

Reading Recovery[®] Teacher Expertise: Gaining and Structuring Content Knowledge for Early Literacy Intervention

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This study examined the quality and characteristics of Reading Recovery intervention teachers' expertise in phonological awareness, strategies for word identification, and comprehension, grounded in their knowledge of a specific student and evaluated against research-based standards. The study also utilized a narrative analysis of the instructional reasoning of intervention teachers as constructed within retrospective interview narratives describing case knowledge of a first-grade student's intervention program. Results indicate that reading intervention teachers articulated complex, integrated expertise that was substantiated through detailed observation and theorizing regarding an individual student's intervention program.

Note: All names are pseudonyms.

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The characteristics of intervention teachers' expertise is of primary importance; early literacy intervention instruction must be effective enough to close the achievement gap for struggling readers to average or better achievement levels (Rodgers, Gomez-Bellengé, Wang, & Schulz, 2005). Children who experience difficulty learning to read in the primary grades will continue to struggle (Juel, 1988; Vellutino & Scanlon, 2002) unless they are provided with effective early intervention. The expertise of a teacher who will deliver a literacy intervention to a failing first-grade reader is of paramount importance. "The quality of the teacher is the key to improved student performance, regardless of the condition of the schools, the affluence of the child, the nature of the community, or any other element in the lives or educational environment of school children" (American Council on Education, 1999, p. 5-6). Intervention teachers must possess both the content knowledge and teaching skills to bring failing literacy learners to high academic achievement (Federal Register, 2006).

In-depth knowledge of teachers' expertise for literacy instruction and intervention, then, is of key importance. Previous studies have focused on teachers' content knowledge within such specific domains as fluency (Lane et al., 2009), linguistics (Moats & Foorman, 2003), and literature and phonological knowledge (McCutchen et al., 2002). Additionally, however, performance-based standards for reading professionals require teachers' understanding of the integrated roles of phonological awareness, word identification, fluency, vocabulary, and comprehension for fluent reading (International Reading Association, 2003). These same standards require literacy teachers to analyze the results of formative assessment in order to plan and revise instruction, engaging in knowledgeable problem solving from multiple perspectives. Outstanding first-grade teachers demonstrate explicit awareness of, and the ability to explain, their instructional practices and underlying goals (Wharton-McDonald, Pressley, & Hampston, 1998). Teachers are able to construct pedagogical representations with strong connections to the prior knowledge and dispositions of students (Shulman & Quinlan, 1996). They possess detailed knowledge of the children they teach and work actively to help children make connections across information at word, sentence, and text levels (Wray, Medwell, Fox, & Poulson, 2000).

It is also important to consider how teachers gain and structure their expertise. Traditional professional development for teachers often emphasizes best practices in literacy instruction and/or explicates generative instructional principles derived from research. Research has also, however, identified a significant and ongoing disconnect between research-generated instructional theory and the day-to-day instructional practice of teachers (e.g., Black & Halliwell, 2000; Ethell & McMeniman, 2000; Goodlad, 1990; Korthagen & Brouwer, 2005; Leinhardt, Young, & Merriman, 1995). The tacit assumption that teachers will automatically know how to adapt generative instructional principles and concepts to their own immediate teaching decisions is dangerous at best (Leinhardt et al.).

Content knowledge is more effectively applied when activated, so that teachers explicitly understand their own knowledge base (Wilson & Berne, 1999). Eliam and Poyas (2009), for example, found that preservice teachers who were able to formulate integrative responses to video-recorded cases were more successful in applying academic theories. Evidence also indicates that effective literacy teachers gain expertise by using specific instructional frameworks as a stimulus for decision making based on their detailed understanding of how children develop as readers and writers (Flynn, 2007). Flynn cautions that literacy teachers' content knowledge, therefore, should be considered in a broad sense — knowledge of children's literature, key aspects of written and spoken language, how children acquire literacy, and how teachers nurture children's learning in the classroom. Similarly, Wilkinson (2005) determined that literacy teachers' effectiveness was centered on theoretical knowledge beyond their isolated use of specific pedagogic practices. Theory development, including knowledge of research and teachers' theories about "why we do what we do," provided structure and local ways of envisioning instructional practices. Teachers' development of expertise, then, may be dependent on a reflective interface between specific instructional practices, instructional problem solving, and teachers' local theory building.

Teachers develop case knowledge based on deliberate, reflective problem solving (Frager, 1994), often resulting in "canonical stories" shared by professional communities (Shulman, 1986; Wilson & Berne, 1999). Case knowledge originates from a specific and problematic situation involving an individual student that causes a teacher to consider alternative strategies from a problem-solving stance (Frager). This effective problem solving also requires accurate and detailed noticing behavior. Teachers adjust ongoing instruction based on their expert noticing of key aspects of student responses during instruction, engaging in detailed hypothesizing about the meanings of these observations (Ross & Gibson, 2010). Study of teachers' responses to videos of students' learning indicates that many teachers need coaching and professional development in order to accurately and fully interpret students' thinking based on their interpretation of evidence in student behavior (Gallant & Schwartz, 2010; Ross & Gibson). Van Es and Sherin (2008) found that teachers participating in a professional video club developed understanding of the importance of opportunities for students to explain their mathematical thinking and to recognize crucial instances of their students' thinking around problems. It follows from this research that detailed observation combined with reflection and problem solving is a factor in teachers' development of expertise. Consequently, reform-oriented professional development for teachers now focuses more closely on teachers' immediate instructional classroom contexts and supports active participation and collaboration between teachers (Parise & Spillane, 2010).

There is growing understanding, then, that teachers' expertise is grounded as practical knowledge gained within the context of their work (Vacca, Vacca, & Gove, 1995). Teachers' craft knowledge is recognized as a rich knowledge base (Cochran-Smith & Lytle, 1993) that is integrated and organized around problems of practice tightly connected to what actually occurs in classrooms (Hiebert, Gallimore, & Stigler, 2002). This practice-based expertise allows literacy teachers to orchestrate instructional episodes successfully by utilizing clarifying and validating responses to students' partially correct, emerging understandings (Ruddell, 2004). Distinct from more abstract, generalizable research-based knowledge, teachers' practitioner knowledge intertwines content knowledge, pedagogical knowledge, and pedagogical content knowledge (Shulman, 1986) and is organized around teachers' specific instructional problem solving (Hiebert et al.).

The current study was designed to add to existing knowledge regarding intervention teachers' content knowledge and processes for the development of instructional expertise. The study examined Reading Recovery teachers' articulation of both content knowledge and instructional reasoning, grounded in the context of their Reading Recovery instruction delivered to an individual struggling reader. The following research questions directed the study:

1. What are the range and characteristics of Reading Recovery teachers' expertise in phonological awareness, strategies for word identification (e.g., phonics/decoding, self-monitoring, searching, and self-correcting processes), and comprehension (e.g., vocabulary knowledge, response to text, and literal/inferential understanding)?
2. What instructional reasoning was demonstrated in Reading Recovery teachers' narrative descriptions of a successful intervention for a first-grade student?

METHOD

The current study is based on standards-based and narrative analyses of the interview statements of Reading Recovery teachers, with interviews conducted shortly after a Reading Recovery student taught by each participating teacher had improved his/her literacy skills to an average or better achievement level. Interview questions focused on each teacher's perception of the focus student's phonological awareness, word identification strategies and comprehension from beginning to end of the intervention, and the specific roadblocks and strengths of each child.

Participants

All trained Reading Recovery teachers in a school district affiliated with the researcher's university training center were asked to consent to an interview, scheduled shortly after a focus student taught by each teacher reached grade-level expectations (and his/her intervention lessons were discontinued). Twenty Reading Recovery teachers participated in this study. Participants were credentialed teachers with 2 to 13 years of experience teaching Reading Recovery (mean of 6 years) and 5 to 32 total years of teaching experience (mean of 18 years). Teachers typically taught a half-day kindergarten class plus four individual Reading Recovery lessons each school day. The 16 different schools that participants taught at were located in urban or suburban environments. The school district, with 24 elementary schools, is located within the southwestern United States and was supporting a 16-year, districtwide implementation of Reading Recovery with approximately 200 children receiving Reading Recovery instruction on a yearly basis. The district served over 33,000 students in total, with an overall student population of African American 3.1%, American Indian/Alaskan Native 0.4%, Asian 16%, Filipino 7.2%, Hispanic 11.0%, Pacific Islander 0.7%, and White 57%. The researcher is an experienced trainer of Reading Recovery teacher leaders. She provided ongoing professional development for the school district's Reading Recovery teacher leader, but had no direct involvement otherwise with the study's Reading Recovery teachers.

Data Collection

The school district's Reading Recovery teacher leader presented the request for an interview to be conducted by the researcher as each Reading Recovery teacher indicated that one of her Reading Recovery students had reached discontinuing. Reading Recovery is an effective early literacy intervention (D'Agostino & Murphy, 2004; Iverson & Tunmer, 1993; Pinnell, Lyons, DeFord, Bryk, & Seltzer 1994; Rodgers & Ortega, 2009; Schwartz, 2005) for struggling first-grade readers. Students selected for Reading Recovery are the lowest-achieving literacy learners in their regular education classrooms, and are discontinued (i.e., released) from the intervention when they demonstrate average or better levels of literacy achievement. Each teacher then contacted the researcher and individual interviews were scheduled. Each of the 20 Reading Recovery teachers participated in one individual interview, occurring shortly after her focus student reached an average or better literacy level. Each interview lasted approximately 30–45 minutes and was held at the teacher's school site.

Interview questions were designed to provide a semistructured, retrospective context for the teacher's construction of an oral narrative describing a specific student's intervention, with the intent to encourage each Reading Recovery teacher to elaborate on the details of the focus student's literacy skills

and progress through the series of lessons. Participants were explicitly requested to refer to the student's lesson records during the interview, and asked to describe the focus student's biggest roadblock, his/her phonological awareness, word identification strategies, and comprehension at the beginning and end of the intervention, and the teacher's most-significant area of learning (see Appendix A).

Data Analysis

Interviews were analyzed to determine teachers' content area expertise and narrative-based instructional reasoning for beginning reading instruction, grounded in each teacher's description of the intervention program provided to the focus student. Analyses for this study are described below and consisted of four distinct steps organized by research question: Standards development, rating each individual interview against standards, analyzing for rating patterns across all interviews, and narrative analysis.

Research question 1: Expertise

Standards development. Prior to conducting any interviews for the study, standards were developed for phonological awareness, strategies for word identification (e.g., phonics/decoding, self-monitoring, and self-correcting processes), and comprehension (e.g., vocabulary knowledge, response to text, literal and inferential understanding). The researcher first reviewed research within each content area (e.g., Adams, 1990; Armbruster, Lehr, & Osborn, 2003; Barr, Kamil, & Mosenthal, & Pearson, 1991; Chapman, 2003; Clay, 1991, 2001; Doyle & Forbes, 2003; Farstrup & Samuels, 2002; Flood, Lapp, & Heath, 2004; Forbes & Doyle, 2004; Harris & Hodges, 1995; Israel, 2008; Kamil, Mosenthal, Pearson, & Barr (2000); NICHD 2000a, 2000b; Pressley & Afflerbach, 1995; Snow, Burns, & Griffin, 1998) in order to develop drafts of these standards. Five researchers at four different universities then reviewed the draft standards and provided feedback. Each of these consulting researchers is a recognized expert and published researcher in the area of early literacy instruction and is engaged in providing intensive teacher training and support. The researcher then revised each set of standards based on this feedback. Table 1 presents the completed, revised standards used in this study for the three, distinct areas of teachers' content knowledge. Next, three rubrics were created to rate a teacher's knowledge of the individual standards for each of the three literacy content topics studied (see Appendix B). All component standards were rated on a scale of 1 (very limited knowledge) to 5 (strong knowledge), and the teacher's overall rating was the mean of these individual scores.

Rating of individual interviews. Next, the content of each interview was evaluated based on the revised standards. Each interview was first closely read as

Table 1. Standards for Reading Intervention Teachers' Content Knowledge

Phonological Awareness	Strategies for Word Identification	Comprehension
<ul style="list-style-type: none"> • Knowledge of the definition of phonological awareness as (1) an awareness of and ability to segment spoken words into such linguistic units as syllables, onset/rime, and/or phonemes; and (2) blend phonemes into words. 	<ul style="list-style-type: none"> • An awareness that beginning readers must break into "real reading" by learning how to search for and utilize information from the print while drawing meaning from text (i.e., not just memorizing specific texts or "guessing" from context). • Awareness of the need to teach for strategic activity during the reading of continuous text: Teach for and support the child's strategic activity so that he can learn to monitor, check on himself, and search for information in text. • An understanding that the identification of a printed word in text requires a visual/phonological decoding process, based (in part) on increasing knowledge of orthographic representations, and attention to context-sensitive associations of phoneme sequences to letter strings. 	<ul style="list-style-type: none"> • An understanding of the value of comprehension as the outcome and reward of text reading. • An understanding that beginning readers can and should focus their attention on comprehending texts. • Awareness that readers should seek to understand the overall meaning of text by responding to text in light of their own prior background knowledge. • Awareness that readers should seek to understand the overall meaning of text in pursuit of main ideas. • Understanding the importance of teaching for beginning readers' use of meaning for monitoring and problem solving during text reading.
<ul style="list-style-type: none"> • A recognition that a complete reading program requires more components than phonological awareness instruction alone. 	<ul style="list-style-type: none"> • Awareness that beginning readers need to internalize the serial order of print, picking up and using features of print, and attending to words in a line and letters in a word in left to right sequence. 	
<ul style="list-style-type: none"> • Knowledge that children should be taught how to use letter-sound relationships to read and write, including learning how to map letters and spellings of words onto the speech units that they represent. 		

a whole and annotated for the researcher's overall assessment of the teacher's demonstrated expertise in relationship to the standards. All interview statements were then qualitatively coded, line-by-line, utilizing the standards as *a priori* codes. Next, each individual teacher's interview statements were disaggregated by standard using this coding. The researcher then read through each disaggregated set of comments for each interview, and using the appropriate Likert scale (see Appendix B) assigned a rating (1 to 5) for each individual standard. Finally, an overall rating was assigned to each teacher for each content topic (i.e., phonological awareness, word identification strategies, and comprehension) by averaging the scores for standards within that topic. Each interview yielded three overall ratings, one for each topic area.

Rating each interview against the developed standards required the researcher to determine participants' expertise as they described the focus student's intervention. Participants demonstrated their knowledge for each standard within their description of a student's strength, areas of need, instruction provided, or their own instructional reasoning. The following interview statement, for example, demonstrated a participant's knowledge of strategic activity (monitoring and searching for information in text):

Initially, [the student] leaned very hard on visual [e.g., graphophonetic information], crosschecking with pictures, meaning. Gradually, not until week four was she starting to use some syntax. So she really wasn't even using [the language] pattern. She was really using pictures and visual. First letter, initial visual. But she was self-monitoring. She was trying to fix it.

The following interview statement demonstrated awareness of comprehension of the overall meaning of text in pursuit of main ideas:

I think in comprehension he always really understood what he was reading. So that was a definite strong point for him. At the beginning levels he was able to understand what was really going on in the book.

All statements within each interview coded for each specific standard were considered together in order to determine rating scores for each standard.

After all interviews were rated against the standards using the process described above, an additional researcher (who was not one of the five researchers consulted during the development of the standards) also scored two of the same interviews. This researcher is an acknowledged expert in reading instruction with over 30 years of university experience in teacher education, with no experience in Reading Recovery teaching or training. The author demonstrated the coding and rating procedures as described above for this additional

researcher, who then independently scored two interviews chosen at random. Scoring on these two interviews was within 1 point of the author's original scoring for all standards. Differences in scoring were discussed and clarified, and the author then rescored all interviews based on this input.

Analyzing for patterns of ratings across all interviews. After the rating was completed for each individual interview as described above, the researcher then examined aggregated ratings for all participants. This analysis revealed three general patterns of responses (see Results section). The researcher used this initial examination as the basis for an additional review and close reading of all statements coded for each overall topic and standard, aggregated within each of three identified rating patterns. All statements coded by the standards within these three groups were then disaggregated and annotated, in order to determine group characteristics as described in the results below.

Research question 2: Instructional reasoning

Each interview was also qualitatively coded for narrative elements (Riessman, 1993; Labov, 1982): (a) abstract, summarizing the teacher's assessment of the child and self-directing the teacher's learning; (b) orientation, alerting the audience to background information and context; (c) complicating action, delineating the student's particular strength or weaknesses; (d) evaluation, presenting the teacher's analysis, elaboration, justification, theory, or explanation; (e) problem solving, describing specific instructional decisions and procedures; and (f) resolution, describing the student's growth. The overall structure of each participant's narrative was then mapped, presenting a graphic illustration of key descriptors provided by each teacher for the focus student's intervention (see example, Figure 1). This analysis illuminated the structure and context of each teacher's narrative description of the focus child's intervention and the teacher's instructional reasoning.

Limitations

This study analyzed interview statements rather than participants' actual teaching. It is possible that some participants were able to utilize content knowledge effectively during instruction even when they did not provide a thorough and articulate description of that same knowledge during an interview. The accuracy of participants' interview statements was enhanced by teachers' explicit access to all lesson records for the focus student during the interview. Records included daily lesson plans, running records, and observation notes for each of the lessons provided to the focus student across the entire intervention, as well as all assessments administered and graphs demonstrating the child's progress in text reading level and reading/writing vocabulary knowledge. This study's analysis of participants' interview narratives presented within the context of a

specific student's successful intervention, then, provided a useful perspective on intervention teacher expertise.

The sample of 20 participants used in this study constituted a sufficient data set given the in-depth analysis required, but also limits the generalizability of findings. The study's focus on Reading Recovery teachers undoubtedly influenced the specific findings. Some aspects of phonological awareness, strategies for word identification, and comprehension discussed in this study are also applicable only to beginning reading instruction. Other aspects of reading development were not directly addressed in interview questions, such as fluency development or students' affective responses to instruction.

RESULTS

This study analyzed Reading Recovery teachers' statements as they responded to interview questions by constructing a narrative of the focus student's responses to the intervention. All Reading Recovery students are tested using *An Observation Survey of Early Literacy Achievement* (Clay, 2006) for selection, entry, discontinuing, and end of year. Entrance text reading levels for this study's focus students ranged from 0 (not able to read Level A) to emergent level 9 (mean 2.4). Exit reading levels ranged from 8 to 18 (mean 14.5), with a mean growth of 13 text levels during the intervention. Focus students were released from the intervention after 10 to 20 weeks of daily instruction and demonstrated achievement to grade-level standards. Participating Reading Recovery teachers responded to the opportunity to describe a student's intervention enthusiastically and thoughtfully, constructing a narrative of the student's transition to grade-level appropriate literacy achievement.

Participants also indicated that their focus students, however, faced an impressively wide array of roadblocks. These roadblocks were generally not presented as simple, singular challenges. Instead, most teachers described children's interacting difficulties with disposition, affect, cognition, and literacy behavior. Participants delineated a series of interrelated instructional challenges requiring continuous problem solving; supporting each student's progress to discontinuing was not described by any participant as a simple matter of program implementation. Each teacher was highly invested in her student's literacy difficulties and the struggle to implement an effective program for that child.

Rating Patterns: Limiting, Applicative, and Expert

Examination of aggregated rating results (as described previously) identified three general patterns of expertise. When interview statements within each of three groups that had been coded for each of the standards were reanalyzed, it was possible to provide a general description of the characteristics of each group. The term *limiting* was used for Group 1 to indicate that the teacher's

knowledge appeared to restrict her ability to help students gain full use of an important conceptual understanding. The term *applicative* characterized the interview statements of Group 2, indicating that the teacher's knowledge appeared to be sufficient in support of persistent teaching for an important aspect of reading development. The term *expert* was applied to Group 3 interviews, indicating multidimensional and comprehensive expertise that would allow a teacher to provide detailed instructional solutions for a range of specific, hard-to-remediate difficulties.

Results are presented below for limiting, applicative, and expert participants for phonological awareness, strategies for word identification, and comprehension, followed by analysis of participants' instructional reasoning arising from narrative analysis.

Reading Recovery Teacher Expertise

Teachers in this study conceptualized phonological awareness, strategies for word identification, and comprehension as multidimensional concepts highly related to a student's reading and writing of text. Teachers demonstrated inter-related content knowledge, with strong relationships in their talk across content areas beyond routine use of Reading Recovery's instructional procedures. There were also, as expected, individual differences in participants' knowledge in each area, as presented in the following sections.

Phonological awareness

Participants did not describe the use of isolated practice for phonological awareness. Instead, they taught this linguistic knowledge to students directly, within reading and writing tasks. Participants were rated with an overall score on phonological awareness standards at 3 or above, with a mean score of 4.2 (scale of 1 to 5). All participants were evaluated at 5 for the understanding that a complete reading program requires more than phonological awareness instruction alone. Examples from the interview data are presented below (and summarized in Table 2), illustrating findings for teachers' expertise in the area of phonological awareness for the limiting, applicative, and expert groups.

Limiting. All teachers demonstrated an accurate, basic understanding of phonological awareness, and were able to discuss a student's progress within instruction for hearing and recording sounds in words: "Say the word slowly. What sounds do you hear?" A few participants (15%) were hesitant and provided limited information when asked to describe their student's phonological awareness. These teachers typically focused their talk only on "learning his sounds." Carrie, for example, described Ron's phonemic awareness at the beginning of his intervention as "very low, poor."

Table 2. Interview Findings Illustrating Three Levels of Expertise for Phonemic Awareness

	Limiting	Applicative	Expert
Definition	<ul style="list-style-type: none"> • Hesitant, provided only limited information • Defined phonemic awareness as knowledge of sounds 	<ul style="list-style-type: none"> • Articulate and comfortable discussing a child's phonological awareness • Defined phonemic awareness as hearing sounds within words and knowing and using letter sounds when reading and writing 	<ul style="list-style-type: none"> • Insightful discussion regarding a child's use of phonological awareness across all aspects of instruction • Defined phonemic awareness as a specific sub skill needing direct and targeted instruction
Instruction	<ul style="list-style-type: none"> • Briefly discussed students' progress in hearing and recording sounds in words 	<ul style="list-style-type: none"> • Persistent and targeted hearing and recording sounds in words instruction 	<ul style="list-style-type: none"> • Persistent and targeted hearing and recording sounds in words instruction • Detailed attention to change over time in a child's skills for hearing and recording sounds in words
Application to Text Reading and Writing		<ul style="list-style-type: none"> • Discussed need to train students' perception for how words look and how words sound • Connected hearing and recording sounds in words procedures to other aspects of instruction 	<ul style="list-style-type: none"> • Discussed need to train students' perception for how words look and how words sound • Integrated hearing and recording sounds in words instruction with student's use of strategies when reading and writing text

Not really making associations between the [letters and sounds]. We would do a picture, the alphabet chart with a picture [i.e., reading through a chart associating each letter with a key word/picture]. I wanted him to have a meaning anchor for the sound, something he could refer to and to make that connection with him.

Carrie did not elaborate on Ron's phonological awareness beyond this focus on letter-sound correspondence.

Applicative. Over half of participants (55%) demonstrated an applicative level of knowledge for phonological awareness. These teachers were articulate and comfortable defining phonemic awareness as both hearing sounds within words and knowing and using letter sounds. They described persistent, direct, and targeted instruction and provided details of the child's learning over time. Teachers, for example, described the need to slow a student down when saying a word slowly during writing to insure that the student was hearing specific sounds.

Participants explicitly applied the concept of phonological awareness to other aspects of their teaching. Grace described instructional procedures she used to teach Alice how to access letter sounds:

The alphabet book [i.e., a simple book with one page for each letter known by the student and an associated picture] was huge for her in that she would pull a letter "out of the air." If we were going to write the word *time*, she'd start with a P. She was all over the place. So what we would do is we'd grab the alphabet book. And if for instance the word was *time*, I'd go to the T [page], and she would see that that's a T. And [I'd ask], "What's the word? And does it start the same?" And I'd say the words, and she'd say the words, and then she'd recognize [the same initial sound].

Teachers also reported teaching students to perceive how words both look and sound. Brianna, for example, described Howard as a student who initially would "just create the story [when reading], make it up, look at the picture, try the first sound hardly at all. Mostly creating the story as he went along." She described the need to teach Howard explicitly that words are made up of both letters and sounds:

Just don't take it for granted that a student is going to know that a word is made up with letters. They see [the word] *mom* as a big chunk. So just to go slow and make sure from the very beginning that the student knows that the words are made up of letters. Words are made up of those letters that make the sounds.

Expert. Approximately one-third of participants (30%) demonstrated an expert level of knowledge of phonological awareness. Like applicative-level participants, experts described persistent instruction for sound and letter box procedures during story writing (i.e., hearing and recording sounds in words procedures with the support of a box drawn for each sound or each letter within a word). They defined phonological awareness as an integral aspect of reading and writing strategies:

I think when he started the program he really thought that lists of words go together because they look somewhat right. He didn't really understand the principle...they also sound the same. He wasn't tying in the sound with the looking. And so, for him at the end of the program we had worked so hard on the word work in text and in isolation and in familiar reading and the writing all across the lesson, that it really started to become apparent to him that, "Oh, they look the same because they sound the same" or "Those two letters work together in this way."

Experts also extended their ongoing work in sound boxes to explicit teaching for their focus student's solving of difficult words when reading text:

River, clap *river*, and then break [the word] *river*. "Show me that part [*riv*], show me this part [*er*]." So, getting him to use that strategy on unknown words was powerful.... Because at that point, he was ready for that type of instruction. It was a little bit of nudge in the beginning, but that's exactly what he needed to get him away from the phoneme by phoneme into larger parts of words....So I think a lot of it was just losing old, old habits that he was doing and reteaching a lot of new, higher-level skills.

Summary. Most participants emphasized not only teaching for phonemic awareness within hearing and recording sounds in words procedures, but for a student's use of phonemic awareness when reading text. Participants provided intentional, targeted teaching for both phonemic awareness itself, and for the focus student's improved perception for how words look matched to how they sound.

Word identification strategies

Participants all described direct teaching for the student's use of meaning, structure, and visual/graphophonetic information for word identification as well as such strategic behavior as monitoring, self-correction, and rereading. Participants were evaluated with an overall score on strategies for word identi-

fication standards at 3 or above (mean 4.4). All participants were rated at 5 for awareness that beginning readers must break into “real reading” (i.e., searching for and using information from print coordinated with meaning and language structure). Most participants (75%) were also rated at 5 for their description of teaching for strategic activity during the reading of continuous text. Examples from the interview data are presented below (and summarized in Table 3), illustrating findings for teachers’ expertise in the area of word identification strategies for the limiting, applicative, and expert groups.

Limiting. Three participants (15%) demonstrated limiting, restrictive knowledge of word identification strategies. Each of these participants responded to virtually all interview questions with elaboration regarding one particular issue. This “one-issue” approach appeared to override the teacher’s reflection regarding explicit teaching of strategies for word identification.

Carrie, for example, described Ron’s consistent tendency to resist engagement in literacy tasks:

He really would try to avoid [writing]. Didn’t want to, just did not want to. I don’t think he was afraid of taking risks. I think he’s a child that would take risks, but didn’t want to deal with it at all. Just didn’t want to work on learning.

When asked what strategies Ron typically used to identify unknown words at the beginning of his program, Carrie’s response again emphasized Ron’s avoidance of literacy tasks:

I think he was, he was really guessing at first [when reading text] and inventing text. And later [he] realized that that wasn’t going to work for him, [because] I was going to ask him the [teaching prompts (e.g., “Would that make sense?”)]. That he would really have to make a [one-to-one] match. And he would have to [make it] look right and sound right and so forth.

Carrie did not provide alternate theories explaining Ron’s lack of effective strategies for word identification, stating that his biggest roadblock was avoidance: “He wanted to talk about anything else but reading.”

Applicative. All teachers discussed monitoring, rereading, and self-correction in the context of learning to use graphophonetic information integrated with meaning and language structure. Approximately half (45%) demonstrated an applicative level of knowledge for word identification strategies. These teachers demonstrated consistent attention to teaching for the use of effective strategies for accessing multiple sources of information.

Table 3. Interview Findings Illustrating Three Levels of Expertise for Word Identification

	Limiting	Applicative	Expert
Strategic Behavior	<ul style="list-style-type: none"> Maintained "one-issue" focus: Single aspect of student's work, overriding attention to teaching for strategic activity 	<ul style="list-style-type: none"> Discussed consistent, multifaceted teaching to shift students from limited strategies and attention to sources of information to orchestration and "real reading" 	<ul style="list-style-type: none"> Discussed consistent, multifaceted teaching to shift students from limited strategies and attention to sources of information to orchestration and "real reading"
Instruction in Phonological Decoding Processes		<ul style="list-style-type: none"> Described teaching procedures that would lead to development of a visual/phonological decoding processes 	<ul style="list-style-type: none"> Described a visual/phonological decoding process, based on knowledge of orthographic representations, and attention to context-sensitive associations of phoneme sequences to letter strings
Instruction in Serial Order		<ul style="list-style-type: none"> Described teaching to look across or through whole words when problem solving difficult words in text 	<ul style="list-style-type: none"> Described the importance of teaching for the serial order of print, picking up and using features of print, and attending to words in a line and letters in a word in left to right sequence

Katie emphasized the need for Betsy to learn how to solve a difficult word by using letters and word parts while checking against a text's meaning:

She would read into her elbow; that would be mumbling the words. That way you don't have to try. And then we worked on working through the letters and working through each sound to get the tricky words. And looking at the picture and trying to [determine meaning], but as a second language learner those labels just weren't there for her. And she would make an attempt at [using] the sounds [within a word], but she didn't notice if it didn't make sense and that it wasn't right.

Krista noted that Eran did not engage in problem solving for difficult words at the beginning of his intervention: "He didn't know what to do when he came to a word that he didn't know.....He would just stop. Just stop. And wait for someone to tell him what [the word] said." Krista described her teaching as consistent and specific prompting:

I tried to be specific with him about exactly what I wanted him to do. And we practiced that skill in particular and repeatedly until he was able to do it. When he came to a word he didn't know, if I wanted him to read the sentence again and think about what would make sense and look like that word, then whenever he came to a word I would say, "Read the sentence again and think what would make sense and look like that word." And then we would do it throughout the entire lesson.

Expert. Close to half of participants (40%) demonstrated an expert level of knowledge for word identification strategies. Like most participants, these teachers demonstrated consistent attention to teaching for the use of effective strategies and accessing multiple sources of information. Experts also, however, talked explicitly about the need for the focus student to internalize knowledge and expectations for common patterns integrating phoneme segments with letter strings.

Mandy, for example, described Jase as a student who needed to learn how to use his existing knowledge strategically when reading text. Mandy's instruction focused explicitly on learning how to scan words left to right, and framing parts of words to identify patterns of graphophonetic information.

It got to the point where it would look like nothing; those skills were underground. You truly weren't seeing any of it. Early on, you could see where [Jase] would use his fingers to take those words apart. So he would find *climb* in *climbing*, he

would find *plant* in *planted*. And *grandfather*, he would break it up. He was able to clap out those parts that we would work on in our writing and talk about interesting parts of words like I-G-H-T in *night*, that is important to acknowledge because they are going to see that again.

Summary. All participants emphasized the use of effective strategies and multiple sources of information for word identification, and the need for each student to break into “real reading.” All teachers also demonstrated awareness of the student’s need to learn how to monitor, reread, and self-correct while using all sources of information, and many also described teaching procedures that lead to the focus student’s development of a strong perception for common phoneme/letter string patterns.

Comprehension

All participants described an important role for comprehension in beginning reading acquisition. Participants were evaluated with an overall score on comprehension standards at 4 or above (mean 4.6). No participants of this study were evaluated at a limiting level for knowledge of comprehension. Examples from the interview data are presented below (and summarized in Table 4), illustrating findings for teachers’ expertise in the area of comprehension for the limiting, applicative, and expert groups.

Applicative. All participants clearly valued comprehension as an important goal for their student. Approximately half (45%) demonstrated an applicative level of knowledge for comprehension. Sally’s comments, for example, emphasized Nathan’s need to understand the gist of stories for his use when identifying words in text.

I think I had a great story sense, which helped him a lot when we did the book orientation....I don’t think it helped him in his text reading, however. Because I think at that point (I talked about the overwhelming feeling that he had) I think he lost any of that story sense. So I think the comprehension was okay. But it was a minimal comprehension. I mean in spite of having a wonderful engaging book orientation where he really did most of the talking...It was almost like, “Okay, great. Now I said the story, okay, now I’ve got to read the words.”

Sally described Nathan’s accurate use of character’s voices and prosody when reading aloud. Her narrative, however, did not address background knowledge needed by Nathan for effective comprehension. Sally did not, for example, discuss her focus student’s strength or difficulty understanding character’s motivations, language structures, or literary devices.

Table 4. Interview Findings Illustrating Three Levels of Expertise for Comprehension

	Limiting	Applicative	Expert
Value of Comprehension	<ul style="list-style-type: none"> Likely to undervalue or not notice the role played by comprehension in student's enjoyment and motivation to read, as well as for word identification strategies during text reading 	<ul style="list-style-type: none"> Valued comprehension of text as an important goal for beginning readers to insure students' ability to gain information from text 	<ul style="list-style-type: none"> Valued comprehension of text as an important goal for beginning readers, both to insure students' ability to gain information from text and for students' enjoyment
Background Knowledge and Main Idea		<ul style="list-style-type: none"> Included limited detail regarding students' need for background knowledge and/or overall understanding of the main idea/gist of texts 	<ul style="list-style-type: none"> Provided significant detail regarding students' need for background knowledge and overall understanding of the main idea/gist of texts
Role of Comprehension		<ul style="list-style-type: none"> Discussed comprehension primarily for its role in students' problem solving of difficult words 	<ul style="list-style-type: none"> Discussed comprehension as an important goal in its own right, integrated with students' strategic behavior for word identification when reading text

Applicative-level participants emphasized the value of comprehension for purposes of strategic problem solving. Erin, for example, described Olive as someone who had initial difficulties with comprehension.

Sometimes at the beginning I would have to repeat the sentence [she had just read incorrectly]. “You said this, did that make sense?” But then as time went on, I didn’t have to do that and if I said it she would be able to notice. But at the beginning she needed more guidance from me in that sense.... Because it was almost like she wasn’t necessarily listening to herself. It was just spitting it out.

Erin observed that Olive demonstrated good general understanding of texts, especially later in her intervention. When asked how she was able to determine this, Erin described monitoring and self-correction during text reading: “By the end she was noticing things herself. So if she read something and it was totally off the wall she would say, ‘That doesn’t make any sense’ and she would go back and she’d try to fix it.”

Expert. More than half of participants (55%) demonstrated an expert level of expertise for comprehension. These participants all commented in detail on a student’s understanding and enjoyment of stories:

By the end of the program she loved talking about, “Oh, this story is like this story because it’s alike in this way” or, “Oh, my gosh, look, he’s playing a trick. He’s trying to trick him, isn’t he?” I mean she would pick up a little, and you would hear this chitter-chatter, too, [during] the running record. But it was important chitchat. Maybe it wasn’t chitchat. Maybe it was talk. Comprehension talk. Meaningful talk.

Experts described specific aspects of a child’s background knowledge, comprehension of literary language, and attention to overall meaning. According to Melissa, for example, Cindy could retell stories using literary language and signal words:

Cindy would tell “in the beginning of the story” and then a “next” and “after that” and “finally....” Because the stories get more and more complex and as you get more complex language you get into those time sequences. What does it mean “while something happened” or *after* or *before* or *but*? That’s a big stop sign, isn’t it? So talking about those things with youngsters I think not only helps to understand that story, but when they come to the next story they can use those....It’s

almost like the language gets embedded just from hearing it, reading it, saying it, using it, and then all of a sudden, there it pops out.

Similarly, Sherrie described Noah's comprehension as "phenomenal," including personal connections to characters and events and strong vocabulary knowledge:

Even at the beginning...as he was reading it he would laugh about the story. He would go back and talk to me about, "Oh, isn't this funny?" At the end when we do the follow-up on the story he would always know what the story was about, 99% of the time what was happening in the story, and he was very involved in the story.... His vocabulary was so strong that I think that he was able to plug through the books much faster....because he had the vocabulary and he can comprehend the whole, get the whole meaning throughout the story.

Summary. All participants emphasized the importance of teaching for comprehension for struggling first-grade readers. More than half of participants provided detailed information on the focus student's background knowledge and understanding of the overall gist of stories. Participants conceptualized comprehension as an important goal in and of itself, in addition to its role in effective word identification.

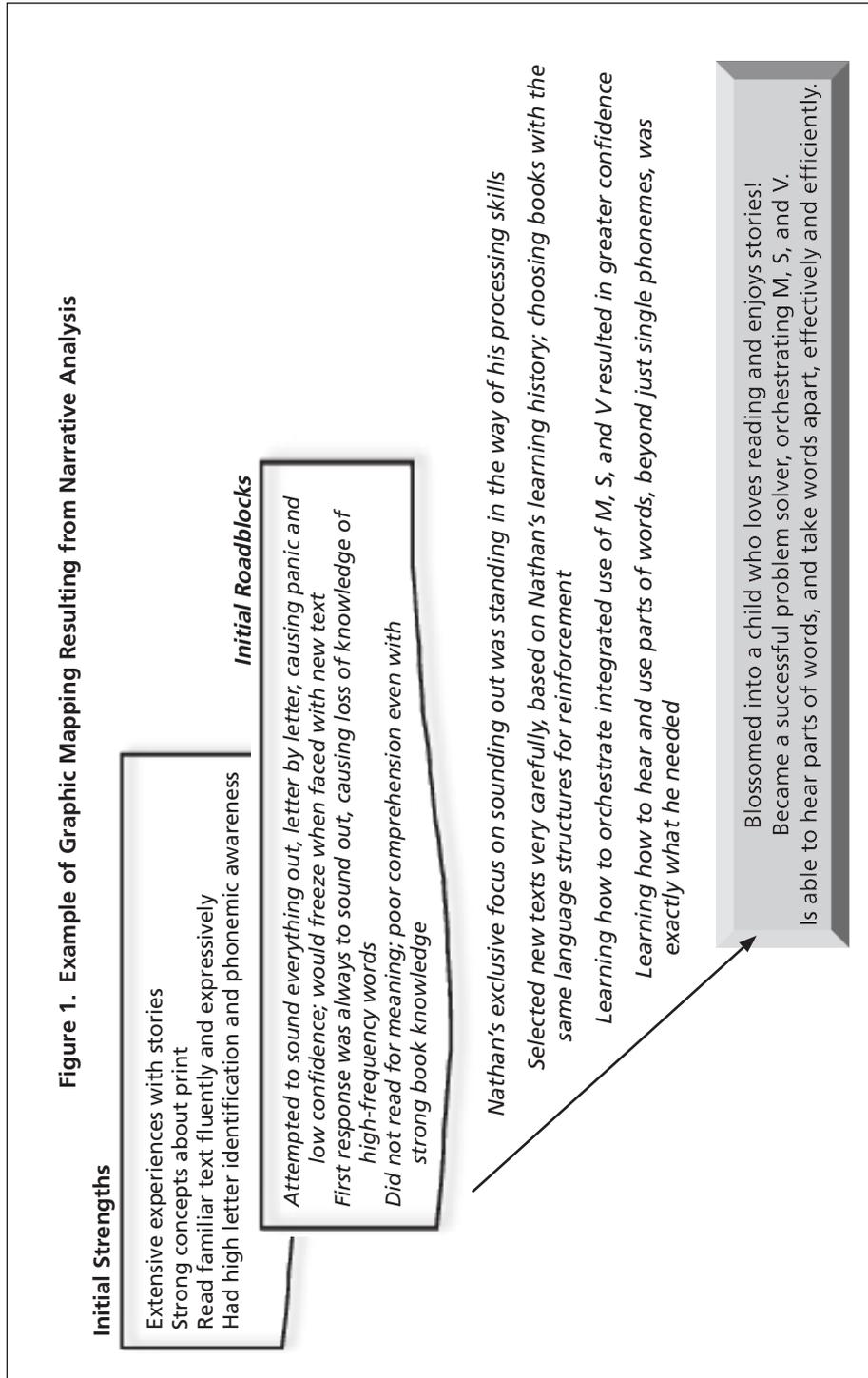
Reading Recovery Teachers' Instructional Reasoning

The following discussion of instructional reasoning is based on narrative analyses of each teacher's interview statements. Presented here are summary descriptions resulting from the coding process and resulting graphic maps (as depicted in Figure 1). The analysis allowed identification of the pedagogical reasoning of individuals with varying levels of expertise (i.e., limiting, applicative, and expert).

The narrative structure of participants' comments delineated each teacher's efforts to structure an intervention based on her own case knowledge for that student, problem solving against his/her roadblocks for accelerated progress. Participants' articulation of case knowledge provided elaboration or applicable theory as explanation of their problem solving for that child's gaps and confusions.

All participants also articulated an abstract within their narrative describing an overall "lesson" learned about effective instruction. Rated as applicative for all areas, for example, Christina described Sam's overall difficulty as one of stubbornness and an unwillingness to attempt hard tasks. Christina paid close attention throughout Sam's intervention program to keeping tasks at

Figure 1. Example of Graphic Mapping Resulting from Narrative Analysis



instructional level, demonstrating to him how using a set of strategies made tasks easier when reading and writing texts. Rated at expert for all areas, Sara described June's difficulties as based primarily on her confusions between English and Vietnamese print. Sara noted that June "really took off" as soon as she understood the reciprocity between (a) known words and phonemic awareness in writing, and (b) looking across the letters within words and searching for known parts of words when reading.

In the following sections, findings in regard to the instructional reasoning identified in the interviews of three participating teachers, one from each of three distinct levels of expertise are detailed.

Limiting/Applicative: Pam and Kathy

Pam's observations, rated at limiting and applicative levels, provided useful details regarding her focus student's literacy behavior. She noted, for example, that Kathy had good comprehension from the beginning:

After I gave the book introduction the next day on the running record she seemed to do fine, and understand what she was reading. We'd discuss it and write the sentence. You could tell she had meaning. I usually gave her a choice, but many times I had her write about the book. Just so she'd get used to using that book language....If her sentences were about the book, they pertained to what was going on in the book or she would relate it to herself in a way.

Pam theorized that Kathy's mispronunciation of words created a significant challenge for her development of processing skills. She described instances, for example, when Kathy became confused when writing mispronounced words (e.g., *teef* for *teeth*).

Pam described instruction focused on monitoring and understanding how words would be expected to look:

[I was] saying, "Did that make sense? Does that sound right?" Although I didn't use that one all the time because with her, it didn't always work because of her speech problem. But I'd say, "Think about the meaning in the story. What's happening here? Look at the picture. Could that be that word? Look at the beginning. Does that match what you are trying to say?" Usually it went smoothly. It was just some of the words, her speech problems with D-R, *drive*. She would say *rive* and so she wasn't hearing the D....I would have [her] look at me while I was saying it, repeat it, and have her look in the mirror and see how it would look to say it.

Pam utilized an abstract providing a structure for her own learning about effective instruction, derived from Kathy's success:

[Kathy's progress] taught me to not always jump to a conclusion, that the student may not progress because of the problems they have. And not prejudge them, by the beginning of the program. Because so many times I guess we all do that on certain things and then later on they prove us wrong. She proved that because of the things that got in the way of her reading, her speech, that she could compensate for that and she still made very good progress.

Applicative/Expert: Sally and Nathan

Sally's comments, like those of most participants, were evaluated at applicative or expert for each of the three content areas. Sally's detailed observation of Nathan's literacy behavior led directly to hypothesizing and explanation of her instructional decision making. She observed that, although he demonstrated strengths in the areas of letter naming and phonetic knowledge, Nathan's consistent use of this knowledge in isolation interfered with his overall processing skills.

He was assessed at the beginning of the year for Reading Recovery. High letter ID at that point. High phonetic knowledge, but it was standing in the way of his processing skills. He almost lost all knowledge of high frequency words because he was attempting to sound everything out. That was kind of his basis.

Sally stated that even when Nathan identified a word quickly this was accomplished via fast processing (i.e., sounding out) rather than automatic recognition. She utilized her observation that Nathan needed to learn to *orchestrate* (an integrated, efficient use of all sources of information for problem solving during text reading) as an abstract that directed her own decision making:

I think for Nathan it was just orchestrating everything. I think he had great book sense, strong skills in his phonics approach, some word recognition, obviously quite a lot [of strengths]. But even the words that he did recognize, I think a lot of times he would process pretty quickly. It wasn't like a sight vocabulary. And was lacking reading for meaning when he'd do text reading. Even though he had wonderful book knowledge, he would panic. Self-confidence was at a low. He'd turn the page and if there were a lot of text on the page he'd freeze, because he didn't think he knew all those words.

Expert: Mandy and Jase

Mandy also presented a complex and comprehensive description of her student's literacy learning, utilizing significant theorizing and engaging in new learning. Her interview comments were evaluated as expert for all three content areas. Mandy utilized her observation that, "for Jase it was just a clear confusion of not quite understanding what reading was" as an abstract that structured her teaching decisions. Mandy defined "what reading is" as she described the outcome of the intervention for Jase:

He is able to carry meaning through while attacking a word, [and] then put it all together and keep going. He doesn't slow down now to attack words. He has several different strategies to work on words and parts with analogies, but he doesn't lose the meaning. He does it quickly and he is able to just keep going, which is so good.

Mandy based her instructional decisions on specific and detailed observation of Jase's strategic behavior and oral reading fluency, hypothesizing that these difficulties took up too much of his time and attention and resulted in loss of meaning. Mandy described her implementation of deliberate, step-by-step instruction for perceiving and using parts of words:

I think really breaking it down piece by piece. I think that with [*Literacy Lessons Designed for Individuals*] and really scanning from left to right, I think that was such a crucial component this year and with him it made all the difference....For this student in particular, that left-to-right scanning, that word work from left to right, helped him hold on to the meanings, scan visually, and just keep going. It didn't slow him up.

Jase scored "100% on every single thing at the end-of-the-year total scores across the board" and was described by Mandy as a fabulous reader: "He is now kind of like the word attack kid. He'll see a word anywhere and will be able to just plug through [the word], scan quickly left to right."

Summary. These intervention teachers conveyed explanation, causes, and solutions for each student's particular roadblocks, engaging in challenging problem solving. Participants based their teaching on flexible use of instructional procedures arising from detailed and comprehensive observation of a student's specific strength and weaknesses. Participants also utilized an abstract of their student's overall difficulties to structure their own reflection and new learning.

DISCUSSION

The teachers in this study articulated complex, integrated expertise for intervention instruction. They appeared to gain and structure applicable, activated content knowledge during—rather than simply as a prerequisite for—their intervention instruction. The findings of this study, then, support the need for a distinct and comprehensive conceptualization of (a) the content knowledge possessed by effective literacy intervention teachers, and (b) how this content knowledge is gained and structured by teachers. This study extends our understanding of intervention teachers' expertise beyond considerations of isolated content knowledge or research-based, best practices in reading instruction.

Reading Recovery teachers in this study demonstrated strong expertise for the definition and applicability of phonological awareness, strategies for word identification, and comprehension. As teachers described their focus student's progress, they depicted these aspects of reading development as interrelated, multidimensional concepts directly related to students' use of strategies when reading and writing text. Most teachers in this study were appropriately concerned, for example, with the ways in which focus students not only "knew their sounds" but also used phonemic awareness to build expectations for how letters/sounds within words work. Teachers described persistent, targeted instruction for phonemic awareness and provided details of the child's learning over time. All participants in this study emphasized the need for each student to break into "real reading," demonstrating awareness of the student's need to learn how to monitor, reread, and self-correct while using all sources of information (i.e., meaning, language structure, and visual/graphophonetic). All participants also valued teaching for comprehension, and most provided detailed information on the focus student's background knowledge and understanding of the overall gist of stories.

In this study, expertise appears to have developed within teachers' active engagement in close observation and problem solving as participants taught for each Reading Recovery student's successful discontinuing. Teachers constructed expertise around individual children as salient examples for their development of instructional theory. It is likely that this knowledge base became well structured or activated at least in large part through teachers' deep and extended focus on real problems of practice. Participants' practice-based learning, then, was supported and expanded through their detailed observation and assessment of a child's literacy-related behavior, as well as their efforts to theorize and explain the child's roadblocks and their own instructional decisions. Teachers explained their implementation of a successful reading intervention for a failing first-grade student through active creation of case knowledge focused on instructional challenges and continuous problem solving. It seems feasible that

this observation/reflection/problem-solving cycle, focused on the progress of individual students, plays a central role in the development of the complex instructional expertise needed for effective intervention instruction.

This study's findings also point to the need to conceptualize teacher expertise beyond knowledge of the procedures for best practices in instruction or ability to simply apply research-derived instructional principles. Teachers exhibited both a programmatic perspective, utilizing a shared set of Reading Recovery instructional procedures, and a high level of commitment to the detailed observation and problem solving necessary for each focus student's accelerated progress. This finding is illustrated in part through the abstracts articulated by each participant as explanation of her ongoing inquiry and new learning as it "played out" in focus students' intervention lessons: Teaching for (a) literacy tasks at an instructional or easy level of difficulty in response to a student's unwillingness to engage; (b) an English learner's understanding of the reciprocity between known words in reading and phonemic awareness in writing; (c) a student's orchestrated, integrated and efficient use of all sources of information in place of a routine letter by letter sounding out; or (d) teaching what "reading really is" through deliberate instruction in using word parts to solve difficulties during text reading. Participants described their own engagement as educative practice and inquiry, working beyond any routine use of Reading Recovery-prescribed instructional procedures.

It is also critical to speculate on factors that would cultivate teachers' acquisition of applicable, integrated content knowledge. Reading Recovery teachers share ownership of and familiarity with a set of instructional routines, but are encouraged in behind-the-glass lesson observation and individual coaching to apply these instructional practices in flexible ways to meet each student's needs. Teachers are also required to engage in systematic formative and anecdotal assessment on a lesson-by-lesson basis throughout each child's intervention. And, Reading Recovery teachers are held accountable for the end result of each child's series of Reading Recovery lessons (occurring at no more than 20 weeks of lessons in the U.S.). These factors may account, at least in part, for Reading Recovery teachers' attention to theory building arising out of rich problem solving as they assist each student's development of strong literacy processing systems. Research-derived instructional principles and explication of best practices in instruction, then, may be most effective only when utilized by teachers within a problem-solving stance and in accord with high levels of immediate accountability. It is in this context that practitioner-based knowledge may be most likely to become integrated with the more abstract and generalizable knowledge arising out of research, providing the context within which teachers can integrate research and best practices with practice-based expertise.

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APPENDIX A
Interview Questions

1. Tell me about the Reading Recovery student that you have just discontinued.
2. What are his/her exit scores? How many Reading Recovery lessons did he/she receive?
3. What are you most proud of, in your Reading Recovery teaching for this student?
4. What were this student's entry scores?
5. What was his/her biggest challenge during Reading Recovery lessons? What did you do to help him/her with this challenge?
6. What phonological awareness did he/she demonstrate at the beginning of his/her program? At the end? What did you do to help him/her with phonemic awareness? In what ways was this development in phonemic awareness important to his/her success?
7. What strategies did he/she typically use to identify unknown words at the beginning of his/her program? At the end? What did you do to help him/her with word identification strategies? In what ways was this development important to his/her success?
8. What were this student's strengths and weaknesses in comprehension at the beginning of his/her program? At the end? What did you do to help him/her develop stronger reading comprehension? In what ways was this development important to his/her success?
9. What do you think that your work with this particular student taught you about effective reading instruction?

APPENDIX B-2
Intervention Teachers' Expertise for Beginning Reading Instruction
Strategies for Word Identification

1. An awareness that beginning readers must break into "real reading" by learning how to search for and utilize information from the print while drawing meaning from text (i.e., not just memorizing specific texts or "guessing" from context)?

Very Limited Strong
1.....2.....3.....4.....5

Comments:

2. Awareness of the need to teach for strategic activity during the reading of continuous text: Teach for and support the child's strategic activity so that he can learn to monitor, check on himself, and search for information in text?

Very Limited Strong
1.....2.....3.....4.....5

Comments:

3. An understanding that the identification of a printed word in text requires a visual/phonological decoding process, based (in part) on increasing knowledge of orthographic representations, and attention to context-sensitive associations of phoneme sequences to letter strings?

Very Limited Strong
1.....2.....3.....4.....5

Comments:

4. Awareness that beginning readers need to internalize the serial order of print, picking up and using features of print, and attending to words in a line and letters in a word in left to right sequence?

Very Limited Strong
1.....2.....3.....4.....5

Comments:

5. Overall, how would you rate this participant's knowledge of word identification during text reading for beginning reading instruction?

Very Limited Strong
1.....2.....3.....4.....5

Comments:

