

HOW DO NOVICE AND EXPERIENCED FIRST-GRADE TEACHERS
EVALUATE READING PROGRESS IN THEIR STUDENTS?

by

ALBA B. LANGENTHAL

A dissertation submitted to the Graduate Faculty in
Educational Psychology in partial fulfillment of the requirements
for the degree of Doctor of Philosophy,
The City University of New York

2004

UMI Number: 3127890

Copyright 2004 by
Langenthal, Alba B.

All rights reserved.

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI[®]

UMI Microform 3127890

Copyright 2004 by ProQuest Information and Learning Company.

All rights reserved. This microform edition is protected against unauthorized copying under Title 17, United States Code.

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

© 2004

ALBA B. LANGENTHAL

All Rights Reserved

This manuscript has been read and accepted for the Graduate Faculty in Educational Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

April 15, 2004
Date

Linnea C. Ehri
Chair of Examining Committee

April 15, 2004
Date

Carol K. Tittle
Executive Officer

Dr. Linnea C. Ehri

Dr. Alan L. Gross

Dr. Carol K. Tittle
Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

Abstract

HOW DO NOVICE AND EXPERIENCED FIRST-GRADE TEACHERS
EVALUATE READING PROGRESS IN THEIR STUDENTS?

by

Alba B. Langenthal

Advisor: Professor Linnea C. Ehri

The purpose of this study was to investigate the impact of experience and coursework on first-grade teachers' knowledge of beginning word reading acquisition and the relationship between this knowledge and assessment practices. Experience and training in reading instruction and linguistics courses focusing on language structure were examined with respect to practice-based working knowledge, assessment practices, content knowledge, theoretical orientation to reading, and teaching efficacy. Ten experienced and ten novice first-grade teachers were interviewed. Practice-based working knowledge was measured in a think-aloud procedure in which teachers discussed their pupils' reading skills. Teachers then responded to questions on their assessment practices, which were assigned blind ratings. Content knowledge of commonly used reading terms, phonics rules, and language structure was measured, and teachers responded to the TORP and Teaching Efficacy scales.

Comparisons of experienced and novice teachers showed no significant group differences except in the think-aloud in which experienced teachers made more references than novices to non-academic factors influencing reading progress. Courses in reading and linguistics were significantly correlated with working knowledge, content knowledge

of reading terms, and assessment practices. Working and content knowledge were also related to assessments. Theoretical orientation and teaching efficacy were not related to knowledge and assessment practices.

Teachers who reported having taken a greater number of courses had higher content knowledge and higher assessment ratings. These teachers used both formal and frequent informal assessments, were flexible in their practices, and made strong and logical connections between what the assessments revealed and their instruction. They actively used assessments in an ongoing improvement of their lessons to work on the most relevant problems, and adjusted their instruction to children's needs.

In sum, experience can enhance instruction by enabling teachers to view a broad range of factors affecting their pupils' development. The findings support the conclusion that coursework in beginning reading acquisition and word structure enhances teachers' knowledge and use of assessments in the classroom. While results need replication with a larger sample, they support the argument that amount and quality of training in teaching beginning reading are key factors affecting teachers' knowledge, performance, and effectiveness in teaching beginners.

Dedicated to my Father, Vincent Bevacqua, who taught me to read, and to my Mother, Marie Celauro Bevacqua, who took me to the library and encouraged me. They were avid readers who modeled their love of reading and learning.

Acknowledgments

The path toward obtaining a Ph.D. has been a long and fascinating one, at times frustrating, always rewarding. I could not have achieved this goal without the help, support, and encouragement of many people. First, I am particularly grateful to Dr. Linnea Ehri, a true mentor. Her extensive research and knowledge in beginning reading processes gave me background to understand what children need to become successful readers, and what teachers need to know to teach their pupils effectively. Dr. Ehri was always available to help and guide me during the process of working on this project, from conceptualizing the design to its completion. Her faith in my ability, her encouragement, patience, and support, as well as being challenging when I needed challenge, and her thoughtful and creative suggestions helped me advance toward and reach my goal.

I also thank my Committee members, Dr. Alan Gross and Dr. Carol Tittle for their instruction. Dr. Gross was particularly helpful in reviewing and answering all of my questions on statistical procedures for my project. Dr. Tittle's ideas, suggestions and supportive encouragement were extremely valuable. Special thanks go to Dr. Lois Dreyer and Dr. Alpana Bhattacharya for reading my dissertation and so generously giving me their ideas, feedback, and advice.

My lovely daughter Carla deserves special credit and thanks for helping me with the coding and ratings. Her perceptiveness in detecting and noting important characteristics of teachers from reading the transcripts was priceless. The process was shortened greatly, and my work was enriched by her efforts.

I am indebted to both Dr. Miriam Balmuth and Dr. Joanna Uhry for their gracious help. Dr. Balmuth's experience in educating teachers was invaluable in guiding the development of my interview questions and referring me to teachers. I could not have completed my interviews without Dr. Uhry's help in locating several teachers. I very much appreciate the encouragement and support of Dr. Henry Solomon and Dr. Irene Strum throughout this process. Dr. Solomon, Dr. Strum, Dr. Vincent Bellefiore, and Dr. Evelyn O'Connor were all instrumental in helping locate teachers. I also hold in highest esteem the teachers who participated in this study and shared my desire to add to knowledge about reading instruction.

My colleagues and friends, Kathy, Simone, Marcy, Connie, Ingrid, Donna, Marc, Julie, and Alan, with whom I have studied and shared ideas, have been a wonderful source of support. I will miss our meetings, but look forward to their graduation, and congratulations to Donna!

The dissertation could never have been possible without the support of my extended family and friends, whose confidence motivated me. I especially appreciate my husband Stephen's patience, encouragement, and support throughout the entire process.

Table of Contents

	<u>Page</u>
Approval Page.....	iii
Abstract.....	iv
Dedication.....	vi
Acknowledgments.....	vii
Table of Contents.....	viii
List of Tables	xiii
Figure and List of Appendices.....	xiv
<u>Chapter</u>	
I. Introduction.....	1
II. Literature Review.....	9
Knowledge Base about Reading Acquisition in Beginners.....	9
Simple View of Reading.....	9
The Interactive Model of Reading.....	12
Chall’s Stage Theory.....	16
Phonemic Awareness and Knowledge of the Cipher.....	20
Disabled Reading.....	30
Dyslexia.....	32
Development of Word reading Ability.....	39
Approaches to Word Identification.....	39
Phases of Development of Word reading.....	43
Spelling Development.....	47

<u>Chapter</u>	<u>Page</u>
Stages of Spelling Development.....	50
Text reading Processes.....	54
Oral Reading.....	54
Fingerpoint Reading.....	56
Instructional and Frustration Reading Levels.....	58
Theory and Research on Teaching.....	60
Approaches to Beginning Reading Instruction.....	60
Importance of Teachers' Knowledge Base.....	62
Research Evidence about Teachers' Knowledge Base.....	65
Teachers' Theoretical Orientation to Reading Instruction.....	67
Development of Teacher Experience.....	69
Expert-Novice Research.....	72
Experience in Reading Instruction.....	79
Accuracy of Teacher Assessment.....	83
Teaching Efficacy.....	86
Think-Aloud Procedure.....	93
Summary and Hypotheses.....	95
Hypotheses.....	104
III. Methods.....	106
Participants.....	106
Materials.....	110

<u>Chapter</u>	<u>Page</u>
Written Questionnaire.....	110
Think-Aloud Task.....	110
Questions on Assessment Practices.....	111
Identification of Reading Terms.....	112
Teacher Efficacy Scale.....	113
Theoretical Orientation to Reading Profile.....	114
Durkin Phonics Test for Teachers.....	116
Linguistic Knowledge Questionnaire.....	117
Procedures.....	117
Coding and Scoring Variables.....	118
Statistical Analyses.....	129
IV. Results.....	130
Dependent Measures.....	130
Think-Aloud Task.....	130
Tests of Content Knowledge.....	150
Assessment Practices.....	152
Teaching Efficacy.....	156
TORP.....	156
Comparison of Experienced and Novice Teachers.....	157
Contribution of Coursework in Reading and Linguistics.....	162
Relationships Between Other Variables.....	168

<u>Chapter</u>	<u>Page</u>
Teaching Efficacy.....	168
Theoretical Orientation to Reading Profile.....	170
Summary of Hypotheses and Evidence.....	171
Influence of Teaching Experience.....	171
Contribution of Coursework.....	172
Impact of Content Knowledge on Application.....	173
Relationships Between Similar Variables.....	174
V. Discussion.....	176
Overview.....	176
How Did Experience Influence Teacher Knowledge and Practices?.....	179
What May Account for the Observed Difference Between Experienced And Novice Teachers?.....	181
What Were the Findings on the Other Variables with Regard to Experience?.....	184
What May Account for Lack of Differences on the Other Measures?.....	186
Are There Alternative Explanations for the Findings on Experience?.....	188
How Did Teachers with Differing Amounts of Coursework Compare?.....	192
Assessment.....	195
Content knowledge.....	202
What May Account for Differences Found between Teachers with More and Less Coursework?.....	206
Are There Alternative Explanations for the Findings on Coursework?..	208

<u>Chapter</u>	<u>Page</u>
How Were Variables Assessing Similar Characteristics or Capabilities Associated?.....	208
What Might Explain the Lack of Findings on the Teacher Efficacy Scale and the TORP?.....	210
Conclusions.....	216
Limitations and Future Research.....	219
References.....	256

List of Tables

<u>Table</u>	<u>Page</u>
1. Constructs, Measures, and Data Sources.....	101
2. Teacher Characteristics.....	108
3. Think-aloud Categories, their Descriptions, Frequency and Percentage of References, and How Many Novices and Experienced Teachers Referred to the Categories at least Once.....	131
4. Think-aloud Categories and Examples.....	135
5. Correlations between Teacher Characteristics and Teachers' Use of the Think-Aloud Categories.....	146
6. Comparisons of Means of Novice and Experienced Teachers on Dependent Variables: t tests.....	159
7. Comparisons of Novice and Experienced Teachers in the Proportion of Times they Referred to Non-Academic-Personal Categories: Mann-Whitney U Test.....	160
8. Correlations between Measures of Experience, Coursework, Assessment, Content Knowledge, TORP and Teaching Efficacy.....	164
9. Summary of Stepwise Regression Analysis for Variables Predicting Assessment Practices and Reading Terms Definitions.....	166
10. Correlations of Think-Aloud Categories with Assessment, Content Knowledge, TORP, and Teaching Efficacy.....	169

Figure and List of Appendices

<u>Figure</u>	<u>Page</u>
Figure 1, Interactive Model of Reading.....	13
<u>List of Appendices</u>	
A Invitation Letter to School Principal.....	226
B Invitation Letter to Teacher.....	228
C Written Questionnaire.....	230
D Think-Aloud Procedure.....	234
E Questions on Assessment Practices and Written Tests.....	237
F Reading Terms Definitions.....	244
G Phonics Test for Teachers.....	248
H Linguistic Knowledge Questionnaire.....	252
I Scoring for Coursework Variables.....	253

CHAPTER I

Introduction

The purpose of this study was to examine first-grade teachers' practice-based working knowledge of the development of word reading skills in beginners. Practice-based working knowledge is the knowledge about beginning reading acquisition and instruction that teachers have gained from their training and experience, which they use to instruct, observe students' progress, and make instructional decisions. This study investigated how teachers' knowledge influences assessment of their students' growth in reading, how they determine when children are making adequate progress, when they are not, and how they diagnose children at risk for possible reading disabilities.

While the goal of reading instruction is to promote reading comprehension, rapid, accurate, and automatic word recognition is a necessary prerequisite for effective reading comprehension. The Simple View of reading (Hoover & Gough, 1990) conceptualizes reading as consisting of two basic components: decoding, which is efficient word recognition, and linguistic comprehension, the ability to interpret spoken language. Both are equally necessary for reading comprehension, and weakness in either component is associated with less skilled reading. The focus of this study was on decoding and word-recognition skills, which need to be in place before reading comprehension can progress. Teachers' emphasis on acquisition of word-recognition skills in beginners and the necessary alphabetic and phonological capabilities underlying development of these skills were examined as factors in their practice-based working knowledge.

The role of teacher experience and training was investigated with respect to their relationship to practice-based working knowledge. According to theories about developmental change in teachers, experienced teachers who have taught first graders to read for many years are expected to have more practice-based understanding, and to be able to present instruction more effectively, than novice teachers with only a couple of years of experience (Berliner, 1991; Ehri & Williams, 1996).

Another purpose of this study was to determine the extent to which teachers have benefitted from research findings on development of word reading skills and whether they applied it in their teaching. Researchers have made significant advances during the past thirty years in understanding the development of reading acquisition in beginning readers (Adams, 1990; Anderson, Heibert, Scott, & Wilkinson, 1985; Barr, Kamil, Mosenthal, & Pearson, 1991; Brady & Shankweiler, 1991; Gough, Ehri, & Treiman, 1992). For example, results of many studies have revealed that letter knowledge and phonemic awareness, which is the ability to break words into phonemic units, measured upon entry into kindergarten, are the strongest predictors of how well children will learn to read during kindergarten and first grades (Share, Jorm, Maclean, & Matthews, 1984). Children having difficulty learning to read are almost always found to be deficient in phonemic awareness skills (Rack, Snowling, & Olson, 1992). Studies have also shown that training beginning readers in phonemic awareness, particularly when it involves letters of the alphabet, facilitates reading and spelling acquisition (Bradley & Bryant, 1985; Byrne & Fielding-Barnsley, 1989, 1991, 1993; Lundberg, Frost, & Petersen, 1988).

Researchers investigating effects of different types of reading instruction have found that inclusion of early systematic phonic instruction in reading programs, especially direct, explicit instruction in phonics with emphasis on phonemic awareness and the alphabetic principle (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998), is the most effective type of literacy instruction (Adams, 1990; Foorman, Novy, Francis, & Liberman, 1991). Effective phonics instruction early on enables children to develop strong decoding skills, which facilitate their acquisition of a reliable vocabulary of sight words and eases text comprehension because they are not struggling with word identification (Ehri, 1995b).

Development of beginning reading skills has been described by several researchers (Chall, 1983; Ehri, 1995b; and others). According to these views, reading acquisition begins with emergent reading during preschool years when children are exposed to print in storybooks, learn alphabet letters, and “read” words in the environment by recognizing their visual attributes. In Stage 1, around kindergarten or first grade, children learn about how the alphabet represents speech, and they begin to use letter-sound correspondences to read and remember words. At Stage 2, around grades 2-3, children improve in decoding skills, their sight vocabularies grow substantially, and they become faster and more fluent readers of text. In Stage 3, grades 4-8, there is greater reading efficiency, less focus on decoding, and readers can direct their attention at comprehending more challenging text. Poor readers show deficiencies which require remediation to make progress. At Stage 1, alphabetic-phonemic and lexical skills are lacking. At Stage 2, poor readers may have decoding skill but lack speed and fluency. At

Stage 3, poor readers have comprehension difficulties (Chall, 1983; Ehri, 1998; Ehri & Williams, 1996).

In order to become effective instructors of beginning reading, teachers need to know about the development of word reading and spelling abilities in students and how to assess children's progress. This knowledge enables them to perform several important functions: (1) to monitor progress during the year to determine if children are meeting expectations and whether to adapt instruction; (2) to determine how varied the reading ability levels of their students are in order to identify and plan appropriate instruction for individual children; (3) to choose instructional activities that teach capabilities necessary for reading progress; (4) to ensure that children have the capabilities they need to respond to instruction; (5) to communicate useful information to other teachers and to parents, and (6) to identify children who are at-risk for possible reading disability and take steps toward remediation. First grade teachers are in a key position to identify at-risk students if they are aware of the early signs of reading disabilities. Furthermore, there are many outside forces exerting an influence on teachers' decisions about how and what to teach beginning readers, including authors of basal reading series, in-service courses, magazine articles on teaching, school administrators, parents, and legislators. Teachers' knowledge of the progression of reading and spelling acquisition allows them to develop reasons for their instructional decisions (Ehri, 1995a), and they can use this knowledge to teach reading effectively with a variety of instructional materials.

Many teachers appear to be aware of the need for phonics instruction for beginners and have described their own instruction as combining phonics and holistic

principles and practices in compatible ways (Baumann, Hoffman, Moon, & Duffy-Hester, 1998; Pressley, Rankin, & Yokoi, 1996). These studies indicate that teachers may realize that teaching of codes is important and that use of one approach need not exclude use of others. However, the extent of their knowledge about development of reading and spelling processes in beginners that guides their instructional decisions is not clear. It presently appears that many teachers are not fully informed about the course of development of these processes. Research findings suggest that although teachers appear to support teaching of letter-sound correspondences, many lack critical knowledge of phonemic awareness and the structure of spoken and written language (Moats, 1995, Moats & Lyon, 1996; Rath, 1994; Scarborough, Ehri, Olson, & Fowler, 1998) which can limit their effectiveness in teaching children to read. More recent research found that teachers who were knowledgeable about children's literature and those who were knowledgeable about the linguistic structure of English were more likely to focus children's attention on word sounds and letter-sound relationships in their instruction (McCutchen, Harry, Cunningham, Cox, Sidman, & Covill, (2002b).

The quality of reading instruction is thought to depend to some extent on teaching experience. The aspects of teaching and reading acquisition that teachers gain from experience with beginning readers should influence their views of reading development in beginners and their assessment of children's reading skills. Although experience may not lead to expertise in teaching (Berliner, 1986), teachers gain from their experience, and this can influence the way they conduct lessons and respond to their students. According to Ehri and Williams (1996), teachers are thought to follow a developmental course in

learning how to teach beginners to read. Teacher education students first learn about aspects of teaching and learning to read. They advance when they become student teachers under the guidance of a classroom teacher mentor, and are thought to gain the most experience and make the most progress when they have their own classrooms. At this time they can use student information about the appropriateness of their teaching methods, and learn effective assessment techniques to determine whether their pupils are making progress (Ehri & Williams, 1996). Research comparing experts and novices in different domains has shown differences between these two groups. Research comparing experienced and novice teachers of reading has shown differences in the types of student factors they use in making instructional decisions (Borko & Niles, 1982).

Proficiency in teaching is gained through application of metacognitive skills such as asking questions of oneself while performing an activity, monitoring one's own and other's behavior in a situation, seeking alternative solutions to problems, and taking note of cues in the environment that provide information (Berliner, 1987). Important sources of knowledge required for skillful teaching include understanding of the subject matter, ability to translate understanding of the subject into lessons that teach the content, and ability to manage classrooms (Borko & Niles, 1982; Hollingsworth, 1989). When teachers reflect on their performance and encode cues from students and the environment, they can adjust their strategies according to the needs of their pupils in order to increase their effectiveness (Berliner, 1987; Ehri & Williams, 1996).

Together, teachers' experience, their knowledge base about beginning reading processes, and knowledge of the structure of the English language can affect students'

responses to instruction. This in turn can have an effect on teachers' self-efficacy in teaching, defined as teachers' conceptions of their own teaching capabilities. This was considered an important factor to examine because it may be related to individual differences in teaching effectiveness (Gibson & Dembo, 1984). Self-efficacy in teaching also influences children's confidence in their ability to learn (Bandura, 1997) and teachers' job commitment and longevity (Bandura, 1997; Moats, 1995). As teachers develop, they accumulate knowledge about teaching, about their students, and about their own effectiveness (Ehri & Williams, 1996). Through knowledge and experience teachers' efficacy beliefs may increase.

To investigate the practice-based knowledge that experienced and novice first-grade teachers possess and use in their reading instruction, a think-aloud task (Ericsson & Simon, 1993; Wineberg, 1991) was utilized in order to examine the criteria teachers use to assess and rate the reading capabilities of their students. For this task, teachers were asked to rank order their students from most to least developed in their growth in reading. Responses were examined with respect to the number and types of factors teachers used to assess reading ability, how much time they spent comparing students to rank them, and to what extent they showed knowledge of developmental differences in individual students. Teachers were also asked open-ended questions about the assessment practices they were using in their classrooms to determine how much they rely on these practices to make decisions about their pupils' progress and their instruction.

Relationships among the following variables were examined: teaching experience, amount of training in reading instruction and linguistics (phonological structure of

language), practice-based working knowledge, content knowledge, assessment practices and criteria teachers used to evaluate students' reading skill, theoretical orientation to reading instruction, self-efficacy in teaching, and linguistic and phonics knowledge. Of interest was whether, and to what extent, experienced and novice first grade teachers differed in their knowledge about development of beginning word reading skills, and whether these characteristics were related to each other and to performance on the think-aloud task.

Results of this study were expected to provide some insight into how experienced and novice teachers envision and assess development of reading skills in beginners. Differences found in knowledge of the progression of reading skills, teacher training, assessment practices, and adjustment of instruction to meet individual children's needs provides useful information to teacher educators in planning effective instruction for student and in-service teachers. Identifying areas of knowledge and understanding that teachers may lack is also helpful in planning instruction for teachers. If student teachers begin with a sound knowledge base in reading development and assessment strategies, they can make greater gains as they develop experience, have greater commitment to their work, and teach beginning reading more effectively to a greater number of students.

CHAPTER II

Knowledge Base about Reading Acquisition in Beginners

Academic success is based on the ability to read and understand text. To understand the meaning of print, readers must use their linguistic comprehension abilities and world knowledge (Swank & Catts, 1994). Learning how to read is a complex process that requires mastery of spoken language and communicative skills that children normally develop early in life and operate simultaneously. These skills include phonology (the sound system), morphology (rules of word formation), semantics (the system of meanings), and syntax (rules of sentence formation) (Adams, 1990; Rice, 1989). Reading in an alphabetic language also requires several visual and conceptual skills, in addition to language skills, so that the reader can understand and map the code onto the language (Adams, 1990; Liberman & Liberman, 1992). To understand written text, readers must be able to identify the individual words in sentences rapidly and correctly, and to understand the words and phrases contained in those sentences. While comprehension is the ultimate goal of reading, readers first need to become skilled in processing graphic cues in order to process words during text reading. Word identification involves knowledge of letters, their phonological translations, and spelling patterns which, in turn, requires the ability to process the individual letters (Adams, 1990; Ehri, 1987).

Simple View of Reading

According to the Simple View of reading (Gough & Tunmer, 1986; Juel, Griffith, & Gough, 1986; Hoover & Gough, 1990), reading can be divided into two basic

component processes: (1) decoding, which is efficient (i.e., fast and accurate) word recognition, and (2) linguistic comprehension, which is the ability to interpret spoken language using lexical information, measured by listening comprehension (Hoover & Gough, 1990). Decoding involves learning to decipher print, which is mastered typically through instruction and practice. Linguistic comprehension skill is acquired during the course of language acquisition. Although this model is referred to as the “Simple View”, decoding and linguistic comprehension are actually complex processes that must operate simultaneously to read for meaning. They are equally necessary for reading comprehension, which is the ability to interpret text from grapheme-based information obtained visually from the text. Weakness in either of these components results in less skilled reading. To become literate, the beginner must acquire phonologically-based representations of written words in order to access the mental lexicon for printed words they know but have never seen. After beginners learn to decode words, they must then encounter the printed word at least once to associate the word with its pronunciation. Several encounters allow the reader to develop a graphemically-based direct access system to read the word without sounding out its parts. The skilled reader quickly derives phonological representations of words from print, accesses the mental lexicon, and retrieves the word’s meaning without conscious use of decoding processes (Hoover & Gough, 1990).

Researchers have studied the relationships among decoding, linguistic comprehension, and reading comprehension as children progress from beginners to proficient readers. According to several studies reviewed by Hoover and Gough (1990),

almost no relationship between decoding and linguistic comprehension was found in early school grades. However, both skills were related to reading comprehension, and decoding was found to be more strongly related than linguistic comprehension to reading comprehension. As children progressed to later grades, the relationship between decoding and linguistic comprehension grew stronger, and while both skills remained related to reading comprehension, linguistic comprehension contributed increasingly to reading comprehension by fourth and fifth grades (Hoover & Gough, 1990). In support of the Simple View, a study by Savage (2001) assessing reading accuracy and comprehension skills of 15- and 16-year-old students, showed that the best predictor of reading comprehension was listening comprehension, while reading accuracy was predicted by non-word reading. Although Savage's sample consisted of only 14 students, the findings were consistent with the view that after fast and accurate decoding skills have been acquired, listening comprehension plays a larger role in reading comprehension in later grades.

The Simple View, by specifying the relationships between the two basic components of reading and their relationship to reading for comprehension, is a useful way for teachers to view the development of beginning reading skills. It brings into focus the importance for beginners of early decoding instruction, which leads the way to accurate word recognition. Effective decoding instruction provides a basis for effective practice and the continued development of solid word reading skills and comprehension abilities. This understanding, together with knowledge of processes involved in

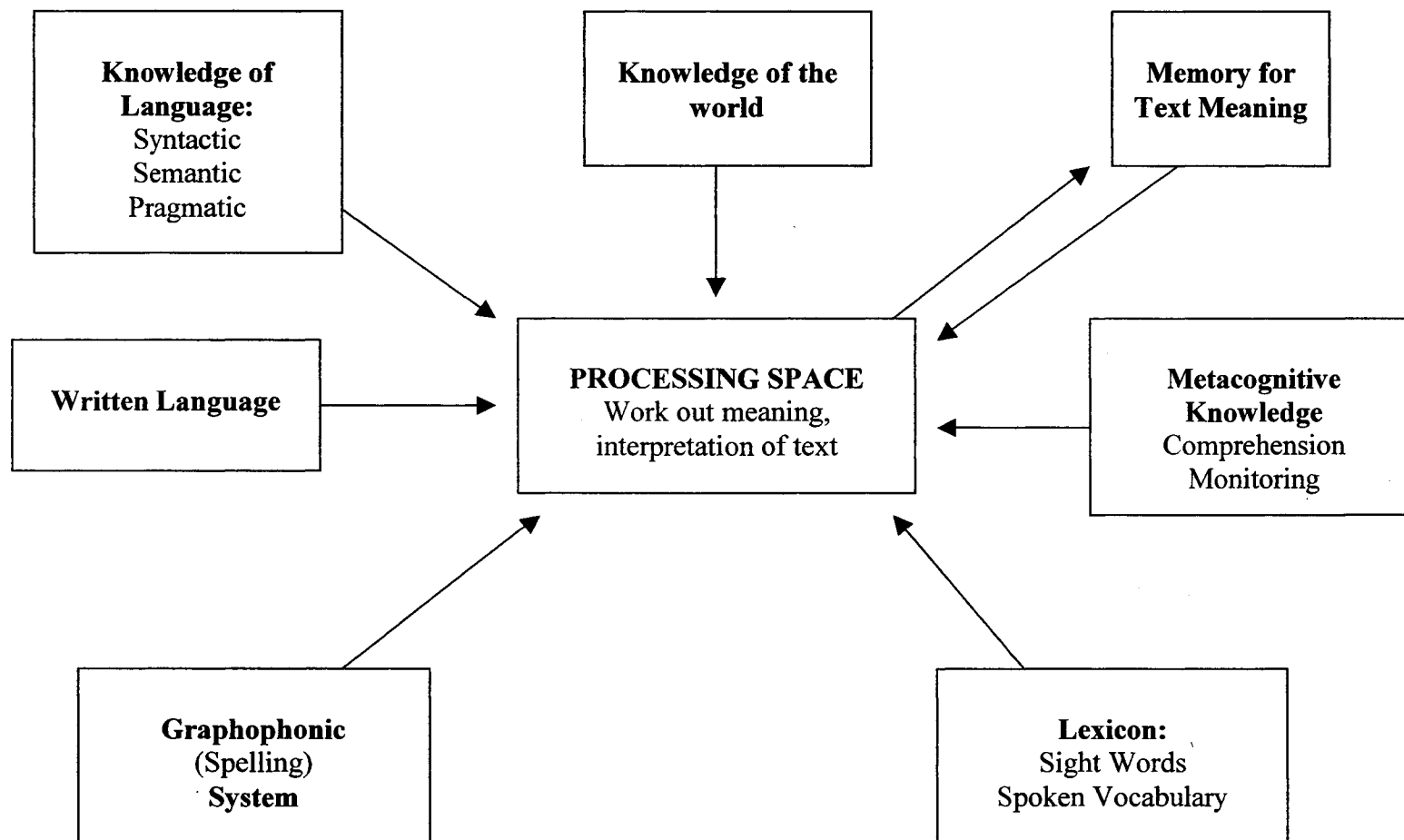
beginning reading, should enable teachers to effectively assess progress and identify reading problems at an early stage.

The Interactive Model of Reading

To read words, readers access several different sources of information that are stored in memory. Semantic and syntactic information allows readers to form expectations about upcoming words in text. Knowledge of the world and about the structure of language, combined with information from text contributes to semantic and syntactic expectations to make predictions about what the word may be. Graphic information enables readers to identify the printed forms of words when the words are in the reader's print lexicon or sight vocabulary, stored as associations between a word's spelling and its pronunciation. Unfamiliar words are read by transforming letters into blended sounds. Information from graphic and other sources confirms the word's identity, and provides redundancy, which enhances accuracy and fluency in text reading (Ehri, 1987). According to Ehri (1998a) the interactive model of reading (adapted from Rumelhart, 1977, as cited in Ehri, 1998a), presented in Figure 1, describes how words are processed during reading (Ehri, 1995a, 1998a). The interactive model illustrates some of the many cognitive and linguistic processes that operate simultaneously and automatically in skilled reading.

The box shown in the center in Figure 1 represents a central processor that takes in visual information and information from the surrounding knowledge sources. The surrounding boxes show the information sources that the reader retains in memory. After readers obtain visual input from written language, they use the information from their

Figure 1. Interactive Model of Reading: Sources of Knowledge Used to Read Text (Ehri, 1995a, as adapted from Rumelhart, 1977)



knowledge sources, all of which merges in the central processing space to help them to recognize and interpret text.

Knowledge of language includes syntactic, semantic, and pragmatic knowledge of language. This enables readers to recognize sentences and their meanings and allows them to understand how text is structured. Knowledge of the world is based on the reader's existing knowledge and prior experiences. It includes both encyclopedic and experiential knowledge and is necessary to understand ideas and to fill in gaps in the text that are not explicitly stated, where meanings are assumed to be known. Readers use their Metacognitive knowledge to monitor their comprehension of the written material so that if there is an anomaly or deficiency, they may go back to the sources of knowledge, and context in which the words are embedded, to correct errors or look for new information to resolve the misunderstanding. Memory for text meaning is important for associating the meaning of a text to previously read text and for combining it with information from other knowledge sources. It is constructed as readers combine previous knowledge of the subject, predictions, and hypotheses, with new information to form new knowledge structures that add to existing knowledge. Readers' understanding of the text is stored in memory, accessed to understand later text and revised to accommodate new information. Knowledge of the graphophonic system is alphabetic-phonemic knowledge and knowledge of the spelling system. It involves knowing how to transform letters into their representative sounds and how the spelling system represents speech. This knowledge can be used to decode unfamiliar words and confirm the identity of words guessed from context or read by sight. Lexical knowledge contributes the definitions of

words for the reader to use when combining them with other sources of knowledge for interpretation. Lexical knowledge also refers to the written forms of known sight words, which is the principal means of recognizing words in text. Knowledge of the graphophonic system and lexical knowledge are referred to as deciphering skills and enable readers to process letters and words in text (Ehri & Williams, 1996; Ehri, 1998a).

Deficits in one knowledge source can lead readers to compensate by using information from stronger knowledge sources regardless of their level in the system. According to the Stanovich (1980) model of interactive compensation, readers with less knowledge of the graphophonic system will compensate for poor decoding skills by using higher-level knowledge sources to decide what a word is. This is the reason that poor decoders rely more on contextual constraints than do good readers. If graphophonic skills are weak compared to syntactic and semantic knowledge, poor readers will show greater use of context in identifying unknown words (Stanovich, 1980).

Awareness of the different sources of knowledge contributing to reading comprehension and compensatory processes provides a cognitive scheme that teachers can use to interpret students' reading behaviors and assess their capabilities and needs in each area. Teachers can provide further instruction for students who require support in particular knowledge domains. For example, poor decoders who rely on context to guess words could be given extra attention to decoding skills. Children who lack knowledge of the world could be provided with information and/or various experiences related to the subject matter so they can form a link with their own prior knowledge and experience.

Chall's Stage Theory

The development of reading processes has been portrayed by Chall (1983) as a series of stages. Stage 0 is an emergent, or prereading stage that takes place between birth and about age 6 when the child begins grade 1. Children have not learned to decode. They learn to focus on the message when stories are read to them. During this time, children gain control over syntax and words. They learn about letters, words, and books, especially if reading takes place in their homes. Children also learn about sounds such as rhyme and alliteration, and about breaking apart and blending words. Many preschoolers learn to discriminate and name most of the letters of the alphabet, and print their names and some letters. Many children have grasped universal features of writing. They can hold a book right side up, recognize common words and signs, and “pretend” read a favorite book that they have memorized, pointing to words and/or pictures, and telling the story. Many children watch educational television programs such as *Sesame Street*, which add to interest in early reading and writing, as well as provide instruction in letter and word identification (Chall, 1983). Some children are explicitly taught by their parents or caretakers to recognize some words, or they ask for information leading to the development of word recognition skills during reading time at home (L.G. Dreyer, personal communication, April 4, 2004).

Abilities, knowledge, and skills acquired during this stage have been positively related to reading success in grade 1 (Share et al., 1984). To promote reading development and prepare children for the next stage, Chall recommends that instead of

direct instruction at this stage, children have an assortment of picture and alphabet books from which to choose, and writing materials to use in an unstructured way.

At Stage 1, according to Chall, children are usually about 6 or 7 years old, and are in grades 1 and 2. They are still pretend reading, i.e., retelling familiar stories from memory with the aid of pictures, and they still prefer reading aloud. However, at this stage the major focus is on the print. Children learn to name letters and associate them with corresponding parts of spoken words; and they acquire metacognitive knowledge about reading and letters, such as what letters are used for, how to discriminate between two similar-looking words (e.g., *bun*, *bug*), and how to identify mistakes. They stick closely to the print during this stage, struggling with the words, and they abstract the information that words are made up of a finite number of sounds. By the end of this stage, children have acquired working knowledge of the alphabetic system (Chall, 1983).

As they acquire decoding skill, children appear to move through three phases in this stage, according to research by Biemiller (1970), who studied children learning to read in a whole word program: (1) Children make word substitution errors which are semantically and syntactically correct but they focus on the meaning and do not stick too closely to the print. Whereas mature readers can go back to the print to correct errors, early Stage 1 readers are not yet skilled enough in decoding to do this, so they supply their own words. (2) In the next phase beginners abandon their pseudo-reading to focus more on the print. There is greater concern for graphic accuracy and, consequently, there is an increase in non-response errors and in errors that have graphic resemblance to the printed word but are not necessarily semantically correct. Focusing on the print allows

them to build their skills and advance to the next phase. (3) In the third phase there is continued concern with graphic exactness, and at the same time, children return to greater semantic correctness because their decoding skills have improved, allowing them to once again focus more closely on the message. According to Chall (1983), there is need for direct instruction in decoding through beginner books because there is much for children to learn that cannot be discovered their own.

Stage 2, is referred to by Chall as involving “confirmation, fluency, ungluing from print”. This occurs during grades 2-3, ages 7-8. In this stage, children have mastered basic decoding skills and consolidate what was learned in Stage 1, gaining in fluency as they practice on their own. Readers may not necessarily gain new information about print, but confirm what they have already learned. Content of the books is familiar; children can recognize common high frequency words and can focus more on meaning. As readers gain in fluency, they may learn additional more complex phonic elements and generalizations. However, most children learn to use their decoding knowledge, language redundancies and redundancies of the stories to gain skill. There is still need for direct teaching and structure because these readers still need to learn more decoding and word recognition (Chall, 1983).

To facilitate development at this stage, an environment that contains many familiar books is essential. Familiarity with the readings, words and syntax is needed to allow children to practice reading and develop fluency with print. This helps prepare them for the next stage in which they will be acquiring new knowledge and begin to read

faster. Basal readers, workbooks, fiction, and nonfiction trade books are the most facilitative reading materials for this stage (Chall, 1983).

In Stage 3, referred to as the stage when children read to learn, children are 9-13 years old, and in grades 4-8. Beginning in this stage, reading becomes more efficient when it is silent. Students begin to acquire new knowledge, facts, concepts, and learn how to do things. Materials are used that explain information clearly, simply, and from one viewpoint because of children's limited knowledge, vocabulary and cognitive abilities. While Stages 1 and 2 were mainly concerned with relating print to speech, in Stage 3, the emphasis is more on relating print to ideas. Word meanings and prior knowledge become increasingly important for comprehension and to obtain conventional knowledge of the world. Literacy skills at Stage 3 should be mastered enough by this time so that children can read simple popular fiction and literature, and learn information such as history or geography or science that is not directly related to their experiences (Chall, 1983).

Chall recommends direct teaching to help students master increasingly difficult and sophisticated texts; at the same time readers need to learn more vocabulary and background information as the material covers a broader range. Instructional materials need to be more varied at this stage. Basal readers and workbooks are still used, but textbooks covering subject matter, reference books and children's books are also added (Chall, 1983).

Chall's (1983) characterization of reading development as a series of stages represents a global view of the progression of reading development from the earliest

stages, when children are learning to read, to later ones, when children are reading to learn. It provides teachers with information about the behaviors and needs of readers at different points in reading development.

Phonemic Awareness and Knowledge of the Cipher

Whereas linguistic comprehension develops during the early years together with normal speech and language acquisition, learning to read involves first learning to break the code of the written form of speech. Children do not learn to decipher words during the course of acquiring normal conversational and language skills. Decoding in an alphabetic system requires beginners to be able to recognize letters, associate them with the appropriate phonemes, which are the individual sounds in words, and then blend the phonemes into words (Juel, Griffith, & Gough, 1986; Juel, 1988). They also need to be able to identify the same phoneme in different words (Byrne & Fielding-Barnsley, 1991). Before beginners can learn to break the code of written text, they need to become aware that speech consists of sequences of meaningless phonemes. This is difficult because there are no boundaries between phonemes in speech production. Rather, they overlap and blend with one another. However, because decoding depends on mapping phonemes to their written symbols, awareness that speech is made up of individual sounds is a necessary prerequisite to learn to break the code of written text. This awareness must be present at the beginning of reading instruction. Children could learn to sound out and read words while interacting with their parents about storybooks and discussing alphabet letters and sounds during reading time at home. Phonics instruction in schools can make phoneme-grapheme correspondences explicit, but phonics instruction has not been found

to be effective if children did not develop some phonemic awareness initially (Juel et al., 1986; Juel, 1988).

Phonemic awareness (PA) has been defined as the awareness of, or sensitivity to, the sound structure in spoken language, and involves the ability to consciously manipulate phoneme-size segments in speech independent of letters or any kind of visual symbol (Lundberg, Frost & Petersen, 1988; Swank & Catts, 1994). PA has consistently been found in preschool, kindergarten, and first-grade children to have a strong relationship to later reading success (Adams, 1990; Byrne & Fielding-Barnsley, 1989; Catts, Fey, & Procter-Williams, 2000; Juel et al., 1986; Juel, 1988; Lundberg, Frost, & Peterson, 1988; Torgesen, Wagner, & Rashotte, 1994), and measures of PA have been found to be more predictive of reading achievement than IQ, age, and socioeconomic status (Stahl & Murray, 1994; Swank & Catts, 1994). Findings of the National Reading Panel's meta-analysis, which examined outcomes of 52 experimental studies of PA instruction, indicated a significant impact of PA on word reading, spelling, and comprehension. While PA training promoted reading growth in disabled readers, it did not result in spelling gains for these students, however (Ehri, Nuñez, Willows, Schuster, & Zadeh, 2001). Disabled readers seem to retain their difficulties in spelling even when they have learned to read reasonably accurately (Shepherd, 1999). Overall, however, the meta-analysis found that explicit PA instruction combined with instruction in alphabet letters was more effective than PA training alone, and the findings suggest that amount of time spent on PA activities may have an effect on gains in PA (Ehri, et al., 2001).

In order to accurately assess a child's PA, the teacher must have knowledge of the development of this skill and activities that promote it. A beginning level of PA that develops in children is an implicit knowledge of sound units of speech, such as recognizing or producing alliteration or rhyme patterns. These abilities require shallow phonemic processing ability and represent typically spontaneous and implicit behaviors corresponding to sensitivity to sound (Ball, 1997; Swank & Catts, 1994). Children who begin school with a basic level of PA (e.g., appreciating rhymes) seem more likely to become successful readers later on (Ball, 1997). A slightly higher level of complexity is seen in categorizing or production of words (on request) according to onsets and/or common rimes (Ball, 1997). More explicit knowledge of speech sound units can be seen in segmentation of words into syllables and phonemic units (e.g., *but*, *but-ter*, *but-ter-fly*; *c-a-t*) (Swank & Catts, 1994). This is the level of PA that is most related to beginning reading skills (Ball, 1993). Once children learn that speech can be segmented into smaller parts, and that letters can represent these parts, they are ready to profit from sound-symbol instruction and literacy experiences. When they can use sound-symbol relationships, their phonemic awareness increases, which further promotes their reading and writing skills. At this time, the relationship between PA and reading changes to one of reciprocal causation, in which each skill promotes further development of the other (Ball, 1997; Ehri, 1979).

When PA is combined with experience with print, it promotes knowledge of the orthographic cipher, which is the set of spelling-sound correspondence. Both PA and exposure to print are necessary for developing cipher knowledge (Juel et al., 1986).

Cipher reading involves processing all of the letter-sound relations in word spellings, and it develops when children learn the alphabet and can segment words. They understand how spellings systematically correspond to pronunciations, and can use orthographic rules of English, which they have internalized, to decode unfamiliar words and nonsense words. Beginning readers who process letter-sound cues only partially in words have not yet acquired this understanding (Ehri & Wilce, 1987b). In first grade, children were found to use their cipher knowledge predominantly, suggesting that they used a "sound it out" strategy to identify words. In second grade, lexical knowledge was found to predominate, indicating that children were processing words automatically. Cipher knowledge was also found to be highly correlated with spelling, indicating that these two skills depend on the same sources of knowledge, cipher and lexical (Juel et al., 1986). Cipher sight word reading occurs in the full alphabetic phase of sight word learning, according to Ehri's (1994, 1998a) model of sight word learning. At this phase, readers read sight words by connecting the entire sequence of letters in spellings of words and their phonemic components in the pronunciations (Ehri, 1992).

Cipher reading cannot occur without PA. Young children can have difficulty identifying individual units of sound and acquiring awareness of the phonological structure of spoken language (Lundberg, Frost & Petersen, 1988). Children having trouble learning to decode are often unaware of the fact that spoken language is segmented (Blachman, 1991). If they are unable to perform PA tasks at the beginning of reading instruction, children experience less success in reading than those who score high in these tasks (Ball & Blachman, 1991). For example, Juel et al. (1986) found that poor

readers who had no initial PA in first grade were unable to read any nonsense words, which requires ability to decode, and they could not decode as well as their age-mates after reading instruction, even after phonics instruction. Children who began first grade with low PA and poor reading ability were later found to remain in roughly the same position relative to their age mates at the end of first grade. While poor readers had made gains in PA and had approached ceiling on a phonemic test given at the end of third grade, good readers had reached ceiling at the end of first grade. At the end of fourth grade, most poor readers were much lower on decoding and spelling-sound knowledge than good readers, and they could not decode nonsense words. Poor readers had had many fewer reading experiences than good readers, and poor readers stated that they did not enjoy reading (Juel, 1988).

In order to avoid delayed development in reading, and to increase children's exposure to print, researchers have recommended early PA training for children with poor phonological skills, so that they could focus their attention on higher level processes such as text integration, comprehension and composing rather than on word recognition (Ball & Blachman, 1991; Ehri, et al., 2001; Juel, Griffith, & Gough, 1986; Juel, 1988). Positive effects of PA training have been found on reading and spelling performance, both initially, and over time (Ball & Blachman, 1988; Ehri, et al., 2001; Lundberg et al., 1988). In Denmark, Lundberg et al. (1988) administered metalinguistic training, which consisted of listening to sounds, rhyming games, segmentation of sentences, words, and syllables, and phonemes, to 6-year-old Kindergartners. Results showed positive effects on metaphonological skills, especially those requiring manipulation of phonemes. When

tested at the beginning of Grade 1, these children performed significantly better than a no-treatment control group on phoneme segmentation (especially initial sound analysis and phoneme segmentation). Children's levels of phonemic ability predicted their later performance in spelling and reading. At the end of Grade 1, reading scores were marginally significant for the experimental group, and spelling scores were significantly higher than those of the control group. By the end of Grade 2, reading and spelling improved for both groups, but scores for the experimental group were significantly higher than those of the control group. In Grade 1 when children began to accumulate letter-sound knowledge during reading instruction, differences between trained and untrained children in reading and spelling appeared. Larger differences appeared by the end of Grade 2 in both reading and spelling, apparently as a result of the training in combination with their letter-sound skill. These results indicated that PA can be developed in young children before, and independently of, reading ability, and that training can facilitate reading and spelling (Lundberg et al., 1988).

Ball & Blachman (1991) conducted an experiment in which kindergarten children were trained in both phoneme awareness and letter-sound knowledge. Children who received both types of training performed significantly better in segmenting transfer items than did a language activities group which received only letter training, and a no-treatment control group. Both the PA and language activities groups performed better than controls in letter-sound knowledge, but the PA group performed significantly higher than the other two groups in reading and spelling, indicating that segmentation plus letter-

name and letter-sound training was more effective than letter-sound training alone or no treatment.

It was noted that training in PA can be started before children master sound-symbol associations, and as individual letter sounds are mastered, the letters can be introduced into the segmentation activity (Ball & Blachman, 1991).

In another training study, Byrne and Fielding-Barnsley (1991) taught preschoolers the concept of phoneme identity, which is the ability to recognize the same phoneme in different words. Children may have segmentation ability, but not necessarily be able to identify the same phoneme. For example, ability to delete a phoneme from a word such as the /f/ from *fall* and *fin* does not necessarily mean the child knows the identity of the sound, but when children can recognize that the words *broom* & *drum* end with the same sound, they have implicitly analyzed the words at the phoneme level. Hypothesizing that once the principle of phoneme identity is acquired, this ability spreads to other sounds without help, the researchers trained preschoolers to recognize phoneme identity of 9 phonemes (7 consonants and 2 vowels) in initial and final positions of words. Once children acquired phoneme identity, they were able to accurately judge phoneme identity for sounds other than the ones on which they had been trained, thereby lessening the need to teach all phonemes (Byrne & Fielding-Barnsley, 1991).

A one-year follow-up study at the end of kindergarten showed that children who entered school with high levels of phonemic awareness, letter-sound knowledge, and an understanding that words can share individual sounds performed at higher levels in reading real and nonsense words, and in spelling, than those who did not understand

phoneme identity. This finding shows that trained children were able to maintain their grasp of the concept of phoneme identity in their performance on nonword reading and spelling (Byrne & Fielding-Barnsley, 1993).

In a study of intact classrooms, Foorman, Novy, Francis, & Liberman (1991) examined the relationship between phonemic segmentation and letter-sound instruction in first grade classes which differed in the amount of letter-sound instruction that was given. Results showed that overall, children receiving more letter-sound instruction per day (45 minutes) in their classrooms did not differ significantly in phonemic segmentation from those receiving less (15 minutes), but the former group improved at a faster rate in reading and spelling than the latter group. Although amount of letter-sound instruction, and not PA training, was the focus of the investigation, children's initial phoneme segmentation ability was related to later reading and spelling and was found to be predictive of word reading performance at the end of the year. For spelling, the researchers found that early skill in segmentation predicted spelling performance and improvement in spelling, and that improvement in spelling predicted later segmentation performance (Foorman et al., 1991).

In a later study, Foorman, Francis, Fletcher, Schatschneider, and Mehta (1998) examined three types of reading instruction in first- and second-grade classrooms for at-risk children. The researchers compared three classes that differed in approaches to reading instruction: direct code (DC), embedded code (EC), and implicit code (IC). The DC class received direct, explicit instruction in phonics with emphasis on phonemic awareness activities and the alphabetic principle, including phonics and blending,

invented and conventional spelling. Their instruction also included practice reading with decodable texts, Big Book reading, and writing workshop activities. The EC class received less explicit phonics instruction and literature activities, which consisted of instruction in letter-sounds and systematic spelling patterns (onset-rimes) contextualized within literature selections. This program focused on phonemic awareness and spelling patterns in predictable books, and included whole-class reading and writing activities and comprehension strategies. The IC class received only meaning-based instruction guided by whole language philosophy. Learning the alphabetic code was incidental to the focus on making meaning from print.

The researchers found that the DC class that received explicit instruction with phonemic awareness activities improved significantly faster than the other two groups. Even children whose initial phonemic skills were low showed more growth in word reading, decoding, and passage comprehension than children with comparable initial skills in the other two groups. The EC group, which was given systematic instruction in spelling patterns improved at a slower rate, and their performance fell between that of the DC and IC groups. These findings underscore not only the importance of initial PA for beginning readers, but also positive effects of PA training for beginning readers with weak phonological skills (Foorman et al., 1998).

These and other studies on phonemic awareness show that PA together with knowledge of letter names (Ehri, 1987) and their sounds are essential skills for beginning readers. The evidence suggests that early assessment of children's PA, and training for those with poor phonemic skills and letter knowledge is necessary to facilitate their

reading acquisition. Poor phonemic skills combined with inadequate instruction in the classroom contributes to reading failure for at risk children (Foorman et al., 1998). Teachers' knowledge of how to assess phonemic abilities and train children in the necessary skills can guide their instruction to help reduce or prevent reading failure. While the report of the National Reading Panel did not find benefits of PA training in spelling for disabled readers (Ehri, et al., 2001), this training together with letter-sound and explicit phonics instruction did improve their reading, and is likely to remediate some difficulties for many at-risk children.

One of most important differences for teachers to have knowledge of is the one between phonemic awareness and phonics (e.g., Rath, 1994). There are several tasks a teacher can perform informally to assess phonemic abilities. The teacher may begin by assessing abilities to recognize or produce alliteration or rhymes, since these are the simplest phonemic tasks to perform (Ball, 1997; Swank & Catts, 1994). The teacher can also assess children's abilities to count syllables or phonemes in spoken words, clap hands or tap feet in rhythm with songs and/or rhymes (Catts, 1997).

Children whose performance is weak in these skills can have instruction that incorporates PA activities with letter-sound and phonics instruction. For example, the teacher can use games that focus on listening to sounds, rhyming games, sentence, word, and syllable segmentation (Blachman, 1991; Lundberg et al., 1988), alliteration in which words share initial, middle, and end sounds, or segmentation of two- or three-phoneme words using manipulatives such as tiles or blocks (Blachman, 1991). The teacher can also add activities that focus on letter sounds. For example, children can learn keywords

and phrases using picture cards containing the sound of the letter to help them remember the sound of each letter (e.g., the sound /f/ is represented by *five funny faces*) (Blachman, 1991). Picture cards of objects in the shape of the initial letter of the word also help children remember sounds of letters (e.g., a picture of a flower in the shape of the letter *f*) (Ehri, Deffner, & Wilce, 1984). Additionally, it may be helpful to provide children with conceptual information about how language can be examined independently of meaning, how segmentation and blending are related to decoding, and when and why these skills can be used (Cunningham, 1990). At the same time, it is important for teachers to recognize that focusing exclusively on abstract component skills to the exclusion of meaningful literacy experiences is a mistake if the activities promoting the skills are meaningless to the children (Ball, 1997). Including broader literacy opportunities is necessary to build language skills and increase knowledge.

Disabled Reading. As mentioned in the previous section, children who start out as poor readers almost always remain poor readers if the instruction they receive does not address their reading problems. It appears that the most common underlying cause of disabled reading is weakness in ability to process phonological features of language, which includes inability to identify, think about, or manipulate individual sounds in words (Stanovich, 1986; Torgesen, 1998). While difficulties in phonological processing can affect children with a broad range of cognitive and verbal abilities and backgrounds and can be caused by cognitive or linguistic factors, several researchers have noted that some children may be at greater risk for reading failure because of factors such as low socioeconomic status, cultural differences, and differences between home and school

language (including experience with language play and games, rhyming, and exposure to storybooks) (Ehri, 1986; Foorman et al., 1998; Juel, 1988; Stanovich, 1986; Torgesen, 1998). Some of these children have been found to have lower phonemic awareness, and they may also have less preparation in pre-reading and general oral language skills which is required for good reading comprehension. The differences place some children at a disadvantage in learning to read compared with those who have had more preparation (Foorman et al., 1998; Juel, 1988; Torgesen, 1998).

Those children who start school with lower phonological and language skills and less exposure to print than their peers can be at greater risk for becoming and remaining poor readers. According to Stanovich (1986) these children rarely catch up to the better readers in their class, and the consequences are that the gap between good and poor readers grows exponentially over time, contributing to “Matthew effects”; i.e., the rich get richer while the poor get poorer. Insufficient growth in reading can result in lack of practice, poor motivation, negative attitudes toward reading, low vocabulary growth, difficulties in reading comprehension (Catts, 1991; Juel, 1986, 1988; Nagy, Anderson, & Herman, 1987; Stanovich, 1986; Torgesen, 1998), and socioemotional problems (Catts, 1991), all of which lead to academic failure. Matthew effects can explain variance in reading achievement and in many other academic areas. Skilled readers acquire more knowledge vocabulary and knowledge base in academic areas than those who are less skilled because of greater exposure to print. Consequently, good readers acquire greater proficiency at a faster rate (Stanovich, 1986).

It is important to note that the difficulties most poor readers experience in accurately identifying printed words occur early and continue during their school years. Typically they demonstrate difficulty in understanding and applying the alphabetic principle to decode words, which causes their sight vocabularies to grow at a slower rate than average readers. Their difficulties in word recognition lead to comprehension problems later on because poor readers are using their cognitive resources to focus on identifying words rather than on meaning (Torgesen, 1998). Although children with good intellectual abilities but who are experiencing difficulties learning to read show early problems, they are often not diagnosed until they are nine or ten years old and have been struggling for several years, and this increases their risk for academic failure and associated problems. In order to prevent beginners from falling behind their classmates, these children's difficulties must be diagnosed at the earliest stage so that they can be given appropriate and effective remediation as soon as the problems are identified (Catts, 1997).

Dyslexia. Dyslexia has been defined as disability in learning to read despite conventional instruction, adequate intelligence, and sociocultural opportunity. A working definition of dyslexia developed by the Committee on Dyslexia of the Health Council of the Netherlands stated, "Dyslexia is present when the automatization of word identification (reading) and/or word spelling does not develop or does so very incompletely or with great difficulty" (Gersons-Wolfensberger, 1997). The British Psychological Society's definition further defined dyslexia as "evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty.

This focuses on literacy learning at the ‘word level’ and implies that the problem is severe and persistent despite appropriate learning opportunities. It provides the basis for a staged process of assessment through teaching” (British Psychological Society, 1999, p. 18, as cited in Regan & Woods, 2000). Dyslexia has also been defined as a significant discrepancy between oral language (verbal IQ, listening comprehension) and reading achievement (Uhry & Shepherd, 1997). Some researchers argue that it may be appropriate to investigate discrepancy between a listening comprehension measure and a measure of decoding skill (Regan & Woods, 2000; Savage, 2001).

One method of determining whether a student has dyslexia has been to test for a discrepancy between intelligence and reading performance. Students who have a sizeable difference favoring intelligence as measured by IQ test over reading achievement have been considered dyslexic (Catts, 1996; Rack, Snowling, & Olson, 1992; Scarborough, 1990). The aptitude-achievement discrepancy definition has not been supported in some research, however. There has been evidence in some studies that after word recognition was considered, IQ was found to make very little contribution to variability in reading accuracy and comprehension (Savage, 2001). In one study of Spanish children, Jimenez, Ortiz, Rodrigo, Hernandez-Valle, Ramirez, Estevez, O'Shanahan, & Trabaue (2003) conducted an intervention involving computer-assisted reading practice with two groups of poor readers, one with and one without achievement-intelligence discrepancies. The researchers found that although the dyslexic children continued to have difficulty with phonological tasks, both dyslexic students and “garden variety” poor readers performed better in word recognition after the intervention than a control group of low-performing

readers who were given no intervention. The researchers concluded that their study did not show empirical evidence favoring the IQ-achievement discrepancy definition of reading disability, because IQ did not differentially predict treatment outcomes (Jiminez et al., 2003).

While there has been lack of consensus concerning the definition and diagnosis of dyslexia, researchers have found that individuals with reading disabilities who are labeled dyslexic have deficits in phonological language skills which are causally related to accurate word reading and spelling problems (Catts, 1996; Catts, Gillispie, Leonard, Kail, & Miller, 2002; Rack et al., 1992; Stanovich, 1986; Wagner, Torgesen, & Rashotte, 1994). Phonological processing is defined as the mental operations that an individual applies to make use of the phonological or sound structure of oral language when learning to decode written language (Torgesen et al., 1994; Wagner et al., 1994).

Phonological deficits have been found in difficulties with verbal short-term memory, sound segmentation, and sound blending, which result in reading and spelling problems (Rack et al., 1992). Several types of phonological processing associated with dyslexia have been identified by researchers that are related to individual differences in the rate beginners acquire reading skills. One is phonemic awareness. As discussed earlier, children who are relatively strong in phonemic awareness in kindergarten usually learn to read more easily than those whose development in this area is delayed. As children gain reading skill, they develop fuller explicit phonemic awareness when reading instruction begins in first grade. As indicated in the section on phonemic awareness above, this ability is measured by tasks that require children to identify, isolate, or blend

individual phonemes in words. Kindergartners with good phonemic awareness can perform simpler phonemic tasks such as rhyme or alliteration. As their reading skills develop in first grade, they can perform more difficult tasks such as segmentation or phoneme deletion (Torgesen et al., 1994; Uhry & Shepherd, 1997).

A second phonological process is phonetic recoding to maintain information in working memory (Uhry & Shepherd, 1997), also called memory span (Torgesen et al., 1994), which is the brief, verbatim retention of verbal items in working memory. Verbal short-term memory can influence word reading ability by affecting retention of phonemes during sounding out and blending. Memory span is measured by the ability to repeat back verbatim sequences of orally presented material such as words, pronounceable nonsense words, sentences, or strings of numbers or words. Difficulty in this area is one of the most frequently reported problems of children with severe reading disabilities. This indicates difficulties with mental representation of phonological features of language, which is necessary to store verbal material on tasks that require immediate, verbatim, and ordered recall (Torgesen et al., 1994; Uhry & Shepherd, 1997).

A third type of phonological process is rapid continuous serial naming ability. It requires the ability to easily and rapidly access phonological information that is stored in long-term memory. The speed and efficiency with which a child can access phonological codes associated with letters, word segments, and words affects the extent to which the child can use phonological information in decoding (Torgesen et al., 1994). This ability is measured by rapid automatic naming tasks that ask a child to name, as rapidly as possible, a series of 30 to 50 items such as digits, colors, letters, or objects that are shown

on a page. Individual differences in this ability in kindergarten have been found to strongly predict differences in acquisition of word reading skills later on (Torgesen et al., 1994; Uhry & Shepherd, 1997). Catts et al. (2002) suggested that difficulties in rapid naming may result, at least in part, from general deficits in speed of processing.

A fourth deficit related to reading disabilities is in speech articulation, in which some children mix up speech sounds (e.g., “aminal” for “animal”) and say complex phonological sequences more slowly than children who read normally. This can interfere with ability to hold phonological information in short-term memory (Uhry, 1999). A study by Kamhi, Catts, and Mauer (1990) identified encoding deficiencies as a major cause for speech production deficiencies. Poor readers in second grade were found to take significantly longer to recognize as well as produce multisyllabic nonsense words than non-disabled peers reading at the same level. While normal readers in the study were able to maintain accurate representations of the words, the findings that the poor readers had difficulty recognizing the words indicated that they had difficulties with encoding, resulting in deficiencies in storing, retrieving, and reflecting on phonologically coded information and inaccurate recall of the information (Kamhi, et al., 1990). One way of measuring articulation speed is to have a child repeat nonsense syllables as quickly as she or he can (Uhry, 1999).

To avoid, or at least diminish, Matthew effects, and to address reading difficulties at an early stage before children are labeled dyslexic or disabled and before they develop later cognitive, motivational, and emotional problems as spinoffs of reading problems, children with possible reading disabilities need to be diagnosed and receive appropriate

remediation early on. Evidence of the benefits of early identification and treatment was found in a training study by Uhry and Shepherd (1997). After reading instruction, phonological awareness training, and reading practice, dyslexic 7-year-old children made faster progress on word identification and word attack skills than 11-year-old dyslexic children in another study did with similar training. Dyslexic children may still have difficulties with phonological processing even after remediation, but direct instruction can have positive effects (Uhry & Shepherd, 1997). One way for the classroom teacher to address reading difficulties, as discussed earlier, is to provide explicit phonics instruction together with phonemic awareness activities (Foorman et al., 1998). Instruction can also include meaning-based activities, and children can be encouraged to use their emerging recoding skills to attack unfamiliar words. Instruction that incorporates phonemic awareness training may not eliminate, but can help reduce dyslexic children's phonological processing difficulties. Although children with deficits in rapid naming and memory span were found to make somewhat slower progress than children with phonological awareness deficits alone, Uhry and Shepherd (1997) found that direct instruction increased phonological recoding and sight-word reading after training in segmenting and spelling.

First grade teachers are in a very good position to identify children who are falling behind their classmates in reading. If they are aware of the reading behaviors that suggest dyslexia, they are likely to identify the difficulties early on and employ or seek appropriate treatment. In a recent British study, primary school teachers were asked to explain their understandings of dyslexia. The majority of the teachers understood

dyslexia to be a discrepancy between intelligence and reading ability and was concerned about the educational needs of bright children who were not able to read. Teachers were also not clear about differences between dyslexic children and poor readers and showed confusion about a possible difference between dyslexia and specific learning difficulty (Regan & Woods, 2000). Clear knowledge of the kinds of reading behaviors that suggest a reading disability is important when teaching young children to read. Identification at an early age can enable teachers and specialists to address problems quickly. To make decisions about instruction, teachers can test these children using phonological tasks, including phonemic awareness, rapid naming, memory span tasks (Uhry & Shepherd, 1997), and observe children's speech production, expressive language and language comprehension abilities (Catts, 1997). Moats & Lyon (1996) suggest that because instructional needs of dyslexic children, which involve integration of oral and written language that continues throughout the school day, clinicians with formal training lack the time to address these needs. This makes it necessary for classroom teachers and special educators to provide the necessary instruction to children who need it, and it requires teachers to have the depth of language knowledge necessary for effective reading and writing instruction for children with reading disabilities.

An approach to instruction for disabled readers is one that combines explicit instruction in word analysis procedures with training in reading words by analogy. This approach includes helping students understand the goals and rationale of the instruction, teaching and modeling word analysis, segmenting sounds and matching them to letters, and guiding students' practice to develop metacognitive awareness and control over their

word learning (Gaskins, Ehri, Cress, O'Hara, & Donnelly, 1997). As indicated earlier, explicitly teaching children to reflect upon and discuss the value, application, and usefulness of phonemic awareness for reading can help children make progress (Cunningham, 1990).

Intensive and explicit instruction of linguistic concepts can be most helpful for beginners with phonemic deficits who may be at risk for possible reading disabilities. These children include those whose phonological and general oral language skills are deficient because of environmental differences. Other children with good or average phonemic skills can benefit from this instruction as well. Better readers who have good phonemic awareness and may not need this instruction can also benefit because they can grasp relationships between written phonograms and words more easily and with fewer examples. They can profit from this instruction together with instruction that promotes language comprehension skills because they can make reading and spelling progress more rapidly (Moats, 1995).

Development of Word Reading Ability

Approaches to word identification. Words can be read in several ways: by sight, by decoding, by analogizing, by processing spelling patterns, and by contextual guessing. When an individual reads a word by sight, the word is read as a whole unit, without pauses between phonemes or syllables. Mature readers, who are able to read phonetically, have established direct connections between the visual forms of words they see in print and their meanings stored in memory. These connections occur as a result of much practice reading the words (Ehri, 1992). Eventually readers accumulate a store of

sight words which they use to read words automatically and rapidly, without needing to process component parts. Words encountered frequently in text are more likely to be read by sight than those that occur infrequently because practice is necessary to form access routes to lexical memory for specific words. When readers see a familiar word, they access the word's identity, pronunciation, meaning, and its syntactic and orthographic identities (Ehri, 1994).

Another way of reading words is by decoding, also referred to as phonological recoding of words. Phonological recoding involves the process of translating letters into sounds by applying letter-sound rules to identify a word by its pronunciation (Ehri, 1992). Knowledge of letter names and sounds helps beginners become able to use phonetic, rather than visual, cues in learning to read words. Readers use grapheme-phoneme correspondences to construct pronunciations from spellings and then search the lexicon for meaningful words that match the pronunciations. A reader may sound out and blend words, but this is usually not visible except in novice readers who receive explicit phonics instruction. If a word is unfamiliar and irregularly spelled, the reader may need to experiment with varied pronunciations in order to find a recognizable word (Ehri, 1994, 1997).

Readers may also read unfamiliar words by analogizing to known sight words. Readers search lexical memory for specific known words that have similar spelling patterns to the unfamiliar word. Analogizing requires that readers have phonological recoding skill and knowledge of the full spellings of familiar words to discover analogous relations between known and unfamiliar words. They must be able to analyze letters in

words fully enough to recognize analogous relations between spellings. They must also be able to segment words into onsets and rimes and match the spoken units to letters in their spellings. They must then blend onset letters of the new word with rime letters of the known word so that they may read the new word (Ehri, 1994). Kindergartners and first graders with some decoding skill were found, after training, to be able to read transfer words by analogy to training words, whereas nondecoders misread transfer words as training words, and had difficulty segmenting and blending onsets and rimes (Ehri & Robbins, 1992).

Using orthographic, or spelling, patterns is another way of reading new words. Readers need to have spellings of several words stored in memory and organized by pattern. Orthographic knowledge accumulates and phonological recoding becomes automatic as readers phonologically recode different words with the same pattern and store the spelling patterns in memory. When the reader identifies letters in a word, several words with similar orthographic features are activated in memory. The reader coordinates and synthesizes several phonological representations to pronounce the word. Rimes are usually more likely to become patterns than are other parts of words. Letter patterns become part of the reader's spelling system knowledge and combine with specific spellings stored in the lexicon. Large letter units facilitate decoding of new words, reduce the memory load needed to store sight words, and, by facilitating letter identification, they speed the process of accessing words (Ehri, 1994).

A fifth way to read new words is by contextual guessing. It is used primarily to read unfamiliar words without phonologically recoding them. The text that precedes an

unknown word provides clues that allow readers to form expectations about a word's identity. According to Goodman (1976), graphic, syntactic and semantic information from the text are used by readers to select cues to make predictions based on their expectations, prior knowledge and experiences. By selecting as few cues as possible, readers process this partial information and confirm, reject or modify hypotheses based on this information. Biemiller (1970), Goodman, and other researchers observed that beginning readers substituted words that were syntactically and semantically consistent with the text they were reading, indicating that they were forming expectations. Although they were not accurately identifying the words by decoding, readers were obtaining the intended meaning from the cues they took from the text (Ehri, 1994).

One of the problems with contextual guessing is that if readers have little knowledge about the topic, they cannot generate predictions. In addition, if skilled readers were to predict, it may take more time to generate a prediction than to recognize the word (Samuels & Kamil, 1984). Skilled readers recognize familiar words quickly and automatically, and do not need to use contextual guessing to read most words. Poor beginning readers have been found to rely more than good readers on context because of their poor decoding ability (Nicholson, 1991). To read unfamiliar words correctly, readers need to use alphabetic information. To guess unfamiliar words correctly, the surrounding words must be familiar. In order to read the surrounding words accurately, strategies other than contextual guessing are necessary. Ehri noted that in previous research, only about 25-30 percent of words in text were found to be guessed correctly, and that the most important content words were correct only 10 percent of the time (Ehri,

1994). Difficulty of the text also affects context use. As text becomes more difficult, poorer readers make more errors that are contextually inappropriate. Skilled readers have been found to show more contextual facilitation, but their decoding efficiency is also much better (Stanovich, 1992).

Teachers' ability to recognize the different strategies that children use to read unfamiliar words helps them in assessing reading progress. Children who use contextual guessing as a main approach indicate that they may need increased attention to decoding strategies. Use of sound-it-out strategies indicates that a child is phonologically recoding words. A teacher's observations of a child's using a combination of sight word reading together with sounding out or analogizing indicate good progress in reading.

Phases of development of word reading. The ability to read and decode words accurately is one part of reading development. Speed of word recognition is another part. After learning to decode, readers need practice in order to be able to recognize words as units, without attention to their individual parts. To gain speed, words must be read automatically. This ability is accomplished through practice, and is important for text comprehension because automaticity frees space in memory for higher-level comprehension processes (Ehri, 1994).

Sight word learning starts as a nonalphabetic process in which the pre-reader makes connections between selected visual cues and words. Once beginners start to acquire knowledge of the alphabetic system, sight word learning becomes an alphabetic process in which readers make connections between letters in words and the sounds in their pronunciations. These links are partial, and, with practice, progress to full

knowledge of the alphabetic system in which readers form complete connections between graphemes in spellings and phonemes in pronunciations of words. Letter patterns that recur become consolidated into multiletter units that symbolize phonological blends (Ehri, 1998a).

Ehri (1994, 1998a) proposed four phases to describe the development of word reading ability. Phase 1 is referred to as a pre-alphabetic phase (Ehri, 1998a). In this phase, children have little knowledge about letters. They begin to recognize words in their environment by forming connections between visual attributes of words and their pronunciations or meanings, and storing this information in memory. Examples of such associations are the tail at the end of the word *dog* that signals “dog”, the two tall posts in the middle of the word *yellow*, the shape of a *STOP* sign, and the two humps in *camel*. When these characteristics are seen, the word is retrieved from memory. The links between visual cues and associated words are usually arbitrary, and not phonological; therefore they are not very accurate or reliable. Although this method enables a child to remember how to read those words, other similar looking words with the same cues may be mistaken for the familiar words. Another disadvantage is that the connections are forgotten unless they are practiced frequently. Also, because the cues are associated with meanings, youngsters may produce synonyms rather than the correct word. As children learn more words in this way, visual features of each word may be similar and cause them to mistake words sharing the same features for each other (Ehri, 1987, 1992).

Phase 2 is a partial alphabetic phase. In order to be able to process graphophonemic cues to read words, beginners must learn the shapes and names or

sounds of most alphabet letters and have enough phonemic segmentation ability to be able to map some of the letters to their sounds. At this phase beginners link some of the letters in the spellings in words to their pronunciation. Knowing letter names may help beginners associate relevant sounds with letters because most letter names contain their sounds. For example, to read the word *jail*, beginners might choose the letters J and L and associate the names of the letters with sounds in the pronunciation of the word. At this phase, reading is more reliable than at phase 1 because the associations between spellings and pronunciations are systematic rather than arbitrary, and they are easier to remember. While children at this stage can read words more accurately than by using non-alphabetic visual cues, they process only some of the letters in words, but do not have enough knowledge of the orthographic system to read unknown words by decoding them (Ehri, 1987, 1994, 1998a).

Phase 3 is referred to as the full alphabetic phase. In this phase, readers are able to phonologically recode written words into pronunciations, and this enables them to read unfamiliar words accurately. Readers set up connections in memory between all the letters in spellings and the phonemic elements in the word's pronunciation. Phonological awareness, knowledge of decoding rules, and phonemic segmentation ability is necessary in this phase for development of phonological recoding skill. Phase 3 readers can analyze spellings completely and understand how most graphemes symbolize phonemes in the conventional spelling system. For example, in reading the word *spoon*, they understand how the five letters correspond to the four phonemes in the word, and how *oo* symbolizes /u/. Letters in spellings are connected to a specific word's pronunciation and meaning,

and words with similar pronunciations are excluded. With practice, readers do not need to continue to read words by phonologically recoding them. They eventually build a store of sight words which they use to read words automatically and rapidly, without needing to process component parts. Word reading is more accurate than at phase 2 because word representations are complete enough for readers to distinguish easily among similarly spelled words. They can also decode words they never read before by blending the letters into a pronunciation. This enables them to form fully connected sight words in memory (Ehri, 1992, 1998a).

The fourth phase is a consolidated alphabetic phase in which readers consolidate letter-sound patterns that recur across words, and the reader uses multiletter units to read words. These may consist of morphemes, syllables, or subsyllabic units such as onsets and rimes. As phonological recoding of larger letter units becomes automatic for full-alphabetic readers, they store similarly spelled sight words in memory. Readers may synthesize specific word spellings stored in the lexicon, and store larger multiletter units, consisting of phoneme blends, for word reading. When readers gain experience reading words, they attend to the larger letter units, rather than use phonological recoding. Use of larger letter units speeds decoding, reduces memory load for storing sight words, and facilitates letter identification. These letter patterns become part of the reader's general knowledge of the spelling system, and this makes it easier to form connections to learn a new word. For example, knowing *-est* enables the reader to recognize its occurrence in several known sight words such as *nest*, *test*, *crest*, and makes it easier to learn the new word *chest* without phonological recoding of all the letters (Ehri, 1994, 1998a).

Ehri's (1994, 1998a) model delineates specific phases of word reading and describes specific processes contributing to skill development in each phase. These descriptions help the teacher to look for behaviors characteristic of each phase of word reading, to assess children's progress, to diagnose particular reading problems at each phase for individual children, and to take steps to remediate difficulties.

Spelling Development

Learning to spell is closely associated with learning to read words because both require knowledge of the alphabetic system. Learning letter-sound relations enables children to learn a variety of spelling patterns (Ehri, 1998). Development of spelling skill takes place at about the same time as growth in reading and decoding skill. Observant teachers notice, for example, that as beginners progress in their word reading, they also make progress in their ability to write or spell words even when there is no spelling instruction (Morris & Perney, 1984).

Ehri (1998b) identified three different ways of spelling words. One is by memory, when the spellings of specific words are available in memory. Another way is by invention. Spellers stretch out a word's pronunciation, detect its sound units, and apply knowledge of the alphabetic system to produce a plausible letter sequence for the sounds in the pronunciation. Because of the irregularities of the English spelling system, invented spellings are not likely to be correct conventional spellings. More advanced readers and spellers may use partial knowledge of word spellings, knowledge of spelling patterns, grapheme-phoneme units stored in memory, or morphographs in their invented spellings. A third way to spell is by analogy, in which spellers can use their knowledge of

familiar words to spell unfamiliar words. In order to be able to spell by analogy, a student must have spellings of familiar words stored in memory and recognize the similarities between the familiar and unfamiliar words. For example, a child may know the spelling of the word *light* and substitute the letter *r* to spell *right*. As in reading, students need to have spellings of familiar words stored in memory so that they can use this information to spell unfamiliar words. Spelling by analogy has been found to be more common among older students than among beginners. Using this strategy does not always produce correct spellings, however. For example, the word *said* cannot be spelled correctly by using the word *bed* (Ehri, 1998b).

The ability to spell words by memory, invention, or analogy, requires knowledge of the alphabetic system. A major factor in growth of spelling, as well as reading, ability especially in the first two years of schooling, is phonemic awareness (Juel, 1986). For example, Juel et al. (1986) found that phonemic awareness affected development of spelling ability in first and second grade children through its influence on acquisition of letter-sound correspondence knowledge. Lundberg et al. (1988) found that the children who received phonemic awareness training scored significantly higher than untrained controls on spelling in grades 1 and 2. Griffith (1991) found that children low in phonemic awareness spelled fewer words correctly than those who scored highly and they were unable to complete an analysis of the words. They represented fewer consonant sounds, and often did not represent vowels. Also, their incorrect spellings sounded less like the target words than children whose phonemic awareness was high. Children low in

both phonemic awareness and letter-sound knowledge made spelling errors that were unrelated to phonetic elements of the words (Griffith, 1991).

While phonemic awareness and letter knowledge are the two primary influences on the development of both reading and spelling, the processes used to produce spellings are different from the ones used in decoding. When decoding words, children must blend the sequences of letters in written words that correspond to the phonemes of spoken words. This process requires blending skill to assemble an entire pronunciation from the separately decoded parts of words (Ehri, 1998b). Phonemic awareness enables children to blend the letters they see into the sounds that make up the words. When inventing spellings, children assign letters to represent the sequence of corresponding sounds in words. This skill requires segmentation ability to separate and distinguish the word's phonemes to be spelled with graphemes (Ehri, 1998b). Phonemic awareness enhances the child's ability to analyze letter-sound correspondences within words and assign a letter to represent a sound in the context of all of the sounds that occur in the word (Griffith, 1991).

The number of responses necessary to produce word spellings are greater than those required for word reading. When more advanced readers read a familiar word, they access one response from memory, an association between the word's pronunciation and its meaning. To spell a familiar word, they must access several responses, the individual letters, and write them in the correct sequence. In order to do this, spellers need to have stored in memory the associations between the word's spelling, its pronunciation, and meaning (Ehri, 1998b; Ehri, 2000).

Stages of spelling development. Ehri (1986) has distinguished stages of spelling development to reflect children's progress in acquiring knowledge of the spelling system, reflected in their invented spellings. The stages of spelling follow a course paralleling word reading development. The first is a precommunicative stage, which corresponds to the pre-alphabetic phase of word reading. Children have no knowledge of letter-sound correspondence, but they do recognize that symbols, for example the McDonald's golden arches or some letters and numbers, can be used to represent a message or meaning. At this stage, children know how print should look but they choose letters that have no relationship to sounds within the words. They may use symbols from the alphabet, or sometimes numbers, or may use scribbles to spell words. Although they may demonstrate some knowledge of the alphabet, children at this stage show no knowledge of letter-sound correspondence. The letters they use are not likely to bear any relationship to sounds in words, and a reader would be unable to decipher them. For example, the precommunicative speller may spell *boat* NG7G. Although the letters the child writes do not represent the words she or he is asked to spell, the child does show an awareness that words are represented by alphabet symbols. What differentiates this stage from the others is that the child's spellings have no connection to the sounds in words (Ehri, 1986).

The semiphonetic stage begins when children begin to use their knowledge of letter names to represent one or more sounds in words, for example S to spell *dress*. Partial alphabetic word reading is linked to semiphonetic spelling. This is the earliest stage in which spellings represent some of the sounds in words. Children invent spellings because there are phonemes they do not yet know how to spell and they cannot find the

sounds in letter names. In both reading and writing, children use their emerging letter-sound knowledge to partially map letters onto sounds in words. Their spellings are not complete, and they do not yet know correct spellings, but they do begin to show knowledge of letter-sound correspondence in their invented spellings. There is a lack of complete mapping of all the phonemes in the pronunciations of words because children have not yet learned how to divide the speech stream into phonetic segments. Because children are able at this stage to represent some sounds with letters, they may even be able to invent spellings before they have learned to read words (Ehri, 1986).

In their invented spellings children at this stage will often represent initial or final consonants, for example, they may spell *back* BK. Medial consonants may sometimes be included, such as WTR to spell *water*; and long vowels (BOT to spell *boat*) might be included because those vowels say their own names in the pronunciation. Consonant clusters may be ignored as the child uses the first phoneme but not the second (FEZ for *friends*). In the earliest part of this stage, children may include extra letters that have no relationship to sounds in a word because they have seen printed words and know that they have three or four letters (FLME for *feet*). They may use the nearest sounding long vowel letter to spell a short vowel (TIP for *top*). Children may hear the affricate /ch/ in "aich" and use it to spell words containing that sound, for example, HKN for *chicken*, or HK *truck*; they might also hear /j/ in *dress* (JS) or *dragon* (JRN), and use J to spell those words. Sometimes the child uses an incorrect letter to spell a word because the letter name sounds like a phoneme in the word, such as the letter Y in the word *while*, spelled

YIL. Children may also use consonant voicing substitutions when they use a voiced letter for a voiceless sound, or vice versa (BAT for *bed*) (Ehri, 1986).

Children in the phonetic stage use more vowels, both long and short, and have more advanced segmentation skills than semiphonetic spellers. The full alphabetic phase of reading corresponds to the phonetic stage of spelling. Spellings at this stage are phonetically more complete than those of semiphonetic spellers, and children are likely to use one letter for every sound in a word. They can phonologically recode written words into pronunciations, and can invent spellings that correctly represent sounds, but their spellings do not necessarily conform to traditional English orthography. When they stretch a word to sound it out, extra letters may be included (FEREND for *friend*). They may also use one consonant letter to represent an unstressed syllable because they do not hear its vowel, or it may not be articulated (CHIKN for *chicken*). Children may leave out the nasalized vowel sound that precedes consonants such as MOSTER for *monster*. Children may also hear more often the flap sound /d/ rather than /t/ in words containing T, such as WADR for *water*. As they become more familiar with conventional spellings, they will use the nasal in their own spellings, separating the nasalized vowel into two parts, as in /o/ and /n/ for *monster*, and perceive the sounds as /d/ or /t/ according to the word's spelling, as in /t/ for *water* (Ehri, 1986).

At the next morphemic or transitional spelling stage, which corresponds to the consolidated alphabetic phase of reading, children write using more conventional English orthography. In their reading, children are acquiring rapid automatic decoding skill and have stored conventional spellings of words in memory. For this reason they can spell

more words correctly than phonetic spellers, and they can use rules and letter patterns to figure out spellings of unfamiliar words. In this stage, spellers rely not only on letter-sound knowledge, but also on spelling patterns and their developing knowledge of English orthography. They can rapidly check word spellings for correctness. Morphemic patterns include prefixes, suffixes, root words, letter co-occurrence patterns that identify many word spellings (such as final silent E), and orthographic neighborhoods created from word spelling resemblances stored in memory. Children may use analogous spellings (LIGHT/ RIGHT) and may misspell some words when using an analogous spelling (FASHION/ PASHION for *passion*). Misspellings may resemble morphographic patterns (e.g., KITTION for *kitchen*); a correct past tense spelling may be combined with a misspelled root (OPINED for *opened*) (Ehri, 1986).

As in reading development, teachers who have knowledge of the connection between reading and spelling and of spelling stages can keep track of reading and spelling development of individual children. Invented spellings also reflect children's degree of phonemic awareness in their ability to segment words, assign letters to individual sounds, and sequence those sounds to form words. Analysis of invented spellings also provides the teacher with another assessment tool for appraising children's stage of reading development. For children who are having difficulty inventing spellings, teachers can provide phonemic awareness plus letter-sound instruction to improve skills (Tangel & Blachman, 1992).

Text reading Processes

Oral Reading. When children are in first grade, they are usually in Chall's reading Stage 1. There is wide variability among individual children in first grade; thus some children may still be at Stage 0, others may be at the end of Stage 1 or beginning Stage 2. Children at these stages still have a preference for oral reading, perhaps because of a need to associate print with speech (Chall, 1983). This tendency provides teachers with useful opportunities to observe their pupils' oral reading errors. These errors differ at different stages of reading development, and knowledge of these differences allows teachers to assess children's reading levels and progress in order to provide suitable instruction and reading practice.

During oral reading, children may use several different strategies to identify words, depending on the level of reading and the instructional approach. These strategies are described in the section on development of word reading ability. Children's errors provide rich information about children's reading strategies and decoding abilities. An example can be found in Biemiller's (1970) study. Biemiller observed that children in a meaning-emphasis reading program at first made errors based predominantly on contextual information, using syntactic and semantic constraints of the language. This strategy often resulted in contextually acceptable errors. However, when children made these errors, they were not using graphic information to identify words, but were using information from their other knowledge sources together with contextual cues. As they learned more about decoding, children made more use of graphic cues because they began to realize each graphic pattern was associated with one specific word. This resulted in

non-response errors, in which children stopped reading just before a word they were unable to recode or guess with those letters, and then skipped to the next word. It also resulted in graphic substitutions, in which they substituted a nonsense word that resembled letters in the printed word. At a more mature phase, children became able to use graphic and contextual information simultaneously. They had made enough progress to combine graphic information with the semantic and syntactic constraints of the text to identify words quickly and effortlessly (Biemiller, 1970).

Biemiller (1970) found that the earlier children progressed to the non-response phase, the better their reading performance was likely to be by the end of first grade because they were using graphic cues to read words. Children who remained at the less mature phase were likely to be the poorest readers at the end of the year (Biemiller, 1970). For this reason, when teachers see that children are relying on contextual cues to read, based on observations of oral reading errors, they can modify their instruction to place more emphasis on use of graphic cues.

Oral reading errors also provide a way of identifying a child's reading stage according to Ehri's (1994, 1998) model. For example, if a child knows the word *dog* and sees the word *leg*, she or he may say *dog* because both words have a tall post at the beginning and a tail at the end. This indicates that the child is reading by using visual cues, not alphabetic information. As the pre-alphabetic reader moves into the next stage, the use of nonphonetic visual information declines, and use of phonetic information increases. The partial-alphabetic (cue) reader's errors are likely to contain some of the letters of the word he or she is seeing. For instance, *bell* may be mistaken for *ball*, or

lamp for *lap*, if the child is more familiar with the words *ball* or *lap*. The errors, which usually preserve the first letters in words, may also be semantically correct (e.g., saying *lantern* for *lamp*) (Ehri, 1992).

Teachers can recognize full-alphabetic (cipher) reading because these students' reading is more accurate than that of the previous stage. They can recognize many words by sight, and they can read similarly spelled words more easily and consistently than cue readers can (Ehri, 1992). Perhaps one of the most effective ways of assessing word reading skills is to ask students to read word lists or pronounceable nonsense words since skilled decoders can read words easily and accurately out of context using their phonological skills (Rack, 1992; Stanovich, 1980).

Fingerpoint reading. Fingerpoint reading is performed by pointing to words in a text while reading them or reciting the text from memory while pointing to words or pictures. Parents as well as reading instructors have used fingerpoint reading while reading storybooks to children. This activity helps young children to understand that the print on the page guides the reader's speech, and teaches print-related concepts such as where words begin and end, the direction in which the print moves, and specific features of print (Reutzel, 1995). Teachers model fingerpoint reading in the classroom by using an enlarged book and pointing to each word while reading and rereading. Children can (1) see that text is read from left to right, (2) understand how print corresponds to speech at the word and letter levels, (3) become able to fingerpoint-read by themselves using smaller versions of the same book, and (4) acquire a sight vocabulary of familiar words. Fingerpoint reading experiences can also be valuable to children with few home literacy

experiences who are at risk for reading difficulties because they can familiarize children with print (Ehri & Sweet, 1991).

Fingerpoint reading begins during Stage 0 when children are “pretend” reading memorized text, as they are retelling the story with the aid of pictures. This stage has been referred to as “emergent storybook reading” (Sulzby, 1985), and is thought to be an indicator of “reading readiness”, when children have acquired basic prerequisite skills they need to learn to read (Teale & Sulzby, 1986). At a more mature stage of fingerpoint reading children are able to point to the words that they have memorized in the text during their “reading.” This is more advanced than pretend reading which relies on pictures and memory of the story rather than pointing to and following the print. The latter is difficult because beginners need to know not only how print represents speech, but also that words are separated by spaces in print. In order to fingerpoint-read memorized text and remember information about print, beginners need some print related knowledge and phonemic segmentation skill so that they can find the appropriate phonemic segments in speech during fingerpoint-reading to fit with the printed letters in words. Letter-name knowledge is also necessary because this may enable beginners to find words using these cues. Preprimer word reading ability is necessary for locating single words in text (Ehri & Sweet, 1991).

Researchers have found that the least mature beginners are unable to point to the correct words or read them afterwards. More advanced beginners use spacing cues to point to words, but there is lack of correspondence between the written and spoken word. Children begin to become proficient when they recognize the initial consonants, and this

precedes understanding the “concept of a word” (Morris, 1989, as cited in Ehri & Sweet, 1991). More advanced readers can point accurately to words as they are said, correct errors, and learn to read new words in a fingertip-reading lesson (Morris & Henderson, 1981, as cited in Ehri & Sweet, 1991).

Fingertip-reading can be incorporated into reading lessons that include teacher-modeling, explanation and discussion of the structure of alphabetic print, attention to printed words and spaces, letter-sound associations, instruction in print concepts, how to identify words in text, left-to-right orientation, familiarity with written language structures, correspondence of spoken and written language, corrective feedback, and reinforcement for children’s efforts (Ehri & Sweet, 1991). In order to familiarize children with the story and promote enjoyment and interest, the teacher may want to read a story two or three times (Reutzel, 1995). Children can quickly learn to fingertip-read when they have been exposed to these instructional experiences and have acquired the necessary print-related knowledge for successful, independent fingertip-reading (Ehri & Sweet, 1991).

Instructional and Frustration Reading Levels. Another important consideration in text reading for young children is selection of texts at appropriate levels for individual readers. Teachers need to assess each pupil’s reading level in order to provide appropriate reading material for each level that will provide plenty of practice and successful reading experiences that encourage children to read. Suitable reading material allows children to make progress without being held back or bored or discouraged by books that are too easy or too advanced for them. Assessing reading level for each child

allows teachers to determine difficulty of text given to individual children, decide on grouping of children, accelerate a child if necessary, monitor children's progress, allow children to move through different books at different speeds while keeping track of individual progress, and observe particular difficulties of individual children (Clay, 1985).

Teachers can evaluate children's reading level by taking running records. This is done by giving a child a sample reading of 100 to 200 words from a text that uses language familiar to the child, and recording on a piece of paper each word the child reads correctly (see Clay, 1985 for detailed instructions). Clay recommends obtaining running records on three levels of difficulty: (1) an easy text, of which the child's accuracy is 95-100 percent, (2) an instructional text, of which the child's accuracy is 90-94 percent, and (3) a hard text, of which the child's accuracy is below 90 percent. Easier materials provide information on children's strengths, while more difficult materials give information on their reading weaknesses. If a child's accuracy level is 90-95 percent with a particular text, he or she will have enough opportunity to practice reading words and to learn new words as well. If he or she is reading a book with less than 90 percent accuracy (frustration level), the text is too difficult to provide enough practice and enable the child to advance with new words (Clay, 1985).

In pilot work three teachers (two novices and one experienced) responded to a question regarding how they decided whether a book was at the correct level for a child. The two novices' responses did not indicate that they assessed reading levels in any systematic way. One novice said that she looked at the words in the text to see how many

of the sight words the children knew; she also knew the level by the series that was being used for a particular group; she asked more experienced teachers for advice; the number of words in the text and size of print indicated whether or not a book would be at the right level for a particular group. Her main strategy appeared to be trial and error. She would give a reading group a book, and if students were struggling with the text, she knew it was too difficult; if they could read it fluently, it was at the right level. The other novice also said that if children were struggling and becoming frustrated, the text was too hard. If there were a few words in a text which the students did not know but could decode, then the text was at the right level. She also remarked that she found it hard, when she first started teaching, to determine what was a first grade level book. The experienced teacher, on the other hand, indicated a more reliable system in which she measured reading errors. She responded that she decided reading level by using the “five-finger rule”, which is if a child made more than five errors per page, the book was too hard and she would select another book for the child. While teachers can have a good intuitive impression of what their pupils are capable of reading, it can be more helpful to both children and the teacher to have a dependable and accurate system for deciding instructional levels so that boredom or frustration do not discourage reading.

Theory and Research on Teaching

Approaches to Beginning Reading Instruction

Although there has been disagreement about the merits of code-emphasis instruction vs. meaning-emphasis instruction to teach beginning reading, both approaches can be combined successfully in reading programs (Foorman et al., 1991). Meaning-

based whole language approaches can contribute to a child's reading development. One feature making this instruction attractive is that the reading and writing activities are meaningful and interesting to both students and teachers. By providing a variety of excellent children's literature, and daily writing activities, it encourages positive attitudes toward literacy and a solid understanding of the nature of reading and writing (Ehri, 1995a).

A weakness of meaning-emphasis approaches is the absence of systematic phonics instruction¹ during the first year of reading instruction. Some attention is paid to letter-sound relationships as students attempt to invent spellings during journal writing and as teachers read Big Books and stop to point out initial letters and sounds in salient words. However, care is not taken to ensure that each student masters the alphabetic system by learning all the letter shapes and names, learning which sounds they typically symbolize in words, learning how to segment words into sounds, and learning how to blend the sounds of letters to form words (Ehri, 1995a).

As discussed in previous sections, studies indicate that meaning-emphasis instruction alone has little effect on early reading achievement as measured by standardized tests of decoding, vocabulary, comprehension, and writing (Pressley et al., 1996). Students who fall behind in learning to read often do so because they have not

¹ Systematic phonics instruction follows a plan and provides students working knowledge of the alphabetic system as it symbolizes speech so that word reading competencies develop and mature. It is not a particular way of teaching phonics. Systematic instruction may not be needed for students who enter school already knowing how to read, but it must be provided to students who enter school with little of this knowledge (Ehri, 1995a).

acquired sufficient, working knowledge of the alphabetic system. While some children may be able to derive the alphabetic principle and learn to read from immersion, many students do not learn without direct instruction (Ehri, 1995; Juel, 1988; Stanovich, 1986; Thompson, 1992). Because this learning is difficult for many children, they do not pick it up simply by being exposed to print (Juel, 1988; Juel, Gough, & Griffith, 1986; Stanovich, 1986; Wagner & Torgesen, 1987). Programs that explicitly teach phonemic awareness, phonics, and letter-sound analysis have been found to be superior to programs that emphasize meaning, and the most effective type of literacy instruction appears to be one that integrates whole language and letter- and word-level teaching (Pressley et al., 1996).

Surveys of teachers conducted by Pressley et al. (1996) and Baumann, Hoffman, Moon, and Duffy-Hester (1998) showed that most teachers combined whole language instruction with phonics principles and practices in compatible ways. The majority of teachers appeared to understand the need to include phonics instruction for decoding, and attempted to incorporate both types of instruction in their classrooms, as these surveys found. The relationship between teachers' theoretical orientation and knowledge was not clear in the pilot project for this study. However, research by McCutchen et al. (2002b) found little relationship between theoretical orientation and subject matter knowledge, but did find that teachers' instructional practices were related to their reading-related content knowledge.

Importance of Teachers' Knowledge Base. There are many outside forces exerting an influence on teachers' decisions about what they teach and how to teach.

These include authors of basal reading series, in-service courses, magazine articles on teaching, school administrators, parents, and legislators. Research-based knowledge of the progression of reading and spelling acquisition, as described previously, enables teachers to develop reasons for their instructional decisions. The more research-based information teachers have about reading and spelling development, the more likely they are to rely on their own knowledge, experience, and judgment, and the less likely they are to rely blindly on authority for making instructional decisions (Ehri, 1995a).

A review of research by Hoffman and Pearson (2000) echoes Ehri's (1995a) point that effective teaching requires a knowledge base that allows teachers to make decisions and control their own thinking and actions based on, among other things, an understanding of conditions that promote learning and responsiveness to students. Courses and professional development that teach skills and strategies that teachers are expected to follow and implement in the classroom provide useful but superficial information about methods of teaching, but do not offer opportunities for teachers to acquire deeper knowledge about teaching and learning processes that would enable them to recognize and appropriately address diverse classroom conditions and pupil requirements. Teachers' knowledge guides their practices, and not vice versa (Hoffman & Pearson, 2000).

Instructional activities must be tailored to individual children's development because children enter school with a variety of reading capabilities. According to Duffy and Hoffman (1999), the teacher needs to decide on instruction based on each child's needs. "Hence, reading instruction effectiveness lies not with a single program or method

but, rather, with a teacher who thoughtfully and analytically integrates various programs, materials, and methods as the situation demands” (Duffy & Hoffman (1999). In order to apply appropriate instructional methods in their classrooms and to address individual children’s needs, teachers need information and knowledge about normal beginning reading development to guide their teaching, and they need to know that this development follows a predictable course. They also need sufficient knowledge about the structure of the English language to be able to teach it, and about children’s reading and language behaviors that signal possible early reading disability. Knowledge of phases of reading and spelling development can guide teachers in their choice of reading activities in the classroom and assessments of children’s progress. Knowledge about phonemic awareness and the development of related word reading processes can tell teachers what to look for as signs of development and what processes need to be in place before other processes can be expected to emerge, and can enable them to implement various activities in the classroom that promote this development (Ehri, 1995a). Teachers’ knowledge and information can have a great impact on their effectiveness and instructional decisions, particularly when teaching children at risk for reading failure. Lack of a solid knowledge base combined with use of an instructional approach that is inadequate for teaching necessary skills, unnecessarily places children at a greater risk for developing reading problems.

Knowledge of development of reading skills and how to assess children’s progress helps teachers to effectively: (1) monitor progress during the year to determine if children are meeting expectations and, if not, to adapt instruction; (2) identify children who are at

risk for possible reading disability at an early stage and determine how to intervene; (3) observe, assess, and draw conclusions about individual children's reading capabilities in order to manage a variety of reading abilities in the classroom and identify appropriate instruction for individual children; (4) choose instructional activities that teach capabilities necessary for reading progress; (5) ensure that children have the capabilities they need to respond to instruction; and (6) communicate useful information to parents, the next year's teacher, and reading specialists about the children's strengths and weaknesses.

Research Evidence about Teachers' Knowledge Base. It appears that in general teachers in today's schools may not be fully informed about the reading and spelling processes that develop in beginners. There is some evidence that many teachers lack knowledge of phonemic awareness or are unclear about its role in reading development (Rath, 1994; Scarborough, Ehri, Olson, & Fowler, 1998). Rath (1994) found that many teachers were uninformed about the difference between *phonemic awareness* and *phonics*; some thought *phonemic awareness* was another term for *phonics*. Although some teachers believed it was important for children to learn to segment words into sounds, few teachers, including those who worked with low-progress readers, showed that they understood how to direct children's attention to speech sounds or segment words. In addition, many teachers did not understand what constituted a phoneme. There was also wide variation found in teachers' performance on phoneme and auditory tasks. Performance was found to be related to teachers' training in code-oriented reading programs, judgments of importance of phonemic awareness, and amount of coursework

in linguistics. Many teachers also complained of inadequate preparation for teaching reading in their preservice programs (Rath, 1994). A more recent study examining relationships among teachers' subject matter knowledge, instructional philosophy, and classroom practice indicated that teachers who had greater subject matter knowledge (i.e., those with knowledge about children's literature, and those with linguistic knowledge) tended to make explicit instructional comments about letter-sound relationships.

Teachers who had greater knowledge of the linguistic structure of English were more likely to provide more explicit instruction in the alphabetic principle in the classroom than those with more knowledge about children's literature (McCutchen et al., 2002b).

Knowledge about the structure of language, especially how phonological and orthographic aspects of language are structured, enables teachers to teach children how the alphabetic system represents speech (Ehri & Williams, 1996). While average adults have sufficient linguistic awareness for basic reading, this level is not sufficient to teach reading and spelling elements, particularly if some children have difficulty with phonological processing (Moats, 1995).

Consistent with some of Rath's (1994) findings, a teacher survey by Moats (1995) found that teachers did not have sufficient understanding of spoken and written language structure to be able to teach it explicitly to beginning or disabled readers. Many were misinformed about differences between speech and print and how print represents speech. The teachers indicated that their previous coursework had not covered these areas (Moats, 1995). A study by Scarborough, Ehri, Olson, and Fowler (1998) found that phonemic awareness in teacher education students was highly variable and fell far short

of perfect. The findings from Moats (1995), Scarborough et al. (1998), and Rath (1994) suggest that many teachers lack critical knowledge of the structure of spoken and written language. This limits their ability to provide sufficient instruction in these areas. Moats and Lyon (1996) stress the need for teacher education in beginning reading processes, phonetics, phonology, morphology, and how beginners learn sound-symbol correspondence. A study by McCutchen, Abbott, Green, Beretvas, Cox, Potter, Quiroga, and Gray, (2002a) found that when teachers were given explicit training in the structure of language and auditory activities intended to enhance teachers' concept of phonological awareness, their phonological awareness increased significantly, and they used their knowledge to improve classroom practice and student learning. In a recent study, Spear-Swerling and Brucker (2004) provided teacher education students with 6 hours of training that covered instruction in English word structure and emphasis on the importance of systematic, explicit teaching to beginners and children with learning disabilities. These teachers also showed positive gains in knowledge of word structure. Although more intensive and focused additional instruction was believed by the researchers to be necessary for teachers to attain a high level of knowledge about word structure, even the short-term training they did receive significantly improved specific reading and spelling skills in the struggling readers the teacher education students were tutoring.

Teachers' Theoretical Orientation to Reading Instruction. As indicated earlier, explicit instruction in phonics and phonological skills can be combined with meaning-emphasis approaches to reading instruction, and it appears that many teachers adopt both approaches in their classrooms. A survey by Pressley et al. (1996) of teachers nominated

as “outstanding” by their supervisors found that the most effective teachers created a literate environment in their classrooms, integrating in their instruction the attractive features of whole language activities and explicit skills emphasizing phonics activities and practice. These teachers also claimed to be sensitive to individual students’ needs, and tailored instruction to individual differences, often attending more to lower-order (word-level) skills. At the same time that they were meeting weaker students’ needs, these teachers also managed to maintain exposure to and experiences with good literature and introduction to higher-order skills and strategies. These teachers, then, integrated compensatory education for less proficient readers with the curriculum provided to all students (Pressley et al., 1996). Results of another survey by Baumann et al. (1998) of pre-K through Grade 5 teachers found that most teachers reported that they adopted an eclectic approach to beginning reading instruction, combining phonics and holistic principles and practices in compatible ways.

The pilot study for this research indicated that teachers who scored higher (three out of five teachers) on a portion of Moats’ Informal Survey of Linguistic Knowledge (Moats, 1995; Moats & Lyon, 1996) tended to mention alphabetic and word reading more often in the think-aloud rankings of their pupils than the two lower-scoring teachers. The relationship between theoretical orientation and linguistic knowledge appeared to be positive, but needed further investigation because of the small sample size and knowledge of a second language by one of the novices.

In the pilot study, the TORP score of one of the two experienced teachers showed a neutral viewpoint towards reading instruction, and the other’s score showed slightly

more agreement with phonics statements. Both experienced teachers mentioned alphabetic reading more often than two of the novices, and scored higher than the two novices on a measure of linguistic knowledge, consisting of a portion of the Moats (1995) Informal Survey of Linguistic Knowledge. The third novice (R.B.), had a linguistic score similar to that of the experienced teachers, tended to agree more with phonics than with whole language statements, and mentioned alphabetic reading as often as the two experienced teachers. (Alphabetic reading score was determined by the number of times the teacher mentioned knowledge of alphabet letters, letter-sound knowledge, decoding, consonant or vowel sounds, or teaching phonics). However, R.B., who had one year of experience, was trained as a student teacher by one of the experienced teachers who participated in the pilot study, and was the only Spanish-speaking teacher in the group. During the interview, R.B. related that her class was a Spanish immersion class two days per week, in which she taught Spanish to monolingual English-speaking first-graders. Given that R.B. was the only bilingual teacher in the group, and was teaching the Spanish language to young children, she may have been more aware of language structure than the other two novices.

Development of Teacher Experience

According to theories about learning to teach, experienced teachers who have taught first graders to read for many years ought to have more practice-based understanding than novice teachers with only a couple of years experience. The teachers in the Pressley et al. (1996) survey had an average of about 16 years experience (range 3-35), and Baumann et al.'s teachers also had an average of 16 years experience. While the

two studies did not compare experienced with novice teachers, Ehri and Williams' (1996) developmental model and Berliner's (1991) five-stage model would both predict large differences between these two groups.

Ehri and Williams (1996) proposed that teachers follow a developmental course in learning how to effectively teach beginners to read. Teacher education students begin the developmental process while they are acquiring knowledge about aspects of teaching and learning to read. A preservice teacher education program that provides background information about written language, reading processes, reading disabilities, as well as a repertoire of methods for teaching reading and assessment strategies, equips the teacher with the basic information teachers need to learn to teach reading effectively. Teachers advance when they become student teachers under the guidance of a classroom teacher mentor. At this point they start to combine their experiences in the classroom with their knowledge base, and this enables them to begin to improve their understanding of how to teach reading effectively. Teachers are thought to gain the most experience and make the most progress when they have their own classrooms. They have a rich source of information from their students as they accumulate a repertoire of instructional activities and materials, and assess whether their teaching methods are appropriate for their students' capabilities. They can observe their students' development and behaviors and learn effective assessment techniques to determine whether their pupils are making progress. Teachers' experiences enable them to reflect on their teaching effectiveness, and modify their techniques to enhance their effectiveness (Ehri & Williams, 1996).

Berliner (1991) suggested five stages of developmental changes of teachers, based on the general model of Dreyfus and Dreyfus (1986) (as cited in Berliner, 1991). The first is the novice stage, and refers to the student teacher. In this stage, teachers learn the customary routines and sets of context-free rules. Their performance is rational and fairly inflexible. The second stage is advanced beginner, which refers to first year teachers. Teachers acquire episodic and procedural knowledge, and permit context to guide their behavior. They notice similarities across domains and acquire strategic knowledge. The third stage is competent performer, and refers to teachers who have had 3 or more years of experience. These teachers have learned to set priorities and prepare flexible plans to meet attainable goals. Teachers have learned what is important and warrants attention. A small percentage of competent teachers become proficient. They are skillful in pattern recognition, have an intuitive holistic perception of situations they encounter, and can recognize similarities across seemingly dissimilar situations. A few of these proficient teachers may become expert. At this stage they can respond intuitively to situations, and their responses appear to be effortless, smooth, and appropriate. The stage theory of skill development and knowledge growth, which take place over a period of time, is supported by research data (Berliner, 1991). A recent study by Al Otaiba and Torgesen (2003) appears to support the argument that teachers begin with a knowledge base and then improve their effectiveness as they gain experience. In that study, preservice teachers were trained in reading instruction and then were provided opportunities to tutor diverse students (English language learners and special education students). These teachers reported that they felt better prepared to teach reading with the combination of the

training they received and their teaching experiences. With added classroom experiences, the teachers would be expected to make additional gains as they learn effective instructional and assessment techniques.

Expert-Novice Research. Research comparing experts and novices in several different domains has shown that these groups differ in various ways. Experts differ from novices in their perception, memory, organization of knowledge, and decision-making processes (Berliner, 1991; Borko & Shavelson, 1990). Expert and novice teachers differ in their perception and interpretation of classroom events. Expert teachers have elaborate schemas containing a store of knowledge about the complexities of the classroom. Their schemas enable them to understand the students and events in the classroom so they can appropriately meet the needs of their pupils. Novices lack the metacognitive and monitoring skills that experts have which allow experts to monitor situations in the classroom, and recognize and solve problems effectively. In addition, novices fail to adapt their instruction in response to cues from the students. Experienced teachers also attend to more instructional goals than do novices when they make interactive decisions, and they use more instructional strategies (Westerman, 1991). Experts' experience allows them to develop functional, sophisticated, and efficient ways of recognizing, organizing, recalling, and processing information in their domain (Berliner, 1991).

Pedagogical expertise resembles expertise in other fields in that it is a very sophisticated form of knowledge that is not easily mastered. However, it is more difficult to demonstrate expertise in teaching than in other domains such as chess or problem-solving in mathematics, in which only one or a few agreed-upon correct solutions exist.

Teaching is an ill-structured domain in which there are few, if any, easily agreed-upon correct answers or solutions to problems. There are no definite specified goals and problem solutions, and task conditions change in ways that are not always under the control of the teacher (Berliner, 1991; Leinhardt & Greeno, 1986). Teaching is regarded as a complex cognitive skill that requires the construction of plans and ability to make instantaneous decisions in an ill-structured, dynamic environment (Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985). In judging teaching expertise, the quality of expert and novice responses must be determined by consensual agreement about the sensibility or reasonableness of the teacher's actions (Berliner, 1991).

Because of the nature of teaching, the variety of tasks that teachers must perform, the judgments and decisions they must make, and the lack of specific goals to meet in order to become an expert, it is difficult to identify objective criteria that make experienced teachers experts. However, domains of knowledge have been identified by researchers that distinguish expert teachers: subject matter knowledge and knowledge of lesson structure (Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985), and similar concepts, referred to as content knowledge, pedagogical knowledge, and pedagogical content knowledge (Berliner, 1991). In the discussion of differences between experts and novices, terms for similar concepts will be used interchangeably.

One of the important components of effective teaching is knowledge of lesson structure, which is knowledge of general teaching skills and strategies. This involves the skills teachers need in order to plan and conduct a lesson smoothly, to shift easily from one segment to another, and to explain the subject clearly. Another important component

in skillful teaching is knowledge of content, or subject matter knowledge. This refers to a teacher's understanding of the structure of the curriculum area, the major concepts and relations among concepts, and ways of thinking that are characteristic of individual curriculum areas. Subject matter knowledge supports knowledge of lesson structure, and includes domain-specific information that the teacher needs to present the content. Teachers access and use subject matter knowledge during the course of a lesson and when they construct plans, which include both actions and goals, in response to the need to achieve specific goals. It is accessed and used during the lesson such as in generating explanations, demonstrations, and selecting examples. This knowledge is supported by such resources as text material, teacher's manuals, and elements of the teacher's experience that distinguish what is difficult to teach. Teachers rely most heavily on their subject matter knowledge when they present material (Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985).

Berliner (1991) described three important sources of knowledge necessary for skillful teaching. One is content, or subject matter knowledge. Second is pedagogical content knowledge, which refers to the teacher's ability to take content knowledge and convert it into forms that enable students to learn it. A third kind of knowledge necessary for competent teaching is pedagogical knowledge. This refers to classroom management, organization of the classroom, assessment, methods for motivation of students, personal knowledge about students, and social-interactional competence (Berliner, 1991).

In research studying differences found between novice and expert teachers, the teachers who were selected as experts were chosen based on student scores or were

judged by a school administrator as experts. Several areas of teaching skills in which experts and novices differ have been identified. Expert teachers have complex knowledge structures that are made up of interrelated sets of organized actions, called schemata, which they can use flexibly and with little cognitive effort (Leinhardt & Greeno, 1986). These contain summarized information about many instances of particular cases and the relationships among them, including information about common and familiar experiences, knowledge of people and objects in everyday classroom events, factual knowledge about elements of the teaching and learning situation (Borko & Livingston, 1989). Borko and Livingston identified three different kinds of schemata in teachers' knowledge systems: (a) scripts, which summarize information about common and familiar experiences, such as checking homework, conducting class discussions, or presenting new information; (b) scenes, which are teachers' knowledge of people and objects in everyday classroom events such as whole group instruction or small group work; and (c) propositional structures, which consist of teachers' factual knowledge about elements of the teaching and learning situation, such as their students, subject matter, or teaching strategies. The teaching of experts is based on their operational plans, or "agendas", which consist of specific versions of their schemata (Borko & Livingston, 1989).

Skilled teachers have a large repertoire of activities, called routines, which they can execute spontaneously and effectively if they have schemata for the actions to be performed. Routines are small, socially scripted pieces of behavior that are known by both teachers and students. They provide quick, efficient ways of performing activities,

and enable teachers to accomplish low-level activities efficiently because they do not require a great amount of mental resources to perform them. This frees the teacher's mental resources for more important activities and goals of teaching (Leinhardt & Greeno, 1986).

Skilled teachers also have information schemata with which teachers note and remember relevant information about their students and daily lessons. They save, revise, and use this information for later actions during another activity. For example, the teacher can note which students have difficulty understanding a concept that is necessary for learning later material. Skilled teachers can record and have this information available for later use (Leinhardt & Greeno, 1986).

Leinhardt and Greeno (1986) found differences in their observations and interviews of eight expert and four novice (student) teachers, and these differences influenced their effectiveness. Experts' lessons were predictable and focused. Routines were consistent, and homework was assigned after children practiced in the classroom. Novices' lessons were not predictable, they did not have a well-established set of routines, and they showed a changing pattern of lesson presentations. Novices spent less time than experts on guided and monitored practice, and when they assigned homework, it was often assigned to finish an incomplete lesson, resulting in students' having more difficulty with the problems and being less likely to get their homework done (Leinhardt & Greeno, 1986).

The major difference between experts and novices was in routines. Experts had a large number of routines that were flexible and required little or no explanation for

carrying them out. Novices did not work in a routine way, so that each part of a lesson was different from the next and each day was different. Consequently, their lessons were less efficiently presented and less predictable for students. Novices had to instruct students in their roles, taking time and energy to explain each action. Lack of routines were caused mainly by lack of experience, and this was intensified by lack of repetition in their activity structures (the main segments of a lesson) (Leinhardt & Greeno, 1986).

Borko and Livingston (1989) found that expert teachers made more organized and well-constructed plans. They kept their lessons on track while at the same time responding to students' questions and comments, and generating examples or problems on the spur of the moment to reinforce concepts or skills. In postlesson reflections, experts were concise, focused, and highly selective in their processing and use of information. They focused on students' understanding of the material, and students' active participation. There was little mention of student behavior, misbehavior, or affect, and the teachers only referred to classroom events that had an effect on instructional goals. They rarely mentioned classroom management, and seldom referred to their own effectiveness (Borko & Livingston, 1989).

In contrast, novices took extra time and energy in preparing lessons and, therefore, their planning was short-term, time-consuming, and inefficient. Their planning consisted of how to present subject matter. They constructed detailed scripts, and relied on the text, teacher's manual, and other sources. They rehearsed their presentations before teaching, and felt they had to work out problems they planned to assign to be sure they understood them (Borko & Livingston, 1989).

In their teaching, novices did not translate their plans into action as well as experts. Their planned explanations may have been clear, but their responses to unanticipated student questions or comments were inadequate because the teachers were not prepared in advance. Planned and unplanned explanations were not connected, and related concepts were not linked. Novices had difficulty maintaining the direction of the lesson when students asked questions, and they had difficulty making a smooth transition back to lesson presentation. Postlesson reflections showed that novices were concerned with the day's events, their own teaching effectiveness, ability to respond to questions, and effectiveness in classroom management, lesson presentations, student participation and understanding, and behavioral management (Borko & Livingston, 1989).

Experts' pedagogical content knowledge included effective explanations, demonstrations, and examples, while novices had to develop these during planning. Experts' well-developed pedagogical content knowledge, content knowledge, knowledge of learners, and the superior interconnections among these schemata enabled them to predict where students would have difficulty, the misconceptions that could occur, and areas of learning the misconceptions were likely to affect. They could quickly determine what information in the environment was relevant to their planning and quickly decided whether it was useful. Cognitive schemata of novices needed to be elaborated during decision-making, so they were less able to decide if the information was relevant (Borko & Livingston, 1989).

Novices' problems keeping the lesson on track can be attributed to inability to improvise because improvisation requires an extensive network of interconnected and

easily accessible cognitive schemata. They do not have as many appropriate scripts for instructional strategies or propositional structures for pedagogical content knowledge to produce explanations immediately. Because of these poor connections, they have difficulty getting back to the lesson once they deviate from it (Borko & Livingston, 1989).

Experience in Reading Instruction. Research examining differences between experienced and novice teachers in reading instruction suggests differences between these groups in use of information in decision-making. In order to determine how experience affected teachers' decisions, and what student characteristic variables influenced decision-making, Borko and Niles (1982) compared responses of student teachers having one year experience with those of the elementary school teachers with whom they worked. The researchers assessed conceptions of reading (defined as teachers' views of reading with regard to linear skills, basal text, natural language, interest, and integrated curriculum). Then teachers were given descriptions of hypothetical first graders to read, which contained content-centered information (i.e., standardized reading score, self-correction of reading errors), and pupil-centered information (i.e., class participation, social competence, classroom behavior). The teachers were asked to predict students' probable mastery of the reading curriculum, place students in reading groups, describe the reading groups, and discuss their strategies for forming the groups (Borko & Niles, 1982).

The researchers found that experienced teachers and student teachers differed in many respects in their use of information. Experienced teachers had more eclectic conceptions of reading, and used both pupil and content-centered information, while

student teachers used primarily pupil-centered approaches. In predicting children's mastery of the reading curriculum and formation of reading groups, almost all of the teachers used reading scores and student self-correction during oral reading. However, student teachers placed more importance on scores than did experienced teachers, while experienced teachers used scores and self-correction plus non-academic factors such as class participation and social competence. Use of non-academic factors was significantly affected by teaching experience (Borko & Niles, 1982).

Borko and Niles (1982) explained that student teachers rely more on textbook learning and college courses than on teaching experiences, and that they are more likely to be child-oriented, which apparently influenced them to place greater importance on pupil-centered factors in their reading conceptions. Experienced teachers have had more opportunities to abstract information about the differential importance of student characteristics, which they could use to make educational decisions. Their conceptions of reading were more content-centered because they were more influenced by the requirement to use basal texts and were held accountable for students' progress. Also, if they began as pupil-centered and moved toward content-centered conceptions as they gained experience, the result was that their beliefs were more eclectic. One year of using basal texts did not appear to be sufficient for student teachers to shift to more eclectic beliefs (Borko & Niles, 1982).

Differences between experienced and student teachers in estimating reading curriculum mastery and grouping were also explained by differences in experience. Because the experienced teachers had worked with reading groups for much longer than

student teachers, and because they were held accountable for student achievement, they had a more complex understanding of the factors that contribute to academic success. For example, they considered social and behavioral factors in addition to academic ones because they were more aware of the impact of group dynamics on the learning process, and could consider the influence of these factors on learning and forming reading groups.

Student teachers selected only the academic cues, apparently because they had not yet reached the point at which they could integrate their beliefs with their actions when making academic decisions, and they selected a less complex strategy which depended primarily on academic cues. Experienced teachers included non-academic cues in their decision strategies, which complemented their conceptions of reading and reflected an integration of both content-oriented and pupil-oriented factors (Borko & Niles, 1982).

As can be seen from the research comparing expert and novice teachers, expertise contributes a great deal to teaching effectiveness in presenting subject matter and classroom management. Experience, even when expertise and knowledge of subject matter is not considered, also appears to influence teachers' use of their knowledge, suggesting that experienced teachers are likely to be more effective in the classroom than novice teachers.

While the Borko and Niles (1982) study examined teachers' conceptions of reading and some factors that influenced teachers' decisions on grouping and assessing mastery of reading curriculum, the knowledge base about beginning reading that the teachers possessed when they were assessing children's performance was not investigated. Experts demonstrate that they have a solid knowledge base. It is important

to study how differences in experience are related to teachers' knowledge about reading development when they make decisions about students, and what they gain in their knowledge as they gain experience. Novices' tendency to be unable to focus on multiple student factors to make academic decisions, their difficulties in presenting lessons, managing classrooms, and lack of well-established routines would be expected to present temporary problems until these teachers gain experience. They appear to make numerous gains in classroom management, lesson presentation, and other aspects of teaching as they gain experience. By working out math problems before teaching them, Borko and Livingston's (1989) novices seemed to make gains in their subject matter knowledge. Pressley (1995) noted that novice mathematics teachers' content knowledge can increase with time and experience. In one example, one of the experienced teachers in the Borko and Livingston study was quoted as saying that in her first year she did all the problems she assigned. In the following year, her content knowledge, combined with interactions with students, was more evident in the quality of her instruction (Borko & Livingston, 1989; Pressley, 1995, p. 95). Do teachers of reading also make gains in their knowledge about reading that increase their effectiveness during instruction and their assessment of children's progress?

As discussed earlier, according to Ehri and Williams' (1996) model of teacher development, a teacher education program provides preservice teachers with basic background information that teachers need to learn to teach reading effectively. They then combine their classroom experiences and observations of children with their knowledge base. At the same time, they reflect on their effectiveness and find ways of

improving it. As noted by Berliner (1986), experience does not necessarily lead to expertise. The Berliner (1991) model proposes that only some teachers reach proficiency at the fourth stage, and only a few of those teachers become expert at the fifth stage. Teachers who possess a rich knowledge base and use it effectively and efficiently in their reading instruction, assessment, and remediation approaches can be considered experts. The questions here were, can teachers reach expertise in knowledge about reading development through teaching experience and if so, what knowledge do they gain, and how do they gain it? Do they need a solid knowledge base when they begin teaching and then build on that, or do they acquire additional information from students and inservice courses as they teach? The research reported by McCutchen et al. (2002a), Spear-Swerling and Brucker (2003), and Al Otaiba and Torgesen (2003) suggests that teachers with less knowledge in some areas may need additional instruction to become more effective.

Accuracy of Teacher Assessment

During the think-aloud task in the proposed study, teachers were asked to rank order their students according to how well they can read. Asking teachers to rank order their students requires them to judge individual children's performance relative to that of other students and make decisions about their ranking based on that judgment. This task assumes that teachers can accurately assess their students' reading abilities and performance. Therefore, accuracy of teacher assessments was a factor that needed to be examined not only for the ranking task, but also because teachers use information about their students to make important educational decisions, and teachers' judgments are

necessary for providing feedback to their pupils, parents, and school staff. Teacher assessments are the primary source of information about students' performance, and the effects of teachers' decisions depend on their degree of accuracy in judging students' accomplishments. Clearly, decisions based on accurate estimates of student attributes are more useful and helpful to students than those based on inaccurate assessments. Researchers have found and regarded teachers' judgments as accurate; however, some critics have argued that their perceptions are often subject to bias and error. Therefore, it was necessary to examine the reliability of teacher assessments (Hoge & Coladarci, 1989).

Researchers (e.g., Carpenter, Fennema, Peterson, & Carey, 1988; Ehri & Wilce, 1983; Skaalvik & Hagtvvet, 1990) have used teacher ratings and rankings as measures of academic achievement, rather than other forms of assessment for several reasons. One reason is that standardized achievement tests are often not utilized in early elementary school either because the curriculum differs from the test content, or because grades are not given at the early elementary level. Another reason is that teachers' assessments are considered accurate. In the past, researchers have found that differences between teacher-based categories and test-based categories are negligible. A third reason is that teachers are considered "significant others" for most early elementary students, and are therefore able to provide important information about academic performance (Skaalvik & Hagtvvet, 1990). Carpenter, et al. (1988) found that first-grade teachers accurately predicted, about three-fourths of the time, whether a student was able to solve a particular math problem. Their ability to predict students' success in solving different problems was significantly

related to students' achievement. Teachers are thought to make decisions about whether to assign particular problems based on their assessment of whether the problems would be too difficult for their students. Thus, knowledge of students' success may be related to achievement because teachers base their instructional decisions on that knowledge (Carpenter et al., 1988).

In a study examining 64 six-year-old children's performance on segmentation and memory tasks, Alegria, Pignot, and Morais (1982) asked teachers to rate their students' reading levels. The researchers noted that the teachers' subjective evaluations in December correlated highly with the children's scores on achievement tests at the end of the school year ($r=.78$ and $.81$) for phonics and whole-language groups, respectively.

Hoge and Coladarci (1989) reviewed literature on accuracy of teacher judgments of academic achievement. The 16 studies used were those that compared teachers' judgments of their students' academic performance with the students' actual performance on an achievement criterion. A summary of the findings indicated a median correlation of $.66$, which indicates a strong relationship between teacher judgments and student achievement. Some of the studies included in the review showed correct judgments of 70 percent of items on reading and mathematics subtests, and 64 percent on a reading comprehension test. In one of the studies in which judgment accuracy was examined according to subject matter, correlations for reading, language arts, and math were significantly higher than for social studies and science. While individual differences among teachers and variations in judgment accuracy were found in some of the studies, subject matter was also found to influence accuracy. In reading (which included reading

recognition, comprehension, vocabulary, and word analysis), correlations ranged from .41 to .92; both the mean and median were .67. Twenty-three of the 29 analyses for reading (79 percent) showed correlations above .61. One study specified teacher accuracy according to grade level. For this study, Grade 1 teachers' accuracy of judgment correlated .79 with a standardized test. In summary, Hoge and Coladarci concluded that there were generally high levels of agreement between teacher judgments and standardized achievement test scores, and that the data support the validity of teacher judgments of academic achievement (Hoge & Coladarci, 1989).

Because it appears that teachers are generally accurate in evaluating their students' performance, especially in reading, teachers' rankings of their pupils in the present study was expected to be reliable. To investigate their practice-based working knowledge, they were asked to explain their rankings according to how pupils were mastering their reading skills and to talk about their reasons for placing each child in that rank. It was also of interest to study the relationship between teachers' knowledge and their assessment practices. Knowledge was expected to contribute to these practices. Teachers' verbal protocols provided the basis for studying their knowledge and practices. Students' actual performance or reading progress was not measured or compared with teacher rankings because teachers' knowledge was the focus of the present study.

Teaching Efficacy

Teaching efficacy is thought to be related to teachers' knowledge and experience. The degree to which teachers feel capable of providing effective instruction and their persistence can affect outcomes for their students, especially for those who have difficulty

learning to read. Factors that affect teaching efficacy are the teachers' knowledge of subject matter, experience, and expertise. Moats (1995) argued that adequate knowledge of reading development and linguistic knowledge would benefit not only children who are at risk for reading and writing disabilities, but would also raise teachers' sense of efficacy in their work. Moats suggested that one of the factors contributing to a 50 percent rate of turnover in teaching is that teachers do not have the expertise needed to teach children who are having difficulty learning. These children are often referred to special education when teachers feel that they cannot provide sufficient instruction (Moats, 1995). Teachers whose self-efficacy is high are likely to be more committed to their work and to stay longer in their jobs (Bandura, 1997; Moats, 1995).

Bandura (1995) defines self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations". It is the judgment of one's capability to initiate and perform a plan of action toward accomplishing a goal in a particular situation. Self-efficacy is not a measure of ability, personal characteristics, or psychological traits, but one's own estimate or prediction of performance of a specific task. Efficacy beliefs are influenced by situational features of the task. For example, a task may be simple or complicated, or have demanding criteria. Self-efficacy for performing the task depends on one's knowledge and skills, and also on how well one believes he or she can meet the performance criteria. Efficacy beliefs are different for different types of tasks. People may view themselves as capable in performing well in one area, but not in another. Self-efficacy beliefs contribute to motivation by determining the goals people set for themselves, their persistence on a task,

how much effort they will expend, and their response to failure. People with high self-efficacy choose more challenging goals, expend more effort on a task, and are more persistent and resilient in response to failure compared with people with low self-efficacy (Bandura, 1986). In addition, people with high belief in their capabilities feel they have more control to produce changes in their environment than do those with low efficacy. People with low efficacy produce little change even when the environment offers opportunities (Bandura & Wood, 1989).

According to Bandura (1986, 1995), there are four factors that influence self-efficacy perceptions: enactive attainment, vicarious experience, verbal persuasion, and physiological state. Enactive attainment refers to a person's experience in performing a task: success usually increases self-efficacy and failure usually decreases it. This is the most influential since it deals specifically with the person's own mastery of a specific behavior. Through vicarious experience, people see similar people succeed or fail at a task. This affects perception of efficacy when people are uncertain about their capabilities in performing a task. Verbal persuasion has limited influence over self-efficacy, but it is effective when it increases the level of effort and induces successful behavior. Verbal persuasion is effective when the source is perceived as credible and expert. The final source of self-efficacy is physiological state. One assesses self-efficacy by monitoring and interpreting somatic arousal such as anxiety. High achievers view arousal as a facilitator whereas low achievers view it as a debilitator (Bandura, 1986, 1995).

Self-efficacy in teaching is an important factor for both the teacher and students. Teachers who have high teaching efficacy believe they have the skills and abilities to bring about student learning. They believe they can accomplish their task through extra effort despite outside influences that hinder learning (Gibson & Dembo, 1984). Teachers' efficacy beliefs affect teaching activities and interactions with students, and they help create students' judgments of their own capabilities. Teachers with low efficacy have been found to have a custodial orientation and distrust their ability to manage the classroom; they have a pessimistic view of students' motivation, rely on coercive practices and authoritarian control to obtain students' cooperation, and focus more on subject matter than on students' development. Teachers with high efficacy are more likely to rely on persuasion than authoritarian control, and support their students' development (Gibson & Dembo, 1984). A study by Allinder (1995) found that high personal efficacy teachers also set higher goals for their students, resulting in higher achievement. Wertheim and Leyser (2002), although they did not measure actual teaching performance, found that preservice teachers with higher Personal Teaching Efficacy scores were more likely to report that they planned to use in their classrooms individualized and diagnostic teaching strategies in their teaching. Additionally, teachers' efficacy beliefs strongly predict academic achievement, especially for younger students. Students learn more from teachers with high self-efficacy than from those who doubt their abilities (Allinder, 1995; Gibson & Dembo, 1984). High self-efficacy teachers see hard-to-teach students as teachable regardless of their learning difficulties, and exert extra effort to teach them, often engaging support from children's families to help overcome

negative community or other external influences. Those with low self-efficacy use low student ability to explain why some students do not learn. When dealing with difficult students or classrooms, teachers with high efficacy direct their efforts toward resolving problems, whereas low-efficacy teachers try to avoid dealing with academic problems. With continued difficulty, low-efficacy teachers eventually withdraw from the situation, suffering from physical and emotional exhaustion, depersonalization of their students, and experience a sense of futility (Bandura, 1997).

Gibson and Dembo (1984) developed a scale, based on Bandura's theory of self-efficacy, to measure teachers' self-efficacy beliefs in teaching. In examining the relationship between teacher efficacy and observable teacher behaviors, the researchers identified two dimensions of teaching efficacy: Personal Teaching Efficacy (PTE) and Teaching Efficacy (TE). PTE was defined as a teacher's belief that he or she has the skills and abilities to bring about student learning. TE was defined as a teacher's sense of personal responsibility in student learning, and the extent to which the teacher believes his or her efforts are limited by external influences, such as pupils' family background, home environment, or parental influence. Gibson and Dembo's observations of teacher behaviors provided some supporting evidence for differences in high- and low-efficacy teachers. High efficacy teachers spent more time in academic activities, while low efficacy teachers spent more time in games and nonacademic activities. High-efficacy teachers were better able to provide effective small group instruction, especially in reading. They were better able than low-efficacy teachers to use the small group format with more ease and flexibility, redirect students who were working independently, answer

questions, and achieved more student on-task behavior. Teachers with low efficacy allocated twice as much time to small group instruction than high-efficacy teachers; they rigidly adhered to the format and appeared flustered if an interruption of the routine occurred. They were also not able to redirect students who were working independently, resulting in students' spending time off-task. Low-efficacy teachers criticized low performance more than high-efficacy teachers and praised low performers less frequently for correct answers, thereby communicating low expectations for those students (Gibson & Dembo, 1984).

The differences between experts and novices may be more closely associated with PTE than with TE. Gibson and Dembo (1984) found that the two factors are only moderately correlated, and PTE seems to be more directly related to teacher's beliefs in their capabilities as teachers and the effects of their efforts on their students and in their classrooms, which supports Bandura's outcome expectancy dimension of self-efficacy (belief that a behavior will lead to desirable outcomes). TE, in reflecting the extent to which teachers consider their ability to bring about change limited by outside forces, may reveal to a greater extent teachers' beliefs about the general relationship between teaching and learning rather than beliefs in their own capabilities (Gibson & Dembo, 1984).

It was expected that experienced teachers would have higher PTE (the belief that the teacher has the skills to teach effectively) than novices. Through experience, teachers who have been teaching for many years have had many of the experiences described by Bandura (1986, 1995) in the classroom, especially enactive and vicarious experiences, that would lead them to develop beliefs about their own teaching abilities. Their

experiences with many different students, various reading materials and instructional methods, and interactions with other teachers, would be expected to contribute to their efficacy beliefs.

The findings from the expert-novice literature suggest that, because of their lack of experience, novices do not yet have the pedagogical expertise, elaborated cognitive schemata, flexible routines, use of pupil and classroom information, planning, content knowledge, and other skills that experienced teachers have developed. For instance, if novices use more time in their planning, have difficulty keeping their lessons on track, lack consistent routines, focus on classroom management and student behavior, and are concerned with their own effectiveness, their cognitive resources are not as free as those of experienced teachers. They are therefore less able to take note of, and use, important student information that would affect their ability to deal with students of differing capabilities in the classroom, and make decisions with regard to children's reading abilities and lessons.

The factor that Gibson and Dembo (1984) defined as Teaching Efficacy (TE, the belief that one's effectiveness is influenced or limited by outside factors), was not expected to show differences between experienced and novice teachers as clearly as PTE (beliefs about possessing adequate teaching skills) because teachers, whether experienced or novice, may feel differently from one another with regard to outside influences affecting their students' learning. For example, in pilot work with five teachers (3 novice, 2 experienced), PTE was found to be lower in the three novices than in the two experienced teachers. This suggests lower efficacy of novices based on self-perceptions

of their own teaching skills. TE, on the other hand, was low in two of the novices, but the third novice's score on this dimension was as high as the scores of the two experienced teachers. In the think-aloud and follow-up questions, the two novices with low TE scores referred to home influences at least twice as often as did the one novice and two experienced teachers with high TE scores. Although the sample was quite small and no conclusions called be drawn from these cases, they did seem to suggest that TE may not have as clear a relationship to teaching experience as PTE might have. The present study further examined the relationship between years teaching and teaching efficacy.

Think-Aloud Procedure

Researchers have used think-aloud procedures successfully to learn about informants' knowledge and perspectives (Ericsson & Simon, 1993; Kucan & Beck, 1997; Wineberg, 1991). In order to obtain information about thought processes that influence decision making, subjects are instructed to think aloud, i.e., verbalize their thoughts, as they are performing a task. They are instructed not to describe what they are doing, but to verbalize the information they attend to while they are generating the answer (Ericsson & Simon, 1993, p. xiii). During the think-aloud it is made clear that social interaction is not intended, subjects may be given practice problems in which it is easy to verbalize concurrent thoughts, and, if the subject stops verbalizing, they are reminded to "keep talking", or "say what you are thinking".

Thinking aloud has been studied as a method of both inquiry and instruction. As a method of inquiry, concurrent and retrospective verbal reports have been used in several subject areas, one of which includes expert performance in different domains.

Researchers have studied experts' knowledge and cognitive processes, task representations, judgments, decision making, and level of performance. Reading comprehension processes have also been studied through verbal protocols, as well as cognitive processes in writing, memory, person perception, and in other areas. In these protocols, experts have demonstrated their flexible and goal-directed processing. As a method of instruction, thinking aloud has been modeled by teachers in the classroom to demonstrate for students different strategies for solving problems and understanding important information in many academic areas (Ericsson & Simon, 1993; Kucan & Beck, 1997).

An example of the usefulness of think-aloud procedures for obtaining subjects' thoughts while performing a task can be seen in Wineberg (1991). Wineberg used the think-aloud procedure to study how experts (historians) and novices (high school seniors) constructed an understanding of an historical event when presented with different versions of the events from primary and secondary sources. He also examined what heuristics subjects used to fill in gaps, and what beliefs they held about history that influenced their making sense of the event. The verbal protocols revealed several differences in thinking between experts and novices. Experts read the sets of documents in more sophisticated ways; they possessed and activated an appropriate and more principled schema for the event, as well as a more general schema for the time frame of the event. They constructed a context-specific schema, building piece by piece, a model of the event in order to reason thoughtfully about the accuracy of the documents. They also puzzled about discrepancies, compared information sources, examined key features,

and explored their own knowledge. Novices' think-aloud protocols were similarly revealing. They searched for a "correct answer" among differing sources, and considered the sources as reporting the facts rather than interacting with the text and questioning as the experts did. They lacked background knowledge, and also knowledge of how to evaluate the validity of differing claims (Wineberg, 1991).

One purpose of this study was to examine the value of a think-aloud procedure for revealing the extent of teachers' knowledge and decision-making processes, and to compare differences in protocols of experienced and novice first grade teachers that might reflect differences in their knowledge about beginning reading, their perspectives, and how they assessed growth in reading. Based on the Ehri and Williams (1996) model of teacher development, and the differences found in research between expert or experienced and novice teachers, it was of interest to explore whether first grade teachers who have taught students to read for many years possess different perspectives, knowledge bases, and ways of assessing growth in students, and have a greater number of instructional strategies to use in addressing reading difficulties compared with novice teachers.

Summary and Hypotheses

There are several reasons it is important to understand the extent of teachers' knowledge of reading processes and how they assess reading abilities of their students. First, knowing what skills to assess and how to assess them is necessary for planning effective instruction for individual children. Second, it is essential to identify children at risk for possible reading disability as early as possible to prevent or remediate the problem effectively, and first grade teachers are in a key position to identify these

students if they are aware of the early signs of reading disabilities. Third, teachers who have sufficient research-based knowledge of beginning reading processes are less likely to be persuaded by outside influences that promote methods of reading instruction that are unsupported by research.

The literature review has examined research on beginning reading acquisition, phonemic awareness as a prerequisite for reading acquisition, development of word reading and spelling ability, oral reading errors as indicators of reading stages, fingerpoint reading as an instructional technique, leveling of text, and phonological processing deficits in disabled readers. Theory and research on teaching has also been reviewed, which includes approaches to beginning reading instruction and teacher knowledge base in reading acquisition, development of teacher experience and differences between expert or experienced and novice teachers, accuracy of teacher assessments, and teaching efficacy. Teachers' knowledge base is thought to affect teaching performance, choice of methods and materials, decision-making, assessment, and teaching efficacy. It appears that experience in teaching reading should affect these factors as well.

Two studies that provided evidence of the impact of subject matter knowledge on teaching were the McCutchen et al. (2002a) and McCutchen et al. (2002b) studies. Other research investigated teacher knowledge about phonemic awareness (Rath, 1994, Scarborough, et al., 1998), and linguistic knowledge (Moats, 1995). These studies tested teacher knowledge but did not interview or survey teachers on their practices and student assessments, and did not examine the effects of experience on teachers' knowledge. A limitation to the usefulness of the data obtained from the Pressley et al. (1996) and

Baumann et al. (1998) surveys of teacher beliefs and practices is that they were self-report, and findings were not supported by actual observations or interviews (Baumann et al., 1998). Also, while the surveys provided information about instructional practices, they did not produce information about how teachers planned their lessons or what information they used to make instructional decisions (Pressley et al., 1996).

Borko and Niles' (1982) study comparing experienced and novice teachers limited students' characteristics to those described in the hypothetical first-graders and examined teachers' decisions based on this information. Teachers' conceptions of reading were assessed by using measures of their views and use of different types of reading instruction. Their views of reading were not examined other than how they were related to the type of instruction described (e.g., linear skills, natural language, basal text, etc.), and effects of experience on their knowledge of reading development were not explored.

The above studies on reading examined teacher knowledge, aspects of instructional practices, or differences between experienced and novice teachers. However, these studies did not directly examine differences between experienced and novice teachers in how they conceptualize the course of word reading development in beginners and how teachers assess beginning reading skills, or whether experience by itself leads to expertise through use of student information, self-reflection, and instructional methods and materials. Examination of teacher knowledge may not indicate how teachers assess their students or use their knowledge in their instruction, assessments and decision-making. A questionnaire or survey by itself may not elicit information such as: (1) how do teachers conceptualize the course of development in learning to read, (2)

what is the role of experience in development of teacher knowledge, (3) how do they apply their knowledge to distinguish among individual students in their development as readers, evaluate students' progress, and make instructional decisions, (4) what observations and assessments do they perform to determine the growth being made by their students, (5) what sources of knowledge do teachers use to identify children at risk for reading disability and what do they do to address problems, and (6) how do teachers differ in other respects, including theoretical orientation to reading instruction, linguistic knowledge, and self-efficacy, and to what extent are these factors related to experience.

This study examined differences between experienced and novice teachers as they performed the think-aloud task of ranking their students. On the basis of the pilot study, this task was expected to elicit ample talk from teachers as they rank ordered their students from most to least developed in their growth in reading and as they discussed reasons for their rankings. Responses were expected to reveal what skills teachers viewed as necessary to adequately develop their pupils' reading skills. Of interest in the think-aloud were the quantity and quality of characteristics and abilities teachers used to assess reading performance and to what extent they showed knowledge of developmental differences in individual students. It was expected that experienced teachers would report more extensive observations and assessments than novice teachers. Experienced teachers were expected to demonstrate greater use of information than novices about their students' reading behaviors to make decisions about instructional activities and materials.

The ranking task was followed by several open-ended questions about teachers' assessment practices and children's progress during the year. These questions focused

more directly than the think-aloud on teachers' assessment practices. Questions were intended to supplement information obtained from the teachers in the think-aloud and provide a view of some of the underlying knowledge that teachers used in observing and assessing their pupils' reading skills. In order to provide a basis for examining the use of knowledge in assessments, the questions referred to the pupils in the class. Examples of assessment questions are:

“Do you test your pupils' reading-related capabilities when they begin first grade? If so, what do you test?”

“Have you grouped your pupils by reading ability? How do you do this?”

“How do you decide which group each child belongs to?”

“Do you keep records on children's reading progress during the year?”

The extent to which teachers relied on assessment to guide their instruction was correlated with practice-based working knowledge based on the think-aloud, and with the other variables being examined in this study.

Tests were given to assess teachers' knowledge of the structure of the English language, the English spelling system, phonemic awareness, and phonics knowledge (Moats, 1995; Moats & Lyon, 1996; Strickland, 1998), their theoretical orientation to literacy instruction (DeFord, 1985), and their self-efficacy in teaching (Gibson & Dembo, 1984). Of interest was whether experienced and novice teachers differed from each other in these respects, and whether these characteristics were related to each other and to performance on the verbal tasks.

Teachers were also given a written questionnaire that asked about their academic background, amount of education in reading instruction, teaching experience, and courses and workshops in reading instruction and linguistics or structure of language. The information obtained from this questionnaire was used to relate teachers' experience and training with information from the think-aloud and assessment questions, and their responses on the written tasks.

Several variables were correlated to examine the strength of their relationships. Table 1 contains a listing of these variables, the measures used, and the source from which measures were obtained. The primary independent variable is Teaching Experience, defined as the number of years experience teaching reading in the primary grades, as indicated in teachers' responses in the Written Questionnaire. Teachers who had fewer than 4.5 years experience were considered "novices". Teachers who had taught more than 9 years in the primary grades were considered "experienced". The original plan was to include teachers with fewer than 3 years and more than 12 years experience. The reasons for originally choosing these time limits were: (1) the teachers participating in the Pressley et al. (1996) survey who were considered "outstanding" had had 3-35 years' experience, with an average of 16 years; (2) teachers with more than 3 years of experience, according to Berliner (1991), have progressed beyond "advanced beginner" to the "competent performer" stage and would therefore no longer be considered novices. However, because of difficulties in locating teachers for a somewhat lengthy interview, it was necessary to relax the criteria to include "novice" teachers with slightly more than 3 years experience, and "experienced" teachers with slightly fewer years experience. The

Table 1

Constructs, Measures, Data Sources

<u>Construct</u>	<u>Measures</u>	<u>Data Source</u>
<u>Independent Variables:</u>		
1. Teaching Experience	Novice <4.5 years Experienced >9 years	Written Questionnaire, Questions 3, 12, 13 (a), (b)
2. Coursework		
a. Reading Instruction	Number of courses or equivalent	Written Questionnaire, Questions 15-20
b. Linguistics/structure of language courses		
<u>Dependent Variables:</u>		
2. Practice-Based Working Knowledge	Percent of references to 14 categories, including alphabetic, word-reading, linguistic, and other processes	Think-aloud task
3. Assessment Practices	Extensive, moderate, low reliance on assessment (blind ratings)	Questions on Assessment Practices
4. Content Knowledge		
a. Reading	a. Score on Knowledge of Reading Terms	a. Identification of Reading Terms Test
b. Linguistics	b. Score on Linguistic Tests	b. Durkin and Moats' Tests
5. Theoretical Orientation to Reading	Composite of Phonics, Skills, Whole Language scores	Theoretical Orientation to Reading Profile (TORP)
6. Teaching Efficacy	Scores on teaching efficacy scales. 2 measures: 1. Personal Teaching Efficacy (PTE) 2. Teaching Efficacy (TE)	Teacher Efficacy Scale (TES)

addition of the novices with more than three years experience could be a limitation of this study. However, the gap of 4.5-years or more in experience between these groups was considered adequate to analyze possible group differences as suggestive of any changes or gains made in the intervening years.

The secondary independent variable listed in Table 1 is Training in Linguistics and Reading Instruction. Teachers were asked, on the written questionnaire, to indicate the amount of education they had in reading instruction and in the structure of language. Teachers who reported having had a greater number of courses and training in reading education and linguistics were expected to show in their think-aloud and linguistic tasks more working knowledge about reading acquisition and greater focus on explicit instruction in the alphabetic principle than teachers who have taken fewer courses.

The primary dependent variable was Practice-Based Working Knowledge. Teachers were expected to demonstrate this knowledge in their verbal think-aloud responses. It was conceptualized as teachers' knowledge of reading acquisition processes applied in their teaching. In the think-aloud task, it was expected to be reflected in their explanations and references to alphabetic and word reading processes as they ranked their students according to their reading skills, described reading problems, and discussed instructional decisions. Practice-based working knowledge was expected to show a strong relationship to experience and training.

The variables in this study that were expected to be reciprocally related to practice-based working knowledge were Use of Assessment Practices and Teaching Efficacy. Use of assessment devices and amount of reliance on assessment during the

school year were measured by analysis of verbal responses to the questions on assessment practices following the think-aloud. Teachers who made greater use of assessments were expected to have greater practice-based working knowledge of reading acquisition.

Because feedback from students and observations of teachers' own teaching are considered major factors affecting teaching efficacy, experienced teachers with greater practice based working knowledge were expected to have higher teaching efficacy, as measured by the Teacher Efficacy Scale (Gibson & Dembo, 1984), than novices and teachers with less working knowledge.

The variables listed in Table 1 that were expected to be strongly related to practice-based working knowledge were Content Knowledge and Theoretical Orientation to Reading Instruction. Teachers with greater practice based working knowledge were expected to show greater content knowledge, defined here as (1) knowledge of reading, and (2) knowledge about linguistics (structure of language). Knowledge of reading was measured by analysis of teachers' verbal responses to questions asking them to define and give examples of 14 commonly used reading terms, as judged by two experts in reading development and instruction. Examples of some of these terms are *instructional and frustration reading levels*, *sight word reading*, *phonemic awareness*, *readability formulas*, and *cueing systems*. Knowledge about linguistics was measured by two instruments, one adapted from Moats' Informal Survey of Linguistic Knowledge (Moats, 1995; Moats & Lyon, 1996), and the other adapted from Durkin's Phonics Quiz for Teachers (Strickland, 1998).

The amount of emphasis placed by teachers in the think-aloud on alphabetic and word reading processes was expected to indicate the importance teachers placed on decoding as a path to fluent reading. Teachers with greater practice-based working knowledge were expected to have a higher phonics orientation to reading instruction than teachers whose orientation is mainly whole language, as measured by the Theoretical Orientation to Reading Profile (TORP) (DeFord, 1985).

Hypotheses:

The following hypotheses were tested in the present study:

Hypothesis 1. Teachers with many years of teaching experience will exhibit higher levels of expertise on the various measures of teacher knowledge, assessment practices, and teaching efficacy than novice teachers, and in addition will exhibit a stronger phonics orientation to reading instruction than novices.

Hypothesis 2. Teachers who have completed more coursework or the equivalent in reading instruction and linguistics will exhibit higher levels of expertise on the various measures of teacher knowledge, assessment practices, and teaching efficacy than teachers with less coursework, and in addition would exhibit a stronger phonics orientation to reading instruction than teachers completing less coursework.

Hypothesis 3. Teachers possessing greater content knowledge of reading terms, phonics, and linguistics will exhibit the application of this knowledge to a greater extent on the measures of assessment practices and practice-based working knowledge, in the latter case by showing a greater number of references to alphabetic, word reading, and related processes.

Hypothesis 4. Variables assessing similar characteristics or capabilities will be significantly related to each other:

- (a) Types of coursework (reading, linguistic);
- (b) Measures of teacher knowledge (reading terms, phonics, linguistics)
- (c) Teaching practices (assessment, alphabetic and word reading and related processes in working knowledge, phonics orientation to reading instruction, teaching efficacy).

CHAPTER III

Methods

Participants

In order to recruit teachers, school Principals in a city in the Northeast were sent a letter (Appendix A) that described the study and explained that the researcher was seeking both first-grade teachers who had taught students in the primary grades for at least 12 years, and those who had taught for less than 3 years. Principals were asked to nominate first grade teachers, and to distribute to them letters of invitation in which the researcher requested their participation and provided an envelope for reply (Appendix B).

This procedure yielded only two experienced teachers who qualified, despite several follow-up telephone calls, letters and faxes to a large number of school principals. It was necessary to locate additional teachers through other means. Teachers were referred to the researcher by educators known professionally to the researcher. Contacting participants directly through these referrals yielded the remaining teachers. After a teacher indicated her or his willingness to participate, the researcher contacted the principal of the school for permission to conduct the interview in the school. Presence in the school was necessary so that the teacher could show the researcher during the interview examples of books, children's work, and other materials used in the classroom. Recruitment of teachers continued until 10 novice and 10 experienced teachers had been interviewed.

The experienced teachers for this study had 9 to 25 years of teaching experience in the primary grades (kindergarten, first, or second grades), and the novice teachers had 4.5 or fewer years of teaching experience in these grades. Although the original plan was to include only those teachers with either more than 12 or fewer than 3 years experience for experienced-novice comparisons, it was difficult to locate within a reasonable period of time first grade teachers who met those criteria. It was therefore decided that the study would include teachers with 9 or more years experience for the experienced group, and 4.5 or fewer years experience for the novice group. While some of the novice teachers had made some advances in their teaching, it was anticipated that the difference of 4.5 or more years between this group and the experienced teachers might still differentiate the two groups in their knowledge and practices as described by Ehri and Williams (1996) and Berliner (1991).

Nineteen participants were currently teaching reading in first grade. Eighteen participants were teaching first grade classes in public elementary schools. One experienced teacher taught first grade in a private school in a nearby town, and one novice teacher taught reading in a public school to a class of second graders whose reading skills were at first grade level or lower. All teachers reported that they were native English speakers and all classes were monolingual English classes. Table 2 shows descriptions of the teachers, the schools, and their classes.

Before the interview began, the teachers were assured of anonymity. They were told that their responses would be kept confidential, and information obtained from them

Table 2
 Characteristics of Experienced and Novice Teachers and Their Students

CHARACTERISTICS	NOVICE TEACHERS	EXPERIENCED TEACHERS
<u>Age</u>		
Mean	33 years	48 years
Range	24-54 years (7 teachers: 24-31 3 teachers: 41-54)	40-60 years
<u>Gender</u>		
Female	9	10
Male	1	0
<u>Ethnicity</u>		
Caucasian	8	7
African American	2	2
Latino/Latina	0	1
<u>Years of primary grade teaching experience</u>		
Mean	3.25 years	16.2 years
Range	1.5-4.5 years	9.5-25 years
<u>Languages</u>		
Native English Speaker	10	10
Bilingual	3 (total)	3 (total)
2 nd language learned at home	2*	1
2 nd language(s) studied in school or another country	2*	2

Table 2 (continued)

CHARACTERISTICS	NOVICE TEACHERS	EXPERIENCED TEACHERS
<u>Characteristics of Schools and Classes Taught</u>		
Public	10	9
Private	0	1
SES Level based on # of students receiving free lunch		
Higher SES	3	6
Middle SES	2	1
Lower SES	5	3
# Students reading at grade level on district-wide 4 th grade reading test:		
> 50% reading at or above grade level	3	9
< 50% reading at or above grade level	7	1
Monolingual classes	10	10
First Grade classes:		
Normal 1 st grade	9	10
Remedial, 1 st grade level	1	
Number of students		
Average	22.3	24.5
Range	12, 17-28**	18-30
Homogeneous class based on reading performance		
Low performing	1	2
High performing		3
Heterogeneous class	9	5

* One teacher in both categories grew up learning English plus a second language, then later studied two additional languages as a college and graduate student.

** One teacher taught 12 remedial students

would be combined in the reporting of results so that no teacher or school would be identified. Any quotation or report of individual responses appearing as part of the findings in this study does not reveal the identity of any participant, school, child or other individual.

Completion of the entire interview and written tasks required about 2 to 2½ hours. In pilot work, it was found that teachers felt very busy and overworked, and it was difficult to obtain their cooperation without providing some form of remuneration. Therefore, teachers were given monetary compensation for their participation. During the interview, most teachers indicated that they preferred to complete the tasks in one session rather than the two sessions requested in the invitation to participate.

Materials

The materials for this study included:

(1) Written Questionnaire (Appendix C). Teachers were first asked to fill out a questionnaire in which they replied to questions about their educational background and teaching experience, specific training in reading instruction, which grades they had taught, how long they had been teaching, the nature of their teaching experiences, and second language knowledge. The questionnaire consisted of 21 short-answer questions. The primary purpose of this questionnaire was to obtain background information related to teaching experience, training in reading courses and linguistics, and to classify teachers into novice and experienced groups.

(2) Think-Aloud Task (Appendix D). Teachers were asked to think aloud as they performed the task of rank ordering their students according to how well they could read,

ranging from the most developed to the least developed reader. They were asked to explain the basis for their ranking decisions by citing their experiences, observations and assessments regarding each child's strengths and weaknesses. The think-aloud (TA) was designed to (1) elicit talk that would provide a basis for appraising the extent of teachers' knowledge of development of reading skills; (2) yield information about teachers' conception of the course of development in learning to read and the criteria signaling when a student is not making satisfactory progress; and (3) reveal individual differences in elements of reading skill development important to teachers. Teachers' responses were coded and grouped into categories for data analysis.

(3) Questions on Assessment Practices (Appendix E). Questions on assessment practices were intended to obtain information on types of assessments the teachers used, and to what extent they used assessment methods to make instructional decisions. The questions focused on what materials and methods teachers used to assess reading progress, how frequently they assessed their pupils, whether they kept records of students' progress, how they detected possible reading problems, what information they obtained from assessments, and how they used their assessment information in instruction and decision making.

The purpose of asking teachers about their assessments was to supplement information obtained from the think-aloud in order gain a greater understanding about how they assessed their children, and to examine the relationship between assessments and the other variables being studied. The pilot study showed that in the think-aloud task teachers focused on their pupils' rankings according to reading progress, individual

children's strengths and weaknesses, and developing skills. However, the teachers provided few, if any, details about how their day-to-day assessments informed their judgments of children's progress and how they provided instruction to promote individual children's skill development.

All verbal responses were tape-recorded in order to have a complete and accurate record of teachers' responses for qualitative and quantitative data analyses. In order to preserve the anonymity of the first graders referred to during the think-aloud and interview on assessment, teachers were asked to use only children's first names and first initials of their last names, if two or more children had the same first name. No child's name is reported here, and any discussion of children cites only the ranking numbers given by the teacher.

(3) Identification of Reading Terms (Appendix E). This task contained 14 commonly appearing reading terms drawn from instructional manuals and articles for reading teachers, as judged by two experts in reading development and instruction. Examples of these terms are *miscue analysis*, *invented spelling*, *phonemic awareness*, *instructional vs. frustration reading levels*. Teachers were asked to indicate on a scale from 0 to 5 their familiarity with these terms, and then, in an open-ended response, to explain their meanings and give an example. This task was intended to provide information on teachers' knowledge of current reading terms, which provided one measure of their content knowledge. Responses were compared to definitions generated by the researcher as well as definitions found in The Literacy Dictionary (Harris, T.L., & Hodges, R.E., Eds., 1995). Responses were judged against definitions appearing in

Appendix F and scored according to the number of correct points contained in each response.

(4) Teacher Efficacy Scale (Gibson & Dembo, 1984). This is a 16-item scale that contains statements about teaching. It is a shorter version of the original 30-item scale, and provides measures on the dimensions of Personal Teaching Efficacy (total of 9 items) and Teaching Efficacy (total of 7 items). Teachers were asked to agree or disagree with each statement on a 6-point scale in which 1 equaled strong disagreement with the item and 6 equaled strong agreement.

A construct validation study conducted by Gibson and Dembo (1984) identified 16 items, in a factor analysis of responses to the 30-item scale, as significant in representing the two dimensions. In their study, the dimension of Personal Teaching Efficacy (PTE) accounted for 18.2 percent of the total variance. PTE is defined as a teacher's belief that he or she has the skills and abilities to effect student learning. An example of an item reflecting PTE is, "When a student is having difficulty with an assignment, I am usually able to adjust it to his/her level". Teaching Efficacy (TE) accounted for 10.6 percent of the total variance. TE is defined as a teacher's sense of personal responsibility in student learning and the extent to which the teacher believes his or her efforts are not limited by external influences, such as pupils' family background, home environment, or parental influence. An example of an item reflecting TE is, "If parents would do more with their children, I could do more". Gibson and Dembo (1984) reported internal consistency reliabilities of Cronbach's alpha coefficient .78 for PTE, .79

for TE, and .76 for the 16 items. The two factors showed a low correlation, $r = -.19$, which suggests that they represented relatively independent constructs.

(5) Theoretical Orientation to Reading Profile (TORP) (DeFord, 1985) . The TORP is a 28-item scale that contains statements of beliefs about reading and reading instruction. Teachers indicated the extent that they agreed or disagreed with each statement on a 5-point Likert scale. In order to have the numbers indicating agreement or disagreement on this scale consistent with the direction of those on the Teaching Efficacy Scale (i.e., 1=strongly disagree, 5=strongly agree), the numbers indicating strength of agreement were reversed from the original DeFord scale. For scoring, the numbers indicating agreement and disagreement were changed back to the original order.

The TORP measures teachers' orientation to whole language, skills, and phonics approaches to reading instruction by categorizing them according to their primary philosophy. The categories that result are not distinct categories, but rather involve a continuum of practices ranging from isolation of phonemes with emphasis on decoding to emphasis on increasingly larger language units.

The TORP assesses three orientations:

(a) Phonics instruction is defined as placing emphasis on isolation of phonemes with concentration on decoding. The instruction focuses on learning and practice of grapheme-phoneme units, with gradual progression toward word units and attention to comprehension. Beginning texts are controlled for phonemic consistency and systematic introduction of consonant-vowel combinations. After letter-sound correspondence is learned, texts become more complex and

instructional activities concentrate on comprehension and fluency. Words that cannot be decoded phonetically are taught as sight words. An example of a phonics item is, “When children do not know a word, they should be instructed to sound out its parts” (DeFord, 1985).

(b) Skills instruction is defined as isolation of skills with emphasis on word recognition. The instruction focuses on building a sight vocabulary to use in reading; words are introduced in context, and there are many opportunities to practice them. Letter-sound instruction is given, and it concentrates on initial and final sounds of the words that are introduced. Long and short vowel sounds are taught in a less systematic manner than in phonics instruction. Word attack skills are usually introduced in a hierarchical sequence; e.g., affixes, word configuration, root words, compound words, context clues. Texts support practice of sight words, and story quality improves as a greater number of words are learned.

An example of a skills item is, “It is important for a word to be repeated a number of times after it has been introduced to insure that it will become a part of sight vocabulary” (DeFord, 1985).

(c) Whole language orientation is defined as no isolation of skills for practice, with emphasis on developing a sense of story and text. Quality literature is used in instruction from the beginning, with emphasis on developing a sense of story or text as a framework for learning smaller units of language. The reading experience establishes the context for learning words or letters. For example,

children may be instructed during the reading activity to underline or circle each instance of a letter, letter combination, or word. Instructional activities include class generation of stories, writing, and shared reading experiences. An example of a whole language item is, “Children’s initial encounters with print should focus on meaning, not upon exact graphic representation” (DeFord, 1985).

The TORP was found to be a reliable and valid instrument for distinguishing among teachers in their theoretical orientation to reading instruction. Using a sample of 90 teachers identified by reading professionals holding phonics, skills, and whole language orientations ($n=30$ in each group), De Ford found in a factor analysis one factor that accounted for 94.5 percent of the variance and this factor separated the whole language items from the phonics and skills items. Three judges’ responses to each orientation corresponded to teachers’ orientation scores, and three observers’ responses also concurred. DeFord (1985) reported a reliability of Cronbach’s alpha =.98 of differences in theoretical orientation to reading, with the greatest differences shown between whole language and phonics teachers, who exhibited little variability within groups. The skills group showed the greatest variance, with scores overlapping with those of the phonics group. The greatest differences in beliefs centered around the importance of phonics and how it should be taught, the importance of accuracy in reading, and how much practice is necessary (DeFord, 1985).

(7) Durkin Phonics Test for Teachers (Strickland, 1998) (Appendix G). This 15-item test asks teachers to identify long and short vowels in words, and to define digraphs, consonant blends, and diphthongs and find these letter combinations in lists of words.

The test also checks knowledge of vowel generalizations and rules. Knowledge about phonics rules and terms helps teachers evaluate and guide their use of instructional materials as well as teach children the strategies they need to analyze and decode words (Strickland, 1998).

(8) Linguistic Knowledge Questionnaire (adapted from Moats, 1994) (Appendix H). This short questionnaire contains items from Moats' Informal Survey of Linguistic Knowledge. Three categories of questions contain lists of words testing teachers' knowledge about the structure of language by assessing their ability to identify and count syllables and phonemes within the words. The remaining three categories of questions test knowledge of letter and spelling rules thought to be necessary for first-grade teachers to use in their instruction.

Procedures

Before meeting with teachers, the researcher asked them to refresh their memories for any courses related to reading that were taken in college, graduate school, or independently, as well as in-service courses or workshops. During the interview, the researcher read from a script (Appendices D and E) to introduce and describe each task. First, teachers were given the Written Questionnaire to fill out. This task took approximately 10 minutes to complete.

The teachers were then asked to perform the think-aloud in which they rank ordered their pupils according to development of their growth in reading, and to discuss reasons for their rankings. To prepare for this task, the researcher had a chart set up containing a list of numbers from 1 to 30. She then copied from the class list each child's

first name onto individual adhesive labels. While thinking-aloud, teachers placed each label with the child's name next to the appropriate number on the chart indicating the ranking the teacher assigned to the child. Following suggestions of Ericsson and Simon (1993), the researcher did not interact with teachers during this part of the interview in order to avoid any influence on their thinking. If the teacher stopped verbalizing, the researcher said as a reminder, "Say what you are thinking" or "What are you thinking about?" The amount of time needed for completion of the ranking task was about 10-20 minutes.

Following the think-aloud, teachers were asked questions about their assessment practices. The assessment interview took approximately 1 to 1½ hours to complete. Teachers then responded verbally to the Identification of Reading Terms task. Next, they completed in writing the TORP and Teacher Efficacy Scale, each of which required approximately 5-10 minutes to complete, and the Phonics Test and Linguistic Knowledge Test, each of which required about 10 minutes to complete. Maximum amount of time required for the entire interview, consisting of the verbal and written tasks was 2 to 2½ hours. All verbal responses were audiotape recorded.

Coding and Scoring Variables

Table 1, in the literature review section, lists the constructs that were measured, the measures, and data sources. Before coding and scoring began, names and other identifying information were removed from the transcripts and other written materials, and all teachers were assigned code numbers. The list of identifying information on teachers was kept separate from materials to be coded and rated.

The following sections describe the coding system and scoring for the seven variables examined. Three dependent measures were created by relying on the judgments of raters: practice-based working knowledge about reading, knowledge of the definitions of reading terms, and assessment practices. To determine the reliability of the rating systems for practice-based working knowledge and Reading Terms, the percentage of agreement between two raters on a sample of the responses was calculated. Interrater agreement was defined as the total number of agreements divided by the total number of agreements + disagreements and multiplied by 100. Any differences found between raters were discussed and the raters reached agreement on the item in question. To determine reliability of the ratings on Assessment Practices, the two raters compared their ratings on six of the transcripts and resolved any differences as described below. The three researcher-devised tasks and scoring schemes were sufficiently reliable to proceed with the analysis of relationships between characteristics of teachers and their responses on these measures.

1. Teaching Experience was coded as either “experienced” or “novice”. This was determined by the number of years that teachers reported teaching primary grades (kindergarten through second grade) indicated on the Written Questionnaire. Teachers who taught primary grades for more than 9 years were categorized as “experienced”; teachers who taught primary grades for fewer than 4.5 years were categorized as “novice”.

2. Coursework in Linguistics (language structure) and Reading Instruction was scored according to number of courses taken, as teachers indicated on the Written

Questionnaire. In assigning scores for courses listed by the teacher, consideration was given to the amount of time the teacher spent studying in each course, the focus of the course, and whether or not knowledge of the subject was tested in the course. For example, required undergraduate courses in reading instruction that taught an overview of reading methods were given less credit (0.5 point) than graduate courses that focused in greater depth on aspects of reading acquisition and covered more material (1 point). In-service workshops were given less credit than academic courses because less time was spent covering the material, less material was covered, and teachers' knowledge of the content was not tested as in an academic course. Further, evidence has shown that workshop attendance results in little lasting change in teachers' practices (B. Miller & Lord, 1993, as cited in McCutchen et al, 2002a). Credit for workshops ranged from 0.1 - 1 point, depending on the extent of participation described by the teacher. In assigning scores for the Reading Courses variable, the researcher did not distinguish between courses or workshops focusing on any specific orientation toward reading instruction. Equivalent scores were given for equivalent courses or reading programs whether they had a whole language or phonics orientation.

Courses that had a specific focus on the structure of language and phonological skills were categorized and scored as Linguistics courses. The language structure courses were expected to contribute to teachers' (a) ability to focus on, manipulate, and demonstrate phonemes and word parts during their teaching, (b) awareness of the necessity of the contribution of phonological skills to development of beginning reading skills, and (c) ability to recognize and address any child's specific phonological

processing difficulty more readily than teachers who had not taken courses in language structure. Because of the additional language knowledge these courses provided the teacher, courses in the structure of language were assigned 2 points each, and they were scored separately from general courses in reading or literature and courses in language use that concentrated on comprehension. Additionally, knowledge or study of a second language was counted as contributing to knowledge of language structure because of the necessity of learning at the graphophonemic and word levels. This learning includes spelling, symbol-sound relationships, auditory sound discrimination and production, and manipulation of phonemes, morphemes, and syllables. One point was assigned for each language. Teachers who reported proficiency in another language listed either Spanish, Italian, or French as the language they had studied or learned (one teacher had also learned Dutch and Haitian Creole in addition to French). Because Spanish, Italian, and French are Latin-based languages whose spellings represent word pronunciations, these languages were considered to contribute to teachers' knowledge of language structure and phonological skills.

In order to establish interscorer reliability, four (20 percent) of the teachers' listings of reading and linguistics courses and second language knowledge were independently scored by two raters based on the scoring scheme, described in Appendix I. Using total number of agreements divided by total number of agreements + disagreements and multiplied by 100, interscorer reliability was 92 percent for coursework.

3. Practice-based Working Knowledge was measured in the think-aloud ranking task. Teachers' comments about their students' reading skills and progress were used to measure their working knowledge. This was conceptualized as the application of knowledge about reading acquisition in order to rank students, to talk about each child's reading skills and difficulties, and to discuss the conduct of reading-related tasks. References by the teachers pertained to reading-related skills as well as behaviors, instruction, problems, and other conditions that the teacher linked to children's reading progress. After the interviews were transcribed, number of comments in each of the categories was tallied. Any comment that was repeated for the same child was counted only once. Comments were coded by category. Because of variation in number of children in the classrooms, percentage of comments in each category was calculated for each teacher using number of references counted in the category divided by the total number of statements made by the teacher in the think-aloud. Total number of statements is defined as number of sentences spoken, which included both coded and non-coded statements. The resulting percentages of references in every category were compared among teachers to determine any differences between experienced and novice groups.

Comments in the think-aloud task were classified into main categories and several sub-categories. For data analysis, the number of statements coded in the sub-categories was summed into a total count for the main category. This was done to reduce the number of variables to be analyzed, and also because the purpose of this study was to explore the think-aloud for its value in assessing teachers' working knowledge of reading

acquisition by measuring references to all aspects of alphabetic and word-reading processes.

The procedures for developing categories and coding the think-aloud responses were as follows:

First, a sample of three randomly chosen think-aloud transcripts was selected by the researcher for coding of teacher statements that referred to alphabetic, word reading, language, and phonological processes. These were the processes targeted in the research. Additional categories were identified by the researcher based on teachers' statements of factors they considered related to or affecting children's reading skills and behaviors. Examples of additional categories are references to text reading and comprehension, motivational conditions affecting learning, home influences, test scores. A second rater (Rater 2) was then trained by the researcher to code teachers' statements using the categories developed by the researcher. Rater 2, a graduate student in education and experienced research assistant, was blind to the participants and hypotheses of this study, and to the researcher's system of scoring and categorizing the independent variables. Four randomly selected transcripts, each approximately eight double-spaced pages in length, were then chosen for coding by the researcher and Rater 2. At this time the two coders, working independently, developed additional categories and sub-categories for statements that did not fall into those previously identified by the researcher. After comparing and discussing the categories developed independently, the coders agreed on a total of 14 main categories and sub-categories subsumed under the main ones for the think-aloud statements.

After the coding scheme was developed, reliability of the coding system for practice-based working knowledge was assessed. The percentage of agreement between two raters on a sample of the responses was calculated. Interrater agreement was defined as the total number of agreements divided by the total number of agreements + disagreements and multiplied by 100. Ten percent (N=2) of the audiotaped think-aloud transcripts were selected at random and independently coded by the researcher and Rater 2. The coded transcripts were compared and found to be in agreement on 91 percent of the codes.

The transcripts from each teacher's think-aloud were then entered into the QSR N5 (Richards & Richards, 2000) program for coding qualitative data, and the researcher proceeded to code the remaining transcripts and record the percentage of statements in each category into an SPSS (2000) statistics program for data analysis.

4. Assessment Practices were measured by the Questions on Assessment Practices following the think-aloud (see Appendix E). For this measure, teachers were assigned an overall rating by Rater 2 on amount of reliance on assessment. A scale of 1 to 5 had been developed by the researcher to assign ratings. Numbers 1 and 2 represented the lowest scores, indicating low and low-moderate reliance. Number 3 represented moderate reliance, and numbers 4 and 5 represented moderate-high and high reliance on assessments. To insure an objective rating, as noted earlier, all identifying information on teachers had been removed, and the transcript on assessment practices had been separated from the think-aloud transcript.

Interrater reliability was assessed by randomly selecting thirty percent of the transcripts (N=6) and comparing the researcher's own ratings with those of Rater 2. The researcher and Rater 2 independently read the transcripts and assigned ratings. Of the six transcripts, the two judges' ratings agreed exactly on four of the transcripts. For the two that did not agree exactly, the differences in ratings were in the low and moderate ranges: the rating for one teacher was 1 (lowest) and the other rating was 2 (low-moderate); the rating for the second teacher was 3 (moderate) and the other was 4 (moderate-high). After discussion of the differences in ratings of the two transcripts, the raters reached agreement. Rater 2 then rated all of the remaining transcripts. While none of the teachers received a rating of 1, six teachers were rated 2, six teachers were rated 3, four teachers were rated 4, and four teachers were rated 5.

In reviewing the assessment transcripts, Rater 2 did not distinguish between individual teachers' focus on any apparent philosophical orientation to reading instruction and did not consider this when rating the teachers. In assigning ratings, the rater considered the extent that the following points were mentioned by teachers:

1. Reading-related skills the teacher discussed; e.g., letters, sounds, making sense, sight vocabulary, knowledge of language.
2. Formal and informal instrument(s) the teacher used; e.g., running records, notations of classroom observations, end-of-chapter test, school or district assessment.
3. How often the teacher formally and informally assessed progress and recorded information; e.g., number of times a year for a school assessment, daily informal observations of progress, weekly assessments.
4. What the teacher recorded; e.g., difficulty with a skill, what words the child could read, reading scores, the teacher wanted to speak with a parent.

5. What information the teacher gained from the assessments; e.g., level of skill development, comprehension, understanding of language.
6. How the teacher used the information; e.g., obtain outside intervention, focus instruction on a specific difficulty, inform parents of progress.
7. What kind of organized system, if any, the teacher had for recording; e.g., child's journals, writing folders, portfolios, notations in notebook, post-it notes, charts.
8. How the teacher detected or described a possible problem or disability affecting reading or writing progress; e.g., speech, hearing or vision problem, information about a child's special education background.
9. The extent to which the teacher adapted instruction according to assessment; e.g., place a child in a different reading group, individualize instruction for additional review of a skill, plan on extra instructional time for practice.

5. Content Knowledge was tested to assess teachers' familiarity with 14 common reading terms as reflected in their ability to define and give examples of these terms.

Each transcript was scored to indicate the accuracy of the definition provided. Appendix F shows the definitions of Reading Terms and values assigned to each point, against which teachers' definitions were scored. The score for each term was determined by number of a teacher's statements that exhibited the definitions. Partial credit was given for responses that contained part of the definition. For example, the following definition of "Dyslexia" was given a score of 1 point. The teacher correctly specified that it was a language problem, consistent with part of the definition of dyslexia as a problem arising from a language disability, but the teacher did not elaborate on how the language difficulty affected reading or what language processes were involved. The scored

statement is underlined, and the number of points given for the statement appears in parentheses next to the word or statement.

“And the dyslexia. I’ve gone to a couple of the Orton Society’s workshops, just to get a little familiar with the whole idea of the language problem (1). ‘Cause they don’t consider it just a reading problem. They consider it a language problem...And I would never use the term because I would never feel myself qualified to decide whether somebody was dyslexic or not. But you kind of at least know that there’s a difficulty and whether the child has that, in quotes, dyslexia, or not. I’d leave it to the (evaluation) team to evaluate.”

In the next example, the teacher was given a score of 2 for the definition of “Dyslexia” because this teacher specified that it was a reading disability and linked that to letter-sound connections.

Dyslexia is a description of a reading disability (1), or difficulty, where the child, or the adult, is having difficulty making the connection between the letters and the sounds they make (1). And they’re having trouble reading.”

A correct response score was calculated for each teacher by summing the number of points achieved across the 14 terms (maximum points scored = 25). Agreement between judges on the test of teacher’s knowledge of Reading Terms was calculated by randomly selecting 15 percent (N=3) of the transcripts and comparing responses to the definitions in Appendix F. The two raters applied the prescribed scoring scheme to assign points to the definitions, and agreed on 88 percent of the items. Where disagreement on an item occurred, the number of points assigned by each rater to the item in question differed by no more than one point. For example, one teacher’s definition of phonemic awareness was assigned a 6 by one rater, and 5 by the other rater.

Disagreements were discussed and resolved, and the researcher continued to score the Reading Terms transcripts.

Phonics and structure of language knowledge were also assessed as part of content knowledge. In assigning scores to the phonics and linguistic tests, the researcher compared teachers' written responses with answers supplied by Durkin (Strickland, 1998) and Moats (1994), and assigned one point for each correct answer. Appendices G and H show the items used and correct responses.

6. Theoretical Orientation to Reading Profile (TORP) (DeFord, 1985) was scored as an average rating on each on the three orientations, phonics, skills, and whole language. Lower scores on each subset of statements reflect greater agreement with the orientation represented by the statements. From these averages, a composite score was derived, using the formula: average phonics disagreement score + average skills disagreement score - average whole language disagreement score (see Rath, 1994, pp. 36-37). Higher scores on this composite rating indicate greater agreement with whole language statements and disagreement with phonics and skills orientations. Lower scores on the composite indicate greater agreement with phonics and skills and disagreement with whole language statements.

7. Teaching Efficacy was measured by the Teacher Efficacy Scale (Gibson & Dembo, 1984). A correlational analysis of PTE and TE for the 20 teachers' scores showed that Personal Teaching Efficacy and Teaching Efficacy were not related ($r = -.12$, $p .62$). This result was consistent with the Gibson and Dembo findings and PTE and TE were therefore treated as separate variables in the data analyses.

Statistical Analyses

For data analyses involving continuous variables, the One-Sample Kolmogorov-Smirnov test was used to assess the distribution of scores. To examine group differences between experienced and novice teachers, first the Kolmogorov-Smirnov test for 2 independent samples was used to assess whether the distribution of scores in each group differed significantly from normal, and the Levene test for homogeneity of variances was performed to examine equality of variances for each variable.

Pearson correlations were used for variables that met the criteria for normal distribution. If any variable did not meet these criteria, Spearman-rho correlations would have been implemented. However, as discussed in the Results section, this was not necessary. In analyses of group differences, t tests were used for group comparisons in which the dependent variables were normally distributed and the homogeneity of variance assumption was met. In cases where these two conditions were not met, the Mann-Whitney U test was performed to examine group differences.

In cases where a dependent variable was significantly correlated with more than one of the independent variables, a stepwise regression analysis was performed to observe the amount of variance contributed by each of the independent variables.

CHAPTER IV

Results

Dependent Measures

Think-Aloud Task. A total of 2,109 statements (sentences) was produced by teachers. Of these, 1,475 statements or about 70 percent were coded into 14 categories. Quite often sentences contained more than one code because of the nature of the teacher's comment. For example, a teacher might refer to decoding a word (coded in Word Reading) and then mention a child's letter knowledge (coded in Alphabetic) in the same sentence. Table 3 lists the main categories that emerged from teachers' think-aloud (TA) comments, their descriptions, frequency and percentage of references recorded in each category, and number of experienced and novice teachers referring to the category. Nine of the 14 categories contained the majority of teachers' references to children's reading progress, and these categories accounted for 64 percent of the total number of statements produced. The number of statements counted in each of the 9 major categories ranged from 101 to 225, about 4.8 percent to 10.8 percent of the total number of statements.

The five smallest remaining TA categories, Writing, Unexplained, Holdovers, Disabilities, and Emergent Reading accounted for a total of approximately 7 percent of all statements produced. These were distinct from the 9 larger categories in that the frequencies of references were many fewer, ranging from 14 to 37 references in each, or 1.8 percent or less per category of the total number of statements counted. Examples of

Table 3.

Think-aloud categories, their descriptions, frequency and percentage of references, and how many novices and experienced teachers referred to the categories at least once

Category	Description	Frequency	Percent	Novice	Experienced
<u>Academic/Instructional</u>					
Word reading	Word identification strategies: use of print, sound and blend, decoding, context, letter cues, sight word reading, self-corrections	225	10.8%	10	10
Instruction	Teacher's use of instructional strategies, supplementary instruction, tutoring, attendance, missing instruction, practice, class work, homework (as it was related to learning or reinforcement of a lesson; no help from parent or other family members mentioned)	163	7.7%	9	9
Alphabetic processes	Alphabet and letter knowledge, letter-sound associations, conventional and invented spelling, phonics skills	151	7.3%	10	10
Test score, assessment, reading level	Child's reading level, test scores, results of assessments	103	4.8%	8	9

Table 3 (continued)

Category	Description	Frequency	Percent	Novice	Experienced
<u>Non-Academic/Personal</u>					
Motivational conditions	Motivation to read, taking risks, attention, enjoyment, effort, confidence, interest	167	7.9%	8	9
Personal characteristics	Includes maturity, hyperactivity, shyness, competitiveness, conscientiousness, physical characteristics, behavior, social skills, ability to work independently	108	5.1%	7	10
Home influences	Parent or older sibling help with homework, reading at home, parent behavior or attitudes, home environment	101	4.8%	4	8
<u>Language/Comprehension</u>					
Text Reading & Comprehension	Oral text reading, reading and listening comprehension, prior knowledge, speed, fluency, thinking skills in comprehension	201	9.2%	10	10
Oral language	Production and comprehension of spoken language, English as a Second Language, phonological processing, structure of language	123	5.8%	8	10

Table 3 (continued)

Category	Description	Frequency	Percent	Novice	Experienced
<u>Other Categories</u>					
Writing	General writing capabilities, writing stories, writing level, beginning writing	37	1.8%	5	7
Unexplained	A reading behavior that the teacher is puzzled by for which she/he does not understand the cause	34	1.6%	6	2
Holdovers	Child was held over from the previous year, or may be held over in the present year because of poor reading	24	1.1%	6	4
Disability	Reading or learning disability or perceptual problem, neurological problem, eyesight, speech, hearing, special education, occupational therapy	21	1.0%	4	7
Emergent Reading	Emergent reading books, environmental print, concepts of print, direction of print, distinguishing between letters and numbers, pretend reading	17	0.8%	4	2

statements in each of the TA categories, organized into groupings described below, are shown in Table 4. The five smallest categories are labeled “other categories”.

As explained earlier, because there were different numbers of children in the classrooms, the percentage of references in each category, rather than number of statements counted, was calculated for each teacher. These percentages were used in the statistical analyses.

In reporting results below, individual categories are discussed where significant relationships or experienced-novice group differences were found. The 9 largest categories were collapsed into three groups representing three general themes for purposes of discussion. Some TA categories within groupings were significantly correlated while some were not. Some categories were significantly related to TA categories in other groupings. The purpose of grouping was to permit discussion of themes or lines of thought as the teachers reflected on children’s reading skills and causes of progress or lack of progress during the ranking task.

(1) Academic-Instructional. These references dealt with children’s classroom learning, instruction, and formal evaluations of reading skill. Specifically, they concerned alphabetic and word learning, reading strategies and skills, instructional conditions affecting learning, homework as it reinforced learning (if no mention of parental or others’ involvement was made), and testing results that teachers related to children’s performance. Correlations of the categories in this grouping, shown in Table 5, revealed significant relationships between the Alphabetic and Word Reading categories ($r = .69$, p

Table 4

Think-Aloud Categories and Examples

Think-Aloud Categories and Subcategories

Examples

Word-reading processes

- Decoding, word attack skills, without referring to sound & blend
- Read unfamiliar words (sound & blend)
- Sight word reading
- Miscues, errors, dealing with errors
- Self-correct, using letters/sounds
- Self-correct, use context
- Self-correct, teacher does not specify how
- Makes errors, does not self-correct
- Recognizes, or does not recognize errors
- Uses strategies
- Strategies in addition to sound & blend
- Guessing
- Guessing, uses some letters
- Sticking to print
- Pointing to words

But she is at the point where if we have like the word BUG, I go, "sound," she can tell me the sound, next sound, "blend," so she can blend CVC words.

So he really needs help because he can get through a story but there are some words that just absolutely stop him. Like the sight words; you really can't teach children to sound out sight words. It's not their purpose. Children are getting stuck on sight words, it really frustrates him.

#13, though, has a tendency to read very slowly and word by word and he tends to lose meaning because he struggles so much over each word.

He's got his sounding out, he's very capable. He goes back if a word doesn't make sense. He goes back, rereads, and figures out the word.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Instruction as a cause

- Absences
- Supplementary instruction
- Practice, not supplementary instruction
- Teacher teaches strategy/strategies
- Extra attention from teacher
- Kindergarten or previous school, class
- Doing classroom assignments
- Child benefits from teacher's help or technique
- Homework, no mention of parent
- Child asks teacher for help
- Participation in reading lessons
- Classroom environment as cause

#20 when he first came he didn't know the difference between numbers and letters. However, a large portion of his problem was being absent and not being here. But since he's been coming every day, I've seen, he knows the letters. Still has some sounds he needs to work on. But I've noticed an increase in his ability to catch on to the stuff that we're doing. He's able to read the material now.

And I'm getting him extra help, we're having a teacher come every day at one o'clock for extra help for certain children, and #19 was one of the first names on that list because he needs a lot of extra attention.

She does not do her homework carefully in the respect that she doesn't follow up what we're doing in class and the child is very far behind in class.

And for her I feel like it's just, she needs more practice memorizing the basic sight words, that's where she trips over. It's the big words that have, keep the sense of story going on that she can figure out very easily. But the sight words, she trips up on.

I'm trying to teach them how to look for smaller words between, in bigger words.

#18 came to us from a private school where the parents said she had been learning how to read four-letter words only, and was quite surprised by the reading list I had sent home that she had to catch up.

He uses a great deal of strategies, and when I listen to him read and I help him get through the words that he struggles with, he never forgets them.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Alphabetic processes

- Spelling, spelling vocabulary
- Invented spelling
- Letter-sound representation in spelling
- Associate letters and sounds
- Vowels, vowel sounds
- Consonants, consonant sounds
- General, knowledge of alphabet, letters
- Use of phonetic skills, phonics

Her invented spelling, #5's invented spelling is a little past where it's a string of just letters, you can start to see the beginnings of where she's making beginning sounds and a little end sounds.

#17, when he came into first grade, despite having been in an extremely rich environment, he could not recognize the letters, he couldn't correctly name the letters or their sounds, and we were really starting at a very remedial place.

He can read the step-by-step stories, I think he's up to maybe step-by-step number 15, and...he's starting to read words like long vowel words, CVCV words like BAKE and TAPE, he's able to read that now.

He knows his sounds, he knows his letters, he rushes, doesn't think through some of the phonics rules.

Test scores, assessment, reading level

- District-wide diagnostic assessment
- Teacher's own, class, or school test
- Standardized test
- Entry level/grade level

I have about seven top readers in my top two groups. And they've scored very high in the (district test) so that's why they're grouped there.

I'll move #17 up because she, she's--I'm pondering putting her in two different groups, one that's closer to her--where she tested, and one that's a little bit higher because she has a lot of sense of letters and sounds and how story goes.

And she's starting to pull it together, we'll see how they do when they take the Iowas, I'm curious about whose comprehension is actually better.

She, in the beginning didn't know her alphabet or sounds. Now she knows alphabet sounds and she's reading on grade level.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Motivational conditions fostering learning

Taking risks, using letters and sounds to make words

Taking risks, using pictures/context

Taking risks, teacher does not specify how

Enjoyment, effort

Attention to work

Observant, alert, curious, interested

Confidence

Wanting to do well, get things right

#10 at the beginning was a little bit hesitant to actually take the risk and make the sounds and take a chance of maybe making an error and not giving the correct word, but now he's much more comfortable with it.

When we work in small groups she tenses up and I need to work on how she can relax when she's here during small group and how she can take more risks of guessing at words.

#22 would definitely rather be fooling around than sitting and reading a book but, when he attends, he's getting the sight words.

Sounding and blending, putting his words together, always volunteering to read the sentences, enjoys some of the games we play, recognizing the clues, word clues, and finding the words on the board.

#12 tries very hard. She gets upset if she doesn't get things the way she thinks she should get them.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Personal characteristics

- Maturity
- Hyperactivity
- Quiet, shy, not saying things right away
- Has potential or ability or lacks
- Behavior issue
- Physical characteristics
- Careful or careless
- Upbeat, positive
- Speed of doing things in general
- Conscientiousness
- Competitive
- Memory, remember instruction
- Wants to please teacher
- Nervous
- Seeks teacher's attention
- Social skills
- Ability to work independently

#23's actually kind of immature, so he's not as focused in his reading and doesn't seem to--that affects how he's doing his stuff.

#12, I think she best exemplifies the person who needs to learn to read by reading. Because she can sound out words, but she's so shy and so hesitant that she doesn't make the effort.

#14's sight vocabulary has come along nicely. He's starting to read fluently...he is quite tall for the grade and much larger than most of the children, he finds it difficult to sit in the same chairs that they're sitting in. And he doesn't like to sit still and this is a problem. When we're reading he's rocking and moving around.

#20 is extremely slow at reading...it will take him two to three times longer to read the story than the rest of the children. But he also is like that in everything else he does. Walking, and there's nothing wrong with him physically, he just likes to take things easy.

#1 probably better than both of them. And I think at times impedes my ability to see how strong she is because she's really quite a nudge. And always asks questions that she knows the answer to, and that makes her appear as though she's less competent than she is. But I think she actually is extraordinarily competent in seeking attention.

He has a lot of antisocial behavior too and that even alienates him from the children in his reading group even though I do try to do things to kind of bring him in.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Home influences as cause

- Homework with parent or older sibling involvement, help, encouragement at home
- Exposure to reading at home
- Parents' influence, attitudes
- Home environment

#15 is progressing to the point that if there was more work at home I think she would do much, much better. I think the parents are working with the words, sight word vocabulary at home, but I'm sending home sentences on Friday night of a review of the words that they have been accomplishing and she has not come in with a good ability of reading them because they have not read them over the weekend.

#21 has some sight vocabulary, but also the home life does not seem to be allowing him to practice as often as he should. This is followed up in the respect that I find there's excuses, "my Mommy didn't have time," "we were busy all weekend."

Her Mom reads to her a great deal, goes to the library, has a lot of books at home, loves to read, couldn't wait to read.

#21's Mom, surprisingly, is a teacher. I don't know where she got her reading degree from, she believes only in whole language. She hardly reads to #21...Tells me often that his mother says he doesn't need to read our books. And he tells me that his mother said that he should only read at the library.

Unfortunately, his mom is sick so he doesn't get quite as much attention and, so sometimes his work is incomplete, his homework and he isn't able to reinforce at home things we've learned in school, so that's kind of holding him back a little bit.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Text reading and comprehension

Comprehension of text

Listening comprehension

Vocabulary

Prior knowledge contributing to
comprehension

Thinking skills

Making sense

Speed, fluency

#9 is reading lower...but she's able to talk about stories and make personal connections and her comprehension and her retelling is higher, at a higher level.

It doesn't seem like their parents talk with them at home; they have very little language, and it's so hard that when they don't have that language, how are they expected to read language when they don't have it in the background.

#6, he has an incredible background knowledge, this child knows a tremendous amount of information about life, about different things. And he brings that to his reading; if we're reading a story, he totally can comprehend it and then even give us more information about that particular thing.

He reads the words but, when he reads them incorrectly he doesn't realize that it's not a word so I have to say does that make sense to him.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Oral language

- ESL comments (general)
- ESL and comprehension and production of spoken English
- ESL and parents' language
- Production of speech
- Phonological processing
- Structure of language, grammar

#19 is a student who is--ESL student who is picking up fast but still is struggling to learn all her sounds and letters.

#11, who's also an ESL learner and, I feel that that's her weakness, it's just the vocabulary. Otherwise--'cause she does use the strategies and she memorizes the basic sight words but when there's a new concept or a word for her that she doesn't know, that's where it becomes challenging.

Also with the ESL it's tricky with the structure because they--the structure of the language, they don't always know when it doesn't sound right.

Her language development is, she's very articulate, communicates ideas very well, but is just at the stage where--translating it to print.

He knows our rhyming words, he's aware with syllables, hearing syllables, when we practice syllables, which is also important for phonemic awareness that children should be able to hear the different parts in a word, which helps them to be able to attack the word when they see it, and not know it.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Writing

General

Write stories about self

Beginning writing

Writing level, writing letters

She seems to read nicely, writes very well, is more shy about expressing herself verbally, more comfortable writing and responding to questions in her response journal.

His parents have gotten him involved in extracurricular activities, and he enjoys basketball now, and now when it comes to writing, he has something more meaningful to bring to it.

He was having so much trouble in kindergarten, according to the mother, that she was quite thrilled when he walked out of kindergarten that he started to write on a line.

OK, I'm starting from the bottom because I definitely know who is the lowest one in the reading group because he's...still scribbling when he writes.

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Unexplained

- All of a sudden the child makes big gains
- Trouble for unknown or unspecified reason
- Read very well for unknown or unspecified reason
- Teacher puzzled about a reading behavior
- Teacher is uncertain about own perceptions

At the beginning of the year he was doing fine. He was up to par with all the other kids, and then as we started to learn newer things, he just started to fall behind...He has a lot of trouble with sight words and decoding.

I think a year and a half, but just blossomed. He just struggles with meaning now, but he's able to read on a higher level than I ever thought imaginable. It's amazing how some children just suddenly blossom.

So her progress is really slow, so I'm very concerned about her learning difference. I can't seem to figure out how to get her to progress further along. Because she seems stuck on the CVC words and when I try to move her to the next level, her number of miscues just increases and her frustration level.

Sometimes children are more difficult to draw out and so I'm not always that aware of how accurate I'm really being.

Holdovers

- Danger of being held over because of poor reading
- Child is holdover from previous year

I'm going to put #23 last. He seems to be struggling-- although his mother--you know, once we send out those holdover notices, they sure do, uh, hop to it. #23 tries, and his mother is working with him... We sent home some extra work he could do there.

He is a holdover and he really shouldn't be at this low level...He is hearing and seeing accurately, but for some reason did not develop sight word recognition, how to sound out words, and the whole structure of words, 'cause he makes guesses that are--don't make sense and again I have to go back and remind him, what do good readers do?

Table 4 (continued)

Think-Aloud Categories and Subcategories

Examples

Disability

- Reading disability, dyslexia
- Learning disability
- Neurological problem
- Eyesight
- Speech, hearing
- Special education
- Occupational therapy, fine motor control

He should be up here. Is this a job for Ritalin? That's what I'm wondering that because this is a really bright kid and I--it doesn't make sense for me; I don't think he's dyslexic, I think he's not attending.

I'm not quite sure at this point what it is, whether there's a learning disability or just a learning slowness, but we're trying to work with him on that.

We just found out her vision was terrible, so I've notified her Mom...so hopefully she's going to get some glasses. And maybe that's one of the things that have been holding her back.

He's a student who receives speech therapy, so his speech problems may be affecting his reading ability.

Emergent reading

- Environmental print
- Direction of print
- Concepts about print
- Distinguish between letters and numbers
- Pretend reading
- Emergent reading books

...very aware of his surroundings, aware of things around him in terms of signs, letters, posters.

So he's the one who had the least amount of skills, who had the least sense of concepts about print, least sense of the letter-sound awareness, and was just the least strong in ability to talk about stories and books and about letters and words.

#20, when he first came he didn't know the difference between numbers and letters.

Like when they sort of just turn the pages and retell the story that, that they're familiar with but when she, even when introduced to a story, she'll add on extra words that aren't written there.

Table 5

Correlations between Teacher Characteristics and Teachers' Use of the Think-Aloud Categories (N=20)

Variable	2	3	4	5	6	7	8	9	10	11	12	Mean ¹	SD
1. Years teaching	-.36	-.15	-.10	-.19	-.02	-.32	.38	.70**	.44	-.04	.24	9.65	7.7
2. Reading courses		.46*	.55*	.15	.50*	.12	-.30	-.27	-.24	-.19	-.22	4.92	3.7
3. Linguistics courses			-.09	-.04	.16	.35	-.23	.06	-.16	.24	-.12	.93	1.4
ACADEMIC-INSTRUCTIONAL													
4. Word Reading				-.06	.69**	-.17	-.14	-.29	-.18	-.07	.10	11.45	9.7
5. Instruction					-.16	.45*	.30	.24	.24	-.01	-.19	6.91	3.9
6. Alphabetic						-.07	-.08	-.16	-.12	-.30	.21	7.52	5.9
7. Test scores							.14	.02	.05	.46*	.02	4.89	4.5
NON-ACADEMIC-PERSONAL													
8. Motivation								.39	.87**	.33	.63**	8.39	8.9
9. Personal									.53*	-.06	.23	4.53	3.0
10. Home										.18	.62**	4.43	6.8
LANGUAGE-COMPREHENSION													
11. Text Reading											.37	10.15	6.6
12. Oral Language												6.45	5.9

* $p < .05$, ** $p < .01$ ¹ Mean percentage in TA categories

< .01), and between the Instruction and Test Score categories ($r = .46, p < .05$). However, the former two categories were not significantly related to the latter. Nevertheless, because of the academic focus of the four categories, these were grouped together for purposes of discussion.

References to the four TA categories represented about 31 percent of the total number of think-aloud statements. The majority of these references were to Alphabetic and Word-reading processes, which constituted about 18 percent of the total number of TA statements. Topics focusing on instructional issues and results of teachers' tests and assessments represented about 13 percent of all statements.

(2) Non-academic-Personal. These references concerned issues involving personal or environmental conditions that teachers viewed as affecting children's learning such as motivation, parental influence, home situations, and social, developmental, or behavior issues. Examples of statements in these categories are presented in Table 4. These references represented about 18 percent of the total number of TA statements. Eight percent of all statements concerned motivational conditions affecting reading progress, while references to personal characteristics of a child and home influences were mentioned almost equally, about 5 percent of the time. The Motivation and Home categories within this group were significantly correlated ($r = .87, p < .01$), and the Personal category was significantly related to Home ($r = .53, p < .05$).

(3) Language-Comprehension. The Language-Comprehension categorization was guided by the Simple View of reading, which divides reading into two basic components, decoding (fast, accurate word recognition) and linguistic comprehension (Gough &

Tunmer, 1986). The references to oral language and text comprehension skills concern expressive language, phonological processing underlying decoding abilities, listening and reading comprehension, and other factors involved in comprehension such as prior knowledge, vocabulary, or English as a Second Language (ESL) effects on reading. While phonological processing might be categorized as an alphabetic-decoding process, it was decided to code phonological references under the Oral Language category, rather than under the Alphabetic sub-category, “decoding”, because of the view that this underlying language skill is needed before decoding skill can be acquired.

Although use of language skills and text reading could be considered part of academic and instructional activities, it was decided to create a separate category because of their relation to linguistic comprehension. The Language-Comprehension group focuses more specifically on language ability or skills and language use, while comments in the Academic-Instructional categories focus primarily on learning of word identification skills and strategies as well as use of alphabetic knowledge and decoding skills. In the latter case, the teacher assumes language abilities are already in place.

References in the Language-Comprehension category represented about 15 percent of the total number of think-aloud statements produced. Most references involve text comprehension, about 9 percent of all statements. References to oral language issues made up about 6 percent of all statements. The relationship between these two categories fell short of significance ($r = .37$). Text reading was significantly correlated with Test scores ($r = .46$, $p < .05$), a category in the Academic-Instructional grouping, and Oral Language was correlated with Motivation ($r = .63$, $p < .01$), a category in the Non-

academic Personal grouping. Although the two Language-Comprehension TA categories were not significantly correlated, they were grouped together for the purpose of discussing teachers' thoughts on children's language abilities.

Overall, teachers referred most often to the TA categories of Word Reading, Text Reading and Comprehension, Motivational Conditions, Instruction, and Alphabetic processes. The frequency of references indicates that teachers' major concerns involved all three themes, with the most discussion centered on the Academic-Instructional and Language-Comprehension topics.

According to the one-sample Kolmogorov-Smirnov test, thirteen of the 14 categories in the think-aloud were shown to be normally distributed. Emergent Reading, the smallest category, was shown not to have a normal distribution ($D = 1.51$; $p = .02$). All other categories met the criteria for normal distribution. Pearson correlations were used for the normally distributed categories, and Spearman rho correlations were used for the Emergent Reading category.

Table 5 presents correlations between the more frequently produced categories. From these values, it is apparent that within each of the three groupings, some of the categories were more highly correlated than others. In the Academic-Instructional grouping, use of Word Reading and use of Alphabetic categories were significantly correlated. Likewise, Instruction and Test scores were significantly correlated. However, the other relationships in this grouping were weak, indicating that these categories did not form a homogeneous grouping. The two categories in the Language group were moderately correlated with each other, although the value fell short of significance. The

categories in the Non-academic grouping were moderately to highly correlated. The correlation between references to motivation and references to home factors was extremely strong, suggesting they were reflecting the same factor. These values indicate that the categories forming the Non-academic-Personal grouping were more homogeneous. Categories in the “other” grouping were weakly and non-significantly correlated, not surprisingly because they were infrequently used. In sum, the lack of homogeneity among categories forming the groupings indicates that individual categories should be preserved in reporting relationships to other variables.

For the most part, categories between groupings did not correlate significantly with each other (see Table 5). The exceptions were few: references to test scores and text reading; references to oral language and motivation; references to oral language and home factors. These findings suggest that references to text reading may belong in the academic grouping, while references to oral language may belong in the non-academic-personal grouping. These correlations support the researcher’s observation that teachers often referred to motivation and language factors in connection with home conditions. For example, they might describe a child as having difficulty producing or comprehending English in class (coded as oral language), or describe a child being unwilling to speak or read aloud in class (coded as motivation) and attribute these characteristics to the fact that English was not spoken in the child’s home (coded as a home influence).

Tests of Content Knowledge. There were three tests of content knowledge. For the Reading Terms test (Appendix E, Question 3F), teachers were asked to define 14

commonly used reading terms found in instructional manuals and articles for teachers. Scores were compared with definitions contained in Appendix F and assigned based on the total number of correct points contained in the teachers' definitions. A phonics test (Strickland, 1998), containing 15 items in 5 categories, assessed teachers' knowledge of phonics rules (Appendix G). A linguistic knowledge questionnaire, adapted from Moats (1994), containing 29 items in 6 categories, tested teachers' knowledge about the structure of language (Appendix H).

For the Reading Terms measure, the scores ranged from 7 to 25 ($M = 14.5$, $SD = 5$). On the Durkin phonics test teachers could earn up to 100 points. Scores on this measure ranged from 30 to 98 ($M = 75.7$, $SD = 15.6$). On the Moats Linguistics test teachers could earn up to 41 points, and scores ranged from 3 to 30 ($M = 20.6$, $SD = 6.9$). The distribution of scores on each of the three measures was shown to be normal on the Kolmogorov-Smirnov test. In sum, the teachers knew an average of about half of the Reading Terms, 75 percent of the phonics rules, and half of the linguistic items.

To determine whether knowledge across these three domains was related, correlations between scores on the Reading Terms definitions measure and scores on the phonics and linguistics tests were examined. The reading definitions measure was significantly correlated with the Durkin phonics test for teachers (Strickland, 1998) ($r = .54$, $p < .05$), and with the linguistic knowledge questionnaire (adapted from Moats, 1994) ($r = .55$, $p < .05$). The correlation between the phonics test and linguistic knowledge questionnaire was $r = .81$, $p < .01$. This last correlation was sufficiently high to justify combining scores on these two tests into one linguistics measure, thereby reducing the

number of dependent variables to be examined in the data analysis. The correlation between the Reading Terms definitions measure and the combined Phonics-Linguistics measure was $r=.57$, $p < .01$. Since the Reading Terms test measured a different and more general area of content knowledge about reading than did the Phonics-Linguistics tests, and its correlation with the Phonics-Linguistics test was lower than the two combined measures, the Reading Terms measure was analyzed separately in the data analysis.

Assessment Practices. To quantify teachers' reports of their assessment practices, Rater 2 used a scale of 1 to 5 to assign an overall rating to each teacher on the extent of reliance on assessment for instruction. The Kolmogorov-Smirnov test showed a normal distribution of scores for this variable. Scores ranged from 2 to 5 ($M = 3.3$, $SD = 1.1$).

Several differences among teachers' responses were observed. The clearest differences appeared between teachers with the highest and lowest ratings. Those rated in the middle range showed some of the behaviors or characteristics listed below, or showed them in lesser degrees. These descriptions were provided by Rater 2 (C.R. Langenthal, personal communications, September 21, 2002, May 17, 2003):

Responses of teachers with high ratings:

1. They talked more about adapting instruction than lower-rated teachers.
2. They were specific about what the assessments told them.
3. They made changes or planned their classes depending on what students needed.
4. They had several different kinds of assessments.
5. They discussed specific skills, methods of grouping (e.g., by reading skill) and changing when necessary.

6. They paid attention to signs of progress.
7. They worked with each child.
8. They observed constantly.
9. They were active in doing assessments:
 - a. They did not merely follow required procedures. They identified skills the students needed to be assessed on and then either used school or workbook assessments or created their own to learn about students' progress in those areas.
 - b. They used the results of those assessments in an ongoing improvement of their lessons and to work with those students (individuals and the class) on the most relevant problems. There were some who came up with a new idea for an activity in class based on a common mistake students were making.
10. They made good connections between assessments and work in class (i.e., clear, logical, and innovative adjustments made to lessons based on information from the assessments).

Responses of teachers with low ratings:

1. They made more references to teaching activities or the process of teaching than to children's progress.
2. They were not specific about grouping and planning.
3. They talked about how they tested children but less about how they used assessments.
4. They were not active in using assessment information.
5. They were less explicit in how children were grouped.

Examples of responses of teachers given ratings of 2 and 5 are shown below.

Because Rater 2 made a judgment based on the entire transcript, and took into account several factors that resulted in the final rating, it is difficult to isolate one or two

exemplary statements that best represent the judgment on a rating. However, since ratings of 2 and 5 showed the clearest differences in responses, these are quoted below. Ratings of 3 and 4 are in the middle range and therefore are more difficult to exemplify without including more context and a greater number of examples from the interview. Examples of teachers rated 3 and 4, are provided in the Discussion section where specific issues are addressed.

In the following two examples, Teacher 1 (rated 2) and Teacher 7 (rated 5) responded to a question about how they judged whether children made the progress they expected during the year:

Teacher 1: “The reading series is usually a pretty good judge of what the children need to master by the end of the year, so if they're having trouble with the phonics workbooks, if they're having trouble with the skills that go along with the reading of a story that we've done, then I know, here's a problem that they might not be able to master all the work by the end of the year.”

Teacher 7: “Well, like I said, with all the components of assessment and – I mean, formally and informally. With this [highly structured] reading program, my primary form of assessment is informally. Because I'm not the one who formally assesses them with a specific package that they have to assess them in the reading program. So I just continually see week by week where they're headed. The children who are getting what sounds and the children who are getting what blends, and the children who are getting what words. And, some times I use to make review days. The program allowed me to do review days. Where if I saw a lot of children were having trouble with, like a C-K together, I did a, I did the story again and we did the sounds again, so I was able to see what their – the spelling part that I told you about where we stretched, where I stretched the words and they have to write it down, and I was able to see what sounds they were getting. What they were able to do. And with all of the other components, there's letter activities that this-- the program has. I was, pretty much see what they had. The major problems that these children have are not really consonant problems, they're mostly vowel problems. The difference between – they didn't even get to long vowels yet. They've only gotten up to short vowels. And that's what's giving them difficulty. They also have problems with the digraphs and the blends. Primarily digraphs. So, I was able to see that and go back with that as time went

on but, and I saw a lot of children as far as this last week or so, a lot of them were starting at least to get the difference between a lot of vowel sounds, which is good because, I mean, that component, like every word you get to, they really have to know the difference.”

In the next two examples, Teacher 14, rated 2, and Teacher 15, rated 5, responded to a question on how they assessed the skills they said they assessed at the beginning of the year:

Teacher 14 (commenting that she only used the school district-mandated assessment): “OK, well, first of all, letter-name and then the sounds that they know, this phonemic awareness. At first it was all kind of mystifying to me. You know, does this really play a part. But it all fits in like a puzzle. You know, so children who-- so it kind of brings in phonics, it brings in prior knowledge, it brings in sight word knowledge. All these components, you know, fit together. And hopefully you get a child who’s able to read, you know, once these pieces start fitting together. And then the comprehension is a whole other issue.”

Teacher 15: “I do a running record, a reading record, where I would probably take a piece of text and type it on the computer that matches the book. Give the children the books, look at their reading behaviors. Are they looking at the pictures, are they looking at the words. Do they know the initial sounds of the letters. Are they just sitting there doing nothing, are they lost, are they confused? Maybe they don’t know where a book starts, where it ends. They turn-- open to page 1 and then they go straight to page 9. So I need to see, are they comfortable with a book. In the very, very beginning. And some, sadly, are not. They can take a book and go to the back cover and go backwards, or go upside down. So I need to know what is their-- what is their comfort-- how are they comfortable with reading. Do they know where to start, do they know where to go. Even-- I assess how they hold the book.”

Overall, teachers who received higher ratings showed many more of the characteristics listed above than teachers with lower ratings. Examination of the transcripts suggested that regardless of experience or type of school or class, the more highly rated teachers consistently demonstrated similar characteristics and behaviors in their assessments.

Teaching Efficacy. Scores in Personal Teaching Efficacy (PTE) ranged from 3.00 to 5.45 ($M = 4.35$, $SD = .68$). The scores in Teaching Efficacy (TE) ranged from 2.29 to 5.71 ($M = 3.87$, $SD = .96$). The correlation between the two measures was $-.12$, $p > .05$. Because the two efficacy scores were not significantly related to each other they were treated as separate variables in the data analyses. The lack of correlation was consistent with the Gibson and Dembo (1984) findings that the instrument measured two constructs.

On average, teachers' PTE (the belief that one has the skills to effect student learning) tended to be fairly high, indicating that teachers felt relatively confident in their teaching. TE (the teacher's sense of personal responsibility and the extent to which external factors limit effectiveness), was slightly lower and scores varied more than PTE. The lower scores suggest that some teachers felt more hindered by adverse external influences than others, and therefore less responsible for student outcome. For example, some teachers, in discussing children's reading problems, referred to parents' inability to speak English or refusal to work with their child at home as reasons for not being able to help the child perform better.

TORP. The TORP scores ranged from $-.55$ to 5.00 (maximum = 5.00). The mean score was 2.14 , $SD = 1.31$. The wide range of scores indicates that teachers varied greatly in their theoretical orientation to reading instruction. On average, most teachers held views that incorporated elements of both phonics and whole language approaches.

Comparison of Experienced and Novice Teachers

Information about the teachers was obtained from a written interview. This information is reported in Table 2. The primary independent variable of interest in the present study involved a comparison of experienced and novice teachers, conceptualized as the number of years of experience teaching primary grades. From Table 2 it is apparent that novice and experienced teachers were similar in several respects. Both groups consisted mostly of Caucasian females. All spoke English as their native language, and the same number in each group was bilingual. Most taught in a public school. As evident in Table 2, the groups differed in several other ways besides years of teaching. The experienced teachers were older by 15 years on average. The majority of experienced teachers taught in higher SES schools whereas the majority of novice teachers taught in lower SES schools. Greater than half of the students in the experienced teachers' schools were reading above grade level whereas more than half of the students in the novice teachers' schools were reading below grade level. The class size for novice teachers tended to be lower than the class size for experienced teachers. Whereas most novice teachers taught heterogeneous classes of students, half of the experienced teachers taught homogeneous classes grouped by academic performance level, either low or high.

The presence of differences on other variables besides years of teaching is important to note in the present study because these variables are confounded with the variable of primary interest. As a result, they offer possible alternative explanations for any findings associated with years of teaching experience.

The present study was intended to determine whether experienced and novice teachers differed on a number of variables related to reading instruction, including practice-based working knowledge, content knowledge, assessment practices, teaching efficacy, and theoretical orientation to reading. It was predicted that experienced teachers would outperform novices on these measures, and would reveal a higher phonics orientation on the TORP.

To compare the two groups, scores on the dependent measures were subjected to statistical tests. The Kolmogorov-Smirnov test for two independent samples showed that the category, Personal Characteristics, did not have a normal distribution ($D = 1.57$; $p = .02$). The Levene test for homogeneity of variances showed unequal variance between groups in the Home Influences ($F = 5.41$, $p = .03$) and Motivational Conditions ($F = 4.81$, $p = .04$) categories. To compare groups on these three categories, the non-parametric Mann-Whitney U test was employed. For the remaining categories, group comparisons were conducted using t tests. Hypotheses were tested at $p < .05$. Results are reported in Tables 6 and 7.

Comparisons of experienced and novice teachers on the 14 categories of responses in the think-aloud task fell short of statistical significance except in two cases, both occurring in the Non-academic-Personal grouping. As shown in Table 7, experienced teachers made a significantly greater proportion of references to home influences and to personal characteristics of students when they rated their reading ability than novice teachers did.

Table 6

Comparisons of Means of Experienced and Novice groups on Dependent Variables

t tests

Dependent Measures Think-aloud categories	Means ¹ Novice N=10	SD	Means ¹ Experienced N=10	SD	df	t statistic
ACADEMIC-INSTRUCTIONAL						
Word Reading	12.95	12.3	9.96	6.6	18	t = .68 (<i>ns</i>)
Instructional	7.20	3.9	6.62	4.2	18	t = .32 (<i>ns</i>)
Alphabetic	7.53	6.5	7.50	5.6	18	t = .01 (<i>ns</i>)
Test, Reading Level	5.79	5.2	3.97	3.7	18	t = .90 (<i>ns</i>)
LANGUAGE-COMPREHENSION						
Text Reading	9.52	5.4	10.79	7.9	18	t = .25 (<i>ns</i>)
Oral Language	4.76	4.4	8.14	7.0	18	t = 1.30 (<i>ns</i>)
OTHER CATEGORIES						
Writing	1.48	2.5	1.97	2.3	18	t = -.46 (<i>ns</i>)
Unexplained	0.66	0.9	2.03	2.0	18	t = -1.91 (<i>ns</i>)
Holdovers	0.86	1.0	0.88	1.3	18	t = -.04 (<i>ns</i>)
Disability	.65	0.9	1.26	1.1	18	t = -1.31 (<i>ns</i>)
Emergent Reading	2.16	3.9	0.31	.82	18	t = 1.43 (<i>ns</i>)
Assessment Practices maximum: 5	3.50	1.1	3.10	1.2	18	t = .78 (<i>ns</i>)
Reading Terms maximum: 25	14.40	3.4	14.60	6.4	18	t = -.09 (<i>ns</i>)
Phonics and Linguistics score maximum: 128	92.20	26.6	100.40	15.5	18	t = -1.03 (<i>ns</i>)
TORP maximum: 5.00	2.45	1.5	1.83	1.0	18	t = 1.06 (<i>ns</i>)
PTE maximum: 5.45	4.17	.5	4.54	0.8	18	t = -1.23 (<i>ns</i>)
TE maximum: 5.71	3.89	.9	3.86	1.1	18	t = .061 (<i>ns</i>)

* p < .05; ns = not significantly different from zero

¹ Mean Percentages in TA categories

Table 7

Comparisons of Novice and Experienced Teachers in the Proportion of times they referred to Non-Academic-Personal Issues

Mann-Whitney U Test

TA Category	Mean Rank Novice N=10	Mean Rank Experienced N=10	Sum of Ranks Novice	Sum of Ranks Experienced	Mann-Whitney U	Asymp. Sig. (2-tailed)
Home Influences	7.55	13.45	75.50	134.50	20.5	.02*
Motivational Conditions	9.50	11.50	95.00	115.00	40.0	.45
Personal Characteristics	7.20	13.80	72.00	138.00	17.0	.01*

The significant relationships detected between years of teaching and references to non-academic factors indicate that the more experienced teachers considered these factors to a greater extent than teachers with fewer years teaching reading. Differences were greatest in the Personal Characteristics category, followed by references to Home Influences. These findings indicate that experienced teachers were more apt to think beyond the school and classroom and to consider home factors in explaining students' progress in learning to read. Also, experienced teachers were more apt to attribute reading progress to personal characteristics of students such as their maturity and ability to work independently than novice teachers. Perhaps their observations and interactions with many students over the years provided the basis for drawing inferences about these relationships.

Findings revealed no relationships between years teaching reading and any of the Academic-Instructional or Language-Comprehension categories in the think-aloud task, suggesting that teachers did not gain working knowledge in these areas of reading acquisition as a result of experience alone. In other words, experience did not promote greater consideration of these categories while thinking aloud about students' progress. References to Alphabetic and Word reading categories were predicted to be especially telling indicators of practice-based knowledge. However, experienced and novice teachers did not differ in their references to these aspects of reading.

In sum, the hypothesis involving think-aloud responses interpreted as reflecting experienced teachers' practice-based working knowledge about reading was not supported. Teachers with more years of teaching experience did not show greater use of

academic or instructional or text comprehension categories in describing their students' progress in learning to read than novice teachers. In fact, quite a different pattern was detected. Experienced teachers were more apt to refer to the non-academic personal and home factors than novice teachers.

Experienced and novice teachers were also compared on several other measures. As evident in Table 6, statistical tests on all of these measures were non-significant. The two groups did not differ in their assessment practices, knowledge of reading terms, knowledge of phonics and linguistics, orientation to reading, or in teaching efficacy (all $ps > .05$).

Several factors may explain the lack of differences between experienced and novice teachers. The explanation favored is that teaching experience by itself does not contribute much to growth in the academic and knowledge-based dimensions measured. However, it is possible that other characteristics besides years of teaching that distinguished the two groups suppressed the observation of differences on the dependent measures. Perhaps if the groups of teachers had been matched on class size, or SES of the school, or academic level of students in their classes, differences might have been apparent. This remains the task of future research.

Contribution of Coursework in Reading and Linguistics

Two training variables, coursework in reading instruction (Reading Courses) and coursework in the structure of language (Linguistics Courses), were listed by teachers in the Written Questionnaire (Appendix C). These background variables were expected to contribute to their working knowledge of reading acquisition, as reflected in the use of

TA categories as well as their performance on the other measures. It was hypothesized that teachers with more training would have higher practice-based working knowledge, higher content knowledge, and higher teaching efficacy. In addition, they were expected to report greater use of assessments in their instruction, and have a higher phonics orientation to reading instruction.

To test these predictions, correlations between the two measures of coursework and the other variables were calculated. Hypotheses were tested at $p < .05$. Results are reported in Table 8. Although the two measures of coursework were significantly correlated (i.e., $r = .46$, $p < .05$), the magnitude was only moderate indicating that the two measures reflect different types of background knowledge. Thus, it would not be surprising for the two types of coursework to differ in their relationships to other variables.

The correlations between years of teaching experience and the two types of coursework fell short of significance, indicating that these variables were independent of each other. The correlations were $r = -.36$ between years and reading courses, and $r = -.15$ between years and linguistics courses. The negative signs indicate that more experienced teachers had taken slightly fewer courses than novice teachers. This runs contrary to the expectation that the experienced teachers were older and hence would have had more time to take more courses. However, it would be necessary to investigate the possibility that coursework requirements may have changed over the years, or that novices might have recalled their coursework more accurately.

Table 8

Correlations between Measures of Experience, Coursework, Assessment, Content Knowledge, TORP, and Teaching Efficacy

Variable	1	2	3	4	5	6	7	8	9
1. Years		-.36	-.15	-.27	-.06	.02	-.32	.32	.06
2. Reading Courses			.46*	.81**	.48*	.08	.26	.28	-.23
3. Linguistics Courses				.54*	.59**	.30	-.13	.28	.18
4. Assessment Practices					.46*	.03	-.04	.16	-.08
5. Content Knowledge Reading Terms						.57**	.05	.02	.25
6. Content Knowledge Phonics/Linguistics							.46*	.04	.09
7. TORP								-.07	-.35
8. PTE									-.12
9. TE									

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

As evident in Table 5, the measure of linguistic coursework was not significantly correlated with any response category in the think-aloud task. However, the measure of reading coursework was correlated significantly with two categories, Word reading, $r = .55$, and Alphabetic, $r = .50$, both $ps < .05$. These findings reveal that teachers who had taken more reading courses produced a greater proportion of references to alphabetic and word reading processes when they described their students' progress in learning to read.

From Table 8, it is apparent that both coursework variables were correlated significantly with two of the other dependent measures. Coursework in Reading was strongly correlated with Assessment Practices ($r = .81$, $p < .01$), and also with knowledge of Reading Terms ($r = .48$, $p < .05$). Coursework in Linguistics was correlated significantly with the same variables: with Assessment ($r = .54$, $p < .05$), and with Reading Terms ($r = .59$, $p < .05$). To explore these relationships further, stepwise regression analyses were conducted to determine whether one or both types of coursework explained unique variance in these two measures. Results of these analyses are presented in Table 9. The analyses indicated that for Assessment Rating, Reading courses accounted for 65 percent of the variance, and Linguistics courses did not explain any unique variance in these scores. For the Reading Terms measure, Linguistics courses accounted for 34 percent of the variance, while Reading courses did not explain any additional variance. This latter finding may be explained by the presence of linguistic terms in the list. These included phonemic awareness, auditory discrimination, and dyslexia, which were defined correctly and in greater detail by teachers who had taken linguistics courses than teachers who had not had these courses.

Table 9

Summary of Stepwise Multiple Regression Analyses for Variables Predicting Assessment Practices and Reading Terms Definitions (N=20)

Dependent Variable	Significant Predictor	Standard Regression coefficient	R Square
Reading Terms Scores	Linguistics/Bilingual Courses	.586	.343
Assessment Practices	Reading Courses	.806	.649

As can be seen in Table 8, coursework variables were not significantly correlated with any of the other variables, including content knowledge in Phonics-Linguistics, scores on the TORP indicating orientation to reading instruction, and Teaching Efficacy scores.

In sum, these findings reveal that taking courses in reading and linguistics contributes to teachers' practice-based working knowledge as revealed by their use of references to alphabetic and word reading skills in describing their students' progress in reading. Also, coursework contributes to teachers' assessment practices and their knowledge of reading terms. The exceedingly strong relationship between reading coursework and assessment practices suggests that teachers may benefit from instruction in development of beginning reading skills and from systematic instruction in how to incorporate sound assessment practices into their teaching of reading. The strong influence of coursework contrasts with the weak or non-existent influence of years of teaching experience evident in the present study.

These findings support the hypothesis that teachers with more training in the form of coursework show greater practice-based working knowledge than those with less training. Although there may be other factors that contribute to teachers' references to these categories, the findings lend support to the view that increased training in reading instruction causes teachers to think more about skill development as they consider their pupils' reading progress.

With regard to content knowledge, the significant relationships of Reading and Linguistics Courses to teachers' definitions of Reading Terms supports the view that

coursework influences teachers' knowledge. While other factors may contribute to this knowledge as well, findings of the regression analysis suggest that coursework in these areas makes a considerable contribution.

Relationships Between Other Variables

Relationships among variables not already considered were examined. Resulting correlation coefficients are presented in Tables 8 and 10. Relationships were judged to be statistically significant if $p < .05$.

Three of the measures involved aspects of teacher knowledge: knowledge of phonics/linguistics, knowledge of reading terms, and assessment practices. Because the latter two measures were significantly correlated with coursework, it was expected that they would be related. From Table 8 it is apparent that knowledge of reading terms was significantly correlated with both assessment and phonics/linguistics knowledge. However, the latter two variables were not related. Because reading was the focus across all three measures, its centrality is not surprising. In addition, both assessment practices and knowledge of reading terms were significantly correlated with one of the TA response categories, references to alphabetic processes (see Table 10). All three of these variables were related to reading coursework. These findings suggest that teacher knowledge about reading processes mediates these interrelationships.

Teaching Efficacy. Two aspects of teaching efficacy, TE and PTE, were measured. As evident in Table 8, these showed no significant relationship to coursework, assessment practices, teacher knowledge, or orientation. However, PTE was moderately

Table 10

Correlations of Think-Aloud Categories with Assessment, Content Knowledge, TORP, and Teaching Efficacy (N=20)

Variable	Assessment Rating	Reading Terms	Phonics/ Linguistics	TORP	PTE	TE
1. Word Reading	.36	.38	.23	-.01	.14	-.34
2. Instruction	.09	.05	-.14	-.09	.07	.39
3. Alphabetic	.46*	.49*	.19	-.15	.03	-.13
4. Test scores	.01	.27	.25	.22	.03	.08
7. Motivation	-.30	-.27	-.13	-.21	.47*	-.07
8. Personal	-.25	-.20	.01	-.26	.16	.14
9. Home	-.17	-.23	-.12	-.16	.24	-.20
5. Text Comp	-.22	-.10	.09	-.08	.41	-.24
6. Oral Language	-.31	-.21	-.04	-.07	.21	.39

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

related to one of the TA response categories, references to motivation. What might explain this relationship is not clear.

Theoretical Orientation to Reading Profile (TORP). The TORP was administered to measure theoretical orientation to reading. From Table 10 it is apparent that the TORP was not significantly correlated with any of the TA categories reflecting practice-based working knowledge. This finding does not support the hypothesis that teachers with a higher phonics orientation would show more working knowledge of alphabets. Teachers having scores consistent with a phonics orientation did not talk about Alphabetic and Word-reading processes or any of the other TA categories more than those with TORP scores indicating a whole language orientation.

The only variable significantly and positively correlated with the TORP was the Phonics-Linguistics measure of teachers' knowledge. It is notable that these variables were positively correlated, suggesting that teachers who had a higher whole language orientation on the TORP tended to have higher Phonics-Linguistics scores. This is the opposite of the relationship expected. However, other characteristics of the teachers may have influenced this result. For example, the raw data show that six of the nine teachers who had taken one or more linguistics course or reported proficiency in one or more second languages also scored above the mean on the phonics-linguistics test (although the correlations do not show this relationship to be significant [$r = .30$, $p = .20$]). These teachers tended to have higher scores on the TORP as well, although there was no relationship between the TORP and linguistics courses. The possibility of a relationship

between teachers' phonics-linguistic knowledge, their theoretical orientation, and their coursework might be explained in a larger study with a larger number of teachers.

Summary of Hypotheses and Evidence

The literature reviewed suggested that teachers with more teaching experience and coursework would perform better than novices in the knowledge they used to guide them in their instructional practices. It was of interest to examine the contribution of both of these variables to teachers' working knowledge in the classroom.

Influence of Teaching Experience. It was hypothesized that teachers with many years of teaching experience would exhibit higher levels of expertise on the various measures of teacher knowledge, assessment practices, and teaching efficacy than novice teachers, and in addition would exhibit a stronger phonics orientation to reading instruction than novices.

The results indicated that experience gives teachers a broader perspective on their pupils' development, shown in their attentiveness to non-academic characteristics of their students. The ability to more fully observe and take these conditions into account in assessing children's progress may provide the teacher with a holistic view of each child. This may enable the experienced teacher to assess students more realistically than the novice teacher especially if the teacher can combine this ability with a solid knowledge base in the development of reading skills.

Experience by itself, however, was not found in this study to affect teachers' practice-based and content knowledge, use of assessments, teaching efficacy, or theoretical orientation to reading. Experienced teachers did not refer more than novice

teachers to the categories in the Academic-Instructional and Language-Comprehension groupings. These results indicate that number of years teaching does not impact teachers' thinking in these academic areas.

Experience also did not contribute to teachers' content knowledge, teaching efficacy, or theoretical orientation. No group differences were found in definitions of Reading Terms or in Phonics/linguistics knowledge. The data suggest that teachers do not acquire this knowledge from years of teaching reading, although this is what would be expected, given the repetitive nature of teaching reading to first graders over a period of years. Likewise, teaching efficacy did not increase with years. Nor was theoretical orientation associated with experience in teaching reading, even though it would have been expected that over a period of years teachers would learn the importance of the contribution of phonetic approaches for accurate word recognition.

Finally, the extent of reliance on assessments in instruction did not depend on years of teaching. Experience was not found to have an effect on teachers' assessment practices, contrary to the expectation that teaching reading repeatedly to first graders gives teachers greater insight into the skills to be assessed at different stages of reading development and the practices most effective for meeting the needs of struggling readers.

Contribution of Coursework. The second hypothesis predicted that teachers who had completed more coursework or the equivalent in reading instruction and linguistics would exhibit higher levels of expertise on the various measures of teacher knowledge, assessment practices, and teaching efficacy than teachers with less coursework, and in

addition would exhibit a stronger phonics orientation to reading instruction than teachers completing less coursework.

The evidence showed that teachers' coursework had a greater impact on these variables than teaching experience. Number of reading courses that teachers had taken was associated with a greater number references to the alphabetic and word-reading behaviors in these categories. This supports the prediction that coursework would have a positive influence on practice-based working knowledge. Reading courses and Linguistics courses were both correlated with Assessment Practices and definitions of Reading Terms. Reading courses accounted for 65 percent of the variance in assessment practices while Linguistics courses accounted for 34 percent of the variance in Reading Terms. Although alternative explanations of results cannot be ruled out because of the small number of teachers, the heterogeneity of the group, and the correlational nature of the data, the strength of the relationship between Reading courses and Assessment suggests that reading coursework is quite likely a central contributor to teachers' assessment practices and resulting instruction. Furthermore, it suggests that teachers may benefit considerably from instruction in the phonological structure of language as well.

With respect to the other dependent variables, coursework was not significantly related to teachers' phonics/linguistics knowledge, theoretical orientation, or teaching efficacy, indicating that other factors may influence these variables.

Impact of Content Knowledge on Application. Hypothesis 3 predicted that teachers possessing greater content knowledge of reading terms, phonics, and linguistics would exhibit the application of this knowledge to a greater extent on the measures of

assessment practices and practice-based working knowledge, in the latter case by showing a greater number of references to alphabetic, word reading, and related processes.

Reading Terms, Assessment Practices, and the TA category, Alphabetic processes were all significantly correlated. The Phonics/Linguistics measure was also significantly related to Reading Terms. These relationships suggest that teachers with greater content knowledge used it to obtain information from their assessments that they applied to their instructional practices. The relationships also suggest that working knowledge benefits from greater content knowledge in teachers' references to alphabetic processes.

Relationships Between Similar Variables. It was predicted in hypothesis 4 that variables assessing similar characteristics or capabilities would be significantly related to each other:

- (a) Types of coursework (Reading, Linguistic);
- (b) Measures of teacher knowledge (Reading Terms, Phonics, Linguistics)
- (c) Teaching practices (Assessment, Alphabetic and Word-reading and related processes in working knowledge, phonics orientation to reading instruction, Teaching Efficacy).

Overall, hypothesis 4 was supported:

(a) Reading and Linguistics courses were significantly correlated with each other, showing that teachers who had a higher degree of education in reading instruction also tended to have taken at least one course in structure of language and/or studied a second language.

(b) The Phonics and Linguistics measures were highly correlated, indicating that these measures were tapping the same knowledge. The combined measure was

significantly correlated with Reading Terms. These relationships suggest that teachers who have acquired knowledge in one of these areas tend to be knowledgeable in the other areas as well.

(c) Assessment practices and the one working knowledge category, Alphabetic processes, were significantly related, suggesting that teachers who rely more heavily on assessments in instruction also tend to focus to a greater extent on children's alphabetic knowledge when assessing their progress. These teachers, however, did not show a stronger phonics orientation and did not score more highly in teaching efficacy than other teachers. These last two results suggest that other factors are related to phonics orientation and teaching efficacy.

CHAPTER V

Discussion

Overview

This study explored the impact of teachers' primary grade teaching experience and linguistic and reading coursework on their knowledge about beginning reading processes and acquisition and how they used this knowledge in their day-to-day instruction and assessments in the classroom. One purpose of this study was to examine whether there were differences in how experienced and novice first grade teachers described the reading progress of their pupils, and how experience influenced teachers' thinking about their children's reading, their knowledge about development of reading skills, and their assessment practices. Instructional effectiveness was thought to depend to some extent on teaching experience. Based on theories about developmental change in teachers, experienced teachers who have taught for many years were expected to have more practice-based understanding, and to be able to present instruction more effectively, than novice teachers with only a couple of years of experience (Berliner, 1991; Ehri & Williams, 1996).

It was also of interest to study the contribution of coursework in reading instruction and the structure of language to teachers' knowledge and practices. Knowledge about beginning reading processes serves as a guide to teachers' instruction and decision making (Ehri, 1995). The goal of reading instruction is to promote reading comprehension, but a necessary prerequisite for effective reading comprehension is rapid,

accurate, and automatic word recognition. Many teachers may not be fully informed about the course of development of processes in reading acquisition, and many may lack critical knowledge of phonemic awareness and the structure of spoken and written language which can limit their effectiveness in teaching necessary skills (Moats, 1995, Moats & Lyon, 1996; Rath, 1994; Scarborough, Ehri, Olson, & Fowler, 1998). Teachers who have greater knowledge in these areas are more likely to provide explicit instruction in the alphabetic principle in the classroom (McCutchen, Harry, Cunningham, Cox, Sidman, & Covill, 2002; Spear-Swerling & Brucker, 2004).

The combination of knowledge and effective assessment practices is beneficial for normally progressing students, and is even more valuable for those students experiencing early difficulties. Ability to assess children's progress enables teachers to accurately monitor their children's reading, plan and adapt instruction, and communicate useful information to parents and others. If first grade teachers are aware of the early signs of reading disabilities, they are also in a good position to identify children who are at possible risk and take early steps toward remediation before academic, motivational, and other problems result as a consequence of reading difficulties (Moats & Lyon, 1996; Stanovich, 1986).

In the present study teachers were compared in experience and amount of coursework they had taken in reading and linguistics or structure of language. A think-aloud procedure was used in a ranking task to examine teachers' practice-based working knowledge. An assessment practices interview concentrated on types of skills assessed, how they were assessed, measures used, record-keeping, frequency of assessment and

record-keeping, information obtained, and responses to assessment information. Blind overall ratings of minimal, moderate, or high reliance on assessments were assigned. Content knowledge of phonics and language structure was also tested (Moats, 1995; Strickland, 1998). As another measure of content knowledge, teachers were asked to verbally define commonly used reading terms. The TORP was administered to assess teachers' theoretical orientation to reading (DeFord, 1985), and the Teaching Efficacy Scale was given to assess teaching efficacy (Gibson & Dembo, 1984).

It was predicted that teachers who had more experience teaching reading in primary grades and more training in reading instruction and language structure would outperform those with less experience and training on the dependent measures. Teachers with more experience and training were expected and to have a higher orientation to phonics instruction because of their knowledge of the importance of phonetic skills in early accurate word identification. The independent variables were years teaching reading, coursework in reading instruction, and linguistics coursework focusing on structure of language. Dependent variables were practice-based working knowledge, assessment ratings, content knowledge, theoretical orientation to reading instruction, and teaching efficacy. Experienced and novice groups were compared on the dependent measures, and correlations were performed to observe relationships among the coursework and dependent variables. Regression analyses were performed where significant relationships were found.

How Did Experience Influence Teacher Knowledge and Practices?

The think-aloud rankings yielded 14 categories of comments related to reading skills, of which nine represented the majority of teachers' reflections. These contained three main themes: skill development in academic and instructional areas, non-academic or personal topics, and language and comprehension skills. The most common concerns centered on word reading skills, the impact of instruction or missing instruction, letter-sound knowledge, motivation to read, and factors affecting ability to read and comprehend text.

Results of this study did not support the first hypothesis predicting that experienced teachers would show more knowledge in their day-to-day instruction than novices. Likewise, experienced teachers did not show more expertise than novices in their assessment procedures and content knowledge. Their teaching efficacy and orientation toward reading instruction did not differ significantly from that of novices, as well. Experienced and novice teachers considered academic and language factors in children's reading success about equally. Experienced teachers did not show more practice-based working knowledge by their references to the development of alphabetic and word-reading skills in their students. Experienced and novice teachers considered these skills, as well as how children benefited from instruction, their test results, and text comprehension skills at about the same frequency when describing their children's reading progress. These results indicate that teachers did not profit as expected from their experience teaching first graders.

The think-aloud procedure, however, revealed some important differences among experienced and novice teachers, although not as predicted by the first hypothesis. The major difference between groups was that experienced teachers linked non-academic factors to children's learning more than novices. These consisted primarily of the child's personal characteristics, such as maturity, social skills, competitiveness, shyness, attention-seeking behaviors, etc. The influence of home factors, mainly parental or family influence, was also discussed more by experienced than novice teachers, but less significantly so than personal characteristics. The category labeled Motivational Conditions, involving references to some internal motivation to perform, contained references to a child's enjoyment of reading, willingness to make an effort, interest, etc. This category was correlated with the home and personal characteristics categories, primarily the home category, but was not significantly related to years teaching. However, the significant correlations among the three categories indicate that the same factor was reflected in this group.

Motivational conditions affecting learning was also significantly correlated with the category concentrating on oral language issues. This relationship suggests that teachers often linked children's speech and language understanding and development while thinking about the child's motivation and home factors that influenced learning to read. The following is an example of how one teacher connected these thoughts:

Teacher 11: “#24 has a problem with language. He's got a lovely, lovely mother who came in open school week and said, ‘tell me what to do to help my child.’ But, she said, ‘I'm very limited in my English abilities and my reading abilities’, so right there we have a problem. #24 tries very hard, wants to please, thinks if he raises his hand and doesn't know the answer, it's OK. He has a sight vocabulary,

but he needs a lot of extra one-on-one attention 'cause he does not have any follow-up at home and he does not have that innate ability, yet, that could help him with his reading.”

By associating non-academic factors with children’s progress, experienced teachers showed awareness of circumstances beyond classroom instruction, which existed both within the child and in the home, that impacted students’ learning. Language learning, abilities, or comprehension also seem to play a part when children’s motivation to read is considered.

What May Account for the Observed Difference Between Experienced and Novice Teachers?

The difference between experienced and novice teachers in the proportions of time they referred to children’s personal qualities and effects of home and family on reading progress are consistent with differences found by Borko and Niles (1982). In that study, experienced teachers used both academic and non-academic factors when predicting children’s mastery of the reading curriculum, while novices relied primarily on academic factors. Consideration of non-academic factors such as children’s social skills, development, or behavior was significantly affected by teaching experience. Borko and Niles explained that experienced teachers had spent a greater amount of time than novices working with reading groups and being accountable for student achievement. They have also had more opportunities than novices to observe children and gain knowledge about different characteristics. This enabled them to develop a more thorough understanding of

factors that contribute to success, which include the social and behavioral influences as well as academic factors that impact their pupils' progress.

The results may also be interpreted as consistent with previous research showing that experience provides opportunities for teachers to develop schemas about their classrooms, students, situations, and routines (Westerman, 1991; Berliner, 1991;

Leinhardt & Greeno, 1986; Borko & Livingston, 1989, Borko & Niles, 1982).

Experienced teachers are not as concerned as novices about their own teaching, managing classroom problems or disruptive behavior. They are not as concerned as novices with lesson planning, keeping a lesson on track, or how to go about solving a problem. Over the years they have developed pedagogical knowledge and schemas for routines. They have learned effective ways of planning and presenting lessons and managing classroom activities. They have developed ways of adjusting their teaching to quickly accommodate different types of situations and events, and have practiced responses to different needs of their students. Because they have developed and practiced these skills, experienced teachers are better able to learn more about the individual children in their classes.

Having gained some expertise in managing their teaching and classes, they have enough cognitive resources to pay attention to other factors that they see as influencing children's learning, such as how parental support helps the child or the way the child's social skills affect behavior during group work.

Novice teachers must concentrate on developing their skills, so in the meantime, they do not think of additional factors affecting learning. For example, Teacher 9, a novice who was quite articulate, mentioned non-academic issues in her think-aloud less

than most teachers. In answering a question on how she used her assessment information, she clearly explained her concern with her own performance, lesson planning, and academic and instructional issues. Consideration of non-academic areas was not part of her thoughts:

“I’m still learning. I’m in my second year. Fortunately I’ve had a lot of support. As I told you, the (reading specialist) who was a classroom teacher for six years, she’s been a huge support. And up until last week she was coming in for three periods a week and we were doing only literacy stuff, reading and writing stuff, and she was helping me form groups and helping me figure out where to go from here with the information that I had. And I’m always constantly talking to her. So I’m still trying to figure out what to do and how to-- you know, I notice that a lot of kids aren’t doing this in their reading, I need to focus a week’s worth of mini lessons around our shared reading, or what not. And independent reading lessons on this particular strategy, so that these kids are going to start using it more. So, I try and look in-- what I notice them doing or not doing and use that to-- help that, say, OK, this is what our lessons are going to be for shared reading for the next week ‘cause we need to focus on that. So, some of it’s observation—that’s sort of informal that I’m noticing in my head and I’m jotting it down, putting it in my plan book to affect how I’m going to structure the next day or the next week’s lessons. Um... it sounds all well and good but I’m not-- I don’t do it in all areas of the reading ‘cause I’m still trying to learn how it goes. I’m trying to-- you know, every year you get better and better, focus it one way and it’ll become easier to transfer it, so... and I kind of know what I have to do but I just don’t always do it, or not always doing it right. ... But I’ve had a lot of support in helping me with that too. So I’ve been very fortunate in that sense. If I don’t know, I can take what I have to somebody and say, ‘help, what did you do, what should I do, I don’t-- or I have, this information, I’m not quite sure what to do with it.’ So, I’m fortunate that I have that here.... It’s a huge school.... So there’s a lot of information and knowledge out there that we can use.”

This teacher seemed anxious to learn and had acquired an extensive language background, which helped her in teaching word analysis. However her main concern was about her teaching. Whereas Teacher 9 was still learning how to teach, in contrast, Teacher 16, who had about 17 years experience, was able to give a more direct answer to

the same question, was able to describe how she used assessment information, and was more focused on her pupils:

“It helps me to group them, helps me to just to know what to say to their parents when I find a problem, now I have to justify it. So I have to be able to say, well, this is what I’m seeing. Consistently. There’s a problem here and it’s consistent. There’s a problem there, it’s consistent. And this is what I think might help if we try it this way. Together with parents. Or if they-- especially if they need testing. ‘Cause then if I have a child whose reading is related to terrible behavior, which definitely does happen sometimes, then I need to have an anecdotal record of all the different times he’s disrupted himself and others, and he’s-- how is he able to continue to-- how can he read if he can’t sit? You know. So we need to get to the bottom of that. So sometimes I have an anecdotal record. That’s totally different from what they’re doing in the area of reading but, definitely, it definitely does impact on it. So sometimes I need to just be able to speak to a parent. And I have to justify it.”

Teacher 16 had her lesson planning, concern about her own performance, and classroom management issues under control, since these were not discussed. She was able to focus on other aspects of children’s reading development and behavior that she saw as affecting a child’s progress. She had a well-practiced solution available that she felt worked for her and that she could immediately use to address the problem.

Awareness of the influence of factors other than academic or instructional conditions gives the teacher an additional window into children’s functioning in the classroom. Experienced teachers have a broader view of their children which can be used when they are assessing their children’s progress.

What Were the Findings on the Other Variables with Regard to Experience?

The ratings on experienced teachers’ assessment practices showed no difference from that of novices. Contrary to expectations, it appears that teachers who had been

teaching for many years did not gain expertise in their use of assessment even though they had more teaching background than novices. These teachers did not profit from their day-to-day experiences teaching reading. Similar results were found with regard to content knowledge. No gains were made as a result of experience alone. Despite exposure to repeated use of assessments and terms used in reading programs and teacher manuals, teachers did not acquire any additional knowledge in these areas. In the tests of knowledge of phonics and language structure, the two groups again did not differ. Many schools used phonics-based reading programs, and even in schools where whole language programs were used in the classroom, the teachers talked about and were familiar with providing phonics instruction in their practice. Nevertheless, experienced teachers did not show greater knowledge of phonics or language structure than novices as a result of having incorporated this instruction in their teaching for several more years.

Similarly, theoretical orientation to reading did not result in a significantly higher phonics orientation in experienced teachers. Although transcripts indicated that teachers varied in how much they stressed letter-sound knowledge in word identification, both experienced and novice teachers realized its value in decoding words. They all emphasized this skill to some extent in their instruction. This observation is consistent with the Pressley et al. (1996) and Baumann et al. (1998) studies, which found that teachers used combined approaches to reading instruction.

The remaining measure, Teaching Efficacy, was also not significantly related to years teaching. Again, despite having developed routines and acquired skill in teaching and managing classrooms and activities, and responding to children's needs, this was not

sufficient to raise the efficacy of experienced teachers. This result indicates that other factors influence teachers' confidence in their teaching skills.

What May Account for Lack of Differences on the Other Measures?

Interestingly, although most teachers indicated on their Written Questionnaires that teaching experience was one of the most helpful ways of learning to teach reading, experienced and novice groups were quite similar aside from their references to non-academic areas of children's functioning. Many teachers even wrote additional comments on their questionnaires about the value of experience for them, e.g., "(Teacher education courses) gave me some background, but the real learning took place in the classroom...My experiences in the classroom have helped me see which techniques have been successful." Considering the value teachers placed on experience, and that experience seemed to enable teachers to consider in greater depth the non-academic aspects of their students' functioning, it was rather surprising to find that it did not contribute to knowledge or assessment practices.

Perhaps one reason that no differences were found on the knowledge and assessment measures is that many of the experienced teachers lacked the background in reading instruction and language before they acquired experience and did not take further courses. An inspection of the Written Questionnaires showed that some teachers had taken only one or two semesters of required undergraduate reading methods courses if they intended to teach elementary students. Others had not taken any undergraduate reading courses. Some teachers who obtained Master's degrees in educational fields had

taken no reading or linguistics courses. Others might have taken a required graduate course if they were thinking of teaching in primary grades. Some other teachers had studied in different fields; for example, Art in Elementary School, and had taken no reading courses.

The Ehri and Williams (1996) model of teacher development assumes that teachers begin with a knowledge base when they start teaching. A pre-service program that includes information about written language, reading processes, reading disabilities, methods of teaching reading, and instruction in assessment strategies provides the information they need to begin teaching. As they gain experience teaching, they can combine information they obtain from their students with their own knowledge base and improve their effectiveness in teaching reading. In the case of teachers who had minimal reading coursework, it is apparent that they had a smaller knowledge base on which to build. This may have prevented them from combining student information with background knowledge. At the same time, they were developing experience and knowledge about their students. Perhaps what is reflected in the high estimate that teachers gave to experience is the practice that enabled them to develop their practices, their schemas and routines. Since they were more sophisticated in their teaching practices than novices, they were better able to attend to other areas of children's functioning. The result was the additional focus on non-academic areas of their children's development.

Are There Alternative Explanations for the Findings on Experience?

Several factors may explain the findings. One was sample size. Only 20 teachers were interviewed, and the findings could be unique to this group. A larger sample of teachers would need to be tested to see if differences found between groups in this sample, or lack of differences, remain true in a larger one.

Other factors due to the composition of the sample can also explain the findings. Characteristics of the teachers and schools or classes are confounded with the experience and coursework variables, thus offering alternative explanations for the results. One of the differences between groups was in socioeconomic level of the schools. Most of the experienced teachers taught in higher SES schools where at least 50 percent of students were reading at or above grade level on the district-wide reading test. In comparison, most novices taught in lower SES schools where 50 percent or more of the students were reading below grade level. The low performance of novices' schools might indicate a higher concern of theirs with academic performance. The result may have been that these teachers were not inclined to think about non-academic influences affecting progress. They may have been more focused than the experienced teachers on making efforts to increase their students' reading achievement, thereby reducing the likelihood of thinking about home factors or students' personal attributes.

Likewise, homogeneity of classes was an issue. Most novices taught heterogeneous classes while only half of the experienced teachers had mixed-ability classes and the other half taught homogeneous classes, either higher or lower performing. In comparison, only one novice taught a low-performing homogeneous class. The

remaining novices' classes were mixed. Because of general higher achieving students and homogeneity of classes for the experienced teachers, they may have had more opportunity to think about influence of home or personal factors on reading performance because they had a more limited range of reading skills to consider. However, since the results support previous research which showed that novices and experienced teachers differed in references to non-academic (i.e., social and behavioral) factors (Borko & Niles, 1982), the range of reading skills being considered by teachers during the think-aloud may be less a factor than their ability to think beyond classroom and academic influences.

Consideration of limited ranges of reading skills could also be an alternative explanation for the measures where no group differences were found. Most of the experienced teachers may not have had as many problematic reading behaviors as novices that caused concern. However, at the same time, the experienced teachers who were teaching high performing students or homogeneous classes when the interviews were conducted had previously taught mixed-ability or low-achieving students. In these cases, they had undergone prior opportunities to increase their knowledge and assessment strategies by their exposure to a wider range of reading skills. In addition, the higher-achieving classes always had students at the bottom of their rankings whose reading behaviors suggested that they needed more attention to improve their skills. The increased attention to these students would have been reflected in the assessment ratings.

It is possible that other factors influenced the results as well. Understandably, experienced teachers, on average, were about 15 years older than the novices, a fact that

could have influenced the results in unanticipated ways. For example, courses in reading instruction in the past may have focused on different methods than the more recent courses taken by novices. In one case, an experienced teacher complained that her methods courses 25 years ago had nothing to do with the realities of teaching in the classroom. The main thing she remembered from her teacher education courses was that of cutting paper into various shapes, perhaps letters, to use in instruction. A response in her written questionnaire was, "I believe you learn by teaching. Some things I learned had no real merit in classroom". A study focusing on differences in specific courses taken by experienced and novice teachers might allow an accurate comparison.

Experienced teachers in this study also tended to have larger classes than the novices. This may have allowed them less instructional time to spend with each student. They therefore might have been more likely to think about explanations other than instructional to explain reading achievement, such as home or child characteristics. With less time, they might also have had less time to focus on acquiring additional knowledge of the reading process or practicing different assessment strategies. However, these teachers had previously taught different types of classes and in different schools, so that their experience had included all types of students over the years. This learning would have been reflected in their knowledge and assessment scores.

Additionally, experience was not significantly correlated with the two coursework measures, indicating that experienced teachers had not taken more courses despite having taught more years. In fact, negative relationships between years teaching and amount of reading coursework suggest that the experienced teachers had taken slightly fewer reading

and language courses than novices. An explanation for this might be that novices were more accurate in reporting the number of courses they had taken because these courses were more recent. Experienced teachers may not have had, or may not have been able to find, all their records and thus relied partially on memory in reporting how many courses they took in reading and linguistics. This might explain the discrepancy between the number of courses reported by each group (\underline{M} experienced = 3.9, \underline{SD} = 4.0; \underline{M} novice = 5.9, \underline{SD} = 3.2). Experienced teachers who had taken additional courses during their years teaching had made a note of it because these courses were more recent. Future research might focus on accuracy of reporting or memory of coursework taken years earlier.

Alternative explanations limit the certainty of the findings on experienced-novice differences. However, given that the results of the present study are consistent with findings from previous research comparing experienced teachers or experts with novices (Westerman, 1991; Berliner, 1991; Leinhardt & Greeno, 1986; Borko & Livingston, 1989; Borko and Niles, 1982), it can be argued that experience does allow teachers to think more globally about their children.

The lack of group differences in teachers' focus on alphabetic, letter-sound, and word reading processes in the think-aloud, and in their assessment practices and content knowledge also supports the Ehri and Williams (1996) model. In cases where experienced teachers had acquired background knowledge, their content knowledge and assessment scores were higher than those of teachers with less background in reading. The fact that content knowledge was related to assessment practices and the think-aloud category referring to alphabetic processes suggests higher general knowledge in teachers

with more background in reading instruction and language. A study that controls for extraneous variables should be conducted which may then be compared with the findings here.

How Did Teachers with Differing Amounts of Coursework Compare?

In contrast to experience, teachers with more background in reading instruction and language showed more practice-based working knowledge, more advanced assessment practices, and higher content knowledge than those with less background in coursework. The significant correlations of measures on reading and linguistic courses indicate that teachers who had taken courses in one of these areas were more likely to have had courses in the other area.

These results show support for hypothesis 2, which predicted that teachers who had more coursework in reading and linguistics would show higher levels of expertise in working and content knowledge and use of assessment in the classroom. As with experience, however, the teachers who had more training did not differ from those with less coursework in theoretical orientation to reading or in teaching efficacy. The latter results did not support the prediction in hypothesis 2 that teachers with higher coursework would have a higher phonics orientation and higher teaching efficacy. This suggests that other factors may influence these views and beliefs.

For the think-aloud, the positive significant correlation between coursework in reading instruction and the word-reading and alphabetic categories suggest that teachers who had taken more courses in reading were using more working knowledge in ranking

their children than those with fewer courses. In other words, teachers who talked a larger proportion of the time about the skills involved in letter-sound associations and word identification and recognition were more likely to have had more formal training in reading instruction and language. For the remaining categories in the ranking task, it seems that teachers who had taken more courses in reading instruction were no more likely to associate non-academic or language factors with children's reading growth than those who took fewer courses.

For the assessment practices measure, coursework in reading was the main contributor to teachers' knowledge and use of assessment in the classroom. The role of coursework in language structure was low. However, given the small sample size, it might be assessed again in a larger study to evaluate its contribution.

Similarly, for the reading terms definitions measure, coursework in linguistics was a significant contributor to this knowledge, indicating that a portion of teachers' knowledge of these terms was due to knowledge they had acquired in their study of language structure. The significance of the relationship between number of courses taken in reading and the reading terms definitions suggests that, although reading courses played a smaller role, it contributed partially to teachers' ability to define these terms. This relationship should also be examined in the future.

The relationships among the coursework measures, references to alphabetic processes, assessment and content knowledge show support for the third hypothesis, which predicted that teachers who had taken more coursework would apply their knowledge in the various dependent measures. First, teachers who had taken more

courses in reading and language structure used more advanced assessment strategies than those with fewer courses. This finding is discussed in greater detail under the Assessment section below.

Second, the significance of the relationships between both coursework measures and reading terms, especially the contribution of linguistics courses, was interesting because it demonstrates how this type of linguistics coursework affects teachers' understanding of terms related to phonological capabilities and reading disability; i.e., linguistic terms such as phonemic awareness, auditory discrimination, and dyslexia. Teachers who had taken courses that included instruction in English language structure were those who were better able to define these terms. The ability to observe and recognize these skills as their pupils were learning apparently helped these teachers assess how well decoding skills were progressing, discover difficulties and address them. The Content Knowledge section below discusses application of this knowledge and the influence of coursework.

Third, the association of the think-aloud categories referring to alphabetic knowledge and word-reading with the two coursework variables indicates that teachers who had taken more courses were considering these skills to a greater degree than those who had taken few courses. The association of the alphabetic category with knowledge of reading terms and use of assessments supports the view that reading coursework, and courses in language structure, form the basis for teachers' knowledge and assessment practices. The teachers with more training attended several aspects of children's skills that support and promote growth in alphabetic knowledge and word reading. They used

their content knowledge to support their day-to-day assessments of alphabetic and word reading skills and adjusted their instruction accordingly. Whereas teachers with minimal training talked about performing required assessments with little or no explanation of how they would help instruction, teachers who had taken more courses easily recognized the value of assessments and keeping track of how individual students' progress. One teacher commented, "...you need to assess because if you don't...where do you go? It's like a doctor who prescribes your medication but he never diagnosed the problem. So assessing is mandatory. And I do it formally, and I do it informally..."

Assessment. The assessment practices of teachers who had taken more reading coursework, listed in the Results section, are consistent with the kinds of practices found in previous studies (Block, Oakar, & Hurt, 2002; Hoffman and Pearson, 2000), and show use of a greater number of instructional strategies, consistent with Westerman's (1991) findings. In the Block et al. (2002) study, characteristics of teachers demonstrating expertise in literacy instruction were examined. The researchers compiled lists of effective literacy teaching practices of Grade 1 to 5 teachers in seven English-speaking countries. Without focusing on materials or philosophical orientation, some of the characteristics that all teachers with expertise possessed, according to the literacy supervisors who nominated them, were being energetic, teaching with flexibility and understanding to meet individual student needs, use of effective instructional repertoires, frequent scaffolding, supporting pupils in learning new concepts, knowing how and when to combine methods that would result in literacy growth, assessing progress and relating it to previous experiences. For first-grade teachers in particular, Block et al. identified

behaviors showing expertise, which included “reteaching, reframing, reminding, and reviewing” information using different content, modalities and texts. The teachers moved around the room while students worked, corrected errors on the spot and in positive ways, created lessons that motivated students’ interest in the literacy lessons, and kept detailed and individualized records of their students’ reading performance.

Although the teachers in the present study were not observed or judged by supervisors as in the Block et al. (2002) research, many of the behaviors noted by Rater 2 from responses of the highly rated teachers are consistent with traits of effective teachers listed by Block et al. They talked more than teachers with less training about the needs of their children and how they responded to these needs, adapting their instruction to the skill to be learned. For example, if one or more children were having trouble learning something, they would focus a lesson on that particular skill either in groups or individually. They also worked with each child, especially those who needed extra support. They paid attention to signs of progress and checked up on how children were learning their skills. They closely observed what each child was doing to be sure they were mastering the skills they needed to make progress. They did this on a daily basis, or very frequently. They used several different kinds of assessments, both formal and informal, and sometimes made up their own as the lesson was going along because they wanted to see whether certain students were able to perform the skill. One teacher commented that the reason she used different assessments was that she could balance her instruction. That is, she could look at her running records and invented spelling and decide on an appropriate textbook, and how to direct the lesson. Another teacher used

results from standardized tests to compare with her own classroom assessments to see whether there were differences, to have an objective measure to check against her own assessments. The teachers were specific – they specified what the assessments told them and they talked about specific skills. Did the children know words and letter sounds? Did the invented spelling represent phonemes accurately? Did the child understand language? What did the reading errors tell them? Which children were learning the skills successfully, and which children were not? They connected their assessment information with their instruction, and used assessments to continuously improve their lessons to work with students who needed extra attention. These teachers were creative in their teaching strategies. For example, some would invent a new activity in class based on common mistakes that children were making. They used the assessments to group their children and changed grouping when necessary according to the skills to be learned or practiced:

Teacher 18: “If I find that a majority of my students are not getting a certain task or certain lessons or, or a certain thing, then I’ll teach it as a whole group. And I’ll maybe spend a week on it. And it depends...if I find that a small group of my kids are not getting a certain task, then I’ll teach it for a day or two because not everybody needs it...and I’ll do it as a whole group just to support those kids who don’t have that information or that ability, but I’ll do it for two days. And then I’ll work in small groups to support that group that didn’t know it. But sometimes I find that a majority of my kids don’t have a certain ability and then I would teach that ability for a whole week during whole group... in different ways... like... making a sentence, making a story, writing them and creating them, or just sounding them out. Or playing a rhyming game, what rhymes with PEOPLE, what rhymes with PLAY, what rhymes with... Just things like that, just to build on it. And-- so that they can really, internalize the lesson or the strategy or the skill...”

Another distinction was in the subject of record keeping. Although Rater 2 had not made a specific note of teachers' record keeping, which was one of the qualities of effective teachers in the Block et al. (2002) study, this activity, combined with the other aspects of assessment, was also one of the factors in the decision on the rating (C.R. Langenthal, personal communication, August 17, 2003). These teachers kept records of children's progress for a number of reasons. They wanted to keep track and have an accurate record of each child's skill level, and to know the student better. They also wanted to report to parents and other teachers or an outside evaluator, if necessary; to have it in writing so in case a child needed to be tested, the teacher could show what the child was doing in order to have evidence to support the recommendation. The following examples of teachers rated 4 and 5 demonstrate the reasoning teachers with higher ratings used in their discussions on record keeping, and differences in their recording of information:

Teacher 3: "I keep a lot of written records of their progress... in the beginning of the year I just do a lot of observing them and watching how they handle themselves. 'Cause it's all, all those physical, gross motor things, it's related to reading. So I keep a record of it and really lean heavily on that. When they first come in, I don't just put this paper in front of them, take this test, whatever. Another thing I do when they first come in, I do sit with each one of them individually and I find out what letters they know, which capital letters, which small letters, what numbers they can identify. Can they count, and I have a folder on each child. I guess that would be my first written diagnostic on each child. And once I do that I feel stronger 'cause I feel like I'm beginning to know the student... Running records, which words they can identify, which words they can't from the sight word list...how they respond, actually, during the lesson. Even during the lesson I'm taking notes on little index cards...for the next lesson..."

Teacher 17: "I'll just make notes, every week I write notes--every day, I have a chart in front of me and I just, I write little notes down as I'm going along. I also keep records on what phonics book they've just completed reading or have not.

...what books I've assigned and which books they've finished and turned in. So each morning I'll check them for which books they read and, if there's a problem, or if someone's having difficulty, I take notes on that and just keep it in the little grade book.... If I think someone has attention difficulties or dyslexia, I want to have the specific reasons documented. And I like to have evidence that, *'is responding to hard questions about comprehension orally, but cannot respond to them in writing,'* or, *'is not able to sound out words and we've had, 1, 2, 3. Here's my notebook, 25 lessons on short vowel sounds. That's a problem.'* It's concrete evidence'."

In contrast to the flexibility and skill with which highly rated teachers performed their assessments, teachers who had taken few courses and had low ratings were not as flexible. They did not seem to keep adequate track of skill development, for example:

Teacher 16: "If they have capability, they pick up. The other children who already come into me reading...I have enrichment...they become my helpers, they help out...if you're having a problem with a word and you can't read the directions... I've always got them sitting next to (a good reader)...so that they can ask the person next to them."

Although a good reader can help the poor reader identify or sound out words, it would help the poor reader more if the teacher attended to the process of word identification; that is, the strategies the child was using and what skills the child needed to learn.

Another characteristic that was typical of teachers with low ratings was that they often talked about what activities they did, but did said very little, if anything, about how the lesson helped children learn. For example, one teacher explained how the class performed the phonemic awareness activities used in the reading program, but never said how this related to their decoding skills:

Teacher 20: "Phonemic awareness, that's so much involved in the beginning part of the Opencourt program and, the sounds, the letters, the association, and then you go into the short words and then how words are longer and then you put them

on the board and they can see that the letters, and you count how many letters are in a word and then you start to try to make the different sounds, or how many times you (*claps hands*) clap your hand out. Do you hear your voice when you say the word and beginning sounds and final sounds and medial sounds and, thumbs up, thumbs down, kind of thing where, if you hear T at the beginning of the word, thumbs up. If you don't hear T, thumbs down, all kinds of different games, so that awareness of sounds, and there's so many, it's such an integral part of the beginning of the Opencourt-- every single lesson begins with a phonemic awareness activity."

Teachers with lower ratings were also not clear on reasons for grouping in a particular way, or not grouping. In one case the grouping was rather haphazard with no clear explanation of why new children in the class were placed in a particular group. Another difference was that these teachers generally relied on only a couple of assessments, for example, the school's required assessment, or they had portfolios for each child. They talked about these assessments, but were not clear on what information they drew from these things, or how they used them to improve instruction. For example, they may have talked about doing several different kinds of activities with the class, but not in response to a problem that the children were having. They were following the sequence of the reading program. They did not talk about finding another way to teach a skill, nor did they talk about monitoring closely and adjusting instruction.

There were differences in their record-keeping as well. They did not keep sufficient records to detail or support their observations. They often did not have an organized system for keeping records. If they did have a system, their record keeping was less frequent and they did not explain how the information was going to guide their next steps. The explanations of Teachers 6 and 8, below, involved checking for progress, but

they did not discuss how the information might help them in diagnosing a possible problem, finding causes or solutions, or plan a lesson:

Teacher 6: “Probably not like I should, I guess. The (required school assessment) is a record, the reading portfolio is a record, I could show you that... The phonics test I record, you know, how many did they get right, how many did they get wrong. And I'd say that's like twice a month...” (*Asked if teacher recorded anything else*): “Yeah, you're not going to see much, here you go.” (*Teacher opens a record book in which scores are recorded*).

Teacher 8: “I have their reading, their journals, I have their writing folders, where it's going to show progress, and what level in assessing them. At the end of the year I can tell their progress by looking at their folders... We have 40 step-by-step books, and I can tell which students are able to move on by the ability that they show reading those step-by-step books... How often, at least once a month. Because at the end of the month I do see the progress that they've made with what we've covered in the program.”

These and other similar comments of teachers with low ratings show a lack of the depth of understanding of ways to promote skill development that teachers with high ratings showed. The teachers with low ratings seemed to be using a more limited knowledge base and to have a superficial understanding of how to teach children their skills. Their responses showed that they relied much more heavily on the school's reading program. The highly trained teachers were more clear on what they were assessing and how they were responding to problems and what specific things they did to help their children to move along. They used the reading program chosen by the school as a facilitator of their instruction. In other words, they were using the program but guiding the instruction whereas the reading program was guiding the teachers with less training. Teacher 14 illustrates the difficulty teachers have when they do not have the knowledge to fill in deficiencies of the reading program. Here, she expressed how much

she relied on the old reading program and pointed out her discomfort with the school's new whole language program after she had used a phonics-based program for several years:

“I feel kind of on shaky ground. I felt much more comfortable when I was doing Opencourt...this is a whole new reading system, first year, so I'm on shaky ground here.... I'm using a little bit of the phonics approach. But this is brand new...brand new readers, brand new, a lot of things. The Morning Message is new to me, the shared reading is new to me, although I use Big Books, but not in the same way. I didn't use it instructively. And the Morning Message is new to me. I used to do Class News. So this is a whole different way. I didn't use it as instructively as I use it now. So that leaves me on shaky ground....”

This observation is consistent with Ehri's (1995a) argument and Hoffman and Pearson's (2000) review that teachers with little training in reading and spelling development are more likely than teachers with more training to rely blindly on the reading series or other authorities for making instructional decisions, and less likely to rely on their own knowledge, experience, and judgment.

Content knowledge. The test of teachers' phonics and linguistics knowledge was not significantly related to courses in either reading or linguistics. Although it fell short of significance, the raw data showed that the teachers who had the higher phonics-linguistics scores also tended to have taken more linguistics courses. The significant correlation of the phonics-linguistics measure with reading terms knowledge suggests higher general content knowledge, particularly with regard to linguistic capabilities. This general knowledge seems to have supported teachers' assessments and their thinking of development of alphabetic skills, and it provided a basis for detecting difficulties in skill development.

It is not surprising that teachers who had taken more coursework in structure of language received higher scores on the reading terms definitions. These definitions included terms referring to specific knowledge covered in courses focusing on language structure and development such as phonemic awareness, auditory discrimination, and dyslexia. Review and comparisons of teachers' responses on the definitions measure show the differences. For example, knowledge about how phonemic awareness affects developing decoding skills is essential for informed teaching of reading and assessment of children's development in this area. In fact, most schools in this study required that their teachers assess each child's reading-related skills, including phonemic awareness, as measured by an invented spelling task. Many teachers with few or no courses in language structure did not talk about what the effects of low phonemic awareness were, and often related phonemic awareness to knowledge of letter sounds:

“Phonemic awareness is where they are, know the sounds of the letters, they know the sounds like, A blank E, says long A. And E-R says /-er/ and they put it together and they sound out the words.”

Defining phonemic awareness in connection with letters and their sounds, and not specifying the more basic concept that it involves hearing individual sounds in words without associating the sounds with letters, was common among teachers who had taken few courses. This observation is consistent with Rath's (1994) finding that teachers who had had little or no training in code-oriented reading programs or coursework in linguistics often confused phonemic awareness with phonics.

Similarly, teachers who had not taken linguistics courses made a common mistake in defining dyslexia:

“Dyslexia, unfortunately, is children who read backwards. They are seeing almost mirror image.”

“Dyslexia, I had a child who was severely dyslexic and everything was too difficult for him...and too many reversals.”

In contrast, teachers who had taken these courses were much more familiar with these terms:

“Phonemic awareness is how well a child understands the various sounds of our language. I think there are something like 46 sounds that are made by 26 letters and can the child hear all the sounds and know they’re there. Do they hear the difference between /br/ and /tr/?...that’s a very important distinction. If they can’t hear it, it’s hard for them to read it.”

“Phonemic awareness is an auditory skill where children distinguish sounds and can figure out rhyming sounds just by listening, can listen to sounds in a word and if you tell them, if you tell them the word FOOT, and you tell them, “where is /f/? Is it at the beginning or is it at the end?” and they don’t need to see the letters and they can tell you, “oh, it’s at the beginning.” And they can distinguish sounds in words being in the middle, in the beginning, or at the end just by listening.”

“Dyslexia is a problem with making the connection between sounds and letters...that A is /ă/ and /uh/...they’re confusing it with another letter. So they try to build phonemic awareness first...then later on build in the phonics to match those letter sounds so that they’re better capable of trying to read text and look at text...it’s something auditory...they’re not making that connection.”

“Dyslexia is a description of a reading disability, or difficulty, where the child or the adult is having difficulty making the connection between the letters and the sounds they make. And they’re having trouble reading.”

In the case of knowledge of phonemic awareness, teachers would be expected to have an understanding of what they were measuring on the school assessment so that they could not only provide additional support to children who needed it, but also be able to give their own phonemic awareness tests that did not involve letter knowledge. Teachers with little training and a superficial understanding of phonemic awareness apparently did

not have the knowledge to use this information as effectively as possible in their practice. These examples support Moats and Lyon's (1996) argument that teachers should have knowledge of beginning reading processes, phonetics, phonology, morphology, and how beginners learn sound-symbol correspondence so that they can provide appropriate instruction and spot difficulties.

In the case of knowledge of dyslexia, misinformation may have been damaging to the child:

Teacher 6: "#21 still doesn't know all her sounds. She can't blend and sound words. Sometimes she knows the sounds but she can't put them all together to form the word, which is a problem. In Opencourt we're doing one sound at a time, too. So, concentrating on one sound, she knows that the sounds are going to be... right now we're doing long U. She knows it's going to be long U, so, when she sees a U, or she sees any of the spellings that long U makes, she should know that it's going to say /ū/, and she still doesn't understand the whole concept. So she's really struggling.... And she failed two subjects last year at (a private school), she's failing in here as well...it's probably a maturity issue with her. So, hopefully, if we do hold her over that one more year in first grade, it may be exactly what she needs. They're holding off on an evaluation for her right now. I don't think it's dyslexia or anything like that. She doesn't make any reversals... holding her over may be what she needs as well."

This teacher had a child who was not learning and the child had already spent her second year in first grade. She was recommending holding the child over again and labeling it a "maturity issue". At the same time she did not know what dyslexia was and could not diagnose a reading behavior that suggested dyslexia. If the child had been held back again at the end of the year, it was quite possible that she did not progress any further the following year. Several of the teachers in this study had holdovers in their classes and had commented that those children should be further along in the class than they actually were, or that the children remembered the books or stories from the previous

year but were not reading them (i.e., decoding). None of these teachers commented that the holdover had been making adequate progress.

Lack of knowledge may not be troublesome if a teacher with little or no training is working with children who have little or no difficulty learning to decode. However, when this teacher is placed in a classroom with young children who are at risk for reading difficulties, she or he may not recognize signs of a possible reading disability. If a school assessment calls for a test of phonemic awareness and the teacher does not understand how to interpret it or what to do with the results, the children whose scores are low are less likely to receive appropriate further assessment and instruction from the teacher that can help overcome the difficulty. As a result, treatment may be delayed until the children are older and have already suffered the consequences of slower sight vocabulary growth and falling behind their peers (Torgesen, 1998; Catts, 1997).

Teachers in this study with few or no courses often had difficulty identifying or addressing a child's reading problem in the classroom before seeking outside help. In the example of Teacher 6, lack of knowledge might have allowed her to attribute reading problems to lack of maturity and, not knowing what reading behaviors to look for or what to do about it, overlook a possible reading disability.

What May Account for Differences Found between Teachers with More and Less Coursework?

The relationships among the two types of coursework, references to alphabetic and word reading processes, assessment ratings, and content knowledge point to effects

of the increased knowledge the coursework provided these teachers. No distinction was made in this study between whole language and phonics oriented programs in scoring the number of reading courses teachers reported. However, the fact that highly-trained teachers had focused on some form of reading development in their studies, whether they stressed literature-based approaches or code-oriented, suggests that these teachers had in mind more skills and reading behaviors that they could assess, and more strategies for individualizing instruction because of their coursework. The results showing that the teachers focused on alphabetic and word reading processes more than teachers with less training support McCutchen et al. (2002b) and Spear-Swerling and Brucker (2004), who found that teachers with greater knowledge of reading used more explicit instruction of the alphabetic principle in the classroom. The association between content knowledge and the alphabetic and word reading categories supports McCutchen et al.'s (2002b) findings that teachers' reading-related content knowledge was related to their focus on attention to sounds and letter-sound relationships in their instruction.

The results are also consistent with Pressley et al.'s (1996) findings of "outstanding" teachers who were considered knowledgeable and showed awareness of the need for attention to word-level learning when these skills needed improvement. The findings on assessments support the Block et al. (2002) study, which listed characteristics of expert teachers. The findings on content knowledge show some support for Moats and Lyon (1996) and Spear-Swerling and Brucker (2004) who argued that it is not sufficient for teachers to be literate, as shown, for example, in the Scarborough, et al. (1998) study in which the researchers found that teacher education students had difficulty with a

graphophonemic task in which they had to count number of phonemes in a list of words. To teach reading and spelling, teachers need to know concepts related to word structure, such as, vowel rules, digraphs, and consonant blends. They should be able to identify syllables and count phonemes. With this knowledge teachers can correctly assess children's errors, give appropriate feedback, and useful instruction. The teachers in the present study whose content knowledge and linguistic knowledge was high were more attentive to children's skill development and more likely to assess accurately.

Are There Alternative Explanations for the Findings on Coursework?

The conclusions that coursework had an impact on teachers' knowledge and assessment must be tempered by the fact that the sample was small and heterogeneous, and that confounding variables such as socioeconomic status or student achievement levels offer possible alternative explanations for the results. However, the higher knowledge and assessment practices of teachers with higher coursework appeared consistently in the teachers with higher training but with differing school and classroom characteristics. The teachers with higher and lower amounts of coursework were teaching in both high and low SES schools. Those with similar backgrounds in their courses showed similar knowledge and behaviors in their schools, whether high achieving or low.

How Were Variables Assessing Similar Characteristics or Capabilities Associated?

The fourth hypothesis concerning relationships between or among similar variables was supported. Reading and linguistics coursework were significantly related.

Reading coursework represented a more general area of study than linguistic coursework, which was more focused on structural aspects of language. This relationship showed that teachers who had taken courses in one area were likely to have taken courses in the other as well. Training in reading coursework provides a foundation for teachers to apply the knowledge they have acquired in their instruction.

Similarly, measures of content knowledge were related. Teachers' general content knowledge, shown in their reading terms definitions was related to their knowledge of phonics rules and language structure. These were linked to their focus on children's alphabetic learning in the think-aloud. This suggests that the teachers with more general knowledge of reading topics and linguistic terms also tended to have higher knowledge of phonics rules and structural aspects of words, and they placed high importance on children's alphabetic knowledge. These kinds of knowledge allow teachers to understand terms used in teacher manuals, reading programs, tests, and other instructional materials, and make them more likely to recognize that difficulties with learning letter sounds, segmenting, or blending can be symptoms of a possible reading disability.

For teaching practices, the significant relationship between the alphabetic category and assessment practices suggests that teachers who make greater use of their assessments focus on children's alphabetic knowledge when monitoring their pupils' progress. When supported by content knowledge, teaching effectiveness is likely to be higher.

With regard to the TORP and Teaching Efficacy scales, these were not correlated with the other variables, indicating that factors other than those measured in this study are related to phonics orientation and teaching efficacy.

What Might Explain the Lack of Findings on the Teacher Efficacy Scale and TORP?

While the results of the present study show the critical importance of teacher knowledge in that the teachers with more knowledge demonstrated their proficiency through attentiveness to the alphabetic and word-reading progress of their students, higher content knowledge, and extensive reliance on assessment in their instruction, other findings were less clear, or were somewhat puzzling. First, neither of the teaching efficacy scores was related to coursework and experience. Therefore, the findings do not support the assumptions in hypotheses 1 and 2 predicting that teachers with more experience and more coursework would show higher self-efficacy in teaching. The finding that the efficacy measures were not related to any of the other variables indicated no support for the prediction in hypothesis 4 that efficacy would be related to teaching practices.

The lack of significance of correlations of the efficacy variables with experience and coursework suggests a possibility that, in addition to the small sample size, that there are factors not measured in the present study that contributed to teachers' perceived efficacy. In considering TE (teaching efficacy, the sense of personal responsibility in student learning and belief that one's effectiveness is affected or limited by outside factors), several factors could explain the lack of findings. These may include a combination of considerable variation in income and achievement levels of the schools, class size and composition, amount of control or independence in decision making the school allowed the teacher to make concerning instruction and assessments, and influence

of administrators' and parents' stated expectations. In the following example, two highly trained teachers, one experienced (Teacher 17) and one novice (Teacher 7), with high content knowledge, and a 5 rating in assessment practices, scored at the extreme ends of the scale in TE. Their schools were at the opposite extremes in the amount of control the school had over the teacher's decision making, as well as in student characteristics, income level, and achievement. Teacher 17 taught in a suburban private school that allowed her broader control in instructional decisions than Teacher 7's urban school, which used a scripted reading program that allowed less opportunity for the teacher to use her knowledge to make decisions.

Teacher 17: "I don't...rely too heavily on (standardized tests). I think you can have a great kid do very poorly on them. But I think if you have a great kid who does poorly on them, you've got to look at it...And you can have a kid that you think is ordinary do extremely well. And then you've got to look at it, say, am I teaching this kid well enough, am I challenging them. I think they're very useful tools for checking how you're teaching. And I want to use more of-- I'm not doing it now, but I'm trying to read the manual. The Computer Curriculum Corporation program, CCC, I use it heavily for giving myself assessment in math. And I understand I can do the same thing with reading, where it will give me reading passages. I like generating reading levels. I would like to have a better understanding of what level they're considered to be on by more standardized tests. Just so that I know how I'm teaching, so that if my internal checkpoints are correct are not. I'm finding with the math I can push them harder, faster, than I thought. Because it goes ahead quicker than I was teaching. So I think that in the same way I could be doing that in reading as well."

Teacher 7: "We have a specific assessment sheet that we have to record each thing, like if I think they're getting decoding skills, if I think comprehension is strong, if I think--whatever--every component that there is in the reading program, I have to comment on how well I think the children are doing... I usually use it for my review days. I also was using it for grouping children together. I really can't use it further because they're not my regular students. If they were my regular students I would take that information and do things throughout the day that would elaborate more. But within the reading program, I use it primarily to group

them and primarily to do my reviewing--what needs to be reviewed and what can I continue with.”

In the first example, Teacher 17 (PTE=5.45, TE=5.71) was learning about and considering using a computer program to apply to her teaching and assessments. She seemed to feel free to choose a program she believed would advance her students, and perhaps to recommend to school administrators. She was clear about what information she would obtain from it and how she would use it. In the second example, Teacher 7 (PTE=4.22, TE=2.29), used information from her assessments for a specified purpose and could think about or plan how she was going to use it, but was clearly limited by the reading program prescribed by the school for the at-risk students she was teaching. By necessity, she was more focused on fulfilling the requirements of the program and working within it than using her imagination and skills to help her students improve. Teacher 7's PTE score indicated that she felt fairly capable of meeting her students' needs, and she commented that she could do more with her assessment information in her regular second grade classroom. However, her TE score was one of the two lowest in the entire sample. It may have been that for this teacher, the highly structured reading program in the school exerted such a high degree of control over the teacher's actions with her at-risk students that it took precedence over her sense of responsibility in effecting her students' learning. This aspect, in addition to some negative influences of her students' backgrounds, may have had an effect on her teaching efficacy.

Factors such as those present in the schools of Teachers 7 and 17 demonstrate the possibility that differing situations can influence a teacher's sense of control over the

teaching conditions. Conditions that restrict teachers' sense of control could lead to feeling that external factors and rules have a greater impact on the effectiveness of their teaching than their own efforts.

Regarding PTE (the belief that one has the skills and abilities to bring about student learning), it is puzzling that the relationships of the efficacy variables with coursework, assessment practices, or the dependent variables were not significant, since some of the assessment behaviors of the more highly trained teachers, listed above, were consistent with teachers with high efficacy (Gibson & Dembo, 1984) and would have been expected to reflect higher PTE. The teaching behaviors of teachers with greater expertise are also consistent with findings by Allinder (1995), whose high PTE teachers set higher goals for their students, and with Wertheim and Leyser (2002), whose high PTE teachers showed intent to use individualized instruction and diagnostic teaching strategies in their classrooms. In addition, while teacher knowledge was not measured in the Wertheim and Leyser study, the researchers noted that their data suggested higher background knowledge in teachers with higher PTE.

A possible reason for the lack of significant results for this aspect of teaching efficacy may be that some of the teachers with higher training might have needed more teaching experience in addition to the requisite subject matter knowledge, and the number of experienced teachers with high training in this study was not enough to show a significant difference. According to Bandura (1997), it is not sufficient to possess knowledge for successful performance of a skill. The knowledge can serve as a guide in performance, but an individual also requires feedback about how accurately the

performance matches his or her cognitive representation of the skill. This feedback allows the individual to correct or make adjustments to his or her actions. Repeated adjustments of the behavior enable the person to more closely match the behavior to the cognitive representation. Performance of the skill in accordance with one's expectations should then raise efficacy. In the case of the participating teachers, those who were more highly trained may have shown more knowledge and flexibility in their practices and performance. However, teachers with more training and less experience may not yet have had enough teaching experience, and thus not as much feedback as experienced teachers. As a result they may not have felt as confident in their skills and effective in their teaching as those with a similar knowledge base who taught for more years.

In addition to the above possibilities, variables besides differences in schools, pupils, training, and experience can have an effect on efficacy, such as teacher's job satisfaction, their motivation to learn, school and classroom climate, and other influences, may affect efficacy. Before evaluating separate or combined effects of training and experience on teaching efficacy and the relationship with teaching practices, other contributing factors would also have to be considered.

One interesting finding regarding teaching efficacy was the link between PTE and the think-aloud category, Motivational Conditions. This connection was difficult to interpret, and given the number of correlations performed in this study, it may be a spurious relationship. However, one explanation may be that teacher modeling could influence the relationship between PTE and children's motivation to perform in the classroom. Motivation may be mentioned to a greater extent in teachers with higher PTE

because those teachers are projecting their own feelings of ability. This remains a link to be further explored at a later time.

Finally, the TORP was not significantly related to any of the think-aloud categories, indicating that a higher phonics orientation did not necessarily translate into a higher focus on alphabetic and word reading processes. This is consistent with the Pressley et al. (1996) and Baumann et al. (1998) studies, which showed that teachers used combined approaches.

Surprisingly, an interesting outcome of the data analysis was that, based on the significant but moderate positive correlation between the TORP and the phonics and linguistics measure, teachers with a higher whole language orientation on the TORP tended to perform better on the phonics and linguistics measure than teachers with a lower TORP score. This result shows that theoretical beliefs about reading instruction may have some relationship to knowledge of word structure, but not in the expected direction. The finding is not consistent with either McCutchen et al. (2002b) who found that the TORP showed little relationship to teachers' linguistic knowledge as measured by the Moats' Informal Survey of Linguistic Knowledge (Moats, 1995), or with Rath (1994), who found that performance on a phonemic awareness test did not appear to be related to theoretical orientation.

The link might be partially explained by the relationship between courses taken in reading and linguistics, which shows that teachers who had taken more courses in reading instruction, some of whom had received whole language training, tended to also have had more linguistics background. The whole language training may have influenced their

theoretical orientation, but their existing linguistic knowledge or ability did not affect their orientation.

Other factors independent of the teacher's linguistic knowledge, such as focus of the school's reading program (e.g., code-oriented vs. whole language), may have influenced teachers' orientation, as well. A qualitative comparison of the training reported by teachers, TORP scores, and transcripts indicated that teachers whose training or school reading programs stressed phonics were more likely to have TORP scores in the lower (phonics) and middle range. Teachers whose training or reading programs were based on whole language philosophy, tended to have higher scores on the TORP and were more likely than teachers with lower scores to stress in their interviews use of context as one of the strategies children should learn to identify words. However, less than 2 percent of statements in the think-aloud referred to use of context for word identification. While some teachers valued the use of contextual cues as an important word identification strategy, most teachers placed high importance on use of alphabet and letter knowledge and print to identify words either as the primary strategy, or in conjunction with contextual cues. These observations appear to support findings by Pressley et al. and (1996) Baumann et al. (1998) in which teachers, understanding the need to include phonics instruction for decoding while attending their students' higher level needs, strove to integrate both types of instruction in their classrooms.

Conclusions

In sum, the most important issues concerning teachers of beginning readers were development of word-reading skills and alphabetic knowledge, instructional issues

affecting reading, development of language production and comprehension, and motivational conditions affecting children's learning. It appears that experience does not play a large role in predicting teachers' knowledge, but it does affect their consideration of non-academic factors influencing children's learning and performance.

In contrast, the amount of courses taken in reading and language structure seemed to play a large part in teacher's knowledge and assessments. Teachers who had taken more courses showed more working knowledge in their references to children's learning of alphabetic skills. Their ability to recognize and define reading terms used in teacher manuals and other reading materials was associated with coursework in language structure. This relationship seems to be due to the fact that teachers who had taken the courses were able to define the linguistics terms accurately, and these teachers showed high than average phonics-linguistics knowledge. The strongest relationship was found in the link between the amount of coursework teachers had in reading instruction and their ratings on assessment, which indicates that teachers with more coursework in reading instruction performed much more effectively in their assessments than teachers with less coursework. They provided individual attention to their students, and adjusted their instruction based on the assessment information they had obtained. They were flexible, worked on relevant problems with individuals or groups, assessed continuously with different kinds of assessments, kept detailed records, used different types of games and activities to maintain interest, and planned classes depending on what students needed. Teachers rated high on assessments also had high content knowledge, which was determined by their coursework in linguistics. Theoretical orientation to reading

instruction may have directed the teacher to focus more or less on context or letter sounds, depending on the philosophy of the coursework or school program, but it was less important in teachers' practices than knowledge and training.

While these findings need replication, the implications are that teachers with a larger knowledge base, acquired through formal training in reading coursework and language structure, can be much more effective in their teaching and assessment of beginning readers than teachers who take few courses. Experience can enhance performance by enabling teachers to expand their view of factors to consider in assessing their children's progress, but teachers need to begin with a base of knowledge. Berliner (1991) and Leinhardt and Greeno (1986) and Leinhardt and Smith (1985) discussed the fact that one of the most important components of skillful teaching is subject matter, or content, knowledge. The contribution of experience in this study can be a result of gains in classroom management and organization, routines, methods for motivation of students, personal knowledge about students, and social-interactional competence (Berliner, 1991). However, gains in knowledge do not appear to take place if teachers had not taken sufficient courses before going into the classroom. Reading courses that provide a broad range of information on reading instruction together with research-based information on normal development of reading skills, language abilities underlying successful development of those skills, information about when skills are not developing normally, and effective methods of assessment, can provide teachers with a broad knowledge base that can positively impact every one of their students' learning. Additional training in language structure can bolster this effectiveness by enabling the teacher to adequately

teach concepts involving phonics and structure of words. The evidence in this study that coursework is a great deal more important than other factors such as teachers' instructional philosophies exemplifies McCutchen's (2000b) point that theoretical orientation to reading instruction is secondary in importance to teachers' content knowledge in predicting their classroom practice.

Limitations and Future Research

This study has limitations that result from the small number of participating teachers, the diversity of their schools and classes, the confounding of these characteristics with teaching experience, and the characteristics of some of the teachers themselves. The difficulty in locating teachers who fit the criteria that were originally set when the present study was proposed resulted in a sample of teachers, some of whom would not have been included. This sample was quite diverse in number of years teaching in primary grades, school achievement, class size and composition of abilities, and types of schools. Inclusion of teachers currently taking courses in reading acquisition might also have affected results.

With respect to the number of years of experience teaching reading, the plan was to recruit novice teachers with fewer than three years of experience and experienced teachers who had taught for 12 or more years. Because the candidates who agreed to participate did not fit these constraints, it was necessary to narrow this range. Narrowing the range may have obscured differences due to experience, especially among novice teachers, who had as many as 4.5 years teaching experience.

In terms of school achievement and types of schools, the schools differed widely. The original plan was to include teachers who taught in public schools that were similar in achievement. Fifty percent of the children would have been reading at or above grade level on the district-wide standardized fourth grade test in schools performing at or above average levels. Experienced and novice teachers were to be matched as closely as possible to these criteria. In contrast, the actual sample included teachers in public schools whose school performance ranged from very low to very high, one teacher in an upper income private school, and one teacher who taught reading to at-risk second grade children reading at first grade level.

Another issue was class composition. The original plan was to include teachers whose classes consisted of children of mixed abilities to give teachers an opportunity to discuss a wide range of students as they demonstrated their knowledge. Although students in most classes were mixed in reading ability, six classes, including the class of at-risk second graders, were homogeneous. Although all of these classes had some children performing at higher or lower levels than the rest of the group, the restriction in range may have resulted in teachers' talking about a narrower range of skills in their children than the teachers of children with varying abilities. The interviews, then, may not have captured the entire range of teachers' knowledge of reading acquisition.

With regard to coursework, the researcher did not intend to include teachers who were currently taking courses in reading. Including only teachers who were not taking courses would have resulted in a sample that represented practices that teachers were applying in the classroom based on the knowledge they had already obtained and were

using at the time of the interview. They would not have been in the process of acquiring new knowledge about reading. This might have allowed more distinct comparisons between teachers with more and less training. As a result of including seven teachers who were currently taking courses, some of these teachers were struggling to integrate new information with what they already knew from their prior education and experience. This was especially true if new research-based information conflicted with their present beliefs about reading acquisition. The teachers taking courses seemed to be either in the process of trying to develop ways of applying their newly acquired knowledge in their reading instruction, or struggling to accept or reject the conflicting information. For example, some teachers had backgrounds in whole language philosophy and their present coursework was covering phonological processes involved in development of reading skills. One of these teachers commented that, "sounding out a word isn't...something I stress...I look at that separate, phonemic awareness...it does help them sometimes, but it's not their only-- it's by no means-- they know other ways, and they use other ways...they need the strategies to read it without worrying about decoding... I think a lot of them don't get that in first grade. And a lot of them aren't going to learn through phonics. They're not going to learn to read like that. Some kids will, some kids won't.... For reading, we definitely do phonemic awareness activities and we want them to have good phonemic awareness, but we stress other reading strategies more than sounds, can you sound it out." Because these were the teachers who were contacted and volunteered, however, it was necessary to include those who were studying reading acquisition. This occurred in both experienced and novice groups, as some of the teachers were seeking additional

knowledge about reading processes in order to help students who were having difficulty. However, it is important to note that including this group may also have clarified relationships between coursework and the knowledge and assessment variables since the teachers had already acquired additional knowledge and were showing benefits by using it in the classroom.

A factor that may underlie and contribute to relationships between training and other variables was the apparent motivation of some of the more highly trained teachers to improve their knowledge in order to teach more effectively. For example, Teacher 17 commented in her written questionnaire, "When I received my M.S. the emphasis in reading instruction was more whole language. I did not have the tools to successfully teach children to read. I went and got Orton Gillingham training after speaking to successful peers." The influence of teachers' motivation to increase their knowledge and its impact on their teaching performance was not assessed in this study.

Another limitation arises from the large number of statistical tests performed. Because of the number of categories correlated with each other and with the other variables, significant findings in some cases may have occurred by chance. In this study, each significant finding was treated as valid. However, in order to support the accuracy of the finding, replication should be further attempted in future studies.

To clarify or replicate some of the findings in the present study, future research may focus on several issues. One would be to study the association between coursework and extent of teachers' focus on alphabetic and word reading processes in evaluating children's progress. The findings here show an important association and suggest that

teachers' concerns in these areas indicate higher knowledge of reading content and more advanced assessment practices. However, the correlations were moderate and future research may provide insight into additional factors influencing these connections.

Other areas of research that might clarify comparisons between experienced and novice teachers are differing coursework requirements and differing characteristics of teachers who took courses years ago versus those whose coursework was recent. Course requirements for education majors could have been quite different for teachers fifteen or twenty years ago, and therefore views on children's learning may have differed because of this factor. Not only could requirements have been different years ago, but characteristics of teachers may have changed as well. Since the majority of teachers are women, they have more educational opportunities and a greater choice of careers today than in the past. Women who may have become teachers thirty years ago may today be likely to go into fields such as law or medicine instead of teaching (Postrel, 2004). Having a greater number of choices could influence one's decision to teach, and this might be a factor to consider when studying differences between experienced and newer teachers.

Another study might replicate the present study by matching teachers as closely as possible on experience, coursework, and school and student characteristics. This would eliminate or reduce the number of alternative explanations.

Replication using different methods of analyzing the interview data might be compared with the findings of the present study. For example, the think-aloud was analyzed by developing categories from the transcripts, and then calculating the percentage of times teachers referred to these categories. It could be assumed that the

areas in the think-aloud most important to the teachers were those to which they referred most. For the assessment part of the interview, an overall rating was given for each teacher. Rater 2 closely examined the assessment transcripts and noted specific qualities or practices of teachers who had high and low ratings. Another way to assess teachers' understanding of student performance might be to analyze the transcripts by developing categories for the explanations teachers give. These categories might document whether teachers' reflections were descriptive or explanatory, and what types of rationale were given (e.g., Bean, Fulmer, Zigmond, & Grumet, 1995; Tittle, 1996).

In another area of study, it would be interesting to learn whether a whole language orientation on the TORP scale could again be associated with phonics and linguistics knowledge, and what other factors contribute to this association.

A possible link between low training and attribution of reading progress to non-academic factors might also be explored. Although the correlations between teachers' reading coursework and references to the categories in the non-academic group were not significant, the relationships between these categories and reading coursework were negative. One could speculate that teachers with less training might have insufficient knowledge about development of reading skills and explain good or poor performance by attributing non-academic factors such as how much the parent works with the child. A further study with a larger sample may shed light on any connection between these variables.

Finally, because of the small number of teachers participating, differences in theoretical orientation of teachers' training were not taken into account when scoring the

coursework and assessment variables. The results, then, are not clear as to the effectiveness of the different types of coursework on classroom practices. Teachers with high amounts of training used the knowledge they had acquired in their courses to assess their children and make instructional decisions. They were more active in meeting their children's needs than teachers with low training and were very likely more effective. However, it is not clear whether the orientation of one teacher's coursework was more or less effective than another teacher's with the same amount of training. Did Teacher 7's Master's specialization in reading that focused on phonological aspects of reading development, diagnosis of reading disabilities and remediation equip her differently for her teaching role than Teacher 15's or Teacher 18's, whose specializations were more focused on whole language philosophy? Did Teacher 7's and Teacher 17's recognition of the importance of the necessity of phonological capabilities for accurate word identification enable them to teach more or less effectively in the classroom? How did the low importance they seemed to have placed on context and guessing words make a difference in their teaching? Did the high importance a teacher placed on context and guessing confuse or help the students? The effectiveness of teachers' instruction and their children's outcomes could be assessed in a study where the orientation of their coursework and their classroom practices are taken into account, as well as the achievement of their pupils, and the outcomes of the students at the bottom of their classes. Such a study might help clarify what specific teaching skills and knowledge are most effective for beginning readers.

APPENDIX A

Letter to School Principal



THE
GRADUATE SCHOOL
AND
UNIVERSITY CENTER

PH.D. PROGRAM IN EDUCATIONAL PSYCHOLOGY

33 WEST 42 STREET, NEW YORK, NY 10036-8099
212 642-2261

THE CITY UNIVERSITY OF NEW YORK

To: Principal of P.S. _____
From: Linnea C. Ehri, Ph.D., Distinguished Professor
Alba B. Langenthal, Research Associate
Re: Research Project on the Teaching of Reading in First Grade

Approved: 3-27-99
Expires : 3-28-00

We are conducting a research project with First-Grade teachers to examine their views, ideas, and experiences teaching children to read in first grade. This letter has three purposes:

1. To explain the project.
2. To invite you to nominate First-Grade teachers to participate.
3. To obtain your permission to conduct the project at your school.

We are seeking two types of teachers, those who have taught students in the primary grades for over 13 years, and those who have taught students in the primary grades for less than 3 years. If you have first-grade teachers in your school who qualify, and if you are willing to give us permission to conduct this project in your school, would you please place in the teachers' mail boxes a copy of the enclosed letter explaining the project and inviting them to participate.

Explanation of the Project. We are researchers at the CUNY Graduate School. Dr. Ehri is on the faculty and has conducted many studies investigating how beginners learn to read. Ms. Langenthal is a graduate student who is working on this project in preparation for her dissertation.

The purpose of this project is to study how First-Grade teachers think about reading instruction and how they make decisions about their students' reading abilities, what factors they view as affecting students' progress, and how they assess their students' development as readers during the year. By examining beginning reading instruction from the teacher's point of view, we hope to discover ways to make the teaching of literacy easier and more effective. Our plan is to interview teachers of differing backgrounds, whose views of instruction represent a range of different perspectives, and whose classrooms represent a range of student populations.

The study would consist of the following procedures. One of us would interview each First-Grade teacher individually at the school at times convenient for the teacher. We would meet for two sessions, each lasting about 1 to 1½ hours. In return for their participation, teachers would be paid \$50.00. They would be asked to do the following kinds of tasks:

- (a) Answer in writing some questions inquiring about their academic background, training and experience, their views about reading instruction and how they assess students' progress in reading, and their understandings about how written words are structured alphabetically;
- (b) Evaluate and talk about their students' progress in learning to read during the year by ranking them according to their ability to read;

(Continued on next page)

Initials: _____

THE GRADUATE SCHOOL AND UNIVERSITY CENTER
IS THE CITY UNIVERSITY OF NEW YORK'S DOCTORATE-GRANTING INSTITUTION, WHICH OPERATES IN CONJUNCTION WITH ALL THE CUNY CAMPUSES

BERNARD M. BARUCH COLLEGE
BOROUGH OF MANHATTAN
COMMUNITY COLLEGE
BROOKLYN COMMUNITY COLLEGE
BROOKLYN COLLEGE

THE CITY UNIVERSITY OF NEW YORK
MEDICAL SCHOOL
THE CITY UNIVERSITY OF NEW YORK
SCHOOL OF LAW AT QUEENS COLLEGE
THE COLLEGE OF STATEN ISLAND
EUGENIO MARIA DE HOZIOS

HUNTER COLLEGE
JOHN JAY COLLEGE OF CRIMINAL JUSTICE
KINGSBOROUGH COMMUNITY COLLEGE
ROBERTO H. LA GUARDIA COMMUNITY COLLEGE
HERBERT H. LEHMAN COLLEGE

MOUNT SINAI SCHOOL OF MEDICINE
AFFILIATED
NEW YORK CITY TECHNICAL COLLEGE
QUEENS COLLEGE
QUEENSBOROUGH COMMUNITY COLLEGE
WWW.CUNY.EDU

Appendix A: Letter to School Principal (continued)

Page 2 - Letter to Principal

- (c) Discuss with us the usefulness of various tasks and behaviors for indicating how far along students have progressed in learning to read.

We are very interested in the information that teachers provide to us in writing and during the interview. In order to obtain a record of the information, we will audiotape the sessions.

Whatever information is related to us by the teachers will be kept confidential. An anonymous code rather than the teacher's name will be placed on the records. In any discussion of the teachers' responses, their names will never be identified with the responses. The tapes will be used for research purposes only and will be secured in our office at CUNY. No one from their schools will have access to the tapes or transcriptions. Teachers will have the opportunity to review the tapes if they wish. When the project ends and the tapes are of no further use, they will be erased or destroyed. Any reports on findings of the study will combine information from all the teachers, and neither they nor their schools will be identified in these reports. Their participation in this study is completely voluntary and they are free to withdraw at any time for any reason without consequence. If they decide to withdraw before the interview is completed, they will be paid for whatever time they have invested in the study.

Results of this research, if useful, will be written up for publication in a scholarly journal such as Reading Research Quarterly. The interviews with teachers will be extremely helpful in providing us with a better understanding of reading instruction from the teacher's point of view, even among those who have just begun to teach. In a pilot study, we found that the teachers we interviewed appreciated the opportunity to reflect on their teaching experiences and the contributions they have made to their students' progress as readers, and they felt they gained a clearer picture of each student's progress. In return for their cooperation, at the end of this study, we will share results with the participating teachers.

In order for teachers to participate in this study, they need to sign the form at the end of the letter of invitation and return it to us in the attached envelope. Then they will be contacted by telephone to make arrangements for their participation.

If you would like to obtain further information about the study or if you have any questions, feel free to call us at the CUNY Graduate Center, (212) 642-2260, or at home, (203) 348-6821 (Dr. Ehn), or (212) 758-5798 (Ms. Langenthal). If you have any questions concerning the rights of the participants in this study, you can call Sponsored Research, Graduate School and University Center/CUNY at (212) 642-2059. Thank you for considering this request.

Instructions for Consent to Participate

1. Initial the bottom of the first page of this form.
2. Sign the second page on the line provided below.
3. Keep the second copy of this letter for your records.
4. Send the first signed copy of this form to us in the enclosed envelope.

Date _____

I am willing to have this project conducted at my school and to invite teachers to participate in the project. I have read the enclosed information about the project and agree to the conditions.

Signature of Principal _____

Printed name _____

APPENDIX B

Letter to Teacher



THE
GRADUATE SCHOOL
AND
UNIVERSITY CENTER

PH.D. PROGRAM IN EDUCATIONAL PSYCHOLOGY

33 WEST 42 STREET, NEW YORK, NY 10036-8099
212 642-2261

THE CITY UNIVERSITY OF NEW YORK

To: First Grade Teacher

From: Linnea C. Ehri, Ph.D., Distinguished Professor
Alba B. Langenthal, Research Associate

Re: Research Project on the Teaching of Reading in First Grade

Approved: 3-17-99
Expires: 3-28-00

We are conducting a research project with First-Grade teachers to examine their views, ideas, and experiences teaching children to read in first grade. Your principal has agreed to allow us to conduct this project at your school if any of the teachers wish to participate. However, participation is completely voluntary.

The purpose of this letter is to invite you to participate in this project. We are researchers at the CUNY Graduate School. Dr. Ehri is on the faculty and has conducted many studies investigating how beginners learn to read. Ms. Langenthal is a graduate student who is working on this project in preparation for her dissertation.

This project is intended to study how First-Grade teachers think about reading instruction and how they make decisions about their students' reading abilities, what factors they view as affecting students' progress, and how they assess their students' development as readers during the year. By examining beginning reading instruction from the teacher's point of view, we hope to discover ways to make the teaching of literacy easier and more effective. Our plan is to interview teachers of differing backgrounds, whose views of instruction represent a range of different perspectives, and whose classrooms represent a range of student populations.

The study would consist of the following procedures. One of us would interview you individually at times convenient for you at your school. We would meet for two sessions, each lasting about an 1 to 1½ hours. In return for your participation, we would pay you \$50.00. You would be asked to do the following kinds of tasks:

- (a) Answer in writing some questions inquiring about your academic background, training and experience, your views about reading instruction and how you assess students' progress in reading, and your understandings about how written words are structured alphabetically;
- (b) Evaluate and talk about your students' progress in learning to read during the year by ranking them according to their ability to read;
- (c) Discuss with us the usefulness of various tasks and behaviors for indicating how far along students have progressed in learning to read.

We are very interested in the information that teachers provide to us in writing and during the interview. In order for your comments during the interview to be useful we will need a record of them. The easiest way to obtain this record is by audiotaping the sessions.

We can assure you that whatever information you relate to us will be kept confidential. An anonymous code rather than your name will be placed on the records you provide to us. In any discussion of your responses, your name will never be identified with the responses. The

(Continued on next page)

Initials _____

THE GRADUATE SCHOOL AND UNIVERSITY CENTER
IS THE CITY UNIVERSITY OF NEW YORK'S DOCTORATE-GRANTING INSTITUTION, WHICH OPERATES IN CONSORTIUM WITH ALL THE CUNY CAMPUSES.

BERNARD M. BARUCH COLLEGE
BOROUGH OF MANHATTAN
COMMUNITY COLLEGE
BRONX COMMUNITY COLLEGE
BROOKLYN COLLEGE
THE CITY COLLEGE

THE CITY UNIVERSITY OF NEW YORK
MEDICAL SCHOOL
THE CITY UNIVERSITY OF NEW YORK
SCHOOL OF LAW AT QUEENS COLLEGE
THE COLLEGE OF STATEN ISLAND
EUGENE MARSH DE HOUSTON
COMMUNITY COLLEGE

HUNTER COLLEGE
JOHN JAY COLLEGE OF CRIMINAL JUSTICE
KINGSBOROUGH COMMUNITY COLLEGE
ROBERTO H. LA GUARDIA COMMUNITY COLLEGE
HERBERT H. LEHMAN COLLEGE
MEDGAR EVERS COLLEGE

MOUNT SINAI SCHOOL OF MEDICINE
(AFFILIATED)
NEW YORK CITY TECHNICAL COLLEGE
QUEENS COLLEGE
QUEENSBOROUGH COMMUNITY COLLEGE
YORK COLLEGE

Appendix B: Letter to Teacher (continued)

Research Study on First Grade Reading - Consent Form Page 2

tapes will be used for research purposes only and will be secured in our office at CUNY. No one from your school will have access to the tapes or transcriptions. You will have the opportunity to review your tapes if you wish. When the project ends and the tapes are of no further use, they will be erased or destroyed. Any reports on findings of the study will combine information from all the teachers, and neither they nor your schools will be identified in these reports. Your participation in this study is completely voluntary and you are free to withdraw at any time for any reason without consequence. If you decide to withdraw before the interview is completed, you will be paid for whatever time you have invested in the study.

Results of this research, if useful, will be written up for publication in a scholarly journal such as Reading Research Quarterly. Your interview will be extremely helpful in providing us with a better understanding of reading instruction from the teacher's point of view, even if you have just begun to teach. In a pilot study, we found that the teachers we interviewed appreciated the opportunity to reflect on their teaching experiences and the contributions they have made to their students' progress as readers, and they felt they gained a clearer picture of each student's progress. In return for your cooperation, at the end of this study, we will share results with you.

If you would like to participate in this study, please complete and sign the attached form and return it to us in the enclosed stamped envelope. You will be contacted by telephone to make arrangements for your interview.

If you would like to obtain further information about the study or if you have any questions, feel free to call us at the CUNY Graduate Center, (212) 642-2260, or at home, (203) 348-6821 (Dr. Enri), or (212) 758-5798 (Ms. Langenthal). If you have any questions concerning the rights of the participants in this study, you can call Sponsored Research, Graduate School and University Center/CUNY at (212) 642-2059. Thank you for considering this request.

Instructions for Consent to Participate

1. Initial the bottom of the first page of this form.
2. Sign the second page on the line provided below.
3. Keep the second copy of this letter for your records.
4. Send the first signed copy of this form to us in the enclosed envelope.

Date _____

I am interested in participating in this research project. I have read the enclosed information about the project and agree to the conditions. You may contact me at the numbers given below.

Signature of Participant _____

Printed name _____ School _____

I can be reached at the following number(s) at the times indicated:

Telephone (home) _____ Times to call _____

Telephone (school) _____ Times to call _____

APPENDIX C

WRITTEN QUESTIONNAIRE

1. Name _____ Gender: M F
2. Age (optional) _____ or check one:
Under 30__ 31-40__ 41-50__ 51-60__ 61+__
3. Total number of years teaching: _____ 4. Native Language: _____
5. Undergraduate Major: _____
6. Highest Degree: _____ Field: _____
8. Certified? _____ Type _____
9. At what college or university did you receive your training in education?

10. How adequate do you think your teacher education courses were in preparing you to teach beginning reading?
Excellent _____ Very good _____ Adequate _____ Fair _____ Inadequate _____
- Please explain

11. Are you currently enrolled in any graduate program? Yes__ No
Master's__ Ph.D. __ Field _____
12. What grade are you currently teaching? Grade(s) _____ School _____
- 13(a) How many years have you taught First Grade?
- (b) If you have taught other grades for at least 2 years, please indicate how many years you have taught that grade.
- Kindergarten _____ year(s) 2nd _____ year(s) 3rd _____ year(s)

Appendix C: Written Questionnaire (continued)

Other grades taught (please list and indicate how long) _____

(c) Did all of these grades require you to provide reading instruction?

Yes__ No__ Which ones did?

(d) Were any of these classes bilingual? Yes__ No__ Which grade(s)? _____

14(a). Have you had any specific training in reading instruction that involved classroom observations of you and feedback by a teacher trainer or mentor teachers?

Yes_____ No_____

Please explain _____

(b). Have you had specific training in reading instruction involving demonstrations in your classroom by a mentor teacher or teacher trainer?

Yes_____ No_____

Please explain _____

15(a). Do you presently tutor individual children from your class in reading outside of the classroom?

Yes__ No__ How many? _____

(b). Are any of your students presently in a program outside the classroom, such as Reading Recovery, Project Read, resource room, etc., in which they receive instruction in reading in addition to classroom instruction? Yes__ No__ Please explain.

16. Did you have specific training or preparation in reading instruction before you began teaching reading? Yes__ No

Please explain _____

17(a). List undergraduate courses in reading instruction in teacher education programs you have taken, and specify approximate dates: _____

Appendix C: Written Questionnaire (continued)

(b). List graduate courses in reading instruction you have taken, and specify approximate dates: _____

18. List courses in the structure of language or linguistics you have taken, and specify approximate dates: _____

19. List in-service courses or workshops in reading instruction you have taken and specify approximate dates:

20. Are you currently taking courses or receiving any specific training related to beginning reading (other than inservice courses listed above)? Yes__ No__ If yes, please list:

21. Have you taken any courses in any of the following instructional programs? If so, please check to indicate the program.

_____ DISTAR	_____ Won Way
_____ Project Read	_____ Words in Color
_____ Whole Language	_____ Reading Recovery
	_____ Other (specify name of program):

22. What specific contributions do you feel your **teaching experiences** have made to your ability to teach beginning reading?

23. How much did each of the following experiences contribute in helping you learn how to teach first grade reading? Rate each one by number indicating importance, from **1=least helpful** to **6=most helpful**. If there are any of the following experiences that you have not had, please cross these out and do not rank them.

Appendix C: Written Questionnaire (continued)

- Courses taken in college
- Courses taken in graduate school
- Student teaching experience
- Mentoring by other teachers
- Reading magazines and books
- Reading professional journals
- Reading instructor manuals accompanying basal programs
- Attending in-service workshops
- Workshops in specific reading methods or programs
- Hands-on experience teaching reading and observing what works & what doesn't
- Informally sharing ideas with colleagues
- Observations and feedback by a teacher trainer or mentor teachers
- Demonstrations in my classroom by a mentor teacher or a teacher trainer
- Other (explain): _____

23 (a). Do you speak another language besides English? Yes _____ No _____

(b) When did you learn?

APPENDIX D

Think-Aloud Procedure

STUDY OF FIRST GRADE TEACHERS - Script

Introduction

Hello. I am Alba Langenthal. I am a graduate student in Educational Psychology at the CUNY Graduate School, and I'm doing a study on teaching practices in beginning reading for my dissertation. As I explained in the letter you received, I am interviewing First Grade teachers in a number of schools about their reading instruction. I will be asking you some questions about your teaching background and experiences, and about your pupils, and I will ask you to answer some written questions. By learning about your views and practices, we may find ways to help make the teaching of reading easier and more effective for future teachers.

As was indicated in the letter, there will be two sessions, about one hour each, which will be tape-recorded. I may also write some notes as we go along.

ORDER OF TASKS:

1. **Written questionnaire**
2. **Student rankings (think-aloud)**
3. **Questions on Assessment Practices**
4. **Teacher Efficacy Scale (Gibson & Dembo, 1984)**
5. **DeFord's TORP**
6. **Durkin PHONICS TEST**
7. **Moats LINGUISTIC TEST**

1. **Written questionnaire**

First, would you fill out this form and answer these questions. (*Give teacher questionnaire form to fill out*). Feel free to ask me questions if anything is unclear.

Start _____

End _____

2. **Teacher Rankings of Students**

I have a script, and I'm going to read parts of it to you. That's because it's important to give everyone the same instructions and be sure not to leave anything out.

I am interested in understanding how teachers go about judging how well or poorly their pupils are learning to read. Research has shown that teachers are quite accurate when asked to rank order their pupils from high to low in how well they can

Appendix D: Think-Aloud Procedure (continued)

read. I would like to study the thought processes and criteria that teachers use when they rank their pupils.

I am asking several first grade teachers to do this task, to help me understand how they think and what they think about when they compare children in their reading.

A new technique has been developed to enable researchers to study how people think and make decisions. It is called a “think-aloud” procedure. The person is asked to do a task in which they have to make various decisions, and think aloud while doing this. Thinking aloud means verbalizing the ideas, observations, and experiences that are running through your mind and guiding your decisions. We often do this when we’re alone and working on problems; for example, if we’re doing a difficult math problem, we may verbalize our thoughts and reasoning while working on the solution. The think aloud procedure has been used for different kinds of tasks. It has been found to be a very valuable approach. It helps researchers understand about the thought processes that go into making decisions.

Before I give you instructions for the think-aloud, I would like you to think of what you consider the most important capabilities that beginners need to learn to read and make progress in their reading. List as many as you can think of and write them down on this paper. *Teacher writes list. Thank you. (Function is to prime criteria for evaluating students; or activate background knowledge).*

I would like you to think aloud as you perform the task of ranking your pupils according to how well or poorly they can read. Rank them from high to low. Say anything and everything that comes to mind as you decide on your ranks.

To make this task easier, I have placed each of your pupils’ first names on a label. Also I have prepared a vertical chart with places numbered from 1 to 30. I would like you to go through the labels and rank order the children according to how well they know how to read. You might begin by thinking aloud about who the best reader is and what makes you think so. Or you might begin by picking the weakest reader and talking aloud about your reasons. You might want to refer to your list and add anything else that you think of about each child as you are ranking. And explain your reasoning.

After you make up your mind, then place that child’s name at the top or bottom of the list. Continue doing the same with the other pupils. Arrange them from top to bottom in the best way that you can. Work in whatever way is most comfortable and makes sense to you.

Appendix D: Think-Aloud Procedure (continued)

As you do each step, tell me what you are thinking by saying out loud your ideas, observations and experiences with this child. Think and reason out loud. You don't have to translate your thoughts into perfect English. Usually our thoughts just flow. That's OK. Let your thoughts speak; I want to get anything and everything you happen to think of about each child, no matter how irrelevant it may seem.

It is most essential that you put into words and say specifically what you know about each child's reading strengths or weaknesses that cause you to give him or her that rank. Give as complete a picture as possible of the reading behaviors and skills that you use to evaluate your pupils. Be sure to focus on each child individually. The point is to learn about the thought processes you use to make these ranking decisions.

I'm going to sit facing away from you so you can think aloud without talking directly to me. I will tape record what you say so that I will have a record that I can study. Do you have any questions about this task?

(Take out labels & chart) OK, here are the labels with the children's names. Here is the vertical chart. You can begin. If you need to remind yourself what issues to address, I have it printed out here. *(Put prompt card on table)*.

WRITE DOWN TERMS TEACHER USES TO ASK ABOUT LATER

Start _____

DIRECTIONS FOR PROMPTING DURING TASK: If teacher makes any move without talking, or stops talking for 10 seconds:

What are you thinking about?
Say what you are thinking.

Time End _____

WRITTEN PROMPT TO BE PLACED ON SEPARATE CARD:

Rank children by reading ability.

Think aloud. Say everything.

Explain your rankings for each child.

APPENDIX E

Questions on Assessment Practices and Written Tests

3. Assessment

Time Start _____

Thank you. You did a wonderful job ranking your pupils and thinking aloud. Did you find it very hard to do? Why or why not?

There were some terms you used during the think-aloud that I would like you to clarify. This is because those terms might have slightly different meanings for different people.

Could you explain the terms (e.g., *vocabulary*--speaking/reading/listening vocabulary; *sight words*--known decoded words; visually memorized words; partially decoded words)

Now I would like to ask you some questions about your rankings. You may have answered them partially already while you were talking. Even so, I'd like you to restate your answers so that I have a complete record. There are no right or wrong answers. I want to have your ideas about children's reading development and what you see as important so I can combine them with the views of other teachers.

A. Now we're in the ___ month of the school year. Think back to the beginning of the year. What steps have you taken since school began to determine how well each child is reading?

- i. Do you assess your pupils' reading-related capabilities when they begin first grade?
 (If yes) What do you assess?
 How do you assess this/these?
 I would like to collect any examples you may have--can you show or give me a sheet showing some examples of what you use? (*Note what teacher lists as assessing reading*).
- ii. Do you use any standardized or published tests? If so, what?
- iii. Do you think standardized tests of reading are useful? Explain.
- iv. Have you determined whether your pupils are reading below grade level?

Appendix E: Questions on Assessment Practices and Written Tests (continued)

- v. *(Referring to students on chart)* Could you point out which children you think are reading below grade level?
Explain what reading behaviors cause you to say this.
- vi. Do you think any of these children are at risk of becoming disabled readers needing special help in 1st grade or afterwards?
What in their reading behavior tells you this?
- B. Have you grouped your pupils by reading ability?
(If yes) How did you do this?
How did you decide which group each child belonged to?
Did you give a test?
(If no) What are your reasons for not grouping?
- C. i. During the year, how do you judge whether your children are making the progress you expect in reading?
Can you give or show me some examples in how you do this?
- ii. What does the second grade teacher expect your children to be able to do in reading so they are ready for 2nd grade?
- iii. Do you keep records on children's reading progress during the year?
What do you record?
How often you record information?
I'd really like to see your system. Could you show me your records?
(Note information the teacher records that is not answered by previous questions).
- iv. How do you use this information?
- D. Here is a list of various things that some teachers use to measure children's progress in learning to read. Would you read through the list and check off anything you use, and circle 0 to 5, how often you use it? *(Hand sheet to teacher)*
- | | |
|---|-------------------------------|
| 1. Informally observing children performing reading tasks | 6. Criterion-referenced tests |
| 2. Primary Language Record | 7. Standardized tests |
| 3. Informal reading inventories | 8. Portfolios |
| 4. Informal observations of invented spelling | 9. Running records |
| 5. Diagnostic tests | 10. Miscue analysis |
| | 11. Round Robin reading |
| | 12. Anything else? |

Appendix E: Questions on Assessment Practices and Written Tests (continued)

After teacher checks items, for each item circled above 0:

For each item checked, please explain what information you gain?

E. How do you use this information? What purposes does it serve?

Do you use it in instruction?

Explain.

Do you use it in planning?

Explain

Do you use any of this for evaluating progress?

Do you use this information for communicating children's progress in reading, for example, to parents or others?

F. *Reading Terms*

This is a list of reading terms that may be used in teachers' manuals or in articles. I would like to know which ones teachers are familiar with and which ones are not so well known. On a scale from 0 to 5, circle the number showing how familiar you are with the term. 0 means you are not familiar with the term, 5 means very familiar.

- | | |
|--|-----------------------------|
| 1. Emergent Literacy | 8. Short and Long Vowels |
| 2. Sight Word Reading | 9. Cueing Systems |
| 3. Invented Spelling | 10. Fingerpoint Reading |
| 4. Phonemic Awareness | 11. Auditory Discrimination |
| 5. Miscue Analysis | 12. Blending |
| 6. Readability Formulas | 13. Compound Words |
| 7. Instructional vs. Frustration
Reading Levels | 14. Dyslexia |

For each term above 0, please explain its meaning and give an example.

TURN OFF TAPE RECORDER

Time end _____

Now I have some written questionnaires I would like you to fill out. These are often used in research with teachers. Again, there are no right or wrong answers. This is to learn more about your teaching and reading instruction. Your answers will help me compare the views of teachers I'm interviewing with those in other studies. (*For each task, see script below*).

Appendix E: Questions on Assessment Practices and Written Tests (continued)

1. GIBSON & DEMBO (1984) QUESTIONNAIRE (TES, short form, 16-items)

This questionnaire asks about your general feelings about teaching and what influences children's learning.

You will read several statements that may or may not describe your views. Then you will decide whether you agree or disagree with each statement. You will circle a number indicating to what extent you agree or disagree. #1 means that you strongly agree. #6 means that you strongly disagree. The numbers in between mean agreement or disagreement to a lesser extent.

Start _____
End _____

5. DeFORD'S TORP (28 items)

This questionnaire is used often in research involving teachers of beginning reading. It asks about your theoretical beliefs about reading and reading instruction. I'm interested in your reactions to statements that are often discussed and argued about by reading educators. Your responses will help me compare the information I'm collecting to other research studies.

In this questionnaire, you will read each statement and then decide whether you agree or disagree. Circle the number indicating how strongly you agree or disagree. #1 means that you strongly agree. #5 means that you strongly disagree. #3 means that you are neutral.

Start _____
End _____

Speech Sounds

Learning to read involves learning about letter-sound relationships. These can be complicated and confusing for young children. They can also be difficult for adults because we usually don't think of these while we're reading.

I have some tasks that ask you to identify individual speech sounds in words. Some parts of these tasks may not be easy. Just do the best you can.

Start _____
End _____

6. DURKIN'S PHONICS TEST FOR TEACHERS (Strickland, 1998):

This is a task that asks about speech sounds and vowels and consonant sounds.

Start _____
End _____

Appendix E: Questions on Assessment Practices and Written Tests (continued)

7. MOATS' LINGUISTIC TASK (Moats, 1995; Moats & Lyon, 1996))

This is a task that asks you to identify syllables and sounds in words. Read each item and then record the response that is requested.

Start _____

End _____

Appendix E: Questions on Assessment Practices and Written Tests (continued)

Name _____

QUESTIONS ON ASSESSMENT PRACTICES - Teacher form

Question 3D

Please check off any of the following assessment practices you use, indicate how often you use it (**1 = infrequently, 5 = used very often**), and circle the approximate number of children you use it with.

<u>Assessment Practice</u>	<u>Frequency</u>					<u>Number of children</u>			
	Low			High					
1. Informally observing children performing reading tasks	1	2	3	4	5	1-5	6-10	11-15	15+
2. Primary Language Record	1	2	3	4	5	1-5	6-10	11-15	15+
3. Informal reading inventories	1	2	3	4	5	1-5	6-10	11-15	15+
4. Informal observations of invented spelling	1	2	3	4	5	1-5	6-10	11-15	15+
5. Diagnostic tests	1	2	3	4	5	1-5	6-10	11-15	15+
6. Criterion-referenced tests	1	2	3	4	5	1-5	6-10	11-15	15+
7. Standardized tests	1	2	3	4	5	1-5	6-10	11-15	15+
8. Portfolios	1	2	3	4	5	1-5	6-10	11-15	15+
9. Running records	1	2	3	4	5	1-5	6-10	11-15	15+
10. Miscue analysis	1	2	3	4	5	1-5	6-10	11-15	15+
11. Round Robin reading	1	2	3	4	5	1-5	6-10	11-15	15+
12. Anything else?	1	2	3	4	5	1-5	6-10	11-15	15+

Appendix E: Questions on Assessment Practices and Written Tests (continued)

QUESTIONS ON ASSESSMENT PRACTICES

Question 3F - Teacher form

Name _____

READING TERMS:

The following terms are sometimes used in instructional manuals and articles for reading teachers. I would like to know which of these terms teachers have encountered, and which may not be well known. Please indicate your familiarity (**0=not familiar to 5=very familiar**).

- | | | | | | | |
|--|---|---|---|---|---|---|
| 1. Emergent Literacy | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. Sight Word Reading | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. Invented Spelling | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. Phonemic Awareness | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. Miscue Analysis | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. Readability Formulas | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. Instructional vs. Frustration
Reading Levels | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. Short and Long Vowels | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. Cueing Systems | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. Fingerprint Reading | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. Auditory Discrimination | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. Blending | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. Compound Words | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. Dyslexia | 0 | 1 | 2 | 3 | 4 | 5 |

APPENDIX F

Reading Terms Definitions

EMERGENT LITERACY

1. Some knowledge about letters (1)
2. Recognize words by visual attributes but do not yet know how letters represent sounds (1)
3. Exposure to storybooks that enables learning about book language, vocabulary, etc. (1)
4. Increasing knowledge about spoken language and the world (1)
5. Learning about universal features of writing; hold a book right side up, recognize common words and signs, “pretend read”, point to words/pictures, and telling the story (1)
6. Association of print with meaning that precedes and develops into conventional literacy (The Literacy Dictionary, 1995) (1)

SIGHT WORD READING

1. Reading a word as a unit, automatically, rapidly without slowing down or stopping to decode (1)
2. Spellings of words are stored in memory and the reader recognizes them immediately (1)
3. High-frequency words that the reader recognizes because s/he has memorized their shapes and spelling patterns (1)
4. Phonically irregular words taught as a whole before student learns to decode (1)

INVENTED SPELLING

1. Spellings that contain letters that represent phonemes in the word but are not conventional spellings (1)
2. Partial knowledge of word spellings, spelling patterns, grapheme-phoneme units depending on child’s reading/spelling progress (1)
3. Indicator of progress in reading and spelling: begin with random letters, progress to letters representing phonemes, then partially correct spellings, then conventional spelling (2)
4. Reflects degree of phonemic awareness in ability to segment words, assign letters to individual sounds, and sequence those sounds to form words (2)
5. Can be used as an instructional strategy in beginning writing as the child moves toward conventional spellings (The Literacy Dictionary, 1995) (1)

PHONEMIC AWARENESS

1. Awareness that speech is made up of individual, meaningless sounds, independent of knowledge of alphabet letters (2)

Appendix F: Reading Terms Definitions (continued)

2. The ability to consciously manipulate phoneme-size segments in speech independent of letters or any kind of visual symbol (2)
3. Must be present at the beginning of reading instruction, and allows the child to make progress (1)
4. Training in PA together with alphabet letters and sounds is more helpful than training in PA by itself. Letter-sound training without PA will not help children learn to read if they are deficient in phonemic awareness (2)
5. Teachers can encourage PA by providing practice in segmenting spoken words with games based on some of the tasks to assess PA such as rhyming, alliteration, invented spelling activities, together with or prior to phonics instruction (The Literacy Dictionary, 1995) (2)

MISCUE ANALYSIS

1. Analysis of word-reading errors that allows teachers to decide how to direct instruction (1)
2. Substitution errors showing what cues the child is using to read the word, whether syntactical, semantic, or graphic (1)
3. Syntactic or semantic substitutions indicate use of context; incorrect or nonsense words or syllables indicate attention to letters but not on meaning (3)
4. Examination of the use of miscues to determine the strengths and weaknesses in the background experiences and language skills of students as they read (The Literacy Dictionary, 1995) (1)

READABILITY FORMULAS

1. These are used to determine difficulty of text at the word, syntactic, or conceptual levels (1)
2. Determine appropriate reading level to reinforce word recognition skills and provide practice while controlling syntactic and conceptual structure so they do not present difficulty while learning to read words (1)
3. Methods of estimating difficulty level of reading materials by analyzing samples, with results usually expressed as a reading grade level; formulas are generally based on vocabulary difficulty, syntactic difficulty and other related factors (The Literacy Dictionary, 1995) (2)

INSTRUCTIONAL VS. FRUSTRATION READING LEVELS

1. Children's reading level can be evaluated by taking running records (1)
2. After the child reads a sample of 100-200 words the teacher can determine (a) easy text - 95-100% accuracy, (b) instructional text - 90-94% accuracy, and (c) hard text - below 90% accuracy - frustration level (2)
3. Explanations of reading levels (The Literacy Dictionary, 1995):

Appendix F: Reading Terms Definitions (continued)

- (a) **Instructional**: challenging, not frustrating; usually 95% word-identification and >75% comprehension (1)
- (b) **Frustration**: too difficult to be read successfully by a student, even with normal classroom instruction and support; usually less than 90% accuracy in word identification and less than 50% comprehension (1)
- (c) **Independent**: easy to read with usually 99% word identification accuracy and >90% comprehension (1)

SHORT AND LONG VOWELS

1. Long vowels say their name, e.g., /ā/, /ē/, /ī/, /ō/, /ū/; short vowels are pronounced /ă/, /ĕ/, /ĭ/, /ŏ/, /ŭ/ (1)
2. Most beginning phonic lessons focus on single consonants, which are easier to learn, but most three-letter words in beginning texts contain short vowels (1)
3. Knowing short vowel sounds allows the reader to distinguish between two similar-looking words such as PET, PAT, CAP, CUP, etc. (2)

CUEING SYSTEMS

1. Three types of cues used to identify unknown words while learning to read: graphic, semantic, and syntactic (1)
2. Graphic cues are used in decoding (1)
3. Semantic cues are used when relying on meaning of the surrounding text (1)
4. Syntactic cues are used to break sentences down into manageable parts to obtain meaning (1)

FINGER-POINT READING

1. Pointing to words or pictures in a text while reading them or reciting the text from memory (1)
2. Helps young children understand that the print on the page guides the reader's speech (1)
3. Teaches print-related concepts such as direction, spaces between words, where words begin and end, etc. (2)
4. Need some letter knowledge to find words, some phonemic segmentation skill so to find the appropriate phonemic segments in speech to fit with the printed letters in words (3)

AUDITORY DISCRIMINATION

1. Ability to discriminate between the sounds heard in a word (1)
2. Ability to identify the same sound in different words (1)
3. Know what letter to assign to a particular sound (1)
4. The ability to hear phonetic likenesses and differences in phonemes and words (The Literacy Dictionary, 1995) (2)

Appendix F: Reading Terms Definitions (continued)

BLENDING

During decoding, putting the sounds together to make a word; sound out; combine the sounds represented by letters to pronounce a word (1)

COMPOUND WORDS

1. Two words that are put together to make one word; e.g., BOOKSHELF (1)
2. A combination of two or more words that functions as a single unit of meaning, written as a single word (*booklist*), hyphenated words (*books-on-demand*), or separately (*book report*) (The Literacy Dictionary, 1995) (1)

DYSLEXIA

1. Disability in learning to read despite conventional instruction, adequate intelligence, and sociocultural opportunity (1)
2. Significant discrepancy between oral language (verbal IQ, listening comprehension) and reading achievement (1)
3. Deficits in phonological language skills causally related to reading and spelling problems. Having difficulty applying the necessary mental operations to make use of the phonological or sound structure of oral language when learning to decode written language (3)
4. Difficulties in phonological processing skills, including phonemic awareness, memory span (resulting in difficulties in retention of phonemes during sounding out and blending), rapid continuous serial naming ability (resulting in difficulties accessing phonological codes associated with letters, word segments, and words). These affect the extent to which the reader can use phonological information in decoding (6)
5. Developmental reading disability, which may be congenital or hereditary; can vary from mild to severe; occurs despite adequate vision, hearing, intelligence, and general language functioning (The Literacy Dictionary, 1995) (1)
6. Dyslexics often have difficulty in spelling and in acquiring a second language, suggesting that dyslexia is a part of a broad type of language disability (The Literacy Dictionary, 1995) (2)
7. In diagnosing a reading disability, the assessment should be comprehensive to determine which skills are intact and deficient, so that appropriate intervention can be provided. This includes assessing visual processing, strategies used to identify words, background knowledge, oral language skills (The Literacy Dictionary, 1995) (2)
8. Even with excellent help, long-term problems can persist. Even though students can make progress, they often have residual problems in decoding, reading speed, spelling and written language (which can be expected because writing requires more skills than reading) (The Literacy Dictionary, 1995) (2)

APPENDIX G

Durkin Phonics Test for Teachers (from Strickland, 1998)

VOWELS: Long and Short

A. In each of the five rows of words listed across below, underline the one word that begins with a long vowel sound.

				Long
1.	all	ask	<u>apron</u>	(a)
2.	<u>eager</u>	early	edge	(e)
3.	ignore	<u>idle</u>	irrigate	(i)
4.	odd	<u>ocean</u>	order	(o)
5.	up	urge	<u>use</u>	(u)

B. In each of the five rows of words listed across below, underline the one word that begins with a short vowel sound.

				Short
1.	ace	all	<u>at</u>	(a)
2.	eagle	earn	<u>engine</u>	(e)
3.	ice	<u>ill</u>	irk	(i)
4.	<u>octave</u>	owl	over	(o)
5.	<u>ugly</u>	use	urgent	(u)

VOWEL GENERALIZATIONS

Answer each section by checking the appropriate blank and by writing the relevant generalization

A. a i f

. If *-aif-* were a syllable in a word, the letter *a* in that syllable would probably:

 X sound like the *a* in *ate*
 sound like the *a* in *ask*
 be silent

Reprinted by permission of the publisher from Durkin, D., Phonics Test for Teachers, (New York: Teachers College Press, © 1964 by Teachers College, Columbia University. All rights reserved.), Durkin phonics test.

Appendix G: Durkin Phonics Test for Teachers (continued)

2. The letter *i* in that syllable would probably:

_____ sound like the *i* in *ice*
 _____ sound like the *i* in *inch*
 X be silent

3. Is there a rule that explains why the letters *a* and *i* make these sounds? If so, how would you state it?

When there are two vowels (in this case, *a* and *i*) in a syllable, the first is usually long and the second is silent, as in *aid* and *note*.

B. e k

1. If *-ek-* were a syllable in a word, the letter *e* in that syllable would probably:

_____ sound like the *e* in *eat*
 X sound like the *e* in *end*
 _____ be silent

2. Is there a rule that explains why the letter *e* makes this sound? If so, how would you state it?

When there is one vowel (here, *e*) followed by a consonant in the same syllable, that vowel is usually short, as in *at* and *up*.

C. b u

1. If *-bu-* were a syllable in a word, the letter *u* in that syllable would probably:

 X sound like the *u* in *use*
 _____ sound like the *u* in *us*
 _____ be silent

2. Is there a rule that explains why the letter *u* makes this sound? If so, how would you state it?

When there is one vowel (here, *u*) in a syllable, but it is at the end of the syllable, it is usually long, as in *be* and *clover*.

Reprinted by permission of the publisher from Durkin, D., Phonics Test for Teachers, (New York: Teachers College Press, © 1964 by Teachers College, Columbia University. All rights reserved.), Durkin phonics test.

Appendix G: Durkin Phonics Test for Teachers (continued)

DIGRAPHS

A. Define the term *consonant digraph*:

A consonant digraph is a combination of two consonants representing a sound unlike that of either of the individual consonants.

B. In the words listed below, find the consonant digraphs, and circle the letters that make up each digraph.

<u>th</u> ief	stain	enough	dumb
ch <u>ai</u> let	phase	fish	write
crust	skip	try	<u>th</u> ere
st <u>in</u> g	plane	rich	brown

CONSONANT BLENDS

A. Define the term consonant blend:

A consonant blend is a combination of two consonants in which each letter represents its own sound.

B. In the words listed below, find the consonant blends, and circle the letters that make up each blend.

<u>b</u> lank	comb	shout	<u>tr</u> ap
kite	<u>sp</u> ring	<u>tw</u> ig	camel
<u>gr</u> ain	g <u>asp</u>	foam	gnaw
<u>sp</u> lit	write	cane	rusty

DIPHTHONGS

A. Define the term diphthong:

A diphthong is a combination of two vowels recording a sound unlike that of either vowel. (Here *y* and *w* function as vowels)

Reprinted by permission of the publisher from Durkin, D., Phonics Test for Teachers, (New York: Teachers College Press, © 1964 by Teachers College, Columbia University. All rights reserved.), Durkin phonics test.

Appendix G: Durkin Phonics Test for Teachers (continued)

Technically, too, a diphthong is a kind of sound which, in the process of being made, requires a change in the mouth position. It is for this reason that vowel combinations like *au* (auto) and *oo* (look) are not diphthongs.

- B. In the words listed below, find the diphthongs, and circle the letters that make up each diphthong.

<u>oi</u> l	float	built
see	<u>ow</u> l	<u>fe</u> w
bow <u>l</u>	the <u>y</u>	<u>cou</u> ch
<u>bo</u> y	pour	each

Reprinted by permission of the publisher from Durkin, D., Phonics Test for Teachers, (New York: Teachers College Press, © 1964 by Teachers College, Columbia University. All rights reserved.), Durkin phonics test.

APPENDIX H

Linguistic Knowledge Questionnaire (adapted from Moats, 1994)

For each of the following words, determine the number of syllables:

salamander	<u>4</u>	finger	<u>2</u>
crocodile	<u>3</u>	pies	<u>1</u>
attached	<u>2</u>	gardener	<u>3</u>
unbelievable	<u>5</u>	psychometrics	<u>4</u>

How many speech sounds are in the following words?

ox	<u>3</u>	straight	<u>5</u>
boil	<u>3</u>	shout	<u>3</u>
king	<u>3</u>	though	<u>2</u>
thank	<u>4</u>	precious	<u>6</u>

What is the third speech sound in each of the following words?

boyfriend	<u>f</u>	prayer	<u>e</u>
thankyou	<u>nk</u>	higher	<u>r or y</u>
squabble	<u>w</u>	chalk	<u>k</u>
educate	<u>y or yu</u>	witchcraft	<u>ch</u>
stood	<u>oo</u>	badger	<u>j</u>

What letters signal that a “g” is pronounced /j/? (e, i, y)

One way to spell the “long a” sound in words is with the letter A. There are also other ways to spell this sound. List all the ways you can think of.

(a, ai; a-e, ey, ay, eigh)

One way to spell the sound /k/ is with the letter K. There are also other ways to spell this sound. List all the ways you can think of.

(c, k, ck, ch); qu and x also correspond to [kw] & [ks]

APPENDIX I

Scoring for Coursework Variables

Explanation Of Values Assigned To Reading And Linguistics Courses Listed by Teachers

READING COURSES

1 semester undergraduate course = 0.5

Undergraduate courses are generally introductory or methods courses. They may not describe the reading process in sufficient detail to enable teachers to assess reading development and diagnose problems at an early stage. Therefore, .5 is considered sufficient to describe the value of these courses towards expertise in reading instruction.

1 semester graduate course = 1

Graduate courses are considered more advanced and focused on specific processes (such as word identification and/or comprehension) than undergraduate level courses. Therefore, a value of 1 is assigned to each course.

Master's specialization in reading = 8

This is assigned 8, based on two graduate courses per semester for 4 semesters.

Program for readers at risk = 2 per semester

One semester of the readers at risk program is assigned 2, based on two courses per semester. Each course is considered equivalent to 1 graduate course because of the focus on specific reading processes.

Summer Institute in reading and/or writing = 1 for each course.

Participation in a summer reading and writing course is assigned 1 for each course because the courses are designed for teachers and focused in a way similar to a graduate course.

In-service workshop presentations (e.g., whole language workshop, reading program demonstrations, etc.) = 0.1 - 1, depending on extent of participation described by teacher.

In-service workshops are assigned 0.1 to 1 based on number of presentations. These workshops are considered informative, rather than instructional. Although teachers participated in workshops, they were not tested on the material to show whether they sufficiently absorbed the content of the presentation. If an experienced teacher did not specify how

Appendix I: Scoring for Coursework Variables (continued)

many workshops, has taught for many years, or specified “many” workshops, a maximum of 0.8 was assigned. Novice teachers who did not specify number of workshops were assigned 0.1 per year based on number of years teaching.

In-service school training programs = 0.5 each

Programs such as Balanced Literacy, After School reading program, Whole Language and Success For All training are assigned 0.5. These programs are considered instructional in that teachers are taught instructional methods to use in the reading program.

Work with Mentor teacher = 0.5-1

Mentoring by a teacher of other school staff was assigned a value of 0.5 if the teacher did not provide information on the mentor’s expertise and did not specify the mentor’s concentration in reading. Mentoring was assigned 1 point if the teacher specified that the mentor was an expert in teaching reading.

Observations, demonstrations, feedback = 0.1-1

Observations, demonstrations, and feedback during teaching are assigned .1 to 1 point depending on type and extent described by the teacher. For example, demonstration lessons of a reading program as part of an in-service workshop were assigned a lower score than those in which the teacher participated in workshops conducted by a literacy staff developer. These activities that are described by teacher as part of graduate level coursework are considered part of their instruction and are not scored separately.

Psycholinguistics or Sociolinguistics course = 1

If the teacher listed Psycholinguistics or Sociolinguistics as courses in linguistics or structure of language, these were scored with Reading Courses for the purposes of this study because of their focus on communicative and social language acquisition rather than word analysis skills.

LINGUISTICS COURSES

Linguistics or language course concentrating on structure of language = 2

Linguistics courses are assigned a value of 2 per course because of the importance of knowledge of language structure in reading instruction (discussed in literature review).

Appendix I: Scoring for Coursework Variables (continued)

Foreign language = 1

Teachers who reported that they were proficient in another language in addition to English are assigned 1 point for each language. This applies to teachers who grew up in a bilingual home and those who studied the other language(s) extensively as part of their education prior to graduate school and/or teaching. Knowledge of and the study of another language require that the student attend and manipulate words, parts of words, syllables, phonemes, etc. in order to pronounce words correctly and to obtain accurate meaning when reading or writing. For the purposes of this study, it is assumed that the word analysis skills necessary for reading, writing, and speaking another language is a resource that the teacher can use in the teaching of reading.

References

- Adams, M. (1990). Beginning to read: Thinking and learning about print. Cambridge, MA: MIT Press.
- Al Otaiba, S., & Torgesen, J. (2003). Leave no teacher behind: Using structured tutoring experiences to prepare teachers to apply scientifically based reading research. Paper presented at the Annual Meeting of the Society for the Scientific Study of Reading, Boulder, CO, June 2003.
- Alegria, J., Pignot, E., & Morais, J. (1982). Phonetic analysis of speech and memory codes in beginning readers. Memory & Cognition, *10*(5), 451-456.
- Allinder, R.M. (1995). An examination of the relationship between teacher efficacy and curriculum-based measurement and student achievement. Remedial & Special Education, *16*(4), 247-254.
- Anderson, R., Heibert, F., Scott, J., & Wilkinson, I. (1985). Becoming a nation of readers. Washington, D.C.: The National Institute of Education.
- Ball, E.W., & Blachman, B.A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? Reading Research Quarterly, *26*(1), 49-66.
- Ball, E.W. (1997). Phonological Awareness: Implications for Whole Language and Emergent Literacy Programs. Topics in Language Disorders, *17*(3), 14-26.
- Ball, E.W. (1993). Assessing phoneme awareness. Language, Speech, and Hearing Services in Schools, *24*, 130-139.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. Educational Psychologist, 28, 117-148.

Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), Self-efficacy in changing societies (pp. 1-45). New York, NY: Cambridge University Press.

Bandura, A. (1997). Self-efficacy: The exercise of control. New York, NY: W.H. Freeman and Company.

Bandura, A., & Wood, R.E. (1989). Effect of perceived controllability and performance standards on self-regulation of complex decision-making. Journal of Personality and Social Psychology, 56, 805-814.

Barr, R., Kamil, M., Mosenthal, P., & Pearson, P. (1991). Handbook of reading research (Vol. 2). New York: Longman.

Barrs, M., Ellis, S., Hester, H., & Thomas, A. (1988). The Primary Language Record. London: Centre for Language in Primary Education.

Baumann, J.F., Hoffman, J.V., Moon, J., & Duffy-Hester, A.M. (1998). Where are teachers' voices in the phonics/whole language debate? Results from a survey of U.S. elementary school teachers. The Reading Teacher, 51(8), 636-650.

Baumann, J.F., Hoffman, J.V., Duffy-Hester, A.M., & Moon Ro, J. (2000). The First R yesterday and today: U.S. elementary reading instruction practices reported by teachers and administrators. Reading Research Quarterly, 35(3), 338-377.

Bean, R.M., Fulmer, D., Zigmond, N., & Grumet, J.V. (1995, April). How experienced teachers think about their teaching: Their focus, beliefs, and types of reflection. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Berliner, D.C. (1986). In pursuit of the expert pedagogue. Educational Researcher, 15(7), 5-13.

Berliner, D.C. (1987). Ways of thinking about students and classrooms by more and less experienced teachers. In J. Calderhead (Ed.) Exploring Teachers' Thinking (pp. 60-83). London: Holt, Rinehart & Winston.

Berliner, D.C. (1991). Educational psychology and pedagogical expertise: New findings and new opportunities for thinking about training. Educational Psychologist, 26(2), 145-155.

Block, C.C., Oakar, M., & Hurt, N. (2002). The expertise of literacy teachers: A continuum from preschool to Grade 5. Reading Research Quarterly, 37(2), 178-206.

Biemiller, A. (1970). The development of the use of graphic and contextual information as children learn to read. Reading Research Quarterly, 6, 75-96.

Borko, H. & Livingston, C. (1989). Cognition and improvisation: Differences in mathematics instruction by expert and novice teachers. American Educational Research Journal, 26(4), 473-498.

Borko, H. & Niles, J. (1982). Factors contributing to teachers' judgments about students and decisions about grouping students for reading instruction. Journal of Reading Behavior, 14(2), 127-140.

Borko, H., & Shavelson, R.J. (1990). Teacher decision making. In B.F. Jones, & L. Idol (Eds.), Dimensions of thinking and cognitive instruction, (pp. 311-346) Hillsdale, NJ: Erlbaum.

Bradley, L., & Bryant, P. (1985). Rhyme and reason in reading and spelling. Ann Arbor, MI: University of Michigan Press.

Brady, S., & Shankweiler, D. (1991). Phonological processes in literacy: A tribute to Isabelle Y. Liberman. Hillsdale, NJ: Erlbaum

Byrne, B., & Fielding-Barnsley, R.F. (1989). Phonemic awareness and letter knowledge in the child's acquisition of the alphabetic principle. Journal of Educational Psychology, 81(3), 313-321.

Byrne, B., & Fielding-Barnsley, R.F. (1991). Evaluation of a program to teach phonemic awareness to young children. Journal of Educational Psychology, 83, 451-455.

Byrne, B., & Fielding-Barnsley, R.F. (1993). Evaluation of a program to teach phonemic awareness to young children: A 1-year follow-up. Journal of Educational Psychology, 85(1), 104-111.

Catts, H.W. (1991). Early identification of reading disabilities. Topics in Language Disorders, 12(1), 1-16.

Catts, H.W. (1996). Defining dyslexia as a developmental language disorder: An expanded view. Topics in Language Disorders, 16(2), 14-29.

Catts, H.W. (1997). The early identification of language-based reading difficulties. Language, Speech, and Hearing Services in Schools, 28, 86-89.

Catts, H.W., Fey, M.E., Tomblin, J.B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. Journal of Speech, Language & Hearing Research, 45(6), 1142-1157.

Catts, H.W., Gillispie, M., Leonard, L.B., Kail, R.V., & Miller, C.A. (2002). The role of speed of processing, rapid naming, and phonological awareness in reading achievement. Journal of Learning Disabilities, 35(6), 509-524.

Chall, J.S. (1983). Stages of reading development, (pp. 9-39) New York: McGraw-Hill.

Clarke, L. (1988). Invented versus traditional spelling in first graders' writings: Effects on learning to spell and read. Research in the Teaching of English, 22, 281-309.

Clay, M. (1985). The early detection of reading difficulties, (pp. 16-22). New Zealand: Heinemann.

Cunningham, A.E. (1990). Explicit versus implicit instruction in phonemic awareness. Journal of Experimental Child Psychology, 50, 429-444.

DeFord, D. (1985). Validating the construct of theoretical orientation in reading instruction. Reading Research Quarterly, 20(3), 351-367.

Duffy, G.G., & Hoffman, J.V. (1999). In pursuit of an illusion: The flawed search for a perfect method. The Reading Teacher, 53(1), 10-16.

Ehri, L.C. (1979). Linguistic insight: Threshold of reading acquisition. In T.G. Waller and G.E. MacKinnon (Eds.), Reading Research: Advances in Theory and Practice, Volume 1. New York: Academic Press, p. 63-114.

Ehri, L.C. (1986). Sources of difficulty in learning to spell and read. In M. Wolraich & D. Routh (Eds.), Advances in developmental and behavioral pediatrics (Vol. 7, pp. 121-195). Greenwich, CT: JAI Press.

Ehri, L.C. (1987). Learning to read and spell words. Journal of Reading Behavior, 19(1), 5-31.

Ehri, L.C. (1992). Reconceptualizing the development of sight word reading and its relationship to recoding. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), Reading acquisition (pp. 107-143). Hillsdale, NJ: Erlbaum.

Ehri, L.C. (1994). Development of the ability to read words: Update. In R.B. Ruddell, M.R. Ruddell, & H. Singer (Eds.) Theoretical Models and Processes of Reading, (4th ed., pp. 323-358). Newark, DE: International Reading Association.

Ehri, L.C. (1995a). Teachers need to know how word reading processes develop to teach reading effectively to beginners. In C. Hedley, Pa. Antonacci, & M. Rabinowitz (Eds.), Thinking and literacy: The mind at work, (pp. 167-188). Hillsdale, NJ: Erlbaum.

Ehri, L.C. (1995b). The emergence of word reading in beginning reading. In P. Owen, & P. Pumfrey (Eds.), Children learning to read: International concerns. Vol. 1: Emergent and developing reading: Messages for teachers (pp. 9-31). Washington, DC: The Falmer Press.

Ehri, L.C. (1998a). Grapheme-phoneme knowledge is essential for learning to read words in English. In J. Metsala & L. Ehri (Eds.), Word Recognition in Beginning Literacy. Mahwah, NJ: Erlbaum.

Ehri, L.C. (1998b). Learning to read and learning to spell are one and the same, almost. In C. Perfetti, L. Rieben, & M. Fayol (Eds.), Learning to Spell: Research, Theory and Practice Across Languages (pp. 237-269). Hillsdale, NJ: Erlbaum.

Ehri, L.C. (2000). Learning to read and learning to spell: Two sides of a coin. Topics in Language Disorders, 20(3), 19-36.

Ehri, L.C., Deffner, N.D., & Wilce, L.S. (1984). Pictorial mnemonics for phonics. Journal of Educational Psychology, 76, 880-893.

Ehri, L.C., & Robbins, C. (1992). Beginners need some decoding skill to read words by analogy. Reading Research Quarterly, 27, 12-26.

Ehri, L.C., & McCormick, S. (1998). Phases of word learning: Implications for instruction with delayed and disabled readers. Reading & Writing Quarterly: Overcoming Learning Difficulties, 14, 135-163.

Ehri, L.C., Nunes, S.R., Willows, D.M., Schuster, B.V., & Zadeh, Z.Y. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. Reading Research Quarterly, 36(3), 250-287.

Ehri, L.C., & Wilce, L.S. (1983). Development of word identification speed in skilled and less skilled beginning readers. Journal of Educational Psychology, 75, 3-18.

Ehri, L.C., & Wilce, L.S. (1986). The influence of spellings on speech: Are alveolar flaps /d/ or /t/? In J.D.B. Yaden, & S. Templeton (Ed.), Metalinguistic awareness and beginning literacy (pp. 101-114). Portsmouth, NH: Heinemann.

Ehri, L.C., & Wilce, L.S. (1987a). Does learning to spell help beginners learn to read words? Reading Research Quarterly, 18, 47-65.

Ehri, L.C., & Wilce, L.S. (1987b). Cipher versus cue reading: An experiment in decoding acquisition. Journal of Educational Psychology, 79, 3-13.

Ehri, L.C., & Williams J.P. (1996). Learning to read and learning to teach reading. In F. Murray (Ed.), The teacher educator's handbook: Building a knowledge base for the preparation of teachers (pp. 231-244). San Francisco, CA: Jossey-Bass.

Ericsson, K.A., & Simon, H.A. (1993). Protocol analysis: Verbal reports as data. Cambridge, MA: MIT Press.

Foorman, B.R., Francis, D.J., Fletcher, J.M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. Journal of Educational Psychology, 90, (1), 37-55.

Foorman, B.R., Francis, D.J., Novy, D.M., & Liberman, D. (1991). How letter-sound instruction mediates progress in first-grade reading and spelling. Journal of Educational Psychology, 83(4), 456-469.

Gaskins, I.W., Ehri, L.C., Cress, C., O'Hara, C., & Donnelly, K. (1996). Procedures for word learning: Making discoveries about words. The Reading Teacher, 50(4), 312-327.

Gersons-Wolfensberger, D., & Ruijssenaars, A. (1997). Definition and treatment of dyslexia: A report by the Committee on Dyslexia of the Health Council of the Netherlands. Journal of Learning Disabilities, 30(2), 209-213.

Gibson, S., & Dembo, M.H. (1984). Teacher efficacy: A construct validation. Journal of Educational Psychology, 76, 569-582.

Goodman, K. (1976). Reading: A psycholinguistic guessing game. In H. Singer & R. Ruddell (Eds.), Theoretical models and processes of reading (2nd ed., pp. 497-508). Newark, DE: International Reading Association.

Goodman, K., & Buck, K. (1973, October). Dialect barriers to reading comprehension revisited. The Reading Teacher, 124-130.

Gough, P.B., Ehri, L.C., & Treiman, R. (Eds.), Reading acquisition (pp. 107-143). Hillsdale, NJ: Erlbaum.

Gough, P.B., Juel, C., & Griffith, P.L. (1992). Reading, spelling, and the orthographic cipher. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), Reading acquisition (pp. 35-48). Hillsdale, NJ: Erlbaum.

Griffith, P.L. (1991). Phonemic awareness helps first graders invent spellings and third graders remember correct spellings. Journal of Reading Behavior, 23(2), 215-233.

Harris, T.L., & Hodges, R.E. (Eds.) (1995). The Literacy Dictionary. Newark, DE: International Reading Association.

Hoffman, J., & Pearson, P.D. (2000). Reading teacher education in the next millennium: What your grandmother's teacher didn't know that your granddaughter's teacher should. Reading Research Quarterly, 35(1), 28-44.

Hoge, R.D., & Coladarci, T. (1989). Teacher-based judgments of academic achievement: A review of literature. Review of Educational Research, 59(3), 297-313.

Hollingsworth, S. (1989). Prior beliefs and cognitive change in learning to teach. American Educational Research Journal, 26(2), 160-189.

Hoover, W.A., & Gough, P. (1990). The simple view of reading. Reading and Writing: An Interdisciplinary Journal, 2, 127-160.

Jimenez, J.E., Ortiz, M., Rodrigo, M., Hernandez-Valle, I., Ramirez, G., Estevez, A., O'Shanahan, I., & Trabaue, M. (2003). Do the effects of computer-assisted practice differ for children with reading disabilities with and without IQ-achievement discrepancy? Journal of Learning Disabilities, 36(1), 34-47.

Juel, C., Griffith, P.L., & Gough, P.B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. Journal of Educational Psychology, 78(4), 243-255.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. Journal of Educational Psychology, 80(4), 437-447.

Kagan, D.M. (1992). Professional growth among preservice and beginning teachers. Review of Educational Research, 62 (2), 129-169.

Kamhi, A.G., Catts, H.W., & Mauer, D. (1990). Explaining speech production deficits in poor readers. Journal of Learning Disabilities, 23 (10), 632-636.

Kucan, L., & Beck, I.L. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. Review of Educational Research, 67(3), 271-299.

Leinhardt, G., & Greeno, J.G. (1986). The cognitive skill of teaching. Journal of Educational Psychology, 78(2), 75-95.

Leinhardt, G., & Smith, D. (1985). Expertise in mathematics instruction: Subject matter knowledge. Journal of Educational Psychology, 77(3), 247-271.

Liberman, I.Y., & Liberman, A.M. (1992). Whole language versus code emphasis: Underlying assumptions and their implications for reading instruction. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), Reading acquisition (pp. 343-366). Hillsdale, NJ: Erlbaum.

Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. Reading Research Quarterly, 23(3), 265-284.

Masonheimer, P.E., Drum, P.A., & Ehri, L.C. (1984). Does environmental print identification lead children into word reading? Journal of Reading Behavior, 16, 257-271.

McCutchen, D., Abbott, R.D., Green, L.B., Beretvas, S.N., Cox, S., Potter, N.S., Quiroga, T., & Gray, A.L. (2002a). Beginning Literacy: Links Among Teacher Knowledge, Teacher Practice, and Student Learning. Journal of Learning Disabilities, 35(1), 69-86.

McCutchen, D., Harry, D.R., Cunningham, A.E., Cox, S., Sidman, S., & Covill, A.E. (2002b). Reading teachers' knowledge of children's literature and English phonology. Annals of Dyslexia, 52, 207-228.

McCutchen, D. & Berninger, V.W. (1999). Those Who Know, Teach Well: Helping Teachers Master Literacy-Related Subject-Matter Knowledge. Learning Disabilities Research and Practice, 14(4), 215-226.

Moats, L.C. (1995). The missing foundation in teacher education. American Educator, 19(2), pp. 9, 43-51.

- Moats, L.C. (1994). Knowledge of the structure of spoken and written language. Annals of Dyslexia, 44, 81-102.
- Moats, L.C. & Lyon, G.R. (1996). Wanted: Teachers with knowledge of language. Topics in Language Disorders, 16(2), 73-86.
- Morris, D., & Perney, J. (1984). Developmental spelling as a predictor of first-grade reading achievement. The Elementary School Journal, 84(4), 441-456.
- Nicholson, T. (1991). Do children read words better in context or in lists? A classic study revisited. Journal of Educational Psychology, 83(4), 444-450.
- Postrel, V. (2004, March 25). Economic scene: Getting the most out of the nation's teachers. The New York Times, p. C2.
- Pressley, M. (1995). The role of knowledge in cognition. In M. Pressley with McCormick, C.B., Advanced Educational Psychology, (pp. 84-109). New York, NY: HarperCollins College Publishers.
- Pressley, M. & Allington, R. (1999). What should reading instructional research be the research of? Issues in Education, 5(1), 1-35.
- Pressley, M., Rankin, J., & Yokoi, L. (1996). A survey of instructional practices of primary teachers nominated as effective in promoting literacy. The Elementary School Journal, 96(4), 363-384.
- Rack, J., Hulme, C., Snowling, M., & Wightman, J. (1994). The role of phonology in young children learning to read words: The direct-mapping hypothesis. Journal of Experimental Child Psychology, 57, 42-71.

Rack, J., Snowling, M., & Olson, R. (1992). The nonword reading deficit in developmental dyslexia: A review. Reading Research Quarterly, 27(1), 29-53.

Rath, L.K. (1994). The Phonemic Awareness of Reading Teachers: Examining Aspects of Knowledge. Unpublished doctoral dissertation, Harvard Graduate School of Education, Cambridge, MA.

Read, C. (1971). Pre-school children's knowledge of English phonology. Harvard Educational Review, 41, 1-34.

Regan, T., & Woods, K. (2000). Teachers' understandings of dyslexia: implications for educational psychology practice. Educational Psychology in Practice, 16(3), 333-347.

Reutzel, D.R. (1995). Fingerprint-reading and beyond: Learning about print strategies (LAPS). Reading Horizons, 35(4), 310-328.

Rice, M. (1989). Children's language acquisition. American Psychologist, 44(2), 149-156.

Richards, L. & Richards, T. (2000). QSR NUD*IST 7 N5 software for qualitative data analysis [Computer software]. Victoria, Australia: Authors.

Ruddell, R., Ruddell, M., & Singer, H. (Eds.), (1994). Theoretical models and processes of reading. Newark, DE: International Reading Association.

Rumelhart D. (1977). Toward an interactive model of reading. In S. Dornic (Ed.), Attention and performance (Vol. 6, pp. 573-603). New York: Academic Press.

Samuels, S.J. & Kamil, M.L. (1984). Models of the reading process. In P.D. Pearson (Ed.), Handbook of Reading Research. New York: Longman, pp. 185-224.

Savage, R. (2001). The 'Simple View' of reading: some evidence and possible implications. Educational Psychology in Practice, 17(1), 17-33.

Scarborough, H.S. (1990). Very early language deficits in dyslexic children. Child Development, 61, 1728-1743.

Scarborough, H.S., Ehri, L.C., Olson, R.K., & Fowler, A.E. (1998). The fate of phonemic awareness beyond the elementary school years. Scientific Studies of Reading, 2(2), 115-142.

Share, D.L., Jorm, A.F., Maclean, R., & Matthews, R. (1984). Sources of individual differences in reading acquisition. Journal of Educational Psychology, 76(6), 1309-1324.

Shepherd, M.J. (1999). Assessment of progress. In J.R. Birsch (Ed.), Multisensory teaching of basic language skills. Baltimore, MD: Brookes Publishing, pp. 383-397.

Skaalvik, E.M., & Hagtvet, K.A. (1990). Academic achievement and self-concept: An analysis of causal predominance in a developmental perspective. Journal of Personality and Social Psychology, 58(2), 292-307.

Spear-Swerling, L., & Brucker, P.O. (2003). What affects teachers' knowledge base about English word structure? Paper presented at the Annual Meeting of the Society for the Scientific Study of Reading, Boulder, CO, June 2003.

Spear-Swerling, L., & Brucker, P.O. (2004). Teachers' acquisition of knowledge about English word structure. Annals of Dyslexia, 53, 72-104.

SPSS® Student Version 10 for Windows [Computer software]. (2000). Chicago, IL: SPSS Inc.

Stahl, S.A., & Murray, B.A. (1994). Defining phonological awareness and its relationship to early reading. Journal of Educational Psychology, 86(2), 221-234.

Stanovich, K.E. (1980). Toward an interactive compensatory model of individual differences in the development of reading fluency. Reading Research Quarterly, 16, 32-71.

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21(4), 360-406.

Stanovich, K.E. (1992). Speculations on the causes and consequences of individual differences in early reading acquisition. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), Reading acquisition (pp. 307-342). Hillsdale, NJ: Erlbaum.

Strickland, D. (1998). Teaching Phonics Today. Newark, DE: International Reading Association, pp. 91-95.

Sulzby, E. (1985). Children's emergent reading of favorite storybooks: A developmental study. Reading Research Quarterly, 20(4), 459-481.

Swank, L.K., & Catts, H.W. (1994). Phonological awareness and written word decoding. Language, Speech, and Hearing Services in Schools, 25, 9-14.

Tangel, D., & Blachman, B. (1992). Effect of phoneme awareness instruction on kindergarten children's invented spelling. Journal of Reading Behavior, 24 (2), 233-261.

Tangel, D., & Blachman, B. (1995). Effect of phoneme awareness instruction on the invented spelling of first-grade children: A one-year follow-up. Journal of Reading Behavior, 27 (2), 153-185.

Teale, W. & Sulzby, E. (1986). Emergent literacy: Writing and reading. Norwood, NJ. Ablex. Introduction.

Thompson, R.A. (1992). A critical perspective on whole language. Reading Psychology: An International Quarterly, 13, 131-155.

Tittle, C.K. (1996, March). Teacher focus, beliefs, and interpretations of students' mathematical dispositions: Content analysis of think-aloud protocols based on a classroom assessment. Paper presented at the meeting of the American Educational Research Association, New York, NY.

Torgesen, J.K., Wagner, R.K., & Rashotte, C.A. (1994). Longitudinal studies of phonological processing and reading. Journal of Learning Disabilities, 27(5), 276-286.

Torgesen, J.K. (1998). Catch them before they fall: Identification and assessment to prevent reading failure in young children. American Educator, Spring/Summer, 32-39.

Tunmer, W.E., & Hoover, W.A. (1992). Cognitive and linguistic factors in learning to read. In P.B. Gough, L.C. Ehri, & R. Treiman (Eds.), Reading acquisition (pp. 175-214). Hillsdale, NJ: Erlbaum.

Uhry, J.K., & Shepherd, M.J. (1997). Teaching phonological recoding to young children with phonological processing deficits: The effect on sight-vocabulary acquisition. Learning Disability Quarterly, 20, 104-125.

Uhry, J.K. (1999). Phonological awareness and reading: Research, activities, and instructional materials. In J.R. Birsch (Ed.), Multisensory teaching of basic language skills. Baltimore, MD: Brookes Publishing, pp. 63-84.

Wagner, R.K., & Torgesen, J.K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. Psychological Bulletin, 101, 192-212.

Wagner, R.K., Torgesen, J.K., & Rashotte, C.A. (1994). Development of reading-related phonological processing abilities: New evidence of bidirectional causality from a latent variable longitudinal study. Developmental Psychology, 30, 73-87.

Wertheim, C., & Leyser, Y. (2002). Efficacy beliefs, background variables, and differentiated instruction of Israeli prospective teachers. Journal of Educational Research, 96(1), 54-63.

Westerman, D.A. (1991). Expert and novice teacher decision making. Journal of Teacher Education, 42(4), 292-305.

Wineberg, S.S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. Journal of Educational Psychology, 83(1), 73-87.