I, Lauren Kimener Donovan, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in School Psychology.

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Examining the Effect of Performance Feedback on Family Literacy Practices

Student's name:  Lauren Kimener Donovan

This work and its defense approved by:

Committee chair: Renee Oliver Hawkins, Ph.D.

Committee member: Janet Lee Graden, Ph.D.

Committee member: Stephen Kroeger, Ed.D.
Examsining the Effect of Performance Feedback on Family Literacy Practices

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Lauren Kimener Donovan, M.Ed.
University of Cincinnati

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Kroeger, Ph.D.
Abstract

The present study evaluated changes to family literacy practices through the incorporation of evidence-based intervention procedures following school-based consultation, specifically through parent or caregiver implementation of a peer-mediated literacy intervention at home. Students’ progress on curriculum-based measures of oral reading fluency were monitored to examine how changes in family literacy practices might remediate this risk. In determining whether changes in the type of language- and literacy-based activities that families participated in at home were related to improved literacy outcomes, direct assessment of procedural fidelity and performance feedback for accurate implementation were employed. A multiple baseline across participants design was used to examine the effect of implementation on oral reading fluency, as well as the effect of performance feedback on implementation adherence. Findings indicated that consultant contact resulted in implementation of the evidence-based intervention procedures, and brief, accurate implementation was related to improved reading outcomes. Directions and implications for future research are discussed in the context of school-based practice and the role of school personnel in supporting evidence-based family literacy practices.
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PERFORMANCE FEEDBACK FOR FAMILY LITERACY PRACTICES

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Introduction

Learning to read is a complex undertaking for children, which involves both formal education, as well as exposure to home literacy practices that support the emergent reader. Research shows that how teachers and parents provide instruction in specific skills and at critical developmental periods can have a significant impact on student outcomes (Hecht & Close, 2002; National Early Literacy Panel, 2008; Senechal, 2006; Torgeson & Davis, 1996). Accordingly, the home literacy environment, which includes the quality of parent-child interactions and engagement with language and literacy activities, is a context which can have important implications for improving reading outcomes.

For children who enter school unprepared for the academic demands of Kindergarten, deficits in early literacy skills may put them at-risk for later reading failure. In fact, students who struggle to acquire early literacy skills continue to make gains in reading at a slower rate, resulting in an achievement gap between proficient and struggling readers that has been described as the “Matthew Effect” (Stanovich, 1986). Students who do not meet indicators of success in reading are more likely to be retained, negatively impacting future achievement, particularly when compared to students who receive targeted intervention (Abbott et al., 2010). Alternatively, large differences exist for students who enter school having had exposure to print and language- and literacy-rich home environments (e.g., Hart & Risley, 1985) and these differences persist throughout schooling, in areas like accelerated vocabulary acquisition and achievement (Duff, Tomblin, & Catts, 2015). Simply, intervening early with effective instruction can set students on the right track for reading success (Joseph, 2008).

Given the implications of the connection between early literacy and language experiences and the classroom, building the capacity of home literacy environments through collaboration is
an important aim for educators. Some parents may seem reluctant to engage in literacy practices at home for a variety of reasons, including a lack of background knowledge, insufficient self-efficacy, or cultural beliefs about education (Rodriguez-Brown, 2010). However, there is a strong rationale for family interventions, as parents are key stakeholders in their children’s educational outcomes (Christenson, 2003). Training can increase parents’ knowledge of best instructional practices (Erion, 2006), and using parents as interventionists is cost-effective, convenient, responsive, and efficient (Barnett, Escobar, & Ravsten, 1988). Furthermore, increasing the amount and quality of home literacy practices may also increase practice opportunities, particularly for students who require an increased number of trials to achieve mastery (Wanzek, Roberts, & Al Otaiba, 2014); it may improve the alignment of home and school contexts for students who struggle to generalize newly acquired skills (Senechal, 2006); and it may increase student motivation for reading through the provision of positive contingencies and appropriate models (Wilkins & Terlinksy, 2014).

**Home-School Partnerships for Building Early Literacy Skills**

The support for family literacy intervention comes from a demonstrated effect of home literacy practices on subsequent literacy achievement in school (Sheridan et al., 2011; Sim & Berthelsen, 2014; Snow, Burns, & Griffin, 2008). Parents serve as a child’s first teachers and the home is the context in which oral language develops and written language (print) is first experienced (Purcell-Gates, 2000). This makes the parent-child relationship a natural context for the extension of language-based skills into the development of early literacy skills (Sloat, Letourneau, Joschko, Schryer, & Colpitts, 2015).

In a 5-year longitudinal study, Senechal & LeFevre (2002) demonstrated how the home literacy environment is related to language, literacy skills, and reading achievement. They found
that the amount of exposure to books in early childhood was related to vocabulary and listening comprehension skills, which were directly related to reading in 3rd grade. Likewise, home experiences that involved teaching children about reading and writing words were also related to the development of early literacy skills, and predicted word reading at the end of 1st and 3rd grades. The findings of this study are consistent with the view that various types of early experiences of reading, whether shared storybook reading or direct instruction in specific skills, are the foundation of fluent reading (Steiner, 2014). It is this approach to emergent literacy that characterizes family literacy intervention as a preventative approach.

An important implication of this line of research is that risk for reading failure can be remediated through the improvement of home literacy practices (Jordan, Snow, & Porche, 2000; Pemberton & Miller, 2015), which provides the rationale for utilizing home environments with a more intensive focus as a context for remediating risk. The research in this area covers several different approaches, including communication between school and home, parental involvement programs and follow-up strategies to consultation, as well as parent training in specific literacy activities (Purcell-Gates, 2000). Because successful family literacy programs are tailored to the needs of the populations that they serve, an evaluation of best practice in supporting effective literacy instruction in the home can also prove to be quite complex (Snow, Burns, & Griffin, 2008).

In general, research on family literacy interventions indicates that parents can help improve reading outcomes for their children (Mol, Bus, DeJong, & Smeets, 2008; Senechal & Young, 2008; Van Steensel, McElvany, Kurvers, & Herppich, 2011;). The extent to which these activities are carried out as intended by the program developers, however, is an important consideration both in interpreting the effectiveness of home-based literacy instruction research
and in ensuring the impact of a proven program. Accordingly, before an evaluation of a family literacy intervention can be conducted, it is important to understand the factors which lead to successful implementation.

**Factors Influencing Implementation**

In evaluating the necessary supports for parental engagement, evidence-based intervention programs can only be proven effective when they are implemented as intended. One method of supporting accurate implementation efforts is through consultation with interventionists. School-based consultation is an indirect service-delivery model in which the consultee is primarily responsible for intervention implementation. Direct training of consultees to carry out recommended interventions has been shown to have a positive impact on both intervention implementation and student outcomes (Sterling-Turner, Watson, & Moore, 2002). For this reason, research regarding follow-up strategies to consultation has examined the best methods for supporting accurate and sustained implementation. Accurate implementation is often referred to as “treatment integrity,” “fidelity,” or “adherence” and it represents the extent to which the intervention is carried out as intended (Yeaton & Sechrest, 1981). In general, several factors can affect treatment integrity, or intervention adherence, including the complexity, acceptability, and perceived effectiveness of the intervention, as well as the training of the interventionist and the severity of the problem situation (Gresham & Noell, 1993; Lilienfield, Ammirati & David, 2012).

Maintaining accurate intervention implementation depends in part on the amount and type of follow-up to training for interventionists (Codding, Livanis, Pace & Vaca, 2008; Reinke, Stormont, Herman & Newcomer, 2014). Performance feedback is a follow-up strategy to training for consultees or interventionists that involves ongoing contact with the consultant
regarding implementation efforts. It may involve daily or weekly observation of the intervention procedures and a performance-based evaluation of the critical steps necessary for accurate implementation. Follow-up meetings allow interventionists to work with consultants regarding new or unanticipated implementation problems, serve as a reminder of the intervention procedures, and provide an opportunity for consultants to praise accurate (or to correct inaccurate) implementation (Noell et al., 2000).

Performance feedback packages that include graphic presentation of information about teacher and student behavior, information about implementation errors, problem solving for future implementation, and praise for correct implementation have been shown to be more effective than other follow-up strategies in promoting intervention implementation in schools (Noell et al., 2005). In combination with performance feedback, negative reinforcement directed toward the interventionist has a demonstrated effect in increasing intervention adherence and on related student outcomes in schools (Coddling, et al., 2008; DiGennaro, Martens, & McIntyre, 2005). For example, when performance feedback is delivered contingent upon poor implementation of an intervention, teachers are more likely to maintain accurate implementation (Gilbertson, Witt, Singletary, & VanDerHeyden, 2007; Mortenson & Witt, 1998).

In application to parents as interventionists, competing contingencies for behaviors incompatible with accurate implementation may also play a role in poor intervention adherence (Witt & Martens, 1988). Research in behavioral parent training shows that parents who have an increased number of stressors (e.g., single parent or low-income households) are more likely to drop-out of training and less likely to sustain effective practices (Serketich & Dumas, 1996; Phillips & Lonigan, 2009). However, limited research has been conducted on performance feedback as a follow-up strategy to consultation with parents, particularly for academic skills,
like family literacy interventions. The research on the effect of reinforcement and performance feedback on implementation adherence is typically based on interventions that take place within the school setting. In building the capacity of home-school partnerships, it is necessary to understand if similar supports promote the implementation of family literacy programs and to understand the relation to student outcomes.

**Effective Early Literacy Intervention**

Another important consideration in evaluating literacy intervention is the pedagogy on which it is based and its incorporation of evidence-based practices. The National Reading Panel (NRP) was established by the National Institute of Child Health and Human Development (NICHD) at the National Institutes of Health to evaluate research on effective approaches to teach children to read. The report of the NRP (2000) outlines several areas that should be targeted for effective reading instruction, which include phonological awareness, phonics, fluency, vocabulary and comprehension. Alphabetics is comprised of phonological awareness and phonics. These are early literacy skills that are often the focus of effective instruction during Kindergarten and first grade. Phonological awareness involves an awareness of the sounds that make up words as a function of oral language. Phonics refer to the skills associated with linking sounds to the symbols that stand for them, such as letter-sound correspondence. The NRP findings strongly support explicitly and systematically teaching early readers to manipulate phonemes to improve reading and spelling skills. Additionally, these findings indicate that phonics instruction is beneficial for students from Kindergarten through 6th grade, especially for students who struggle with reading (NRP, 2000).

The findings of the National Reading Panel (2000) and the National Early Literacy Panel (2008) indicate that the combination of instruction in phonological awareness and phonics is in
fact an effective instructional strategy for improving students’ early literacy skills. In addition, while phonemic awareness alone is a strong predictor of later reading skills, explicit PA training that is paired with activities that teach about specific aspects of print have a greater effect (NELP, 2008).

Interventions that include direct, explicit instruction in alphabetics have been shown to improve early literacy skills and remediate risk for future reading failure (Kamps, Abbott, Greenwood, Wills, Veerkamp, Kaufman, 2008; Rafdal, McMaster, McConnell, Fuchs, & Fuchs, 2011). Additionally, interventions that include components of peer tutoring or peer mediation have also been found to be effective practices that are promoted in schools (e.g., Maheady, 2006). Several intervention programs used in the school setting incorporate these elements of effective instruction. Peer-Assisted Learning Strategies (PALS; Fuchs, Fuchs, & McMasters, 2015) is one such intervention that has demonstrated effectiveness across a variety of student populations (Institute of Educational Sciences, 2012). Interventions are deemed as evidence-based when there is a body of research for methodological rigor and significance of outcomes, and PALS meets these criteria as a classroom-based, teacher-led intervention package that includes class-wide peer tutoring. The intervention has been found to be effective in schools with large percentages of minority and economically disadvantaged children, as well as in schools with middle-class populations (Fuchs et al., 2001), and for students who are low-, average-, or high-performing and those who have disabilities (McMaster, Fuchs & Fuchs, 2007), those who have behavior problems (Locke & Fuchs, 1995) and those who are English language learners (Calhoon et al., 2006). Recent research has examined customization of peer-mediated strategies to support accurate implementation; however, there has not yet been an application of this type of skill-specific intervention to family literacy practices within the home context.
Family Literacy Intervention

Reading research reveals that the quality of home literacy environments accounts for differences in children’s literacy skills (Duff, Tomblin & Catts, 2015; Durkin, 1982; Purcell-Gates, 2000; Sulzby and Teale, 1987). This has led to the increased adoption of family literacy programs to foster early learning, and to an increase in engagement in literacy activities for those involved in such programs (e.g., Chao, Mattocks, Birden & Manario-Leggett, 2015). The findings of the National Early Literacy Panel (2008) indicated a moderate to large effect of home programs on oral language outcomes and general cognitive abilities; however, the current literature base does not offer enough conclusive information about the types of activities that are most effective in remediating risk specific to early literacy outcomes (Purcell-Gates, 2000; Erion, 2006). There is some evidence to support that utilizing parents as tutors in early literacy activities is more effective for improving reading acquisition than having parents just read to their children or listen to their children read (Senechal & Young, 2008). However, more information is needed about how interventions are implemented in the home, how consultation can affect existing family literacy practices, and how to train parents to implement and sustain change in these practices.

A review of research on family literacy programs found a small but significant effect of family literacy programs on general literacy ability, which was assumed by the authors to be moderated by implementation quality (Van Steensel, McElvany, Kurvers & Herppich, 2011). In fact, while 12 of the 30 studies included any measure of intervention adherence (possibly jeopardizing the authors’ conclusions), only one utilized systematic observation of parent-child activities. Such methodological weaknesses in the research on family literacy interventions are consistent with the findings of more general reviews of family interventions and preclude
researchers from making confident assertions about effectiveness (Carpenteiri, 2013; Christenson & Carlson, 2005; Erion, 2006; Fishel & Ramirez, 2005; Mattingly, Prislin, McKenzie, Rodriguez, & Kayzar, 2002).

Senecal & Young (2008) conducted a meta-analytic review of family literacy intervention studies in which they focused on parent-child reading activities in the home. Sixteen studies met the inclusion criteria for the study and were classified according to characteristics of the intervention (parents reading to children, parents listening to children read or parents tutoring with specific exercises), types of training activities, duration of interventions, and participant and study characteristics. Effect size was used as a common index of intervention efficacy across the studies and results showed that parent tutoring was the most effective way to improve reading outcomes for children. However, as a synthesis, this study does not offer further insight into the types of tutoring interventions that may yield the best results, nor conclusive findings about the most effective way to train parents as tutors.

Van Steensel et al. (2011) examined 30 family literacy effect studies between 1990-2010 including a broad range of literacy activities and outcome measures in two domains, defined as code- and comprehension-related effect measures. The findings differed from previous reviews by using these broader inclusion criteria and indicated only a small positive effect for family literacy programs in both domains, and as such, the high expectations of family literacy programs may not necessarily be justified. Calling upon the methodological weaknesses in the monitoring of intervention implementation by researchers, the authors concluded that more process-oriented research is needed to demonstrate how programs are actually carried out by families before conclusions can be made about their effectiveness.
In addition to process-oriented research, there is a gap in the family literacy research in regard to applying evidence-based intervention used in schools to the home setting. The majority of family literacy research to date has been focused on broad strategies for fostering emergent literacy, such as shared storybook, or dialogic, reading (Evans, Shaw & Bell, 2000; Purcell-Gates, 2000;). Finally, while shared storybook interventions tend to demonstrate the preventative approach of early intervention, they do not inform the practice of family intervention to remediate risk for students who have already fallen behind grade-level expectations.

Storch & Whitehurst (2001) have researched domains of early literacy relative to alphabets, as well as vocabulary and exposure to concepts through the use of home-based, family intervention. According to this work, family interventions that focus on shared storybook reading tend to address “outside in” skills associated with exposure to concepts and vocabulary; whereas, interventions that increase practice opportunities for early literacy skills and focus on the “inside out” skills of alphabets instruction may be more effective based on findings of the NRP, and potentially, better aligned with the instruction that takes place in schools. Evans, Shaw and Bell (2000) found that after controlling for participant differences like child age, parental education and initial ability, increased engagement in dialogic reading alone did not account for later improved reading outcomes. Nevertheless, only a few studies have focused on home-based tutoring of specific literacy skills using evidence-based intervention for students who are at-risk for reading failure. For example, of the 32 studies included in the National Early Literacy Panel (2008) meta-analysis of parent-led interventions, only three examined alphabetic knowledge or phonological awareness as keystone early literacy skills.

Increasingly, recent research has focused on the application of skill-specific, explicit instruction and intervention programs to the home context. For example, Flynn and colleagues
(2012) found a significant increase in overall achievement in reading and math for a group of academically at-risk foster children when their foster parents delivered an intervention program called Teach Your Children Well (Maloney, 1998), which was based on individualized, direct instruction tutoring. This study does not detail the specific curricular components included for reading instruction, but implementation was assessed indirectly through permanent product review of performance monitoring data. Intervention dose was selected as a key criterion in determining high fidelity; for example, foster families that participated in 25 or more weeks of intervention and included 60 or more lessons over the course of a school year were determined as accurate implementers. Approximately half of the participants received a categorically high level of implementation fidelity, but the outcome measures for this study were not interpreted relative to adherence.

Daly and Kupzyk (2012) examined the impact of an evidence-based parent-delivered reading intervention on the oral reading fluency of three third grade students who were reading below grade level expectations. The students were introduced to four different evidence-based intervention components (repeated reading, listening passage preview, phrase drill error correction and a flashcard procedure) and allowed to select which components would comprise parent tutoring sessions, given individual outcome data regarding effectiveness. Using an alternating treatment design, student choices of intervention components that were perceived as most effective were also evaluated to be positively associated with improved reading outcomes. By goal setting and providing tangible rewards for performance improvement, the researchers demonstrated the impact of motivational factors in parent tutoring intervention (e.g., choice as an antecedent intervention for adherence); however, implementation fidelity and social validity were not directly assessed.
A challenge of evaluating the effects of home-based literacy instruction is the documenting of intervention adherence. One study of a family literacy intervention program that did systematically measure parent-child reading interactions was conducted by McElvany & Artelt (2009). In this study, the Berlin Parent-Child Reading Program was developed to support home-based learning of reading comprehension strategies using parents as tutors. It consisted of 43 sessions conducted for 30 minutes, 3 times per week, with parents modeling and scaffolding guided reading aloud and comprehension strategies. The families received program materials and instruction booklets as a guide for implementation. McElvany & Artelt (2009) found that selective participation was low at 34% of recruited families, and only 13% of these families implemented the intervention as it was intended. In evaluating effectiveness using a pre-/post-test design, they also found no effect of the program on reading comprehension, but considerable effects on other outcome variables, like vocabulary. Furthermore, the families in the self-selected treatment group differed significantly from those in the control group in that they came from higher socio-economic backgrounds and that the children were more advanced in reading achievement prior to intervention.

Mitchell and Begeny (2014) evaluated the effects of a school-based intervention program, the Helping Early Literacy with Practice Strategies (HELPS) program when implemented by parents. Using a pre-test/post-test design, they examined the effect of the intervention program, which included several evidence-based strategies like repeated reading, modeling, phrase-drill error correction, verbal cueing, goal setting, performance feedback, and positive contingencies on several outcome measures of general reading ability. Implementation by parents was directly observed on four occasions at 2-3 week intervals with a checklist of intervention components, and intervention procedures were reported as acceptable to caregivers via self-report. While
these results demonstrate the potentially positive impact of evidence-based practice strategies to the home literacy context, no procedures were in place to evaluate ongoing implementation and maintenance of intervention effects on student reading or on parental use of these strategies.

In another application to early literacy instruction, McConnell & Kubina (2016) trained parents to implement a reading program called Teach Your Child to Read in 100 Easy Lessons (Englemann, Haddox, & Bruner, 1983), which included 30 scripted lessons focused on letter sounds and phonemic awareness skills. Parent-child dyads engaged in skills practice five nights per week for 15 minutes per session. Parents demonstrated accurate intervention implementation as measured by audiotaped recordings of each intervention session, and student progress monitoring data indicated an increase in accurate word reading over baseline levels. The authors demonstrated that explicit instruction delivered by parents improved early literacy skills for students, and the consistent, direct observation of procedural fidelity was a novel component of this study that provides validity in interpreting intervention effects on family literacy practices; however, no follow up procedures like performance feedback were employed to support accurate implementation.

These studies highlight some of the inherent difficulties in evaluating effectiveness of family literacy interventions. Research designs that only utilize pre- and post- test performance may easily skew or oversimplify the effects of a change in family literacy practices. The findings of these studies also highlight the need for a shift away from research questions that ask only the effect of family literacy programs to research questions that evaluate their value (Hannon, 1989; Carpentieri, 2013). Alternative approaches to evaluating family literacy programs include considering the circumstances that contribute to selective participation (or drop-out) and accurate implementation, as well as parent and teacher views (Hannon, 1989). Through the home-based
application of evidence-based interventions for students at risk for reading failure, several factors of supporting implementation adherence can be addressed in a manner that is consistent with, but supplemental to school-based service delivery. Accordingly, the value of family literacy interventions could be assessed through a systematic evaluation of the necessary supports for promoting high-quality home literacy practices that lead to fluent reading.

**Current study**

The current study examined the effect of performance feedback in promoting intervention adherence for an evidence-based literacy intervention managed by parents. It expands the research on increasing family literacy intervention implementation by applying performance feedback as a follow-up strategy for parents. To date, research on performance feedback in promoting implementation adherence of literacy interventions has been limited to the school setting. The current study extends the research in this area by using early literacy progress monitoring measures as outcomes of skills-based literacy activities, as well as repeated measurement of implementation to determine the extent to which an evidence-based program is implemented as intended at home. The purpose of the study is to examine the effect ongoing and structured consultant contact has on the behavior of parents as interventionists and, in turn, if accurate implementation has a positive effect on student early literacy skills. Accordingly, the findings of this study will contribute to the literature related to effective family interventions in providing reading instruction to those students categorized as at-risk for reading failure.

Specifically, the study addresses the following research questions:

1. Does implementation of evidence-based reading instruction at home improve student early literacy skills?
2. Does performance feedback increase caregiver implementation of skill-specific literacy activities at home?

Method

Participants, Roles and Setting

The participants in this study included 4 student and caregiver dyads from a suburban Midwestern elementary school. The school served approximately 600 students in preschool through sixth grade, with the following demographics: 86% White, 5% Multiracial, 4% Hispanic, 2% African American, 2% Asian, 2% limited English proficiency, 8% students with disabilities, and 12% economically disadvantaged. The classroom teachers of the student participants did not employ a single reading curriculum, rather they followed a district-adopted literacy framework for instructional techniques that included the Guided Reading model. Students frequently engaged in repeated reading of leveled texts at individualized instructional levels, in addition to instruction in comprehension strategies, as the primary literacy activities at school. An average of 89% of first grade students were classified as “on-track” based on the previous three years’ state reading diagnostic test results.

All student participants were in first grade between 6 and 7 years of age, and were not identified as English Language Learners or as being students with any disability. Three of the four students were Caucasian and one was Asian; one student had been diagnosed with Sensory Processing Disorder; and one student was categorized as being economically disadvantaged. Each caregiver participant reported concerns with inattentiveness and/or hyperactivity for their respective child; however, no student participant had a medical diagnosis of Attention Deficit-Hyperactivity Disorder. All students had previously attended a half-day Kindergarten program at the same school and had received small group reading intervention during Kindergarten due to
at-risk early literacy scores. This intervention was teacher-designed and included activities involving letter naming and repeated reading of patterned texts. Caregiver participants included three mothers and one grandmother, and all were the primary custodial guardian. All caregiver participants reported during initial training that the only literacy practice at home was shared storybook reading, using leveled texts sent home by classroom teachers.

Families were recruited by teacher referral, following universal screening measures of early literacy skills. The following selection criteria were used in determining eligibility for participation: (1) each student had to be enrolled in a kindergarten or first grade class; (2) each student must have been identified as at-risk for reading failure based on universal screening scores that fell within a risk category; (3) caregivers must have demonstrated participation in the school community through attendance at orientation activities and/or responses to school communications; (4) caregivers must have agreed to be available for home tutoring at least 3 times per week. Students who were involved in other targeted, school-based literacy interventions were excluded from the study to minimize confounding factors.

Caregiver participants served as tutors in early literacy skills for their respective child participants. They received training in the intervention curriculum from the primary researcher, who was also the building’s school psychologist. The primary researcher consulted with parents and the students’ classroom teachers on appropriate intervention targets and collected data on student progress in early literacy skills. In addition, the students’ classroom teachers served as liaisons in communicating with caregivers and receiving research materials from home. Graduate students in school psychology served as data collectors and were trained to at least a 90% reliability criterion for measurement of dependent and independent variables.
The intervention sessions were implemented in the homes of the caregiver-student dyads. Intervention materials were provided to parents for use in the home. All consultation meetings, training sessions, and assessment of student early literacy skills took place in the students’ school building; however, follow-up strategies to support implementation were communicated in a variety of ways, based on family preference and feasibility and included meetings at school, phone calls, letters sent home, and emails.

Materials

Caregiver participants were provided with intervention materials and a digital recording device. They were trained to implement an evidence-based intervention called Peer-Assisted Learning Strategies (PALS; Fuchs, Fuchs & McMasters, 2015). The following aspects of implementation adherence were considered in intervention selection: perceived effectiveness, feasibility and acceptability of intervention procedures, and caregiver background knowledge. The PALS intervention was selected for use based on its alignment with the findings of the NRP and NELP and its demonstrated effectiveness across a variety of student populations. Because it is designed as a classroom-based, teacher-led intervention package that includes class-wide peer tutoring, the lessons are structured, systematic, repetitive, easy to implement, and most importantly in the current application, do not rely on background knowledge in “coaching” early literacy skills. The lessons include direct instruction in a combination of the skills comprising alphabets and reading fluency, with an emphasis on increasing practice opportunities and a standardized method for delivering corrective feedback and praise. The intervention includes activities that address phonological awareness, decoding and word recognition through explicit instruction. Students were also provided with tangible rewards that included items like pencils, stickers, crayons, markers and small toys.
Experimental Design

Intervention effects were evaluated using a multiple baseline across participants design, in which two or more baselines were concurrently established and the independent variable was sequentially introduced across participant dyads. This design was advantageous to the current study dealing with students at-risk for reading failure in that it allows for the evidence-based intervention to remain in place, without removing or reversing the effects of its introduction (Kennedy, 2005).

Participants were exposed to four phases: baseline, training, intervention implementation with performance feedback, and a maintenance phase. Across phases, data were collected from student early literacy assessments. Caregiver performance implementing the intervention package was assessed during the intervention phases. Introduction of the research phases was accomplished after establishing baseline in a lagged fashion so that comparisons could be made within the same data series (baseline-treatment per student) and at the point of implementation for each student. These lags provide evidence that any changes are attributable to treatment and not to other variables (Kennedy, 2005). Furthermore, participants were grouped based on classroom teacher to limit confounding variables of classroom instruction due to differences within series. The introduction of the intervention condition was based on visual analysis of a stable low or decreasing trend in student literacy skills. The withdrawal of performance feedback components characteristic of the maintenance phase occurred only upon the analysis of consistent and high quality implementation of intervention procedures.

Dependent Variables

Literacy measures. For student participants, the targeted literacy skills for intervention include alphabetics and fluency, and accordingly, assessment measures were aligned to
demonstrate the effect of intervention on phonological awareness, phonics and oral reading fluency. Because all student participants met the inclusion criteria due to at-risk scores on curriculum-based measures of early literacy skills, these measures were also used to assess targeted literacy skills for ongoing progress monitoring and decision-making purposes, based on their demonstrated reliability and validity for such purposes (Goffreda & DiPierna, 2010).

For first grade students, risk indication at the fall benchmark period was derived from measures of Letter Word Sound Fluency (LWSF) and Oral Reading Fluency (ORF) as assessed by AimswebPlus curriculum-based assessments (NCS Pearson, Inc, 2015). As a universal screening practice, all students were assessed in these measures during the fall benchmark period. First grade students whose scores fell below 27 words correct per minute for ORF in the fall were categorized as at-risk for reading failure, indicating the necessity for intervention and eligibility for participation in the proposed study. As a school-based practice, the students’ progress in early literacy skills was assessed approximately every week using the designated subtest(s) for which the student was referred for intervention. For first grade students, risk indication at the winter benchmark period is derived from only an assessment of Oral Reading Fluency. For the present study, ORF was primarily used as the most robust outcome measure and for its consistent use at fall and winter benchmark periods in first grade.

The oral reading fluency task involves the student reading a grade level passage aloud for one minute. The number of words read correctly is scored, as is the number of errors, as a general outcome measure of reading ability. The AimswebPlus oral reading fluency progress monitoring probes have strong alternate-form reliability (range: 0.96-0.97; NCS Pearson, Inc., 2015) and have been shown to be adequately correlated with the Iowa Test of Basic Skills ($r = 0.72$; NCS Pearson, Inc, 2015).
**Implementation adherence.** Adherence is defined as the degree to which the intervention sessions are implemented as intended by program developers (Yeaton & Sechrest, 1981). Audio recordings of each PALS session were reviewed weekly and assessed according to a procedural checklist of the essential intervention components (see Appendix A). This checklist specific to the PALS/K-PALS program was adapted from the work of Stein, Berends, Fuchs, McMaster, Saenz, Yen, Fuchs, & Compton (2008), and includes the standardized prompts and correction procedures of the intervention. Implementation adherence was calculated as the number of steps observed divided by the total number of steps necessary to the accurate implementation of the intervention. The number of steps necessary for accurate implementation varied as a function of the interaction between dyads. For example, if the student did not make an error, the caregiver would not employ the error correction procedure, and therefore it would be scored as a “not applicable” step in the intervention procedures. Any necessary but omitted intervention steps were scored as incorrect. The number and duration of intervention sessions was also monitored. If recordings were not submitted, it was assumed that the intervention did not occur and the omitted sessions were scored as 0% adherence.

**Reliability of Measurement**

The reliability of measurement for both student literacy measures and implementation adherence was assessed to ensure technical adequacy. Inter-observer agreement (IOA) was assessed by independent observers and calculated for 20% of measurements, across participants. IOA was calculated as the total number of agreements divided by the total agreements and disagreements, multiplied by 100 percent. IOA between raters was 100% for oral reading fluency and averaged 94% agreement for adherence.
Procedures

**Baseline.** Following participant recruitment and consenting activities, student participants were assessed weekly using curriculum-based progress monitoring measures to the extent that the students were determined to be at-risk based on referral fall benchmark scores. For example, if the student was determined to be at-risk based on LWSF scores that fell within a risk category, scores on this measure were used in progress monitoring and goal setting, but not previous measures for which goals had been met. This reflects best practice in progress monitoring and data-based decision making, and follows the natural progression of early literacy skills that would be expected to develop. Finally, during this phase, students continued with regular core instruction with no additional intervention support.

**Consultation and training.** The primary researcher consulted with caregiver participants given student baseline data about appropriate targets for individualized intervention. Based on problem identification and analysis conducted per the problem-solving process of behavioral consultation, lessons from the PALS curriculum were selected that appropriately targeted the deficit skills. During an approximately one-hour session, each caregiver participant received training in curriculum implementation, as well as in the recording of intervention sessions using a digital voice recorder. Training in the curriculum included an initial introduction to the skills involved in reading (e.g., phonological awareness, phonics, fluency) and instruction on how to encourage good reading habits and establish an appropriate home environment for the intervention sessions. Next, caregiver participants learned about the PALS procedures, including those for prompting, error correction, and feedback. The primary researcher provided models, practice, and feedback in all components of the intervention. The training also included a discussion of the study procedures, including review of the performance feedback model and
how to interpret graphed progress monitoring data, to build parental skills in both instructional practices and in evaluating intervention effects.

**Intervention implementation.** During this phase, caregivers were provided with PALS intervention materials (see Appendix B for sample lesson) and instructed to carry out the intervention at home three times per week, in addition to their existing literacy practices, for a total of 20 minutes each session, to provide weekly documentation or performance tracking, and to audiotape sessions. Performance tracking included contacting a designated research team member to communicate about the completion of intervention sessions, which included a permanent product (see Appendix C), email or face-to-face communication, and to arrange for exchange of the digital voice recorder. Audio recordings were reviewed by the research team members and scored for accurate implementation using the implementation adherence checklist. The research team members then provided weekly follow-up using a performance feedback model that included graphic presentation of information about the caregiver and student target variables, information about implementation errors, problem solving for future implementation, and praise for correct implementation (see Appendix D). The research team provided this performance feedback to caregivers either in person, over the phone or via email with written and graphic information about the target variables.

Student participants continued to be assessed weekly in ORF during the intervention phase and their progress was monitored by the research team members. These assessments took place individually at the school setting. Weekly, student participants also received a small prize from a selection of rewards (e.g., pencils, erasers, stickers, etc.) for (a) returning intervention materials to school (b) participating in assessment and/or (c) meeting end of year goals.

**Maintenance.** When intervention implementation data (as measured by the adherence
checklist) showed a stable and high level of accurate implementation, only the performance feedback components of the intervention phase were withdrawn. Weekly performance tracking and the review of audio recordings continued in order to monitor implementation adherence. In addition, student literacy skills also continued to be assessed during this phase.

**Procedural Adherence**

Procedural adherence of the performance feedback model was assessed for at least 25% of sessions by review of permanent product with a procedural checklist of the essential features of the model (see Appendix E). The frequency and accuracy of experimenter use of performance feedback represented the percentage of the essential features of the performance feedback script completed (i.e., the number of procedural steps completed out of the total number of procedures essential). It was calculated as the number of steps observed divided by the total number of steps, multiplied by 100. The performance feedback script was used with 95.71% procedural adherence, with the most common missing step being the provision of graphic feedback. On 6 separate occasions across participants, no new literacy data was available for reporting at the time of the weekly feedback.

**Social Validity**

Social validity was informally addressed throughout the study through ongoing contact between consultants and caregivers and discussions about the intervention components. Social validity was also assessed at the end of the study through the use of a questionnaire filled out by caregiver participants regarding acceptability of intervention procedures, contact with consultants, as well as perceived efficacy and satisfaction with outcomes.

**Data Analysis**

The data were evaluated through visual analysis by examining within-phase metrics of
trend, level and variability, as well as between-phase metrics of immediacy and overlap. Rate of improvement in oral reading fluency was also calculated for each student using linear least square estimation, providing an indication of average gains that could be compared to national student growth norms for similarly low-performing peers (based on initial score). Finally, effect sizes were also estimated using the Nonoverlap of All Pairs (NAP) statistic (Parker & Vannest, 2009; Vannest, Parker, & Gonen, 2011). NAP is used in single-case research designs to evaluate the overlap between baseline and treatment phases, and effect sizes between 0-0.65 can be interpreted as weak effects, 0.66-0.92 as medium effects and 0.93-1.0 as strong effects (Parker & Vannest, 2009).

**Results**

The current study examined the effect of performance feedback on the implementation adherence of an evidence-based early literacy intervention managed by caregivers, as well as the related early literacy outcomes of their children. The research design allowed for the replication and validation of intervention effects, which are interpreted through visual analysis in Figure 1. Overall, results indicate that brief, consistent and accurate implementation of skill-specific early literacy activities at home improved oral reading fluency for first grade students who were initially classified as at-risk for reading failure. Performance feedback improved procedural adherence and fluency, but consistent implementation was variable across dyads. Social validity data revealed acceptability and perceived efficacy of intervention procedures. Summary statistics for each target variable across phases are displayed in Table 1 and Table 2 provides additional information regarding the occurrence and adherence to intervention procedures.

Figure 1 shows the outcome data for the four dyads across baseline, intervention and maintenance phases for literacy measures and intervention adherence. Across the first two dyads,
an immediate increase in oral reading fluency and intervention adherence was observed upon training and implementation. A replication of intervention effects was observed for adherence and oral reading fluency, although to a lesser degree for the subsequent dyads. The staggered introduction of training and intervention procedures, indicate that these changes in performance were more likely due to implementation of the intervention procedures than external events.

**Dyad 1**

For the first dyad, a mother-daughter pair, baseline ORF scores were stable and low \((M = 5.66; SD = 2.00; \text{Table 1})\) with a high error rate. Upon training and intervention implementation, an immediate increase in the number of words read correctly was observed for the student participant \((M = 28.44; SD = 13.09)\), with a low and decreasing error rate \((M = 2.89; SD = 2.14)\). Percent of adherence to the intervention procedures was observed to be high and stable \((M = 95.30; SD = 6.11)\) during this phase, so the performance feedback condition was discontinued after 7 weeks. Rate of improvement during the intervention phase was 0.38 words per week (Table 2). The maintenance phase was characterized by continued a continued high level of accurate and consistent implementation \((M = 97.66)\). Additionally, the student’s oral reading fluency continued to consistently increase over baseline and intervention levels at a rate of improvement of 2.20 words per week with a stable, low error rate. NAP was calculated as 1.00, indicating a strong effect size.

The first student’s initial fall benchmark score in oral reading fluency was 5 words correct per minute, which fell in the 2\(^{nd}\) percentile, compared to a national sample of first grade students, and was categorized as “well below average.” Following the family literacy intervention, the student’s score was 42 words correct per minute, which corresponded to the 36\(^{th}\) percentile, nationally and within the average range. The rate of improvement (ROI) from fall to
winter benchmark was 2.18 words correct per week, which exceeded the national average ROI (0.70 words per week) and corresponded to 95th percentile growth when compared to similarly low-performing peers.

**Dyad 2**

The baseline data for the second dyad, a mother-son pair, also show stable and low oral reading fluency with a high error rate \((M = 7.00; SD = 2.00; \text{Table 1})\). Upon training and intervention implementation, the number of words read correctly by the student was observed to increase at a steady rate over baseline levels \((M = 28.80; SD = 12)\), with a low and decreasing error rate \((M = 3.80; SD = 2.04)\). Percent of adherence to the intervention procedures was observed to be high but also variable depending on student behavior during sessions \((M = 88.50; SD = 12.79)\), so the performance feedback condition remained in place for 10 weeks. The rate of improvement during the intervention phase was 0.34 words correct per week (Table 2). During the maintenance phase the direct observation of adherence was discontinued, but student progress continued to be monitored and revealed a continued increase over baseline and intervention levels at a rate of 4.67 words per week with a low and decreased error rate. \(NAP\) was calculated as 0.98, indicating a strong effect size.

In the second dyad, the student’s initial fall benchmark score in oral reading fluency was 6 words correct per minute, which fell in the 4th percentile, compared to a national sample of first grade students, and was categorized as “well below average.” Following the family literacy intervention, the student’s score was 42 words correct per minute, which corresponded to the 36th percentile, nationally and within the average range. The rate of improvement (ROI) from fall to winter benchmark for this student was 2.12 words correct per week, which exceeded the national
average ROI (0.70 words per week) and corresponded to 95th percentile growth when compared to similarly low-performing peers.

**Dyad 3**

Intervention data for the third dyad, a grandmother-granddaughter pair, show stable and low baseline ORF scores ($M = 7.00; SD = 1.00$; Table 1) with a high error rate ($M = 9.00; SD = 2.00$). Upon training and intervention implementation, the number of words read correctly by the student remained steady and low with a minimal increase over baseline levels ($M = 13.63; SD = 1.93$), and a decreased error rate ($M = 4.13; SD = 2.29$). Percent of adherence to the intervention procedures was observed to be highly variable and inconsistent ($M = 54.57; SD = 39.68$), so the performance feedback condition remained in place for all 7 weeks of intervention implementation. The rate of improvement in oral reading fluency was 0.02 words per week during the intervention phase (Table 2). During the maintenance phase the direct observation of adherence was discontinued, but student progress continued to be monitored and revealed a continued increase over baseline and intervention levels with a low and decreased error rate. 

*$NAP*$ was calculated as 1.00, indicating a strong effect size.

For the third dyad, the student’s initial fall benchmark score in oral reading fluency was 6 words correct per minute, which fell in the 4th percentile, compared to a national sample of first grade students, and was categorized as “well below average.” Following the family literacy intervention, the student’s score was 12 words correct per minute at the winter benchmark assessment, which corresponded to the 2nd percentile nationally, remaining in the “well below average” range. The rate of improvement (ROI) from fall to winter benchmark for this student was 0.35 words correct per week, below the national average ROI (0.70 words per week),
representing 15\textsuperscript{th} percentile growth when compared to similarly low-performing peers. The student was referred for school-based intervention at this point.

**Dyad 4**

Data for the fourth dyad, a mother-daughter pair show stable and low baseline ORF scores ($M = 3.00; SD = 2.00$; Table 1) with a high error rate ($M = 8.00; SD = 3.00$). The number of words read correctly by the student increased over baseline levels ($M = 18.85; SD = 5.30$), but the overall error rate remained high ($M = 8.85; SD = 5.72$). Percent of adherence to the intervention procedures was observed to be variable and inconsistent ($M = 55.60; SD = 33.74$), so the performance feedback condition remained in place for 5 weeks of intervention implementation. The rate of improvement in oral reading fluency during the intervention phase was 0.05 words per week (Table 2). During the maintenance phase the direct observation of adherence was discontinued, but student progress continued to be monitored and revealed a continued increase over baseline levels but with a decreasing trend with a low and decreased error rate. *NAP* was calculated as 1.00, indicating a strong effect size.

The fourth student’s initial fall benchmark score in oral reading fluency was 0 words correct per minute, which fell in the 1st percentile, compared to a national sample of first grade students, and was categorized as “well below average.” Following the family literacy intervention, the student’s score was 28 words correct per minute at the winter benchmark assessment, which corresponded to the 18\textsuperscript{th} percentile nationally, in the “below average” range. The rate of improvement (ROI) from fall to winter benchmark for this student was 1.65 words correct per week, exceeding the national average ROI (0.70 words per week) and representing 95\textsuperscript{th} percentile growth when compared to similarly low-performing peers.
Social validity

Table 3 shows the responses to the social validity questionnaire. For each statement, raters indicated their agreement on a scale of 1-5 (with respective response anchors of strongly disagree, disagree, not sure, agree and strongly agree), with a higher number representing a higher level of agreement with the statement. For statements of intervention acceptability, the average rating was 4.33. For statements about intervention use, the average rating was 4.22. When asked if the intervention procedures resulted in a change in behavior, the average rating was 3.67, and when asked if the intervention components were beneficial the average rating was 4.50. The components noted as most beneficial about the intervention procedures by parents were repetition and explicit instruction in “sounding out” words.

Discussion

The results of this study indicate that brief, consistent and accurate implementation of evidence-based, skill-specific early literacy activities at home improved oral reading fluency for first grade students who were initially classified as at-risk for reading failure. These findings are consistent with previous research that indicated parents can implement intervention procedures that have a positive impact on student outcomes, but that intervention effects are potentially moderated by implementation quality (Van Steensel et al., 2011). This effect was replicated across dyads in that those with higher and more consistent implementation adherence also had corresponding, elevated oral reading fluency scores.

The implementation of skill-specific literacy activities represented a change in family literacy practices for all four participant dyads, who had previously engaged in only shared storybook reading at home. The improvement in oral reading fluency over baseline levels observed across dyads offers evidence that is consistent with previous research that parents may
be more effective in tutoring with specific skills than in only listening to their children read aloud (Senechal & Young, 2008). These findings are also consistent with the view that increased exposure alone may account for the increase in reading skills. However, if increased engagement were the extent of necessary changes to family literacy practices, differential outcomes would be seen as a function of time, independent of program features or implementation quality.

In this way, these results are consistent with the research on intervention acceptability in overcoming barriers to parental involvement (Walker et al., 2000). Understanding the four interrelated components impacting intervention adherence as acceptability, use, integrity and effectiveness (Witt & Elliot, 1985), provide a context for interpreting social validity data and the necessity of supports for parental involvement. The intervention procedures were perceived as acceptable (i.e., easy to follow, satisfactory, enjoyable) per the social validity questionnaire results. Mixed results were obtained in the area of “use” (i.e., easy to include in daily routine, willing to use in the future, and targeting important skills), and adherence was most frequently low due to missed sessions rather than inaccurate implementation, which is consistent with the literature on barriers to parental involvement programs. Parental factors that contribute to lower engagement (or use) have been shown to be due to external factors, like an increased number of stressors (e.g., lower socioeconomic status, single parent households, higher ratings of depressive symptoms, conflicting work schedules, transportation issues). An additional consideration in interpreting parental use of intervention components is self-efficacy and several studies have shown that parents can overcome these constraints and effectively implement interventions, particularly when there is a perceived need based on the severity of the problem situation.

For the purposes of the present study, integrity and effectiveness were directly measured and interpreted, but the social validity questionnaire also indicated that caregivers demonstrated
behavior changes by incorporating learned strategies into literacy practices, and that they were accurate in their self-report that indicated a lower average rating for integrity than other components of social validity. Overall, caregiver ratings indicated that they perceived the intervention as beneficial to their children. In analyzing student outcomes, the implementation of skill-specific literacy practices at home resulted in above 95th percentile growth for three of the four participants. The impact of perceived efficacy also has been shown to have an impact on intervention acceptability (Witt & Elliot, 1985).

In light of the research on barriers to parental involvement, these results highlight the advantage of single-case design in evaluating the effect of necessary follow up strategies to support accurate implementation. That is, a change in behavior can be observed upon a change in environmental factors (phase change) and any relative changes in performance can be observed within subjects rather than across potentially incongruent groups, due to drop-out or selective participation. Furthermore, the replications across dyads provide validation that the change in behavior was due to the specific follow-up strategies applied in supporting parental involvement.

While the combination of parent training and performance feedback resulted in high, accurate and consistent implementation for the first two dyads, implementation was less consistent for the subsequent dyads. Recent research on parental implementation of skill specific intervention (e.g., McConnell & Kubina, 2016), indicates that training alone may be sufficient to establish accurate implementation of the intervention procedures. In the present study, implementation data support that parents were able to demonstrate a high level of adherence, and that adherence was most frequently low due to omitted sessions rather than incorrect procedures. Additionally, common initial errors in implementation were observed across dyads indicating
that the addition of performance feedback was a beneficial added intervention component for supporting accurate and sustained implementation.

**Limitations and Directions for Future Research**

While the present study expands the current research on family literacy practices through direct measurement of implementation factors, it does not allow for an analysis of those that contributed to selective participation, which is an important aspect of the generalizability of family literacy interventions. In answering the call for more process-oriented research in family literacy intervention, future research could focus on incorporating the following aspects: baseline-only or training-only comparisons, component analyses of training and performance feedback conditions, curricular alignment, and family-oriented intervention components (feasible, effective, efficient, flexible).

With more baseline data and more participants, the current results could be interpreted with a greater level of confidence. If replicated, adding a comparison condition for families who present with similar needs (i.e., students at-risk for reading failure) but who do not wish to participate in the intervention would allow for a deeper analysis of intervention effects and selective participation. Similarly, adding an initial training-only phase would allow for interpretation about the subsequently added component of performance feedback in supporting parental involvement and implementation adherence. Measurement of the adherence could also focus on utilizing multiple methods for documenting with increased rigor based on at-risk status and need (Barnett, Hawkins, & Lentz, 2011).

In understanding curricular alignment, the results of this study present a challenge, as the core curriculum did not emphasize a skill-specific approach, and all four caregivers reported dialogic reading as the primary literacy practice. The incorporation of skill-specific practices
with PALS was a novel addition to existing family literacy practices, which is better aligned with evidence-based early literacy instruction. There is some evidence to suggest that not only when background knowledge is increased (Noell & Gansel, 2006), but also when parents feel that education is primarily their responsibility (Rodriguez-Brown, 2010; Wilkins & Terliksky, 2014), that implementation and student outcomes are improved. These aspects in addition to curricular alignment would represent an important consideration (and potential confound) to address in future research about supporting implementation adherence that were beyond the scope of the present study.

Furthermore, there is a need for incorporating intervention components that are perceived as enjoyable and not punishing, while still being aligned with effective reading instruction in building the capacity of home-school partnerships. Using parents as tutors shifts the dynamic of reciprocity inherent to peer-mediated intervention in a way that is potentially threatening to motivational factors. Incorporation of reciprocity, as well as choice and incentive (Daly & Kupzyk, 2012; Dart, Cook, Collins, Gresham & Chenier, 2012), and the use of technology (e.g., DuBois, et al., 2016) are all important future directions that not only increase motivation, but also support accurate implementation. Additionally, a standardized measurement tool of home literacy environments (e.g., Nueman, Dwyer & Koh, 2007) would also strengthen conclusions about the types of family literacy practices that are adopted, maintained and perceived favorably.

Finally, future research could address the gap in the literature about the application of performance feedback to family intervention. While there is evidence for the efficacy of the five components of the performance feedback model used within schools, consultant contact primarily functioned as negative reinforcement for poor adherence. If combined with low-preference activities, the application of this model to family literacy practices may in fact be
more punishing than supportive to parental involvement. Taken a step further, this also highlights the need for future research to address barriers to implementation not only for those parents who lack adequate background knowledge of effective instructional practices, but for those who may be marginalized due to their own poor experiences with educational institutions, or due to factors like illiteracy or limited English proficiency.

**Implications for Practice**

The results of this study are consistent with existing research on family literacy practices and offer some additional information about the type of follow-up strategies that support parental involvement in application to school-based practices that build home capacity. Increased contact with school personnel about student progress was perceived as a positive aspect of the performance feedback model, particularly with graphic presentation of results. Increasing the amount and frequency of data reported to parents, especially for students who struggle to learn to read, provides the rationale for the need for intervention, which in turn has been shown to improve accountability and implementation. Furthermore, building parental investment in student outcomes through progress monitoring data simultaneously builds the home-school partnership in which the parent may become better connected to the school, and the consultative relationship is reframed as coaching for continued and collaborative skill development.

The provision of performance feedback within the school-home partnership was also perceived as feasible and acceptable to caregivers. Direct observation or audio recording of sessions allowed flexibility for caregivers in the logistical aspects of implementation that often serve as barriers to implementation, while ensuring the methodological rigor necessary to evaluate intervention effects. The process of recording intervention sessions alone may also have served as a reminder that increased accountability of completing sessions, as well as the accurate
implementation steps. Finally, providing intervention materials and incentives for completion were also simple measures that were shown to address the practical barriers to implementation.

In conclusion, the present study contributed to the current literature around parental involvement by introducing the components of performance feedback and ongoing consultant contact as feasible and acceptable follow up strategies to support implementation of evidence-based family literacy practices that may be applied to a broader use within schools. In building the capacity of home supports, school personnel may play an important role in facilitating positive changes to family literacy practices that occasion improved reading outcomes.
References


doi:10.3109/01460862.2014.983279


Figure 1. Percent Adherence and Oral Reading Fluency across Participant Dyads
### Table 1

**Intervention Outcome Data**

<table>
<thead>
<tr>
<th></th>
<th>Oral Reading Fluency</th>
<th>Intervention Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dyad 1</td>
<td>Dyad 2</td>
</tr>
<tr>
<td>Baseline Mean</td>
<td>5.66</td>
<td>7.00</td>
</tr>
<tr>
<td>Baseline SD</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Intervention Mean</td>
<td>28.44</td>
<td>28.80</td>
</tr>
<tr>
<td>Intervention SD</td>
<td>13.09</td>
<td>12.00</td>
</tr>
<tr>
<td>Effect Size (NAP)</td>
<td>1.00</td>
<td>0.98</td>
</tr>
</tbody>
</table>
Table 2

*Intervention Process Data*

<table>
<thead>
<tr>
<th></th>
<th>Dyad 1</th>
<th>Dyad 2</th>
<th>Dyad 3</th>
<th>Dyad 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Sessions Completed</td>
<td>26</td>
<td>24</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Average Duration</td>
<td>12:17</td>
<td>3:59</td>
<td>11:41</td>
<td>4:56</td>
</tr>
<tr>
<td>Average Percent Adherence</td>
<td>95%</td>
<td>88.50%</td>
<td>76.40%</td>
<td>69.41%</td>
</tr>
<tr>
<td>ROI during Intervention Phase</td>
<td>0.38</td>
<td>0.34</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>ROI Fall to Winter Benchmark</td>
<td>2.18</td>
<td>2.12</td>
<td>0.35</td>
<td>1.65</td>
</tr>
</tbody>
</table>
Table 3

**Social Validity Questionnaire Results**

<table>
<thead>
<tr>
<th>Component</th>
<th>Questionnaire Statement</th>
<th>Mean Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability</td>
<td>The intervention lessons were easy to follow.</td>
<td>4.33</td>
</tr>
<tr>
<td></td>
<td>I liked the procedures used in this intervention.</td>
<td>4.33</td>
</tr>
<tr>
<td></td>
<td>I was satisfied with the intervention.</td>
<td>4.33</td>
</tr>
<tr>
<td>Use</td>
<td>I feel this intervention targeted skills that are important for my child to improve</td>
<td>4.33</td>
</tr>
<tr>
<td></td>
<td>The intervention was easily included in my daily routine.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I would be willing to use this intervention in the future.</td>
<td>4.33</td>
</tr>
<tr>
<td>Integrity</td>
<td>Implementing the intervention changed my behavior (e.g., my use of strategies when reading with my child).</td>
<td>3.67</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Overall, this intervention was beneficial for my child.</td>
<td>4.33</td>
</tr>
<tr>
<td></td>
<td>There were no negative side effects experienced by my child due to the intervention procedures.</td>
<td>4.67</td>
</tr>
</tbody>
</table>
# Appendix A: PALS Implementation Checklist

<table>
<thead>
<tr>
<th></th>
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<th>K-PALS/PALS Activity Implementation Adherence Checklist</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Duration of session:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lesson #:</td>
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## K-PALS

<p>| | | | |</p>
<table>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Caregiver introduces the new letter and its sound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Student repeats the new letter and its sound (check N/A if there is not a new letter)</td>
<td></td>
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</table>

### What Sound?

<p>| | | | |</p>
<table>
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<tr>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td>Completes the entire activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Uses appropriate prompt for activity (<strong>What sound?</strong>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Provides praise for correct responses (at star)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>If demonstrates correction procedure, incorporates all 5 steps of the correction procedure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### A
Caregiver tells the correct answer.

#### B
Caregiver tells the Student to repeat the correct answer.

#### C
Student repeats the correct answer.

#### D
Caregiver asks the student to repeat the line.

#### E
Student reads the line again.

## Sight Words

<p>| | | | |</p>
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<tr>
<td>7</td>
<td>Completes the entire activity</td>
<td></td>
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<tr>
<td>8</td>
<td>Uses appropriate prompt for activity (<strong>What word?/Read the Words</strong>)</td>
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<tr>
<td>9</td>
<td>Provides praise for correct responses</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>If demonstrates correction procedure, incorporates all 5 steps of the correction procedure</td>
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#### A
Caregiver tells the correct answer.

#### B
Caregiver tells the Student to repeat the correct answer.

#### C
Student repeats the correct answer.

#### D
Caregiver asks the student to repeat the line.

#### E
Student reads the line again.

## Sound Boxes

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<tr>
<td>11</td>
<td>Completes the entire activity</td>
<td></td>
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<tr>
<td>12</td>
<td>Uses appropriate prompt for activity (<strong>Read it slowly. Sing it and read it./Sound it out. Read it fast.</strong>)</td>
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<tr>
<td>13</td>
<td>Provides praise for correct responses</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>If demonstrates correction procedure, incorporates all 5 steps of the correction procedure</td>
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</tbody>
</table>

#### A
Caregiver tells the correct answer.

#### B
Caregiver tells the Student to repeat the correct answer.

#### C
Student repeats the correct answer.

#### D
Caregiver asks the student to repeat the line.

#### E
Student reads the line again.
### Reading Sentences and Books

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<tbody>
<tr>
<td>15</td>
<td>Completes the entire activity</td>
<td></td>
<td></td>
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<tr>
<td>16</td>
<td>Uses appropriate prompt for activity <em>(Read the sentence/story.)</em></td>
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<tr>
<td>17</td>
<td>Provides praise for correct responses</td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>If demonstrates correction procedure, incorporates all 5 steps of the correction procedure</td>
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<tr>
<td></td>
<td>A Caregiver tells the correct answer. <em>(Stop. That word is ___)</em></td>
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<tr>
<td></td>
<td>B Caregiver tells the Student to repeat the correct answer. <em>(What word?)</em></td>
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<td></td>
<td>C Student repeats the correct answer. <em>(Good.)</em></td>
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<tr>
<td></td>
<td>D Caregiver asks the student to repeat the line. <em>(Read the line again.)</em></td>
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</tr>
<tr>
<td></td>
<td>E Student reads the line again.</td>
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</tbody>
</table>

\[
A = \text{Total} (+) \\
B = \text{Total} (-) \\
C = \text{Total} (+) & (-) \\
A/C \times 100 \% \text{ accuracy}
\]
Appendix B: Sample Lesson

**Ray’s Pet Snake**

One day, Ray had a big box with him at school. All the kids wanted to see what was in it. Ray set the box on his desk. The boys and girls gathered round. One boy asked, “What is it? What is in the box?” He reached out to get the box. “Quit it!” shouted Sam. “Let Ray show us!” Ray will wait until you are all quiet,” said the teacher.

The kids stopped shouting. Ray lifted the lid off the box. A snake was coiled up in the box. “His name is Max,” said Ray.
Appendix C: Performance Tracking Permanent Product

Permanent Product of Intervention Implementation (sample)

Week of: ____________

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson #5?</td>
<td>Lesson #6?</td>
<td>Lesson #7?</td>
<td>Lesson #8?</td>
</tr>
<tr>
<td>At least 20 minutes?</td>
<td>At least 20 minutes?</td>
<td>At least 20 minutes?</td>
<td>At least 20 minutes?</td>
</tr>
<tr>
<td>Recorded?</td>
<td>Recorded?</td>
<td>Recorded?</td>
<td>Recorded?</td>
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</tbody>
</table>
Appendix D: Performance Feedback Script

In reviewing your tutoring sessions this week, you received a score of ____% adherence to the procedures.

Some of the things you did well are (check all that apply):
- Completing the entire lesson
- Introducing the new letter/sound
- Using the appropriate prompts
- Providing praise for correct responses
- Using all 5 steps of the correction procedure

Some ways you can improve would be (check all that apply):
- Completing the entire lesson
- Introducing the new letter/sound
- Using the appropriate prompts
- Providing praise for correct responses
- Using all 5 steps of the correction procedure

Specifically, you could try:
______________________________________________________________________________
_____________________________________________________

Here is a graph that shows your student’s progress and your adherence scores. (Sample)
### Appendix E: Performance Feedback Adherence Checklist

<table>
<thead>
<tr>
<th>+</th>
<th>-</th>
<th>N/A</th>
<th>Performance Feedback Adherence Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reports Adherence Score</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provides praise for correct implementation components</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provides information about implementation errors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Problem-solves for future implementation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Graphic presentation of target variables</td>
</tr>
</tbody>
</table>

\[ \begin{array}{c|c|c|c}
+ & - & N/A & A/C^* \\
\hline
A = \text{Total (+)} & B = \text{Total (-)} & C = \text{Total (+)} & \text{and (-)} \\
\hline
A/C^* & 100\% & = & \% accuracy
\end{array} \]