected from each class using random selection, similar to procedures used in large-scale studies of preschool quality \( (\text{e.g., Early et al., 2005}) \). In the RIA classrooms, 6 children, on average, were randomly selected from the class roster by the research team. Children (a) who were unable to be tested due to gross sensory, motor, or cognitive reasons; (b) who were absent on the day of testing; or (c) for whom parental assent was not provided to the district were excluded from the study. For the comparison condition, 8–9 children per classroom (on average) were randomly selected from the pool of children for whom parental written consent had been provided to the research team. Exclusionary criteria were the same as those employed in the RIA classrooms.

Children in the RIA classrooms \( (n = 66) \) ranged in age from 39 to 66 months (3.3 years;months) to 5;6 and included 33 boys and 33 girls. In terms of race/ethnicity, all were White/Caucasian. Teacher report indicated that all children spoke English as their primary language, and 7.6% \( (n = 4) \) of the children had an individualized education program (IEP). Children in the comparison classrooms \( (n = 71) \) ranged in age from 42 to 60 months (3.6 to 5.0) and included 27 boys and 35 girls (gender not recorded for 9 children). In terms of race/ethnicity, 42.3% \( (n = 30) \) were White/Caucasian, 48.8% \( (n = 29) \) were Black/African American, and data were not available for 16.9% \( (n = 12) \) of the children. Teacher report indicated that 11.3% \( (n = 8) \) of the children had an IEP, and parent report indicated that all of the children \((\text{for whom data was available}; n = 38)\) spoke English as the primary language in the home.

**Missing data.** In order to maximize power and minimize the impact of missing data estimates of RIA effects, cases were not deleted list-wise as a result of missing data; all participants with relevant data within a specific analytic model were included. Levels of missing data for the fall and spring time points for all child-level measures showed almost no missing data within the experimental group at the fall time point. In contrast, within the comparison group, missing data levels across each of the fall measures ranged from 12% to 18%.

In the spring, data were missing for 19% of the children within the experimental group and for 18% to 21% of the children in the comparison group \( (\text{varying across spring outcome measures}) \). Independent \( t \) tests were examined to determine if children within the comparison group who had missing fall data were statistically different from those with no missing fall data on age or spring outcomes. Results indicated no significant differences \( (p < .05) \) of age, spring language, or emergent literacy scores \( (p < .05) \) between children in the comparison group with missing versus full fall data. Similarly, independent \( t \) tests indicated no significant differences on children’s initial language or literacy abilities for children with missing spring data as compared to children with full spring data. These patterns suggest that children’s data were likely missing at random and that missing data should not have biased the findings in any systematic way.

**PROCEDURES**

This study used a quasi-experimental pre–post comparison group design to evaluate child language and literacy outcomes associated with receipt of the 30-week, 60-lesson RIA preschool supplement. Both the experimental \( (\text{i.e., RIA}) \) and comparison classrooms participated during the 2006–2007 school year, and teachers in both groups received professional development at the beginning of the year as part of their participation. For their participation, teachers in the experimental condition received a binder of the RIA materials and all 15 related storybooks for their classroom. Teachers in the comparison condition were also participants in a larger, randomized controlled trial; for participating in that study, they received $150 in an educational fund, $150 in a materials account to purchase resources for their classroom, and equipment needed to conduct videotapes of small-group activities within their classroom \( (\text{classroom videotapes were relevant to the larger randomized controlled trial, not the current study}) \).

In order to be considered as active participants in the current study, all of the teachers were required to submit information to the research team on a monthly basis. Teachers in the experimental condition submitted implementation logs regarding their use of RIA to the research team on a monthly basis using self-addressed, prepaid envelopes. Teachers in the comparison condition videotaped a specified small-group activity and sent this tape to the research team biweekly in self-addressed, prepaid envelopes. Teachers in both conditions were aware that the research team was interested in how preschool may help children learn language and literacy skills and that data were being collected on their classroom and from individual children in their classroom. No teachers were aware of the study’s specific research questions. Teachers’ compliance in sending these materials to the research team was not reported to administrators.

All teachers involved in this study reported using the same general curriculum to establish child learning goals and instructional practices in their classrooms \( (\text{i.e., Creative Curriculum}) \); thus, RIA effects can be considered as influencing children’s skills above and beyond that curriculum.

**Professional Development for RIA Teachers**

RIA teachers participated in two phases of training. The first phase occurred during the semester before the current study’s inception. During this semester, teachers attended a 1½-day workshop—1 day (8 hr) on language and literacy development and ½ day (4 hr) on the RIA materials specifically. Participants in this workshop included not only teachers who would be using RIA, but also assistants in these classrooms, district speech-language pathologists \( (\text{SLPs}) \), and program administrators. Following training, teachers implemented a pilot version of RIA for a 15-week period, submitted weekly notes on implementation, and had telephone contact with research personnel twice regarding their use of RIA. This telephone contact involved the research team asking predesigned questions about the
RIA program in order to glean feedback on the materials’ usability. No coaching or feedback was given to teachers regarding their implementation and, if questions were initiated by teachers, the research team provided generic feedback that guided them to follow the lesson plans as closely as possible and document any changes they made on their implementation notes. The second phase of training was conducted at the start of the current feasibility study; this included a half-day workshop (4 hr) for teachers that focused primarily on expectations for implementation; that is, how long RIA should be used (30 weeks) and how often lessons should be implemented (twice weekly). Classroom assistants, district SLPs, and program administrators also participated in this workshop, per the request of administrators in the West Virginia Department of Education. However, only lead teachers (e.g., study participants) implemented RIA, and other attendees of the workshop were not formally consented into the study. Given that our intent in this feasibility study was to explore whether RIA could be used with little ongoing professional development resources, no coaching or feedback was provided to teachers during the 30-week period of implementation with the exception of periodic calls (three times in total) to the 2 teachers who did not consistently submit fidelity documents (as discussed below). No incentives were provided to teachers for participation other than the materials needed for implementation of RIA and the set of corresponding storybooks for their classroom. In agreeing to participate, the teachers were agreeing to evaluate and use the RIA curricular tool and to allow us access to their classroom in order to assess children whose parents had provided consent and who were selected into our study.

### RIA Description

RIA is a 30-week language and literacy curriculum supplement consisting of 60 separate lesson plans. Each lesson includes three sets of activities organized around a whole-class group storybook reading interaction: before reading, during reading, and after reading. Each lesson addresses two of the four instructional domains in the RIA scope—vocabulary, narrative, print knowledge, and phonological awareness—such that each domain is addressed once within a given week of instruction. Implementation of RIA lesson plans is sequenced over a 30-week period such that each domain’s instructional objectives increase in complexity and difficulty over time and lessons build on prior knowledge. Materials needed to use the supplement include common classroom tools (e.g., whiteboard, marker, paper) with the exception of a set of 15 storybook titles that are used repeatedly as a content of instruction. Teachers were provided with the set of storybooks at the start of the academic year but received no additional materials.

Each lesson is designed to last approximately 20 to 30 min. Implementation recommendations suggest that teachers deliver two lessons per week, although when the lessons are delivered within the classroom schedule is based on teacher preference. Both lessons for a week correspond to the same storybook, thus requiring the teacher to read the week’s designated book two times. The same set of storybooks is used repeatedly during the 30-week period of instruction; typically, a storybook is used every 4 to 5 weeks as a vehicle for instruction. Each lesson provides a scripted outline that specifies a step-by-step sequence of instruction as well as suggested language that teachers can use to support children’s learning during each activity. A sample lesson is presented in Appendix B. The RIA lessons can be conducted in large-group, small-group, or one-on-one settings; however, teachers in this study implemented all lessons with the full class and only lead teachers conducted RIA lessons.

### Fidelity of Implementation to RIA

To track adherence to the RIA program and its schedule of implementation, the experimental teachers were required to complete an implementation log after every lesson. This log required teachers to indicate the date of the lesson, that the lesson was conducted as a whole group, the length of each activity in the lesson, any challenges with the lesson’s activities, the general performance of the children, and any extensions or modifications that occurred. Teachers were required to submit these logs to research personnel on a monthly basis and received stamped addressed mailers for this purpose at the start of the project. As long as teachers indicated that the lessons were conducted according to the designated schedule and that all activities in the lesson were conducted, teachers were considered as having fidelity to that lesson. Previous studies have found that teachers are reliable reporters of their classroom practices, as seen by high correlations between reported and observed behaviors ($r = .7$; Rimm-Kaufman & Chiu, 2007).

Of the 11 RIA teachers, 1 teacher submitted no implementation logs, and another teacher logged only 3 weeks of lessons out of the possible 30 weeks of instruction. These 2 teachers were sent four letters and received three phone calls regarding fidelity, yet their fidelity logs were never submitted. It is therefore impossible to know with certainty whether the program was being implemented in these classrooms. (These same teachers had participated in the prior year of pilot implementation, and their implementation logs from that period provided evidence of their cooperation and fidelity during a 15-week period of implementation.) Averaging fidelity across all 11 teachers, the percentage of lessons implemented was 66%, with an average of 40 lessons implemented according to teacher report. Averaging fidelity across the 9 teachers who submitted fidelity logs on a regular basis, the percentage of lessons implemented was 80%, with an average of 48 lessons implemented over the 30-week period.

### Professional Development for Comparison Teachers

At the start of the school year, teachers in the comparison classrooms attended a 2-day workshop addressing topics applicable to preschool educators but not directly related to language and literacy (e.g., behavior management, enhancing learning in the block center). Comparison teachers were asked to maintain business-as-usual classroom practices. No specific feedback on instruction was provided to these teachers over the course of the year, although the teachers had periodic communications with project staff regarding various project deliverables.

### Measures

Two sets of measures are of relevance to this study: measures of child language and measures of child emergent literacy skill. These measures were collected in the fall and spring of the year as part of a larger battery that was administered individually to each child. All measures were administered by research assistants (e.g., undergraduate and graduate students, part- and full-time project staff), all of whom received standardized training on each measure and

Justice et al.: A Feasibility Study of a Preschool Curriculum Supplement 167
passed a test on each measure’s administration procedures. Children were tested outside of their classrooms in a relatively quiet area of the school, and tests were typically administered in two short (approximately 15 min) testing sessions. After test administrations were completed, scoring of measures was completed by undergraduate research assistants who had received training on the scoring of each measure and who were blinded to the study conditions of the participants. All measures were double scored by two research assistants working independently of one another using paper copies of administered protocols; any discrepancies were resolved in order to achieve 100% agreement by both scorers.

The language measures used consisted of three subtests of the standardized norm-referenced Clinical Evaluation of Language Fundamentals Preschool—Second Edition ( CELF Preschool–2; Wiig, Secord, & Semel, 2004), namely, Sentence Structure, Word Structure, and Expressive Vocabulary. Collectively, these subtests require approximately 15 min to administer. For data analyses, we used individual subtest raw scores as outcome measures. To consider the association of general language ability in response to treatment, we used the combined standardized composite score of the three subtests, the core language composite (M = 100, SD = 15). Adequate reliability and validity are well established for this measure (see Wiig et al., 2004). The three specific subtests used in this study provide estimates of children’s grammar (Sentence Structure), morphology (Word Structure), and vocabulary (Expressive Vocabulary).

The emergent literacy measures used included tests of phonological awareness (i.e., rhyme and alliteration) and print knowledge (i.e., alphabet knowledge and print concepts) that collectively require approximately 15 min to administer. The Rhyming Individual Growth and Development Indicator (Rhyming IGDI; Early Childhood Research Institute on Measuring Growth and Development, 2000b) was used to measure children’s ability to identify as many rhyming pairs as possible in a 2-min period. The Alliteration Growth and Development Indicator (Alliteration IGDI; Early Childhood Research Institute on Measuring Growth and Development, 2000a) was used to measure children’s ability to identify word pairs that share an initial sound during a 2-min period. Children’s alphabet knowledge was measured using the Phonological Awareness Literacy Screening: Preschool (PALS–PreK) Upper-Case Alphabet Recognition task (Invernizzi, Sullivan, Meier, & Swank, 2004). In this task, children are asked to name each of the 26 individual, uppercase letters as they are presented in random order on a single printed sheet. Scores range from 0 to 26. The Preschool Word and Print Awareness Test (PWPA; Justice & Ezell, 2001; see also Justice, Bowles, & Skibbe, 2006) was used to study children’s knowledge of 14 print concepts (e.g., print directionality, print forms, meaning of print) in the context of a shared book reading. Raw scores were converted to standard scores based on M = 100 and SD = 15.

RESULTS

Analytic Approach

In our data analyses, we used an intent-to-treat framework whereby children attending treatment classrooms were included in our models regardless of the classroom teacher’s fidelity to the program. In an intent-to-treat framework, all individuals assigned to a particular condition are maintained in analyses irrespective of compliance, withdrawal, or deviations in implementation (Peduzzi, Detre, Wittes, & Holford, 1991).

The data adhere to a multilevel structure in which 6 to 8 children are nested within 20 classrooms. Given the nonindependence of multilevel data, it is possible that Type I error rate is inflated, such that a statistical test failing to account for nesting effects may be liberal (Raudenbush & Bryk, 2002). Thus, it may be the case that children in the same classroom would perform more similarly than children in different classrooms due to classroom-level influences. To examine the effects of RIA, hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) was employed, accounting for nonindependence and allowing examination of both child- and classroom-level components. Through the use of HLM6 software (Version 6.06; Raudenbush, Bryk, Cheong, & Congdon, 2006), full maximum likelihood estimation procedures were employed, with all continuous variables entered grand-mean centered for ease of interpretation. To maximize power and to minimize the influence of missing data, we used the largest sample size possible per analysis by deleting missing data while running the analyses; thus, sample size varied for different models. Further, it is important to note that all models were also rerun excluding any children with IEPs (4 in RIA classrooms, 8 in comparison classrooms), and no differences in statistical findings were noted. The results presented include all possible children (including children with IEPs) who have data for the given model.

Seven HLM models were examined, one for each area of language and emergent literacy skill. The dependent variables with regard to language were grammar, morphology, and vocabulary. The dependent variables with regard to literacy were rhyme, alliteration, alphabet knowledge, and print concepts. We first estimated the variance components associated with the unconditional model (i.e., without predictors), examining the magnitude of the intraclass correlations (ICCs). The ICCs ranged from .17 to .51 (with 4 of the 7 models > .25), indicating that substantial nesting effects were present in the data.

To address our first research aim investigating the impact of RIA on children’s language and literacy skills, we examined children’s spring scores of language and emergent literacy skills while controlling for fall scores; this approach allows for a consideration of performance after controlling for pre-intervention scores, which is important because initial between-group differences are a common artifact of the quasi-experimental research design that relies on intact groups. Raw scores were used in this set of analyses, and we used the following base model (Equations 1a and 1b). For each outcome indicator, a child’s performance (Equation 1a; \( Y_{ij} \)) is a function of the mean spring score for the classroom (\( \beta_0 \)) after adjusting for the influence of child age (\( \beta_1 \)) and fall score (\( \beta_2 \)).

\[
Y_{ij} = \beta_0 + \beta_1 \text{(age)} + \beta_2 \text{(fall score)} + r_{ij} \quad (1a)
\]

The estimate of the classroom mean (\( \beta_0 \); Equation 1b) is a function of the grand mean of all classrooms (\( \lambda_{00} \)), the experimental condition of the classroom (\( \lambda_{01} \)) dummy coded as 1 (treatment) and 0 (comparison), and the estimation error.

\[
\begin{align*}
\beta_0 &= \lambda_{00} + \lambda_{01} \text{(condition)} + \mu_{0j} \\
\beta_1 &= \lambda_{10} \\
\beta_2 &= \lambda_{20}
\end{align*} \quad (1b)
\]

We computed effect sizes for each model by multiplying the predictor coefficient with its standard deviation and dividing by the outcome’s standard deviation (see Mashburn et al., 2008).
To address our second research aim investigating whether RIA would impact children equally regardless of their initial language ability, we evaluated the extent to which the effects of RIA were moderated by children’s initial language ability through a second set of seven HLM models. Building on the base model, we examined the cross-level interaction between children’s initial language ability (i.e., fall language composite) and condition (Equations 2a and 2b). The fall language composite is a standard score based on $M = 100$ and $SD = 15$.

$$Y_{ij} = \beta_0 + \beta_1(\text{age}) + \beta_2(\text{fall score}) + \beta_3(\text{fall language composite}) + r_{ij} \quad (2a)$$

$$\beta_0 = \lambda_{00} + \lambda_{01}(\text{condition}) + u_{0j} \quad (2b)$$

$$\beta_1 = \lambda_{10}$$

$$\beta_2 = \lambda_{20}$$

$$\beta_3 = \lambda_{30} + \lambda_{31}(\text{condition})$$

**RESULTS**

Table 1 presents the means and standard deviations for the full sample on all measures of language and literacy. The data in Table 1 also identify the percentage of children in the sample who received scores ≤16th percentile (≤ –1 SD of the mean) and ≤25th percentile on the norm-referenced measures at the fall time point. These results show that a higher percentage than expected of the full sample exhibited depressed language abilities with respect to normative references. That is, based on a normal curve, we would expect approximately 16% of the children to fall ≤1 SD; in our sample, one quarter to one third of all children fell within this risk category before the start of intervention. Table 2 presents the means and standard deviations for the children in the RIA (n = 66) and comparison classrooms (n = 71) for both fall and spring assessment time points.

**Impact of RIA Curriculum on Children’s Language and Literacy Skills**

The first aim of the present study was to examine the extent to which participation in RIA impacted end-of-year performance on children’s language and emergent literacy skills relative to participation in the prevailing preschool curriculum. To evaluate differences between the two groups on end-of-year language abilities, we considered differences in three dependent variables of spring performance (grammar, morphology, vocabulary) using raw scores while controlling for child age and fall performance. The results from the three HLM models are presented in Table 3. Children who participated in the supplemental RIA curriculum demonstrated significantly higher spring language performance than those in the comparison condition in all areas: grammar (outscoring by 2.08 points, $p = .02$, effect size = .24); morphology (3.20 points, $p < .01$, effect size = .35); and vocabulary (2.68 points, $p = .04$, effect size = .17).

To evaluate children’s performance on end-of-year measures of emergent literacy, we examined differences by condition for children’s spring scores when controlling for child age and fall scores. The results from the four HLM models presented in Table 4 indicate that children in the RIA condition outperformed children in the comparison condition on three of the four skill areas: rhyme (outscoring by 4.70 points, $p < .01$, effect size = .41), alliteration (2.09 points, $p < .01$, effect size = .30), and print concepts (3.57 points, $p < .01$, effect size = .44). Between-group differences on alphabet knowledge were not significant (1.02 points, $p = .51$, effect size = .05).

**Initial Language Ability as a Moderator of RIA Effects**

To address our second research aim investigating whether RIA would impact children equally regardless of their initial language ability, we examined whether the effects of RIA were moderated by children’s language ability before intervention. Condition × Language interactions were not significant when examining language outcomes. In other words, children’s initial language ability did not

<table>
<thead>
<tr>
<th>Table 1. Means and standard deviations for the full sample (N = 137 children) on all measures of language and literacy.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td><strong>n</strong></td>
</tr>
<tr>
<td>Language</td>
</tr>
<tr>
<td>Grammar</td>
</tr>
<tr>
<td>Morphology</td>
</tr>
<tr>
<td>Vocabulary</td>
</tr>
<tr>
<td>Literacy</td>
</tr>
<tr>
<td>Rhyme</td>
</tr>
<tr>
<td>Alliteration</td>
</tr>
<tr>
<td>Alphabet knowledge</td>
</tr>
<tr>
<td>Print concepts</td>
</tr>
</tbody>
</table>

**Note.** Grammar, morphology, and vocabulary scores are from the Clinical Evaluation of Language Fundamentals Preschool—Second Edition (CELF Preschool–2; Wig, Secord, & Semel, 2004), maximum = 22, 24, 40, respectively; rhyme and alliteration scores are from the Rhyming Individual Growth and Development Indicator (Rhyming IGDI; Early Childhood Research Institute on Measuring Growth and Development, 2000b), no maximum score; alphabet knowledge scores are from the Phonological Awareness Literacy Screening for Preschool (PALS–PreK) Upper-Case Alphabet Recognition task (Invernizzi, Sullivan, Meier, & Swank, 2004), maximum = 26; print concepts scores are from the PALS Word and Print Awareness Test (PWPA; Justice & Ezell, 2001), maximum = 17.
moderate the effects of RIA for language outcomes (see Table 3). In contrast, for three of the four literacy measures, Condition × Language interactions were significant. Specifically, initial language ability moderated the effects of RIA for alliteration, alphabet knowledge, and print concepts (see Table 4). Figures 1, 2, and 3 depict the nature of the resulting interactions. For the sake of illustration, we present figures illustrating spring scores for children with low (standard score of 85), middle (standard score of 95), and high (standard score of 105) initial language ability. These graphs illustrate that, in general, as children’s language ability increased, the positive benefit of RIA to the emergent literacy skills of alphabet knowledge, alliteration, and print concepts also increased.

**DISCUSSION**

In the current climate, which emphasizes not only accountability but also the arrival of “evidence-based progress to education” (Stanovich & Stanovich, 2003), preschool teachers are expected to meet children’s needs and even equalize disparities among students who enter school from remarkably diverse ethnic, linguistic, racial, and economic backgrounds. This is particularly true in the area of language and emergent literacy achievement, both of which serve as critical determinants of children’s successful adjustment to the kindergarten milieu and as consistent predictors of later outcomes in word recognition and reading comprehension (e.g., Storch & Whitehurst, 2002). The use of evidence-based programs and practices for accelerating children’s language and literacy achievement within rural preschool programs is an ideal that remains out of reach for many preschool educators today, whose programs may not have the financial resources to access empirically validated programs or to provide teachers with the ongoing specialized mentorship or course work needed to implement such programs. Although there is evidence that available, comprehensive language and literacy curricula may effectively enhance young children’s language and literacy skills, many of these programs are complex, involve high-cost materials, and require intensive mentorship for successful implementation. The design of these programs may be prohibitive to many preschool classrooms; thus, their design may preclude their short-term scalability.

Table 2. Means and standard deviations for the children in the “Read It Again!” (RIA; Justice, McGinty, Beckman, & Kilday, 2006; n = 66) classrooms and the comparison classrooms (n = 71).

<table>
<thead>
<tr>
<th>Language</th>
<th>RIA</th>
<th></th>
<th>Comparison</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fall</td>
<td>Spring</td>
<td>Fall</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>Grammar</td>
<td>66</td>
<td>13.29</td>
<td>4.37</td>
<td>53</td>
</tr>
<tr>
<td>Morphology</td>
<td>66</td>
<td>13.85</td>
<td>4.75</td>
<td>53</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>66</td>
<td>20.53</td>
<td>7.34</td>
<td>53</td>
</tr>
<tr>
<td>Fall composite</td>
<td>66</td>
<td>97.55</td>
<td>14.63</td>
<td>58</td>
</tr>
<tr>
<td>Literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alliteration</td>
<td>65</td>
<td>1.74</td>
<td>2.73</td>
<td>54</td>
</tr>
<tr>
<td>Alphabet knowledge</td>
<td>66</td>
<td>7.77</td>
<td>8.76</td>
<td>53</td>
</tr>
<tr>
<td>Print concepts</td>
<td>66</td>
<td>6.82</td>
<td>3.81</td>
<td>54</td>
</tr>
</tbody>
</table>

Note. Grammar, morphology, and vocabulary scores are from the CELF Preschool–2, maximum = 22, 24, 40, respectively; rhyme and alliteration scores are from the Rhyming IGDI, no maximum score; alphabet knowledge scores are from the PALS–PreK Upper-Case Alphabet Recognition task, maximum = 26; print concepts scores are from the PWPA, maximum = 17.

Table 3. Hierarchical linear modeling results demonstrating the impact of RIA on children’s language outcomes.

<table>
<thead>
<tr>
<th>Grammar (n = 100 children in 20 classrooms)</th>
<th>Morphology (n = 102 children in 20 classrooms)</th>
<th>Vocabulary (n = 100 children in 20 classrooms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coeff.</td>
<td>SE</td>
<td>dF</td>
</tr>
<tr>
<td>Base model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring intercept, $\gamma_{00}$</td>
<td>14.60**</td>
<td>0.56</td>
</tr>
<tr>
<td>Age, $\gamma_{10}$</td>
<td>0.13*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fall score, $\gamma_{20}$</td>
<td>0.43**</td>
<td>0.08</td>
</tr>
<tr>
<td>Classroom-level condition, $\gamma_{01}$</td>
<td>2.08*</td>
<td>0.79</td>
</tr>
<tr>
<td>Interaction model Condition × Language, $\gamma_{31}$</td>
<td>-0.02</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01.
The unique contribution of the present study resides in our intent to provide a curriculum supplement that may be applied at scale with relatively low costs and require minimal professional supports to teachers for its effective use. Replication of this study under more rigorous conditions is needed to establish the causal impacts that RIA may have on young children’s language and literacy development. However, the two major findings suggest that RIA may be a promising curricular tool that is beneficial to children and yet easily accessible to teachers and early childhood programs.

Specifically, the first finding of this study was that children in classrooms using the RIA curriculum supplement demonstrated significantly higher end-of-year scores in language and emergent literacy skills than did children in classrooms implementing business-as-usual curricula, with significant effects ranging from $d = .37$ to $d = 1.21$ across skills examined. In interpreting these findings, it is important to consider that this study relied on intact groups for its estimation of program impacts and is a quasi-experimental, rather than experimental, evaluation. In any quasi-experimental design, there are potentially systematic differences across experimental and comparison groups (observed and unobserved) that may impact the results. Thus, the positive effects of RIA on children’s gains in language and literacy skills cannot be definitely attributed to RIA and could be the result of some other aspects of the experimental classrooms. Despite this caution, consideration of the statistical differences between children in the RIA classrooms and comparison classrooms, as well as the effect sizes of these differences, is informative for determining whether RIA may warrant further investigation as a potentially effective, low-cost, accessible alternative to existing language and literacy curricula.

Effect sizes, in particular, suggest the potential magnitude of influence that RIA may have had on children’s skills and provide a means of comparing findings across curricular intervention studies. In fact, RIA achieved effect sizes equal to or larger in both magnitude and scope to those reported for other curricular interventions, many of which are more intensive and expensive in nature than RIA. For example, Wasik et al. (2006) reported moderately large vocabulary effects ($d = .44$) when implementing an experimental curriculum featuring 22 prop boxes and professional development in the form of 2-hr monthly workshops and 2-hr monthly in-class mentoring during the implementation year. Assel et al. (2007) found smaller effects ($d = .36$) when implementing an approximately $3,000-per-kit commercial language and literacy curriculum and providing teachers with a 4-day workshop coupled with 1.5-hr monthly in-class mentoring. DeBaryshe and Gorecki (2007) found moderate effects on

Table 4. Hierarchical linear modeling results demonstrating the impact of RIA on children’s literacy outcomes.

<table>
<thead>
<tr>
<th></th>
<th>Rhyme (n = 103 children in 20 classrooms)</th>
<th>Alliteration (n = 105 children in 20 classrooms)</th>
<th>Alphabet knowledge (n = 103 children in 20 classrooms)</th>
<th>Print concepts (n = 101 children in 19 classrooms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed effects</td>
<td>Coeff. SE df</td>
<td>Coeff. SE df</td>
<td>Coeff. SE df</td>
<td>Coeff. SE df</td>
</tr>
<tr>
<td>Base model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring intercept, $\gamma_0$</td>
<td>2.86* 1.05 18</td>
<td>1.43** 0.46 18</td>
<td>13.17** 1.10 18</td>
<td>8.17** 0.61 17</td>
</tr>
<tr>
<td>Child-level condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, $\gamma_1$</td>
<td>0.10 0.09 99</td>
<td>0.04 0.06 101</td>
<td>0.04 0.11 99</td>
<td>0.15** 0.06 97</td>
</tr>
<tr>
<td>Fall score, $\gamma_2$</td>
<td>0.42** 0.12 99</td>
<td>0.26* 0.12 101</td>
<td>0.82** 0.07 99</td>
<td>0.42** 0.08 97</td>
</tr>
<tr>
<td>Classroom-level condition, $\gamma_01$</td>
<td>4.70** 1.45 18</td>
<td>2.09** 0.66 18</td>
<td>1.02 1.53 18</td>
<td>3.57** 0.82 17</td>
</tr>
<tr>
<td>Interaction model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition × Language, $\gamma_31$</td>
<td>0.08 0.06 93</td>
<td>0.14** 0.04 93</td>
<td>0.17* 0.08 92</td>
<td>0.08* 0.04 89</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01.

Figure 1. Condition × Language interaction for spring alliteration scores.

Figure 2. Condition × Language interaction for spring alphabet knowledge scores.
print knowledge ($d = .37$) when implementing a language and literacy curriculum ($3,000 per kit) with weekly and monthly individual teacher coaching. RIA matched or exceeded these effects when teachers used the 30-week scope and sequence of lessons (commercially costing approximately $100 in material) with little ongoing professional support (e.g., 2 days in training, a semester of independent lesson exposure/practice). When considering the comparability of these findings, it is important to note that all effect-size estimates are based on experimental or quasi-experimental group-based intervention studies, and that effect-size estimates standardized measures of outcome, thus providing a statistically viable way of comparing findings across studies and samples (Fan, 2001). We must note, however, that it is unclear whether the effect-size contrasts demonstrated in this study as well as others have meaningful and functional impacts to children. Longitudinal research is needed to show that relatively modest increases in children’s language and literacy skills as we observed provide long-term advantages to fostering academic and reading success in children.

Nonetheless, the effect-size findings from this study suggest the possibility that curricular tools such as RIA, which has a focus and scope based on research but a design that is pragmatic and amenable to teachers, may offer a reasonable means for influencing teachers’ instructional practices and children’s skill development. Importantly, these effect sizes suggest the potential for designing curricular tools that may enhance classroom language and literacy instruction in preschool classrooms (and thereby children’s skills within these classrooms) without the need for costly ongoing professional development and coaching components emphasized in many current professional development models (e.g., Assel, Landry, & Swank, 2008; Dickinson & Brady, 2006; Hamre, LoCasale-Crouch, & Pianta, 2008; Pianta, 2006; Walpole & Meyer, 2008). That is, although models of coaching teachers in language and literacy instructional practices have had positive effects on teachers and students (e.g., Assel et al., 2007; Wasik et al., 2006), this option may not be feasible or desirable for all early childhood programs. Notably, the gap between the ideal of intensive, ongoing professional development and the constraints on the field are evident, with research studies showing high attrition and poor recruiting rates for professional development programs, poor sustainability of curricular programs requiring significant professional development, and a lack of widespread use of coaching in early childhood education programs outside of the research context (Assel et al., 2007; Dickinson & Brady, 2006; Jackson et al., 2006; Maxwell, Field, & Clifford, 2006). Further, not all studies have found coaching models to provide added benefit to teacher practices and children’s outcomes when implemented in conjunction with other forms of professional development (Assel et al., 2007; Jackson et al., 2006). The findings of this study suggest that highly supportive curricular materials that are scripted, sequenced, self-contained (i.e., a manual and books), and limited in scope (i.e., limited to a single context, namely, book reading) may represent a valid option for improving the language and literacy instruction of preschool classrooms. The potential of RIA as a low-cost, high-yield alternative to higher cost curricula and professional development models (e.g., in-class coaches) suggests the need to continue to investigate RIA to determine whether findings from this study replicate under more tightly controlled, experimental conditions. Additionally, researchers should consider how RIA—implemented with and without ongoing professional development supports—might influence teacher and child outcomes relative to other presently available practices and curricula.

As a means of exploring the extent to which RIA may be applicable to the diverse learning needs of young children in early childhood programs, this study also considered whether RIA effects varied by children’s language skill at the beginning of the preschool year. Understanding whether and how RIA may have varied in its effect on children is important to understanding how well a single curricular program such as RIA may sufficiently meet the diverse instructional needs of young children. Our findings indicated that RIA equally benefitted children’s vocabulary and syntactic growth, regardless of their initial language ability, but that RIA had a more variable influence on children’s emergent literacy skills growth as a function of their initial language. Specifically, RIA had a positive effect on children’s rhyme development, regardless of their initial language skill, but was more beneficial to the print concepts development of children with higher language skills as compared to lower language skills. Further, the effect of RIA on children’s alliteration and alphabet knowledge was notably different based on children’s initial language ability. Findings suggest that RIA may have had a positive effect on the alliteration development only of children with relatively average or high initial language abilities and may have had a positive effect on the alphabet knowledge only of children with relatively high initial language abilities. Our findings that children with weaker language skill may have benefitted less comprehensively or strongly from RIA is consistent with studies showing that children with weak language demonstrate slower and more variable growth in language and literacy interventions when compared to children with more average skills (O’Connor et al., 1996; Penno et al., 2002; Ukrainetz et al., 2000, but see Justice, Meier, & Walpole, 2005). However, it is also important to note that for many skills (e.g., vocabulary, grammar/morphology, and rhyme), RIA had an equal effect on children’s growth, regardless of variation in children’s language ability. Collectively, our findings point to the importance of considering factors related to individual variability in children’s intervention responsiveness and emphasize the point that no one curricular tool or approach may be sufficient for building a classroom that effectively supports all of the learning needs of all of the children. Further, our data suggest that it is unlikely that any particular group of children may benefit or fail to benefit from an intervention, but that it is important to consider the “match” between a particular curricular tool, the outcomes of interest, and the characteristics of the children in the classroom.
In sum, RIA is a promising curricular tool for which benefits appear to extend across many skill areas for children with diverse language abilities. Nonetheless, its use failed to significantly affect the literacy skills (alliteration, alphabet knowledge, print concepts) of children with very weak language skills. Exploring whether RIA may more comprehensively reach the needs of more vulnerable children (such as children with very weak language skills) when implemented in a different intensity level or in a different instructional context is an important direction for future research in order to inform classroom practices regarding the use of RIA for diverse learners.

Limitations and Conclusions

Several limitations of this study warrant mention and suggest directions for future research. First, as we have noted, the current study employed a quasi-experimental design to study the potential impacts of the RIA curriculum supplement on the language and literacy skills of children, providing a weaker form of causal evidence relative to true effect studies due to lack of random assignment and other internal controls. Of particular concern, and one that relates to the quasi-experimental nature of this study, is the difference in the educational levels of the teachers who implemented RIA as compared to those in the comparison classrooms. Descriptive data showed that RIA teachers were better educated than the comparison teachers, and it is possible that improvements in child outcomes that we are attributing to RIA impacts may, in fact, reflect the higher educational status of the teachers. Consequently, the results from the current study require further replication in more rigorous research designs and within a range of real-world contexts to increase confidence. Use of a fully randomized design that can therefore control for any effects attributable to teacher education is an important next step. Until such replication occurs, RIA must not be considered a fully validated empirical curricular tool, but a potentially promising curricular tool that balances the language and emergent literacy learning needs of young children with the needs of early educators to have a low-cost and easily accessible curricular option.

A second limitation of this study is its generalizability of findings given the relatively small sample size and limited scope of teacher and child heterogeneity. The children in this study were not representative of the fairly ethnically diverse preschoolers who are served by many preschool programs. For example, our sample did not include any children who were English language learners. Replicating this study’s findings within samples that allow for consideration of additional child characteristics such as English language learner status is an important step in building the field’s knowledge of optimally designed early intervention programs suited to the heterogeneous needs of preschool-age children.

It is also important to consider that the teachers in this study were part of the development process of the RIA program. All teachers in this study used a pilot version of the RIA program for 15 weeks in the year previous to this study. Although the final RIA program was different from the pilot program, the teachers in this study could be considered as having prior experience with RIA. Intervention studies have not found consistent differences between teachers who were second-year implementers of a program versus teachers who were participating in a program for the first time (Fischel et al., 2007; Landry, Swank, Smith, Assel, & Gunnewig, 2006). However, whether the success of RIA was related to teachers having some implementation experience gained during their use of the pilot version of the program is a question to be addressed in future program evaluation studies.

In sum, intervention efforts that seek to bridge the research-to-practice gap must be “adaptive” to the context in which implementation occurs and must be cognizant of the capacity of the current system so as to achieve incremental change that is sustainable (Fullan, 2000; Yoshikawa & Shinn, 2002). Presently, the field of early education is in a state of substantial capacity building with the aim of promoting higher quality and quantity of language and literacy instruction within preschool classrooms. We contributed to this capacity building by studying a specific curriculum that may effectively support children and yet also effectively bridge the research-to-practice gap by being easily accessible to preschool teachers. Specifically, we examined the effectiveness of a practical tool that was designed to meet the needs of early educators who work in challenging contexts that preclude the short-term scalability of some currently available high-cost programs and practices requiring intensive mentorship for successful implementation. RIA offers preschool educators a potentially high-impact instructional tool for facilitating children’s growth in language and literacy. Although building globally high-quality teachers likely requires a sustained and multipronged approach (Zaslav & Martinez-Beck, 2006), our findings suggest that improvement of a specific aspect of the classroom, namely, language and literacy instruction, may be aided in the short term by a stand-alone curriculum supplement. In particular, RIA offers a model of a curriculum supplement that is responsive to children’s learning needs and is cognizant of the needs and constraints of the teachers and early childhood programs in which they work. The promising findings of the benefits of RIA to children suggest the need to consider the value of designing curricular tools with issues of scalability in mind and of the need to evaluate RIA as such a tool, specifically.

Acknowledgment

This study was supported in part by the West Virginia Department of Education and in part by the U.S. Department of Education, Institutes for Education Sciences Award Grant R305F05124. These data were collected while the second author was on a Predoctoral Training Fellowship awarded to the University of Virginia Interdisciplinary Doctoral Training Program in Education Sciences, supported by the Institute of Education Sciences U.S. Department of Education Award R305B040049. The authors are grateful to the administrators, teachers, pupils, and research assistants who participated in this study.

References

Justice et al.: A Feasibility Study of a Preschool Curriculum Supplement


Bryant, D., Clifford, R. M., Saluja, G., Pianta, R. C., Early, D. M., Barbarin, O., ... Burchinal, M. (2002). Diversity and directions in state pre-kindergarten programs. Chapel Hill, NC: The University of North Carolina, FPG Child Development Institute, NCEDL.


Received May 26, 2008
Revision received November 7, 2008
Accepted February 2, 2009
DOI: 10.1044/0161-1461(2009/08-0058)

Contact author: Laura Justice, Arps Hall, School of Teaching and Learning, The Ohio State University, Columbus, OH 43210.
E-mail: justice.57@osu.edu.
APPENDIX A. “READ IT AGAIN!” SCOPE AND SEQUENCE OF INSTRUCTION

Instructional Domain 1: Vocabulary
Objectives
1. To understand and use words for the names of unfamiliar objects (nouns) and actions (verbs) and that describe things and actions (adjectives and adverbs)
2. To understand and use new words representing spatial concepts (e.g., over, under, above)
3. To understand and use new words representing time concepts (e.g., before, after, then)
4. To talk about the meaning of new words, including how words can have more than one meaning
5. To understand and use new words representing feelings (e.g., embarrassed, sad, joyful)
6. To understand and use new words representing thinking processes (e.g., believe, imagine)

Instructional Domain 2: Narrative
Objectives
1. To identify and describe the setting and characters of a story
2. To identify and describe one or more major action(s) or event(s) in a story
3. To order three or more major events in a story
4. To produce a fictional story that has a setting and characters
5. To produce a fictional or personal story that has a clear beginning, middle, and end
6. To share feelings, ideas, or experiences in a single story that is precise and understandable

Instructional Domain 3: Print Knowledge
Objectives
1. To recognize that print carries meaning and to distinguish print from pictures
2. To recognize the left-to-right and top-to-bottom directionality of print
3. To identify some uppercase letters, including those in own names and those of some friends or family members
4. To understand and use new words describing aspects of books (e.g., illustrator, author, cover, title page) and print (e.g., word, letter, spell, read, write)
5. To recognize the difference between letters and words
6. To recognize some common sight words, including environmental print

Instructional Domain 4: Phonological Awareness
Objectives
1. To identify when two words or sounds are the same (e.g., dog–dog, b–b) and when they are different (e.g., dog–man, d–m)
2. To identify when two words share a rhyming pattern
3. To produce words that share a rhyming pattern
4. To segment words into syllables and to blend syllables into words
5. To identify when two words share the same first sound
6. To produce a word starting with a specific first sound
APPENDIX B. "READ IT AGAIN!" SAMPLE LESSON PLAN

Week 1

Lesson 2: Which words sound the same?
Book: Clifford Goes to Dog School by Norman Bridwell

Before Reading: Phonological Awareness

Learning Objective 1: To identify when two words share a rhyming pattern.
1. Introduce the activity by saying: We are going to look at some pictures that rhyme. I'll say the name of the picture and you say it after me.
2. Show each of the “OG” picture cards (dog, frog, hog, and log), and have the children name each card. Tell the children: All these words rhyme; they sound the same at the end. See how my mouth is the same at the end?
3. Make some rhymes with the “OG” cards, and discuss these rhymes with the children, as in: This picture is dog (show card) and it rhymes with frog (show card). My mouth does the same thing at the end: frog, dog. Continue this process for other pairs (dog-log, dog-hog).
4. Hold all four cards in your hand, and allow children to select two cards from your hand and say the two words on them. Then ask the whole group: Do (word) and (word) sound the same? Does your mouth do the same thing?

During and After Reading: Narrative

Learning Objective 2: To identify and describe the setting and characters of a story.
1. Read the book Clifford Goes to Dog School with the children. Stop reading periodically to highlight the character and the setting in the book. Ask children open-ended questions about the characters, such as: Why did he do that? What will he do next? Also, describe any changes that happen in the setting, such as Clifford was outside.
2. After reading the book, place the large paper where all children can see it. At the top write the word: Characters.
3. Review each of the key characters in the story. You could say: In our book we met Clifford, Emily Elizabeth, and Auntie. Write each of the names on the sheet, leaving lots of space between names.
4. Go around the group of children and ask each child to tell you his/her favorite character and dictate why. Record children’s answers below the character name. Allow children’s answers to guide what you write, but extend their answers. If the child says, Clifford is good, you could extend this answer, as in: Alex said he likes Clifford the best because he is a good dog and was looking out for Emily Elizabeth.

Materials
- Book: Clifford Goes to Dog School, by Norman Bridwell
- OG Picture Cards: dog, frog, hog, log
- Large paper and marker

Lesson Plans Read It Again-PreK! myreaditagain.com