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Teachers' Use of High- and Low-Support Scaffolding Strategies to Differentiate Language Instruction in High-Risk/Economically Disadvantaged Settings

Jill M. Pentimonti[1], Laura M. Justice[1], Gloria Yeomans-Maldonado[1], Anita S. McGinty[2], Laura Slocum[1], and Ann O'Connell[1]

Abstract

The focus of the present work was to examine teachers' use of dynamic processes when implementing static language lesson plans that explicitly required teachers to employ scaffolding strategies so as to differentiate instruction. Participants were 37 preschool teachers and 177 children in their classrooms. Videotaped classroom observations were carried out and coded for the frequency of teachers' use for six types of scaffolds. Children were assessed on measures of language skills. Study findings indicated that teachers utilized scaffolding strategies at relatively low rates and that they utilized low-support scaffolding strategies more frequently than high-support strategies. Furthermore, results suggested that the use of certain types of scaffolding strategies may be beneficial for children's development of language skills. Findings from this work suggest that teachers may benefit from professional development opportunities focusing on the use of dynamic features of language interventions, such as scaffolding strategies, in the preschool classroom.

Keywords

scaffolding, differentiation of instruction, language intervention, preschool

Introduction

An important consideration when assessing the potential for classroom-based language interventions to be used at-scale is the extent to which teachers can adopt, adhere to, and sustain use of particular features of the intervention. Recent descriptions of teachers' fidelity to various components of language interventions (e.g., Hamre et al., 2010), coupled with examination of teachers' maintenance of intervention components after an initial period of implementation (Sanford DeRousie & Bierman, 2012), show there to be great variability among teachers in the extent to

[1]The Ohio State University, Columbus, USA
[2]University of Virginia, Charlottesville, USA

Corresponding Author:
Jill M. Pentimonti, American Institutes for Research, 1000 Thomas Jefferson Washington, DC 20007, USA.
Email: jpentimonti@air.org

which they adopt and maintain specific intervention components within their classrooms. Of particular interest are findings showing that teachers may show less adherence to using and maintaining the dynamic processes of language interventions as compared with more static processes (Pence, Justice, & Wiggins, 2008; Piasta, Justice, McGinty, & Kaderavek, 2012).

Importantly, adoption of the dynamic processes of a language curriculum may represent a key way in which teachers can differentiate language interventions to meet the individual needs of children in their classrooms. To differentiate instruction in language interventions effectively, teachers may use specific strategies, referred to here as *scaffolding* strategies, which serve to modify the instructional demands of a given task based on the current skills of the learner. The theoretical underpinnings of scaffolding lie in the work of Vygotsky (1912/1978), who theorized that a young child's interactions with more experienced and knowledgeable peers, including parents, teachers, and older peers, are an essential component of children's learning. Later interpretations of Vygotsky's work introduced the term *scaffolding* as a way to describe the provision of assistance that helps children complete tasks beyond their capabilities (Bruner, 1981).

Scaffolding Strategies as Dynamic Processes

Children aged 3 to 5 within preschool classrooms are diverse with respect to their language skills, and these individual differences are predictive of children's future academic achievement (Cabell, Justice, Konold, & McGinty, 2011; Cabell, Justice, Zucker, & Kilday, 2009). Work by Cabell and colleagues (2011), for instance, showed that preschoolers participating in targeted-enrollment preschool programs who exhibited a profile characteristic of poor language and early literacy skills (23% of their sample) tended to be poorer readers in kindergarten than children with less poor profiles of language and early literacy skills. Such data suggest that preschool teachers may need to differentiate the language instruction they provide in their classrooms, as it is probable that children with relatively low language skills would have different instructional needs than children with relatively high language skills. Children with low language skills, for instance, may have a limited vocabulary, comprising only several hundred words, whereas those with high language skills may have a vocabulary repertoire numbering in the thousands (Nation, 2014). The need to differentiate language instruction for children may present a challenge for teachers who use instructional programs featuring static lesson plans. Static lesson plans provide teachers with a hard- or soft-scripted plan to follow when delivering language instruction and are a common component of a number of preschool language interventions (Hamre et al., 2010; Pollard-Durodola et al., 2011). However, teachers' adherence to the delivery of a scripted lesson plan may inhibit their use of the more dynamic processes of implementation (e.g., differentiation of lessons, engaging in high-quality conversation)—a point supported by the work of Justice, Mashburn, Hamre, and Pianta (2008) who found that the correlation between preschool teachers' adherence to a scripted language lesson and the quality of instruction was very low.

In the present study, we examined teachers' use of dynamic processes when implementing static language lesson plans that explicitly required teachers to employ scaffolding strategies during lesson implementation so as to differentiate instruction. To date, little work has examined how preschool teachers might differentiate language instruction for their students, particularly when adopting interventions that feature static lesson plans, although there is considerable research on this topic in the later grades (e.g., Gersten, Fuchs, Williams, & Baker, 2001; Klingner, Vaughn, & Schumm, 1998; Reis, McCoach, Little, Muller, & Kaniskan, 2011; Tomlinson, 2000; Tomlinson et al., 2003). Given that much instruction in classrooms takes place in groups, teachers use various scaffolding strategies to modify a specific task to the individual capabilities of each of the participating students. For instance, when reading a book with students and seeking to teach them how to predict future events in the story, both as a means to engage students and to promote their language comprehension, the teacher might provide a

subset of possible choices to a student for whom the task is difficult (e.g., "Do you think Spot will be a cowboy or a dancer for the party?"). For the student for whom the task is easy, the teacher might make the task more challenging, such as pressing the child to reason or hypothesize and thus use higher level language skills (e.g., "Why is it useful to predict what might happen later in this book?"). Teachers' use of such scaffolding strategies, which link higher or lower levels of support to a given task in accordance to the current capabilities of the student, may be an effective way to ensure that implementation of static language interventions improves the skills of all children in a classroom.

Research on adult–child interactions has been important for examining ways that adults scaffold children's performance across varied tasks to facilitate their learning (e.g., Diaz, Neal, & Vachio, 1991; Juel, 1996; Maloch, 2002; Pratt, Green, MacVicar, & Bountrogianni, 1992; Rodgers, 2005). However, there are limitations in the extant literature that make it difficult to extrapolate how scaffolding may look and work within the early childhood classroom environment. First, much of the literature on scaffolding with young children is based on parent–child interactions (e.g., Diaz et al., 1991; Duncan & Farley, 1990; Kermani & Janes, 1999) that involve only one child and one adult who is likely to be aware of that child's level of functioning. Certainly, scaffolding requires that the adult providing support be sensitive to the child's abilities relative to the difficulty of the task (Berk & Winsler, 1999; Rogoff, 1990) as familiarity with a child's skills allows an adult to dynamically modify the amount and type of support the child receives over time (Rogoff, 1990). However, this literature does not speak directly to a teacher's ability to adjust the amount and type of supports children receive within larger group setting in the early childhood classroom.

Second, much of the work on scaffolding within school settings has been conducted with older children (e.g., Juel, 1996; Maloch, 2002; Rodgers, 2005) and is typically focused on teacher–student or tutor–student interactions in one-on-one settings (e.g., Juel, 1996; Rodgers, 2005). The work with older children and in individualized settings represents much more structured learning environments than those typically occurring in early childhood settings in which instruction is often embedded within more naturalistic activities, such as shared reading. Finally, research relevant to scaffolding in the classroom is limited in terms of research design, as most studies are descriptive in nature (e.g., Maloch, 2002; Many, 2002; Rodgers, 2005; Roehler & Cantlon, 1997). To date, we have limited understanding of how preschool teachers' use of scaffolding within the early childhood classroom may influence learning.

Operationalizing Scaffolding in the Preschool Classroom

The present study draws from literature on teachers' use of scaffolding with older children and caregivers' use of scaffolding with their children, and extends consideration of this topic to the early childhood classroom within the context of whole-class language instruction. We examined preschool teachers' use of six scaffolding strategies representing two general categories: *high-support strategies* and *low-support strategies*. High-support strategies are those that provide high amounts of guidance to children to help them successfully complete a task. By providing high support, teachers limit the cognitive demand placed on children when engaging in a particular task, thus improving their likelihood of success (Hammett, van Kleeck, & Huberty, 2003; O'Connor, Notari-Syverson, & Vadasy, 1998; Roehler & Cantlon, 1997). For instance, consider a language task in which a child is asked to identify the meaning of a word (e.g., "What does the word *huge* mean?"). A high-support strategy is reducing choices (e.g., Which is *huge*—a truck or a bike?"). By reducing the possible range of responses, or choices, the teacher is introducing specialized supports to the child to help her complete a task she cannot do independently; this is called "mediated assistance" in the scaffolding literature (e.g., Levine, 1993). In general, high-support strategies are considered to be more directive than strategies providing lower levels of

support (Pratt et al., 1992). Higher levels of such strategies tend to be observed among caregivers when children display lower levels of skill (Pratt et al., 1992) and we might theorize that the same would be true of preschool teachers; namely, that their use of high-support strategies during language instruction would be highest in the fall of the year, when children's skill levels are lowest, and lowest in the spring, when children's skill levels have increased.

An important aspect of scaffolding is that use of highly directive strategies (which we refer to as *high-support strategies*) should decline over time to reflect children's gradually increasing skill levels. Adults may shift from using highly directive strategies to more generalized strategies, like providing "hints" or suggestions that support the child's engagement in the task or application of the skill to other tasks (Diaz et al., 1991). This change in strategies is referred to as *distancing* or *sensitive withdrawal* (Wood, Bruner, & Ross, 1976); caregiver application of distancing is associated with children's learning over time (Diaz et al., 1991). Distancing is reflected when, at the onset of the learning process for a given task, the adult provides high amounts of support and scaffolding, which might appear authoritative. However, as the child progresses and takes on a greater role and responsibility in performing the task, less support and scaffolding is provided by the adult. An essential component of this withdrawal is the fact that the adult must be sensitive to the amount of support the learner requires to modify support when necessary.

These latter types of scaffolds, which provide the child with low levels of support, are most typically utilized by adults when children are engaging in a task they can do independently; therefore, we refer to these as *low-support* scaffolding strategies, as they provide limited support to the child to complete a task. Low-support strategies can not only help to maintain a child within a given task but may also provide additional challenge to a child for whom a particular task is too easy. In the present study, we examined preschool teachers' use of three types of low-support scaffolding strategies—generalizing, reasoning, and predicting (see Table 1)—which we would expect would occur at relatively low rates in the fall of the year but gradually increase over time as children's skill levels increase. Furthermore, consistent with the ideas of distancing and sensitive withdrawal, we theorized that preschool teachers would gradually reduce their use of high-support strategies while increasing their use of low-support strategies during language instruction. Such a pattern would suggest that preschool teachers are providing language instruction that is within children's "regions of sensitivity" (Wood & Middleton, 1975) by reducing the directiveness of support as children's skill levels increase.

Aims of This Study

The aims of this study were twofold. Our first aim was to describe preschool teachers' use of high- and low-support scaffolding strategies as embedded within a language instruction intervention implemented over 1 academic year. Implementation of this intervention, a supplemental curriculum, *Read It Again-PreK!* (RIA; Justice & McGinty, 2009; https://earlychildhood.ehe.osu.edu/research/practice/read-it-again-prek), requires teachers to deliver 60 whole-group lessons over a 30-week period (two lessons per week); the scripted lessons follow a scope and sequence of instruction to explicitly target children's language skills. Teachers received training on how to couple these static features of the curriculum with six scaffolding strategies embedded in each lesson so as to differentiate instruction for the children participating. The scaffolding strategies, reflecting the dynamic processes of the intervention, were theorized as key mechanisms for teachers to meet the varying needs of children participating in RIA lessons, given that the children in preschool are likely heterogeneous in their current skill levels (Cabell et al., 2011). Consequently, the present study provided the opportunity to consider the extent to which teachers used scaffolding strategies in their classroom instruction, albeit within the context of training.

In addressing this initial descriptive aim, we had three a priori hypotheses. First, we anticipated observing teachers using both high- and low-support scaffolding strategies over

Table 1. Six Scaffolding Strategies Examined in the Study.

	Description	Example
Low-support strategies		
Generalizing	Prompts children to extend the lesson content beyond the lesson itself—to past or future personal experiences.	Tell me about something huge you have seen before.
Reasoning	Prompts children to explain why something happened or will happen, or to explain why something is the way it is.	The next day the snowman melted. Why do you think that happened?
Predicting	Prompts children to describe what might happen next or to hypothesize the outcome of an event/activity.	Where do you think they will go next?
High-support strategies		
Co-participating	Prompts children to produce a correct answer to a task through their completion of the task with another person—the teacher or a peer.	Call out with me the word that can sit on a king's or a queen's head. Crown!
Reducing choices	Prompts children to complete a task by reducing the number of choices of correct answers.	What is this tool called? A hammer or a wrench?
Eliciting	Prompts children to produce a correct answer to a task by providing an exact model of the ideal response.	When I cross a bridge, I have to walk *over* it. How do I cross a bridge?

Source. Justice, L. M., & McGinty, A. S. (2009). *Read It Again-PreK!* (pp. 10-11). Columbus: The Ohio State University. Adapted with permission.

the course of the year, given that there is substantial range among preschool-aged children in their language skills (Cabell et al., 2011; Justice & Ezell, 2001). Thus, within large-group instruction, we expected the preschool teachers to use the full range of scaffolding strategies to differentiate instruction for the children in their classrooms. In addition, we anticipated that teachers in our study would use the full range of strategies as a result of receiving professional development in scaffolding strategy use. Given the complexities of scaffolding and the fact that teachers may have difficulty implementing effective scaffolding strategies with their students (e.g., Cazden, 1988; Pentimonti & Justice, 2010), it is possible that providing teachers with professional development related to scaffolding may change and improve their use of such strategies (Justice, Kaderavek, Fan, Sofka, & Hunt, 2009; Piasta et al., 2010).

Second, we anticipated teachers' use of high-support strategies and children's language skills to be negatively correlated in the fall of the year, and, conversely, use of low-support strategies and children's language skills to be positively correlated. In this regard, we expected children in classrooms represented by overall low-skill levels to receive higher volumes of high-support strategies, and children in classrooms represented by overall high-skill levels to receive higher volumes of low-support strategies.

Third, we anticipated teachers' use of high-support strategies to decline over the year, whereas their use of low-support strategies would increase over the year. Such a finding would be consistent with prior work examining parental shifts in scaffolding strategies over time in relation to changes in children's skill levels (e.g., Connor, Knight, & Cross, 1997; Wood & Middleton, 1975); the dynamic nature of strategy use is central to theoretical accounts of scaffolding, and yet this has seldom been measured within the context of classroom instruction.

Our second aim was to determine whether preschool teachers' use of scaffolding strategies, considering their use of both high- and low-support strategies, was associated with children's language growth over time. We theorized that preschool teachers' use of low-support strategies over time would be most strongly associated with children's language growth, as these strategies in particular represent distancing, or *sensitive withdrawal*, in which adult support is lessened in relation to children's gradual learning gains. Prior work has established that adult distancing is positively associated with children's growth over time (Pratt et al., 1992). Thus, we expected that teachers' use of low-support strategies would be a positive predictor of preschoolers' growth in language skill from fall to spring of the academic year.

Importantly, the classrooms in the present study were located in high-poverty, rural communities. Community-level poverty is one of the predominant risk factors negatively associated with early school and reading success (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006). Moreover, these early disparities elevate children's risks for entering school unprepared for formal reading instruction and, by consequence, for failing to achieve skilled reading (Hair et al., 2006). Therefore, gathering and understanding additional information pertaining to scaffolding use in the preschool classroom may be especially imperative for young children at risk for later academic difficulties as scaffolding may provide the additional support they need to succeed in the classroom.

Method

Participants

Participants were 37 preschool teachers and 177 children sampled from those teachers' classrooms. The teachers were drawn from early childhood programs across three states which were recruited to participate in a study of the impacts of the 60-lesson supplemental curriculum, RIA (Justice & McGinty, 2009), on the language and early literacy skills of preschool children. The teachers agreed to take part in the study at the invitation of their program. All of the teachers discussed in the present work were randomly assigned to implement the RIA experimental curriculum; those who were assigned to a comparison condition are not represented. Note that teachers in the treatment condition were assigned to two groups who received a few different aspects of professional development; however as membership in these different professional development groups were not a significant predictor in any models conducted in this study, this variable was taken out as a predictor in all final models for the sake of parsimony. All study classrooms enrolled in the larger study were located in Appalachia, a geographic and cultural region in the United States. Specifically, the larger study classrooms were located in the Appalachian states of Ohio, Virginia, and West Virginia. Appalachia is a region that has experienced high levels of poverty throughout its history; today, more children in Appalachia per capita reside in poverty as compared with the country at large (Lichter & Campbell, 2005). The centers in which the classrooms were located were either affiliated with Head Start (62%) or a state-funded prekindergarten program. The average classroom enrollment for classrooms in the present study was 18 (*SD* = 3.2) with a range of 9 to 30 children. All classrooms prioritized enrollment to children who met specific eligibility guidelines, such as residing in a low-income home. The present study includes two waves of study implementation (2008/2009 and 2009/2010); each wave involved a new cohort of teachers and children.

Teachers. The 37 teachers in the present study were primarily female ($n = 36$; 97%) and White/non-Hispanic ($n = 34$; 92%). In terms of teachers' highest obtained degree, one (3%) teacher had a high school diploma, 17 (46%) teachers had some college but no degree, six (16%) teachers had a 2-year degree, four (11%) teachers had a bachelor's degree, eight (21%) teachers had 1 or

more years of coursework beyond the bachelor's degree, and one (3%) teacher had a master's degree. Teachers' years of experience ranged from 1 to 33 years, with a mean of 10.9 years (*SD* = 7.3 years).

Children. Study methods called for a subset of children in participating classrooms to be assessed longitudinally over time, including fall of the preschool year, spring of the preschool year, and fall of kindergarten. The number of children comprising the subset per classroom was estimated based on a priori power estimates, for which it was determined that between four and six children per classroom should be sampled. Consent forms were sent to the primary caregiver of each child in the participating classrooms who met the following inclusionary/exclusionary criteria: (a) was expected to enroll in kindergarten the following year and was 4 or 5 years of age, (b) did not have an individualized education program (IEP), and (c) resided in a home in which English was the primary language spoken. In each classroom, between four and six children for whom consent was provided were selected randomly to comprise the longitudinal study participants, depending on the number of consents received. Of the 177 children selected to participate, the mean age was 54 months (*SD* = 2 months; range = 48-66 months), and 54% (*n* = 93) were female. Most children were White/non-Hispanic (87%; *n* = 151), while far fewer were Black (8%; *n* = 14), Hispanic (2%; *n* = 3), American Indian/Native Alaskan (2%; *n* = 3), or Asian or Pacific Islander (1%; *n* = 2). The children were primarily from low-income homes according to income guidelines set by state and federal governments. Specifically, 68% of children were from homes with average annual family incomes of less than US$30,000. Information pertaining to mother's highest level of education was available for 168 of the children; data were missing for caregivers who did not return demographic questionnaires. Of these mothers, 16 (9.5%) had an eighth-grade education or less, 53 (31.5%) had some high school but no diploma, 33 (19.6%) had a high school diploma or had passed a General Educational Development (GED) test, 24 (14.3%) had some college but no degree, 13 (7.7%) had a high school diploma plus technical training, 20 (11.9%) had a 2-year degree, and nine (5.4%) had a bachelor's or master's degree.

Study Procedures

Procedures relevant to the present study were threefold. First, children completed individualized assessments of their language skills in the fall and spring of the year, as part of a larger assessment battery. Second, teachers implemented the experimental curriculum for 1 academic year, receiving training in its use in the fall of the year before the start of the academic year. Third, teachers were observed at three time-points to examine their use of the dynamic processes of the curriculum, representing the six scaffolding strategies of interest.

Child assessments. To characterize children's language abilities for descriptive purposes, children's general language skills were characterized by their performance on the Sentence Structure, Word Structure, and Expressive Vocabulary subtests of the *Clinical Evaluation of Language Fundamental Preschool–Second Edition* (CELF-P2; Wiig, Semel, & Secord, 2004) in the fall of their preschool year. The Sentence Structure subtest measures receptive grammar, or the ability to understand morphological and sentence structure. This subtest asks children to listen to a sentence prompt (e.g., "The cat is being chased by the dog") and point to one of four picture options that best represents the stimulus. The Word Structure subtest assesses expressive grammar, or the ability to use free and bound morphological structures. For this subtest, children are presented with two picture stimuli. The examiner provides a model of response (e.g., "Here is one horse") with the first stimuli and then the child is asked to complete a sentence about the picture (e.g., "Here are two _____") with the second stimuli. The Expressive Vocabulary subtest assesses the child's referential naming ability for people, objects, and actions. This subtest asks the child to

Table 2. Children's Fall CELF-P2 and TOPEL Scores.

	M	*SD*	Range
Sentence Structure	9.06	2.40	2-16
Word Structure	8.94	2.56	2-17
Expressive Vocabulary	9.75	2.68	3-17
Definitional Vocabulary	99.78	10.54	67-118

Source. Sentence Structure, Word Structure, and Expressive Vocabulary from the Wiig, E. H., Semel, E. M., & Secord, W. (2004). *CELF-P2 -Preschool: Clinical Evaluation of Language Fundamentals—Preschool.* San Diego, CA: Harcourt Brace Jovanovich; Definitional Vocabulary from the Lonigan, C. J., Wagner, R. K., Torgesen, J. K., & Rashotte, C. (2007). *Test of Preschool Early Literacy*. Austin, TX: Pro-Ed.
Note. Standard scores are reported for descriptive purposes, but raw scores were used in analyses. CELF = Clinical Evaluation of Language Fundamentals; TOPEL = Test of Preschool Early Literacy.

respond to the identified vocabulary items when presented with a picture stimuli (e.g., "What is this?" when presented with a picture of a flag). Satisfactory reliability and validity are reported by the authors (Wiig et al., 2004) with test–retest reliability ranging from .77 to .91, internal consistency (Cronbach's α) of .77 to .95, and moderate to high correlations with other tests of language disorders. Table 2 provides children's standard scores for these three subtests. As population mean for all subtests is 10 and standard deviation is 3, these results demonstrate that on average the children in this study perform a bit lower than the mean. Specifically, on the Sentence Structure and Word Structure subtests, children score about one third of a standard deviation below normative references, whereas children's scores on the Expressive Vocabulary subtest are closer to the mean. Procedural information relevant to the CELF-P2 is provided subsequently.

As the primary outcome of interest in this study, children's language skills (specifically vocabulary skills) were assessed using the Definitional Vocabulary subtest of the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgesen, & Rashotte, 2007). This subtest examines expressive language skill with respect to single-word spoken vocabulary as well as discourse-level descriptions of the single-word items. The child is shown a picture and asked to tell what the picture is and to describe one of its important features. Raw scores are derived to create standard scores based on a mean of 100 and a standard deviation of 15. Test–retest values for this subtest range from .88 to .94, and internal consistency is .82 (Lonigan et al., 2007; see Table 2). The TOPEL was selected as the language outcome measure (rather than the Expressive Vocabulary subtest of the CELF-P2 or other measures available) due to its complex nature. The TOPEL assesses children's basic knowledge of a word via labeling coupled with their deeper understanding of the word via questioning. Therefore, the tasks involved in the TOPEL are closely aligned with the scaffolding techniques teachers use when they are attempting to support children's learning.

RIA curriculum. In terms of the supplemental curriculum implemented by teachers, RIA is a 30-week, 60-lesson program that systematically and explicitly targets language skills in two domains: vocabulary and narrative. In addition to these two language targets, RIA also includes two targets that address the early literacy skills of phonological awareness and print knowledge. RIA lessons follow a scope and sequence aligned to these domains, and are organized around a large-group storybook reading interaction, each designed to last 20 to 30 min. Materials necessary to implement RIA lessons include common classroom materials (e.g., whiteboard, markers, paper), an RIA manual (Justice & McGinty, 2009), and a set of 15 storybooks that teachers use as a context for instruction. Teachers in the larger study received all materials necessary to implement RIA in their classrooms. An important feature of this intervention is that its core components (the 60 lessons) were designed for high levels of procedural fidelity: The 60 individual lessons are scripted, and all materials needed for implementation are provided. As a complement to the scripted lessons, teachers are provided the RIA Learners' Ladder (see Figure A1 of the

appendix) to guide teachers in applying the six scaffolding strategies featured in the curriculum. As can be observed in the appendix (see also Table 1), teachers are provided a visual for each lesson which provides explicit examples for how the six scaffolding strategies can be used to differentiate that lesson's delivery. The three high- and low-support strategies featured in the RIA curriculum are informed by prior descriptions of scaffolding (e.g., Hammett et al., 2003; O'Connor et al., 1998; Pratt et al., 1992; Roehler & Cantlon, 1997).

To promote teachers' use of these scaffolding strategies, which represent the primary dynamic features of the curriculum, all participating teachers received professional development to support their knowledge and application of these strategies. Professional development activities for all teachers included a 1-day workshop prior to the start of the school year as well as a supplemental "refresher" workshop conducted in the winter. The 1-day workshop overviewed language and literacy development, relationships between language and literacy achievements in preschool and later reading outcomes, and the four domains of instruction included in RIA. Teachers also received guidance in implementation of RIA lessons and scaffolding strategies through observations of videotaped example lessons and small-group role-plays. At the refresher workshop (3 hr) in late January, teachers received feedback on their implementation of two videotaped fidelity observations of RIA lessons, as well as review of scaffolding strategies and how they could be used in conjunction with the RIA lessons.

Assessment of Teachers' Use of Scaffolding Strategies

To assess teachers' use of the six scaffolding strategies over the academic year, three videotaped observations were collected for each teacher at three time-points: (a) October—approximately 2 to 3 weeks after the first professional development session, (b) December, and (c) March. Videotapes were collected by research staff at visits to each classroom. Of a possible 111 videos to be analyzed for this study, 12% (n = 13) were missing due to noncollection (weather, teacher absence) or technology malfunction, which is similar to missing data percentages found in other studies involving the use of teacher videos (e.g., Cabell et al., 2011).

Each video session featured a teacher conducting one RIA lesson with her entire classroom, and the average length of each session was 20 min (SD = 8, range = 6-45 min). Each videotape was coded within a laboratory setting using a coding system developed for this purpose, the Scaffolding Coding Checklist (SCC; Justice, Pentimonti, Sofka, & McGinty, 2009). The SCC is an event-based coding scheme designed to capture the raw frequency with which teachers use each of the six RIA scaffolding strategies, representing three high-support strategies (eliciting, reducing choices, and co-participating) and three low-support strategies (generalizing, reasoning, and predicting). Coding of scaffolding is mapped to the level of the teachers' utterance, and only one strategy can be coded per utterance. Scores per strategy thus reflect the raw frequency with which a teacher used a given strategy during an entire RIA lesson.

SCC coding for the present study was conducted by trained research assistants who had completed a comprehensive training program designed to achieve reliable use in the scheme. At the end of the training program, coders exhibited 80% agreement with three master-coded videos, after which they continued to participate in monthly drift meetings among all SCC coders. Following all SCC coding, 20% (n = 22) of the video observations were randomly selected for double-coding by trained coders. The intraclass correlation coefficient (ICC) calculated on the composite score was .88, which is considered excellent (Fleiss, 1981; Shrout & Fleiss, 1979).

Analytic Strategy

To address the first aim, two strategies were used. First, descriptive data on teachers' scaffolding use based on the SCC at three time-points (fall, winter, and spring) were examined. Changes in SCC scores over the academic year were graphed to examine changes visually from the fall to

spring time-point. Second, to examine the associations between teachers' use of high- and low-support strategies in the fall and children's language skills, we conducted two separate hierarchical linear modeling (HLM) regressions, given the data structure whereby 177 children (Level 1) were nested within 37 teachers (Level 2). All analyses were conducted using HLM7 software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011) with full-information maximum likelihood (FIML) estimation. As Restricted Maximum Likelihood (REML) is recommended for models with a small number of Level 2 units, all models were also run using REML and no differences were found in either the fixed or random effects. Given that the deviance tests we were most interested in involved the fixed effects and REML is only appropriated for model comparisons with the same fixed effects, we opted for FIML as the estimation method. For each of the HLM regressions, the fall Definitional Vocabulary score was used as the outcome, and the fall low-support and high-support strategies were used separately as a Level 2 predictor allowing for a random intercept. The coefficients for each of the support strategies provided a measure of association between teachers' use of support strategies and children's language skills, all accounting for the nested structure of the data.

To address the second aim, investigating the relationship between scaffolding strategy use and children's language gains, a set of HLMs were examined, with Level 1 as the individual level (children) and Level 2 as the group level (teachers). A null model was estimated first, which provided the information necessary to estimate the ICC. ICCs estimated from the unconditional model provide important information regarding whether the teacher-level variance significantly differs from zero and what percentage of the outcome variance lies between teachers. Next, to address the relationship between teachers' scaffolding strategy use and children's language growth over the academic year, two separate HLMs were conducted. First, a two-level HLM was created with spring language scores as the individual-level outcome variable (Y_{ij}) and amount of high-support scaffolding strategy use at each time-point as the teacher-level variables (W_{ij}) while controlling for fall language scores. A similar model was then conducted for low-support scaffolding strategy use. For all models, the children's fall language scores were grand mean centered. Therefore, variance in the intercepts represents between-group variance in the adjusted means (i.e., adjusted for Level 1 predictors). Grand mean centering was used in these analyses, as the interest in this study was on the effects of Level 2 variables while controlling for Level 1 covariates (Enders & Tofighi, 2007).

Model assumptions were investigated by examining normality, linearity, multicollinearity, and residual diagnostics. In addition, analyses were conducted to investigate assumptions of homogeneity of variance across teachers. To address the missing data of the 13 videos affecting the Level 2 scores of 10 teachers, multiple imputation of the high- and low-level scaffolding scores for these 10 teachers was used. The multiple imputation took into account the nested structure of the data and was implemented using a SAS macro designed to impute multilevel data (Mistler, 2013). The 10 multiple imputed data sets were then imported into HLM7, and the subsequent multilevel analyses were carried out as usual. One thing to note is that HLM7 does not report the deviance statistic when multiple imputed data sets are used. Thus, to calculate the deviance statistics reported in Table 6, the average of the 10 log likelihoods was used.

Results

Teachers' Use of Six Scaffolding Strategies

The raw frequency with which teachers used the six scaffolding strategies, comprising three high-support strategies (eliciting, reducing choices, and co-participating) and three low-support strategies (generalizing, reasoning, and predicting), was calculated for each of three time-points. These descriptive data, particularly the range and standard deviations, showed

Table 3. Descriptive Statistics for Scaffolding Strategies by Time-Point.

Scaffolding strategy	*M*	*SD*	Range
Time 1			
High support	5.33	4.46	0-25
Eliciting	0.27	0.52	0-2
Co-participating	2.30	2.16	0-22
Reducing choices	2.72	4.07	0-22
Low support	7.15	5.79	0-20
Generalizing	1.82	2.51	0-10
Reasoning	2.94	2.41	0-10
Predicting	2.39	2.52	0-10
Time 2			
High support	3.79	3.81	0-13
Eliciting	0.18	0.46	0-2
Co-participating	2.09	2.97	0-11
Reducing choices	1.51	2.12	0-7
Low support	6.18	6.33	0-29
Generalizing	2.30	4.47	0-25
Reasoning	3.33	3.78	0-20
Predicting	0.58	1.12	0-5
Time 3			
High support	2.74	2.76	0-11
Eliciting	0.26	0.51	0-2
Co-participating	1.13	1.57	0-6
Reducing choices	1.35	1.87	0-9
Low support	11.16	6.98	0-25
Generalizing	3.97	4.78	0-19
Reasoning	6.19	3.98	0-14
Predicting	1.00	1.29	0-5

there to be variability among teachers on use of the six target scaffolding strategies over time. As an example, the range and standard deviation of one low-support scaffolding strategy, generalizing at Time 2, were relatively large ($SD = 4.09$, range = 0-25). Furthermore, results indicated that the strategies had positively skewed distributions. Positively skewed distributions are not unusual for count data, as many distributions of count data have observations in the data set with a value of zero (Gardner, Mulvey, & Shaw, 1995; Long, 1997). Overall, teachers used an average of 12 strategies ($SD = 7.55$, range = 1-34) per lesson, with about 35% comprising high-support strategies and the 65% comprising low-support strategies. Teachers used significantly more low-support ($M = 8.10$) than high-support strategies, $M = 3.98$; $t(96) = 5.17$, $p < .01$, $d = 0.76$.

The data in Table 3 show scaffolding use per time-point, and these data are presented visually in Figure 1. Results from a repeated-measures ANOVA showed that the total amount of scaffolding strategies (both high and low support) used by teachers did not significantly differ at the beginning of the year (Time 1) compared with the end of the year (Time 3); $F(1, 26) = 1.86$, $p = .82$. Specifically, teachers averaged 12.48 ($SD = 7.24$, range = 2-27) scaffolding strategies at Time 1, 9.97 ($SD = 7.57$, range = 1-34) strategies at Time 2, and 13.9 ($SD = 7.55$, range = 3-31) strategies at Time 3. However, there were differences in the fall and the spring with respect to teachers' use of the scaffolding strategies. In the fall ($M = 7.15$), teachers used significantly fewer low-support strategies compared with the spring ($M = 11.16$); $F(1, 26) = 4.37$, $p < .05$, multivariate $\eta^2 = .14$. In

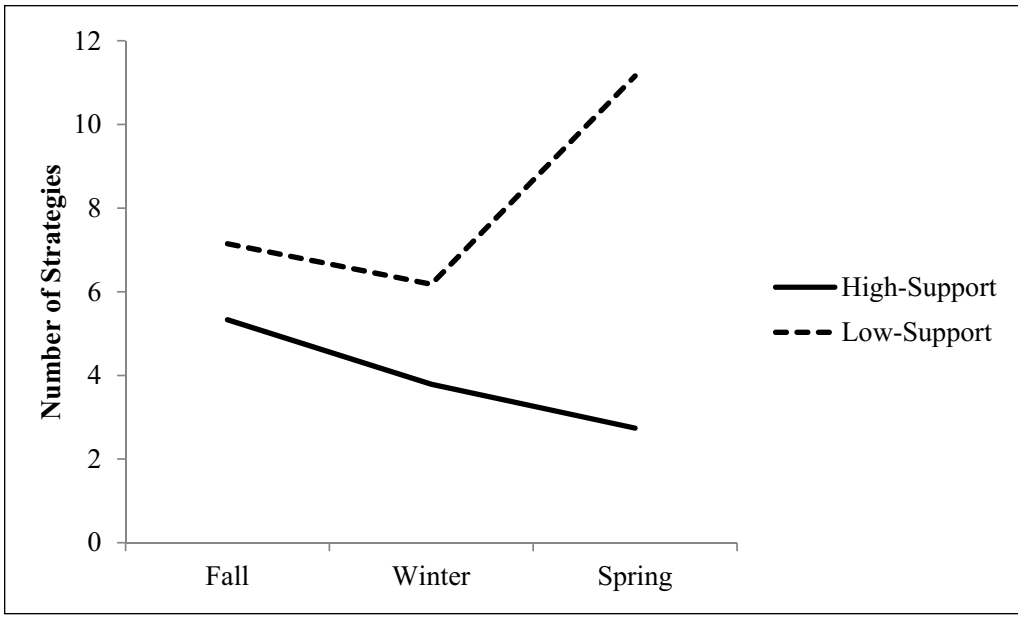

Figure 1. Volume of high- and low-support scaffolding strategies observed over the academic year.

contrast, teachers used significantly more high-support strategies ($M = 5.33$) in the fall as compared with the spring ($M = 2.74$); $F(1, 26) = 8.27$, $p < .05$, multivariate $\eta^2 = .24$.

To explore the relationship between teachers' use of scaffolding strategies and children's fall skill levels, we conducted two HLM regressions using the low- and high-support scaffolding strategies as Level 2 predictors for each of the regressions, respectively. Use of high-support scaffolding and children's fall skill levels was negligible and nonsignificant ($\gamma_{01} = .07$, $p = .73$). When examining low-support scaffolding and children's fall skill levels, results suggested that low-support scaffolding was negatively but weakly associated with children's fall skill levels ($\gamma_{01} = -.14$, $p = .34$). Overall, results from these analyses revealed that teachers' use of both high- and low-support strategies was not significantly associated with children's Definitional Vocabulary scores in the fall of the school year.

Teachers' Scaffolding Strategy Use and Children's Language Gains

HLMs were estimated for the primary outcome of interest, which was children's spring language scores. Intercorrelations among predictor variables used in these models are shown in Table 4. Various assessments of these data were conducted prior to conducting the main analyses. Investigations of correlations and tolerance values revealed that multicollinearity was not an issue. Also, tests for homogeneity of Level 1 variance revealed homogeneity across groups. In addition, residual assumptions and diagnostics were investigated. In examining the Level 1 variable, leverage values less than 0.20 indicated that the influence of the predictor variable, fall vocabulary scores, was evenly distributed across cases. In examining residuals, three cases were identified with studentized residual values greater than |2|. However, Cook's Distance and Mahalanobis Distance values for the three cases were acceptable, indicating that these cases were not problematic. In examining Level 2 variables, no problems were identified as there was an absence of pattern in all scatterplots of residuals. After the basic diagnostics were completed, a null model was estimated as a first step in the analyses. The ICCs showed that 14.15% of the

Table 4. Intercorrelations Between Variables for Hierarchical Linear Models.

Variables		2	3	4	5
1.	Fall vocabulary skills	.64**	.11	−.01	.07
2.	Spring vocabulary skills		.03	.08	.07
3.	High-support scaffolding—Time 1			.08	.28
4.	High-support scaffolding—Time 2				−.10
5.	High-support scaffolding—Time 3				—
1.	Fall vocabulary skills	.64**	−.05	.15	.57**
2.	Spring vocabulary skills		.29	.30	.46**
3.	Low-support scaffolding—Time 1			.08	.34
4.	Low-support scaffolding—Time 2				.14
5.	Low-support scaffolding—Time 3				—

Note. Fall vocabulary skills = fall Test of Preschool Early Literacy (TOPEL) Definitional Vocabulary raw subtest score; Spring vocabulary skills = spring TOPEL Definitional Vocabulary raw subtest score.
** $p < .01$.

variation in children's spring language scores is attributable to between-classroom variation, whereas 85.85% can be attributed to within-classroom variation.

Two separate models were estimated to investigate high- and low-support strategy use (see Table 5). In both models, slope terms were allowed to vary if they were significantly different from zero. A nonsignificant random effect suggests that variance was sufficiently accounted for and the random effect could be fixed in the model.

The first HLM was created with children's spring language scores as the individual-level outcome variable (Y_{ij}) and high-support strategy use at each time-point as the teacher-level predictor variables (W_{ij}) while controlling for fall language scores (Table 5). Results showed that the amount of high-support scaffolding strategy use at Time 1 was not predictive of children's language gains ($\gamma = 0.05$, $p = .76$), nor was high-support scaffolding use at Time 2 ($\gamma = -0.04$, $p = .84$) or Time 3 ($\gamma = 0.13$, $p = .66$). The second HLM was a replication of the initial model but with low-support strategy use at each time-point as the teacher-level predictor variables (W_{ij} ; Table 5). Findings showed that low-support strategy use at Time 1 was a significant predictor of children's language gains ($\gamma = 0.34$, $p = .01$). However, teachers' low-support strategy use at Time 2 was not significant ($\gamma = 0.18$, $p = .07$), nor was teachers' use of low-support strategies at Time 3 ($\gamma = -0.09$, $p = .45$).

Model fit. According to chi-square difference tests comparing the null model with the more complex models, both of the more complex models used in these analyses were a better fit for the data than the null model (see Table 6). In addition, two measures of model fit were used in these analyses (Table 6): (a) the Akaike information criterion (AIC; Akaike, 1987) which is a log likelihood measure of fit comparing competing models in which smaller AICs indicate better fit (Kline, 2005) and (b) the Bayesian information criterion (BIC; Schwarz, 1978) which is a closely related measure of comparative model fit that imposes a stronger penalty for model complexity than the AIC (Kline, 2005). Both the AIC and the BIC values revealed that both of the more complex models are a better fit for the data. Furthermore, the low-support scaffolding strategy model, which included low-support strategy use at each time-point as predictor variables, was the best fit of the more complex models.

Discussion

In evaluating whether or not a classroom-based language intervention has the potential for use at-scale, it is essential to consider the extent to which teachers utilize both static and dynamic features

Table 5. Hierarchical Linear Models Results for Amount of Scaffolding Strategy Use Models on Children's Spring Vocabulary Skills.

High-support scaffolding strategy use		
Fixed effects	Coefficient (*SE*)	*t* (*df*)
Model for mean spring vocabulary skills (β_o)		
Intercept (γ_{00})	54.73** (0.48)	115.13 (23)
High support—Time 1 (γ_{01})	−0.08 (0.09)	−0.80 (23)
High support—Time 2 (γ_{02})	0.03 (0.12)	0.27 (23)
High support—Time 3 (γ_{03})	0.13 (0.16)	0.82 (23)
Model for fall vocabulary skills slopes (β_1)		
Intercept (γ_{10})	0.56** (0.07)	8.58 (26)
Random effects	Variance	χ^2 (*df*)
Between classrooms (τ_{oo})	0.31 (0.56)	30.65 (23)
Fall vocabulary skills slope (τ_{11})	0.05** (0.21)	47.33 (26)
Within classrooms (σ^2)	19.82 (4.45)	
Low-support strategy use		
Fixed effects	Coefficient (*SE*)	*t* (*df*)
Model for mean spring vocabulary skills (β_o)		
Intercept (γ_{00})	54.87** (0.45)	121.96 (23)
Low support—Time 1 (γ_{01})	0.22* (0.08)	2.64 (23)
Low support—Time 2 (γ_{02})	0.15 (0.11)	1.45 (23)
Low support—Time 3 (γ_{03})	−0.02 (0.08)	−0.30 (23)
Model for fall vocabulary skills slopes (β_1)		
Intercept (γ_{10})	0.57** (0.06)	8.83 (26)
Random effects	Variance	χ^2 (*df*)
Between classrooms (τ_{oo})	0.06 (0.24)	27.69 (23)
Fall vocabulary skills slope (τ_{11})	0.04** (0.20)	50.58 (26)
Within classrooms (σ^2)	18.58 (4.31)	—

Note. Fall vocabulary skills = fall Test of Preschool Early Literacy (TOPEL) Definitional Vocabulary raw subtest score; spring vocabulary skills = spring TOPEL Definitional Vocabulary raw subtest score.
*$p < .05$. **$p < .01$.

Table 6. Model Fit Statistics for All Hierarchical Linear Models.

	χ^2 difference test χ^2 (*df*)	PVAF within classrooms	AIC	BIC
One-way ANOVA model	—	—	965.73	975.19
High-support scaffolding strategy use	303.09** (6)	.57	674.14	702.99
Low-support scaffolding strategy use	311.62** (6)	.60	666.11	694.46

Note. For chi-square difference test, all models were compared with the one-way random effects ANOVA model. AIC = Akaike information criterion; BIC = Bayesian information criterion; PVAF = percent variance accounted for.
**$p < .01$.

of the intervention. The focus of the present work was to examine teachers' use of the dynamic features of a language intervention, as these dynamic features may be particularly important mechanisms for enhancing children's learning in the context of intervention. Specifically, we were

interested in teachers' use of dynamic processes when implementing static language lesson plans that required teachers to employ scaffolding strategies to differentiate instruction. We considered the extent to which preschool teachers adopted and maintained six different scaffolding strategies for 1 academic year, as well as the influence of these processes on young children's language gains. Findings relating to these two goals will be discussed in turn.

Teachers' Use of Scaffolding Strategies as Dynamic Processes

Regarding our first aim, examination of the extent to which teachers used the key dynamic features of a language intervention, study results yielded three major findings. First, findings revealed that teachers used the full range of scaffolding strategies (both high and low support) over the course of the year, confirming our hypothesis that, to support the heterogeneity in language skills of children in early childhood classrooms, teachers would employ all types of scaffolding strategies as a means for differentiation. Although the full range of strategies was observed, the frequency with which these types of strategies were used warrants mention. Specifically, findings demonstrated that the high-support strategies of eliciting, co-participating, and reducing choices were used at very low rates. This finding converges with previous research (Pentimonti & Justice, 2010) and suggests that teachers in the present study rarely used those strategies that provided extra support for children who had difficulty completing lessons. It is surprising that these highly supportive strategies were not used more frequently, however, as the children could be considered at risk for later academic difficulties due to socioeconomic disadvantage and would have likely benefited from such strategy use.

Results relevant to low-support scaffolding use revealed a different pattern, as teachers used relatively more low-support strategies than high-support strategies. This finding is promising, given that the use of low-support strategies, or those strategies that are more inferential in nature and encourage children's higher order understandings about the lesson (i.e., generalizing, reasoning, and predicting), may hold important benefits for children. In fact, previous research regarding teachers' use of inferential questions in preschool classrooms has shown that there are benefits this type of language has on children's language and literacy skills (Dickinson & Smith, 1994; Hindman, Connor, Jewkes, & Morrison, 2008; van Kleeck, Vander Woude, & Hammett, 2006; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013).

We also hypothesized that teachers' use of high-support strategies and children's language skills would be negatively correlated in the fall of the year, while, conversely, use of low-support strategies and children's language skills would be positively correlated. However, the results of our study were contradictory to our hypotheses, suggesting that children in classrooms represented by overall low-skill levels were not receiving higher volumes of high-support strategies, and children in classrooms represented by overall high-skill levels were not receiving higher volumes of low-support strategies. Given that it is likely that some children in these teachers' classrooms required a higher level of support at the onset of their preschool year, it is possible that teachers were not utilizing high-support scaffolding strategies frequently enough to effectively target the skills that were within children's actual and potential abilities—that is, Vygotsky's idea of a zone of proximal development (ZPD; Vygotsky, 1912/1978). Incorrectly targeting children's skills may be problematic, especially in light of Vygotsky's argument that to best cultivate children's learning, teachers should provide children with mediated assistance, or social guidance, at a level beyond independent learning yet within their ZPD (Bruner, 1981; Vygotsky, 1912/1978; Wertsch, 1984).

The complexity involved in identifying children's needs when effectively scaffolding is a potential explanation for teachers' infrequent use of high-support strategies relative to their use of low-support strategies. Identifying the correct level of scaffolding necessary for each child requires teachers to calibrate children's ability levels and adjust methods to adapt the learning and teaching process for each child (Bodrova & Leong, 2007). This type of

calibration and adjustment may be challenging given that the relationship between learning and development may vary among children and areas of development. Unfortunately, research has shown that teachers encounter difficulty when calibrating ability levels of those children who are at risk for later reading difficulties (Cabell et al., 2009) or those children requiring high-support scaffolding. Therefore, the lack of employment of strategy use—particularly high-support strategies—by preschool teachers may be particularly detrimental to those children already at risk for later academic difficulties. As noted earlier, our study is one of the first to examine scaffolding strategy use in early childhood classrooms during large-group instruction. Therefore, our findings have especially important implications when we consider the challenges involved in teachers' use of various scaffolding strategies during large-group instruction to modify a specific task to the individual capabilities of individual student participants. Our results suggest that preschool teachers may require support in navigating the difficult task of differentiating instruction in the large-group context and that exploring the level of scaffolding *teachers* may need to scaffold their students may be an important avenue for future research.

It is also important to note that teachers involved in the present study were trained in the use of scaffolding strategies, which suggests that even with training via professional development, the use of scaffolding may be a challenging and complex task for teachers. The difficulty teachers had implementing scaffolding strategies is consistent with previous research that has indicated that professional development in early childhood has not effectively changed teacher behaviors (Helterbran & Fennimore, 2004; Neuman & Cunningham, 2009; Pence et al., 2008). Furthermore, as scaffolding could be considered a language-focused behavior, it is interesting to take note of the similarities between this study's professional development results and other studies using professional development to train teachers in language-focused strategies. For instance, in their study investigating teacher participation in professional development to use communication-facilitating strategies and language-developing strategies, Piasta et al. (2010) found no effects of professional development for teachers' actual use of language-developing strategies. Relatedly, in their 2008 study, Pence et al. (2008) also found that teachers demonstrated relatively low levels of fidelity to a language-focused intervention to which they were introduced in a 3-day professional development workshop. Therefore, converging evidence seems to suggest that concerted efforts may be required to develop professional development that supports teachers in their use of complex, dynamic features of language interventions, such as use of scaffolding strategies.

In terms of teachers' use of high-support strategies, study findings confirmed our hypothesis that teachers would use relatively more high-support strategies at the beginning of the year than at the end of the year. At the end of the year, teachers used fewer strategies that provided additional support for children having difficulty completing tasks than at the onset of the preschool year. Interestingly, results showed that teachers' use of low-support strategies had the opposite pattern, as more low-support strategies were used at the end of the year than at the beginning of the year.

The fact that teachers were using fewer high-support strategies as the year progressed while increasing their use of low-support strategies suggests that teachers were sensitively withdrawing high-support strategies, which is consistent with the dynamic nature of Vygotsky's (1912/1978) theory of ZPD. In examining this pattern of scaffolding strategy use, it is possible that, over time, children in these teachers' classrooms were becoming more capable of independently learning increasingly complex concepts. In response to this growth, teachers may have gradually removed more supportive strategies (i.e., high-support strategies) and increased the use of strategies exposing children to information at higher levels of their ZPD (i.e., low-support strategies). This finding is encouraging in light of Vygotsky's (1912/1978) argument that a teacher's ability to

appropriately time the removal of scaffolding (i.e., to distance) helps to ensure children's independent performance of a final task.

An important caveat to the finding that teachers are sensitively withdrawing high-support strategies across the year must be noted. As previously established, it is possible that the children in this study were becoming more competent in independently performing tasks, and thereby teachers' decisions to replace strategies that provided high levels of support with those that challenged children to work at the highest levels of their ZPD (i.e., low-support strategies) were completely appropriate. However, it is also possible that some students did not demonstrate the type of growth that warranted greater use of low-support strategies (particularly if new vocabulary or concepts were introduced), suggesting that teachers' continued use of high-support strategies may have been more appropriate. Therefore, although the present study's descriptive characterization of the dynamic nature of general scaffolding strategy use is a useful first step in understanding teachers' ability to scaffold young children's learning, future research is warranted that documents children's specific responses to scaffolding interactions. Such research would serve to more precisely capture teachers' appropriate use of scaffolding strategies in preschool classrooms.

Influences of Scaffolding on Children's Language Gains

The second goal of the present study was to investigate the possible relations between teachers' use of scaffolding and children's language gains, specifically in vocabulary. Study findings showed that use of high-support strategies at each time-point was not predictive of children's vocabulary gains. Thus, one conclusion is that teachers' use of strategies that are more literal and provide support for children encountering difficulty with a task is not associated with children's vocabulary gains. This finding is discordant with previous research relevant to shared reading with young children, which suggests that some children, particularly those with lower initial language skills, benefit most when teachers use a more literal reading style during shared reading (Reese & Cox, 1999). However, the evidence investigating the benefits of adults' use of concrete, literal talk on children's language development has resulted in mixed findings. For instance, other correlational studies suggest that, while adults' literal talk does not support children's language outcomes for children with low initial language scores, inferential conversations are beneficial to vocabulary learning regardless of children's initial skill levels (Hindman et al., 2008).

Turning to teachers' use of low-support strategies, study findings showed that use of low-support scaffolding strategies, specifically at the beginning of the year, was predictive of language gains. The relationship found between teachers' use of low-support scaffolding strategies and children's language skills suggests that the use of such dynamic processes may be an effective mechanism for supporting children's learning during the implementation of static language interventions. Our results are consistent with prior research findings that scaffolding by teachers or tutors in the classroom is associated with increased learning and positive outcomes in young children (e.g., Juel, 1996; Maloch, 2002; Rodgers, 2005). Furthermore, this work suggests that teachers' use of talk that is more inferential in nature (i.e., talk involving generalizing, reasoning, and predicting) seems to be particularly beneficial for children's vocabulary gains. Previous research has found that teachers' use of inferential talk (e.g., inferencing, predicting, and analyzing) is important to children's development (e.g., Dickinson & Smith, 1994; Hindman et al., 2008; van Kleeck et al., 2006; Zucker et al., 2013). It is possible that teachers used more inferential, low-support strategies in the beginning of the preschool year as a gauge for what children in their classroom were capable of and then differentiated instruction from that point based on skill levels of individual children throughout the year.

While our finding confirms our hypothesis that preschool teachers' use of low-support strategies would be most strongly associated with children's language growth, results are only relevant to teachers' use of scaffolding strategies at the beginning of the year. Thus, we are unable to determine with certainty whether or not the use of distancing or "sensitive withdrawal" was associated with children's growth over time, as found in caregiver–child scaffolding interactions (Pratt et al., 1992). Future research to further investigate the relationship between teachers' sensitive withdrawal of low-support strategies over time and children's learning gains is therefore warranted.

Limitations and Conclusion

This study provides important information regarding the use and impact of a dynamic feature of a language intervention in the early childhood classroom; however, some limitations warrant consideration. First, generalizability is a concern as participants were drawn from early childhood classrooms designed to serve at-risk populations. Therefore, it is unclear whether findings would generalize to children and teachers in other settings. Second, teachers were observed for scaffolding use during three brief observations over the academic year; it is unclear whether the observed practices are typical of scaffolding strategy use throughout the day and across the year. In addition, observation for scaffolding strategies occurred after teachers were exposed to relevant professional development; future research should investigate teachers' use of scaffolding strategies in the absence of professional development to gain a more enhanced understanding of teachers' natural use of such strategies in their classrooms. For instance, research that employs social validity measures such as focus groups or interviews might help to disentangle reasons teachers choose to use certain strategies as a part of their typical practice. Relatedly, as frequency of low- and high-support scaffolding was operationalized by aggregating different strategies, future research should address the contribution of these individual strategies to children's language gains to fully understand teachers' differentiation of instruction. Third, as only two levels (high and low) of scaffolding strategies were analyzed, future research might investigate a wider range of scaffolding strategies to provide practitioners with more nuanced recommendations regarding individual strategy use that might support practice. Fourth, the number of teachers involved was relatively small; further research with a larger, more diverse population is warranted. Finally, future research is warranted to fully understand the relationship between teacher behaviors and gains in children's language development, given that other teacher variables (e.g., the static components of the intervention) may play an important role in children's growth.

To sum, the present study sought to improve our understanding of the extent to which preschool teachers used certain components of language interventions, particularly those dynamic processes that may be vital mechanisms for supporting children's learning during intervention implementation. Investigation into the use of dynamic features of language interventions, such as scaffolding strategies, is a particularly relevant avenue for research given that children within today's early childhood classrooms are considerably diverse, particularly with respect to their language and literacy competencies (Cabell et al., 2009; Justice & Ezell, 2001). Teachers in these classrooms may need to employ dynamic processes of interventions, such as differentiated scaffolding strategies, to effectively support children with a diverse set of needs, particularly while implementing language curricula. Study findings suggest that the use of certain types of scaffolding strategies may be beneficial for children's development of vocabulary skills. However, findings also suggested that teachers may benefit from educational and professional development opportunities focused on the use of dynamic features of language interventions, such as scaffolding strategies, in the early childhood classroom.

Appendix

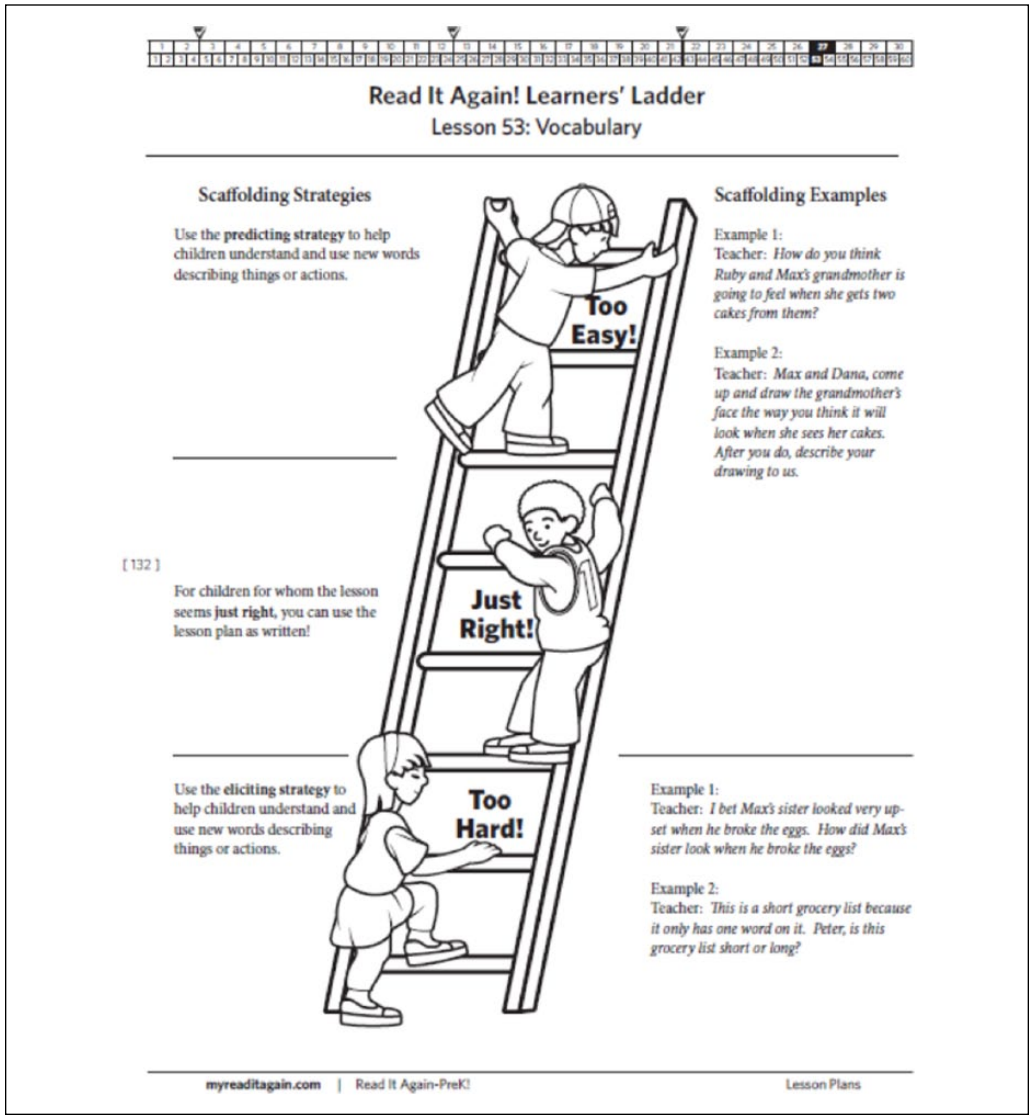

Figure A1. Example of Learners' Ladder page.
Source. Justice, L. M., & McGinty, A. S. (2009). *Read It Again-PreK!* (p. 67). Columbus: The Ohio State University. Reprinted with permission.

Author's Note

Jill Pentimonti is now at American Institutes for Research, Washington, DC. Anita McGinty is now at Applied Science for Education and Community Partners, Charlottesville, VA.

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