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Beginning Reading Instruction in Massachusetts Public Schools: Research, Policy, and Teachers' Knowledge and Beliefs

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ABSTRACT

Research on reading acquisition and instruction has identified the incorporation of an explicit, systematic code-based approach into a comprehensive reading curriculum as most successful in teaching beginning readers, including those who are reading disabled (e.g., Adams, 1990; National Reading Panel, 2000; Pressley, 2002; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). Yet, 70% of 4th grade students nationwide and 60% of such students in Massachusetts are not reading at proficient levels (National Assessment of Educational Progress, 2003), statistics which raise questions about how well the research is translated into educational policies and classroom practices. Over the course of my Fenwick year, I have investigated the process by which research may influence educational decisions regarding early reading instruction in Massachusetts public schools, through a review of the relevant literature and state and national policies (e.g., Massachusetts Education Reform Act, 1993; Massachusetts English/Language Arts Curriculum Framework, 2001; No Child Left Behind, 2001), a set of semi-structured interviews with policymakers, school administrators, and teachers (n=58), and a statewide teacher survey (n=112). Although educational policies are aligned with instructional methods supported by research, the degree to which individual districts or schools utilize these policies or the research itself to guide decisions varies. Furthermore, teachers tend to overestimate their own knowledge of reading research and/or devalue the worth of this knowledge for guiding classroom practices. Teachers' lack of motivation to become more familiar with research findings is compounded by a lack of access to such findings. Nor do teachers generally have the prerequisite knowledge to implement the code-based approach which is supported by research, as found on the Teacher Knowledge Assessment: Structure of Language (Bos, Mather, Dickson, Podhajski, & Chard, 2002). A more concerted effort by all

professionals involved in the educational system, including educators, policymakers, and

researchers, is required to better translate reading research into educational practice.

ABBREVIATIONS

AYP	Annual Yearly Progress
ELA	English/Language Arts
LEA	Local Educational Agency
MCAS	Massachusetts Comprehensive Assessment System
MERA	Massachusetts Education Reform Act of 1993
MTEL	Massachusetts Tests for Educator Licensure
NAEP	National Assessment of Educational Progress
NASDTEC	National Association of State Directors of Teacher Education
NCATE	National Council for Accreditation of Teacher Education
NCLB	No Child Left Behind Act of 2001
NRC	Northeast Regional Credential
PDP	Professional Development Point
SBRR	Scientifically-Based Reading Research
TKA: SL	Teachers' Knowledge Assessment: Structure of Language
TPERS	Teachers' Perceptions of Early Reading and Spelling

BEGINNING READING INSTRUCTION IN MASSACHUSETTS PUBLIC SCHOOLS:

RESEARCH, POLICY, AND TEACHERS' KNOWLEDGE AND BELIEFS

Reading is a fundamental skill necessary for success in today's society; without the

ability to decode and comprehend written language, meaning cannot be derived from printed

text, a primary source of information sharing (e.g., newspapers, magazines, books, instructional

manuals, maps, road signs, labels, the Internet, letters, emails). Unlike speech, however, reading

is not a natural skill in that it cannot develop without instruction or practice (Lyon, 1999).

Failure to develop reading skills early in one's school career impedes further learning, as these

children often remain poor readers throughout their school careers: Eighty-eight percent of those

children who fail to reach appropriate grade levels of reading as of the end of first grade do not

demonstrate grade-level skills through the fourth grade (Juel, 1988), and 75% of those who do

not show sufficient reading skills by the end of third grade do not demonstrate adequate reading

abilities through high school (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996).

Cunningham and Stanovich (Cunningham & Stanovich, 1997) found that those students who

easily acquired reading skills during first grade had better comprehension, larger vocabularies,

more general world knowledge, and were more likely to develop a love of reading when

reassessed in the eleventh grade. Other studies (Cunningham & Stanovich, 1991, 1998; Good,

Simmons, & Smith, 1998; Juel, 1988; Stanovich, 1986; Stanovich & Cunningham, 1992;

Stanovich, West, & Harrison, 1995; West & Stanovich, 1991; West, Stanovich, & Mitchell,

1993) have also described this reciprocal relationship which exists among reading ability,

reading volume or print exposure, and general world knowledge and vocabulary. Because poor

readers tend to have less motivation to read, they do not practice and solidify their reading skills,

creating a disheartening cycle. In turn, as they are reading less, these students receive less

exposure to print materials, which is highly correlated with measures of cultural literacy and

vocabulary even after accounting for age, educational level, working memory capacity, and SAT

scores. Without the benefit of such background knowledge, poor readers are then faced with an

even more difficult time comprehending text when they do read, leading to more frustration, less

motivation for reading, and fewer opportunities to practice reading skills. This phenomenon is

referred to as the Matthew Effect, because the rich (skilled readers) get richer in not only their

reading abilities but general understandings of their world, while the poor (struggling readers)

get poorer, causing the gap between the two groups to widen. Consequently, even those adults

who learn to compensate for poor reading skills show signs of persistent problems in this area;

they are less accurate and slower in identifying words, comprehending passages, and spelling

(Bruck, 1990, 1992; Felton, Naylor, & Wood, 1990; Snowling, Nation, Moxham, Gallagher, &

Frith, 1997; Wilson & Lesaux, 2001).

Hence, the fact that in 2003, approximately 70% of students across the country and 60%

of students in Massachusetts could not demonstrate proficient reading skills on the National

Assessment of Educational Progress (NAEP; U. S. Department of Education, Institute of

Educational Sciences, & National Center for Education Statistics, 2003) is a cause for great

concern, especially when about half of such students scored at below basic levels. Similarly, an

end of third-grade reading assessment administered by the Massachusetts Department of

Education (as part of the Massachusetts Comprehensive Assessment System or MCAS;

Massachusetts Department of Education, 2003) found 37% of the state's public education

students as needing improvement in their reading skills, again suggesting that too many students

are struggling with learning to read. Furthermore, estimates of the number of children in the

United States with actual reading disabilities have risen to 17-20% (Lyon, 1999). Looking at the

myriad of evidence which suggests that reading problems generally begin early in one's school career and persist throughout adulthood, together with the increased incidence of reading disabilities and the statistics regarding student achievement, it is clear that it is of the utmost importance to teach reading skills to the best of our ability during the early elementary years. Not only will more effective instruction serve to prevent reading difficulties and reduce the number of children failing to acquire this basic skill, but it will also minimize the impact of the Matthew Effect on students who initially struggle with reading.

Much research has been conducted on both reading acquisition and instruction (see following sections for a literature review), yet the incidence of students who struggle with reading calls into question the extent to which such research is used to inform educational decisions. The aim of this project was to investigate the translation of research to practice in the area of beginning reading instruction, specifically for Massachusetts public schools. Factors influencing this process were explored through a literature review of relevant research and policy, as well as through a survey of primary teachers' knowledge and beliefs.

Research on the Process of Reading

The process of reading begins when the eye fixates on the visual symbols (letters) representing print. The skilled reader is able to view an area containing approximately 20 letters or letter spaces during any one particular fixation, using perhaps 7 to 8 letters or letter spaces to aid with word identification (McConkie & Rayner, 1975; Rayner, 1975, and Rayner & Bertera, 1979 as cited in Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). Importantly, research shows that skilled readers 1) fixate most words in running text, ignoring only short function words such as "on," "if," "and," etc., and 2) process all the letters in a word in a parallel fashion (see reviews of research on eye movements during reading research in Adams, 1990, pp.

100-102; Pressley, 2002, pp. 48-49; Rayner et al., 2001, pp. 46-48). In terms of word recognition, visual processing provides orthographic information for the reader, sometimes permitting direct access to the mental lexicon (Adams, 1990; Booth, Perfetti, & MacWhinney, 1999). This process is especially important for those words which might be considered irregularly spelled (e.g., yacht), meaning that they must be recognized solely through memorization of the letter pattern. However, with the vast number of words in the English language as well as skilled readers' ability to recognize those words which they may have never encountered in print form, readers do not rely solely on visual, orthographic information for word recognition.

At the same time that they are attending to the orthographic information that a word presents, skilled readers also automatically activate the phonological codes for graphemes, morphemes, syllables, or words, depending on their familiarity with these levels within a particular word (Adams, 1990; Booth et al., 1999; Perfetti, Bell, & Delaney, 1988; Rayner et al., 2001; Rayner, Sereno, Lesch, & Pollatsek, 1995). The advantage of the phonological processor is that it allows one to read words whose print forms are unfamiliar (i.e., those words not yet part of a sight vocabulary; this includes the majority of words for beginning readers). For instance, with the visual input "catnip," readers could activate individual grapheme-phoneme correspondences for each of the letters ("c" → /k/, "a" → /æ/, "t" → /t/, etc.), could activate the phonological codes for onsets-rimes through analogy with other known words ("c" → /k/, "at" → /æt/, etc.), could activate the two morphemes/syllables as wholes ("cat" → /kæt/, "nip" → /nɪp/), or could activate the entire word without breaking it down into components ("catnip" → /kætnɪp/). The size of the chunk of the phonological code which the reader is able to activate, and thus the speed at which an entire word's pronunciation is able to be accessed, depends upon

the frequency the reader has experienced that specific word and its spelling pattern in print.

Because letters are processed in parallel, continued exposure to the same word results in more

familiarity with chunks of its orthography (from graphemes through the word in its entirety),

allowing for activation of phonological codes at the same levels. This allows older, skilled

readers with much print exposure to read words as whole, often entirely unaware of activating

these phonological codes until a difficult word is encountered (e.g., sphygmomanometer).

Because beginning readers have little experience in linking words' oral and print forms, they

have yet to make strong associations between a word's orthographic and phonological

information. Thus, pronunciations require more conscious effort, particularly at the level of

grapheme-phoneme correspondences. It is only with attention to and practice with the letter-

level cues of words that beginning readers will eventually read in a manner similar to older,

skilled readers.

Orthographic and phonological information therefore work in parallel in order to activate

a word's entry in the mental lexicon, thereby accessing its meaning from long term memory

stores (for a more in-depth description of the word recognition process, see Seidenberg &

McClelland, 1989). It is at this point in the process at which context and prior knowledge play a

role. Context clues can facilitate activation of a word's meaning or, in the case of homographs

(e.g., "The police put a bug in the suspect's home." versus "The bug landed on the azalea bush.")

or other somewhat ambiguous words (e.g., "She wore a beautiful gown to the ball." versus

"Wondering who would be knocking at such a late hour, the woman threw on a gown before

opening the door.") ensure that the correct meaning is activated. However, context does not aid

in word recognition directly: "the implication is that context can respond to orthographic

information; it can speed and assist its interpretation; but it cannot overcome it" (Adams, 1990,

p. 140; Booth et al., 1999). Context aids in reading, then, only if the reader can first identify the word on its own (Adams, 1990; Archer & Bryant, 2001; Pressley, 2002; Rayner et al., 2001). This fact underscores the importance of familiarity with the word's orthographic and phonological information. In fact, older, more skilled readers are less likely to try to use context as a cue to word recognition than beginning readers (Simons & Leu, 1987), although the use of context clues can aid in monitoring whether a word was decoded correctly.

Efficient word recognition is essential for developing fluency (i.e., the ability to read with speed, accuracy, and proper expression; National Reading Panel, 2000). Fluency depends on the strength of the associations among a word's orthographic and phonological information, and its entry in the mental lexicon (Adams, 1990). As described above, more experience reading a particular word leads to more automatic recognition of letter patterns and their corresponding pronunciations, and thus quicker access to the mental lexicon and word meaning. Such automaticity frees attentional and memory resources once devoted to grapheme- or other subword-level decoding (Adams, 1990; Booth et al., 1999; LaBerge & Samuels, 1974; Naeslund & Smolkin, 1997; Samuels, 1988), leaving more resources for attending to punctuation and other markers of expression, as well as for constructing and understanding the meaning of the text (i.e., comprehension). It follows, logically, that word reading skills are predictive of text comprehension (e.g., Bruck, 1990; Juel, 1988).

Methods of Reading Instruction

Historically, methods of teaching reading have taken three major forms, whole word approach, literature-based/whole language, and code-based/skills (including phonics), and proponents of these particular philosophies have often been depicted as engaging in a Great Debate or the Reading Wars (Adams, 1990; Adams & Bruck, 1995; Chall, 1967/1983; Kamil,

1995; Perfetti, 1991; Pressley, 1994, 2002; Rayner et al., 2001; Viadero, 1994, October), as to

what constitutes best practice(s) in reading instruction.

Whole Word or Look/Say Approach

The whole word or "look/say" method of teaching reading focused on orthographic

information only, through sight recognition. Students were required to memorize the word's

visual letter pattern together with its spoken counterpart (e.g., the Dick and Jane series). When

one thinks of the countless numbers of words in the English language, the faults of this method

are obvious: one could not possibly memorize the visual form of every word in his or her reading

vocabulary, nor would one be able to read unfamiliar words until these were read for him or her

unless he or she intuitively "broke the code."

Literature-Based or Whole Language Approach

Whole language instruction was popular in education circles in the 1980s (Westwood,

Knight, & Redden, 1997), perhaps as a reaction to the "back to basics" (in reading, phonics)

mentality of the 1970s. Proponents of whole language criticized phonics instruction in its

overemphasis on decoding skills at the cost of reading for content and meaning. Moreover,

critics of phonics held that it was boring to learn and to teach, thus decreasing student

enthusiasm for reading in general. Instead, supporters of whole language believe that reading is

a top-down process, where meaning and context, rather than grapheme-phoneme

correspondences, allow readers to recognize words (Bergeron, 1990; Goodman, 1989; Liberman

& Liberman, 1990; Moats, 2000b; Smith, 2003). Whole language posits that, similar to how

speech develops, children should learn to read naturally through imitating the adult process of

reading, which is holistic and makes little use of decoding, and experiencing works of literature

in their original forms, precluding the use of grade-level, decodable texts, those texts specifically

designed for practicing phonics skills. This approach assumes that children will extract grapheme-phoneme relationships and the structures of written language implicitly as they accrue more exposure to text, consistent with the method's philosophy of a child-centered approach and the teacher as a mediator or facilitator of learning. Thus, explicit reading skills, such as segmenting and blending, are not taught except in passing, such as when students err. When phonics instruction is given, on this "as needed" basis, it is limited to the word(s) at hand; general principles of phonics which allow for transfer of learning across words are not taught formally. For example, in misreading the word "purr" in the sentence "Petting the cat made it *purr*," whole language teachers would ask students what letter the misread word begins with and try to cue the students with questions such as, "What do cats do when you pet them?" In essence, readers learning under the whole language method are expected to "predict" and identify words based on context and possibly their initial or ending sounds. With practice, those words frequently encountered become part of one's sight vocabulary and are recognized immediately (reminiscent of the whole word or look/say approach). In addition, whole language focuses on the process of reading as one of meaning-making and encourages and motivates students to enjoy reading for its own sake.

Code-Based or Skills Instruction

Proponents of the code-based approach see reading as encompassing a set of skills or strategies which must be learned (Adams, 1990; Chall, 1967/1983; Pressley, 2002; Scarborough & Brady, 2002). Students are encouraged to use letter and other subword knowledge in order to "sound out" an unknown word's parts, and then blend them together until a recognizable pronunciation is produced. The teacher therefore takes a more active, directive role in instructing students, although, ideally, as material is covered and skills are learned, he or she gradually

raises expectations and shifts more responsibility to the students (i.e., scaffolding). The code-based approach to teaching reading involves a number of components, most notably phonological awareness and phonics instruction, and, as it is this approach which has found the greatest support from research, such components will be detailed in the following sections.

Research on Reading Instruction

An extensive amount of research has been conducted on how reading is best taught. Recently, much of this research has been synthesized through meta-analysis by the National Research Panel (2000). In response to request from Congress, the National Reading Panel was established by the National Institute of Child Health and Human Development (NICHD) in order to identify best practices in reading instruction as supported by scientifically-based reading research (SBRR). The Panel identified five essential components of reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. It is important to note, however, that although all of these areas must be addressed in an effective reading program, other components are necessary for a truly comprehensive reading program (e.g., a print rich environment, teacher read-alouds, leveled and decodable books, sustained silent reading). The National Reading Panel's meta-analysis was not exhaustive; it sought to explore the role of those five factors believed to have 1) a potentially significant impact on reading instruction, and 2) enough of a research-base to warrant meta-analysis.

Phonemic Awareness and Phonics Instruction

Recent research points to phonemic awareness as an important component of early reading ability. Phonemic awareness is a subskill of phonological awareness, "the broad class of skills that involve attending to, thinking about, and intentionally manipulating the phonological aspects of spoken language, especially the internal phonological structure of words"

(Scarborough & Brady, 2002, p. 312). Under the umbrella of phonological awareness, this metacognitive ability pertains to all levels of language structure, including phonemes (i.e., individual speech sounds), onsets-rimes, syllables, and words (e.g., at the word level, the ability to distinguish individual words in a steady stream of speech, or, at the syllable level, the ability to hear two distinct syllables when the word "butter" is spoken aloud). Phonemic awareness, in particular, refers to such knowledge at the phoneme-level, the idea that spoken words are made up of individual sounds. This knowledge may be tested in asking children how many different sounds they hear in particular words (e.g. "cat" → /k/ /æ/ /t/, "through" → /θ/ /r/ /u/), to identify a beginning, middle, or ending sound (e.g. the first sound in "cat" is /k/), or for rhyming words. Assessments of early phonological ability are good predictors of later reading skill (Bradley & Bryant, 1983; Byrne, Freebody, & Gates, 1992; Foorman, Francis, Novy, & Liberman, 1991; Juel, 1986, 1988; Raz & Bryant, 1990; Wagner, 1988; Wagner & Torgesen, 1987), with children who have high levels of phonological awareness likely to become good readers and poor readers tending to have lower levels of phonological awareness. Phonological training, increasing awareness of individual phonemes within words through tasks that require the manipulation of the individual phonemes, has now been recognized as a valid means of increasing phonological awareness for both skilled or non-impaired and disabled readers, which then translates into better reading skill (Ball & Blachman, 1991; Brady, Fowler, Stone, & Winbury, 1994; Bus & van Ijzendoorn, 1999; Byrne & Fielding-Barnsley, 1991, 1993, 1995; Byrne, Fielding-Barnsley, & Ashley, 2000; Ehri et al., 2001; McGuinness, McGuinness, & Donohue, 1995; National Reading Panel, 2000; O'Connor, Jenkins, & Slocum, 1995; Schneider, Ennemoser, Roth, & Kuespert, 1999; Schneider, Roth, & Ennemoser, 2000; Wise, Ring, & Olson, 1999). Phonological training includes practice in isolating, identifying, and categorizing sounds (e.g. the first sound in "cat" is

/k/, "cat" and "cold" both have the sound /k/ but "race" does not), segmenting words into their sound parts (e.g. "cat" → /k/ /æ/ /t/), deleting sounds from words (e.g. say "cat" without the /k/ → "at"), and blending individual sounds together to form words (e.g. /k/ + /æ/ + /t/ → "cat").

Phonological awareness, however, is only the starting point for learning to read. Various studies involving phonological training programs have expanded upon the idea of phonological awareness as the basis of reading skill, and further identified instructional components necessary for successful reading. Beginning readers must develop knowledge of the alphabetic principle, the idea that individual letters or groups of letters of the alphabet (graphemes) corresponds to a particular sound or sounds (phonemes; Scarborough & Brady, 2002). Because English is a deep language, this grapheme-to-phoneme correspondence is not always consistent (e.g. the letter "a" can create sounds as heard in the pronunciations of the following words: "cane," "hat," "fall," "about"; the letter "c" can sound like /k/ or /s/; "th" is not a blend of the individual sounds of /t/ + /h/ but corresponds to the sound /θ/ as in "thin" or /ð/ as in "this;" Moats, 2000a; Venesky, 1999). Additionally, the phoneme-to-grapheme correspondence is also inconsistent (e.g. the sound /e/ can be represented by the spellings "e," "ai," "ea," etc.). The lack of one-to-one grapheme-phoneme correspondence is one reason why reading of the English language is much more difficult than speaking, and fully understanding this concept, necessitating explicit, systematic instruction, allows what is heard in spoken language (phonology) to be linked to the written form of language (orthography). Children who receive instruction in both phonological awareness and the alphabetic principle show large gains in reading and spelling ability (Bus & van Ijzendoorn, 1999; Byrne & Fielding-Barnsley, 1989, 1990; Foorman et al., 1991; Schneider et al., 2000). Training children in phonological skills allows them to link the phonemes they hear to the written words they see when reading, and using phonological skills to "sound out"

unknown words further improves reading outcomes (Hatcher, Hulme, & Ellis, 1994; Oakland,

Black, Stanford, Nussbaum, & Balise, 1998). This process of "sounding out" a word requires

both knowledge of phonology and orthography; it includes mapping the letters in the word to

sounds and then blending the individual sounds together to form a recognizable word, a process

termed phonological assembly (e.g. written form of "happy" maps "h" $\rightarrow$ /h/, "a" $\rightarrow$ /æ/, "pp" $\rightarrow$

/p/, and "y" $\rightarrow$ /i/; /h/ + /æ/ + /p/ + /i/ $\rightarrow$ spoken word "happy"). Phonics instruction explicitly

teaches these grapheme-phoneme relationships and how to use phonological skills for decoding.

Phonics may also make use of the sounds of syllables, rimes, and word families in order to

increase the transfer and speed of decoding skills. The inclusion of phonics instruction is

necessary for adequate reading development, and has proved beneficial to children, regardless of

reading ability level (Bus & van Ijzendoorn, 1999; Lovett, Lacerenza et al., 2000; Rashotte,

MacPhee, & Torgesen, 2001; Schneider et al., 1999) or IQ (S. P. Abbott, Reed, Abbott, &

Berninger, 1997; Hart, Berninger, & Abbott, 1997; Vellutino, Scanlon, & Tanzman, 1998).

Furthermore, early phonics instruction in kindergarten and first grade shows positive effects for

later word recognition, comprehension, and spelling abilities (Adams, 1990; Chall, 1967/1983;

Freebody & Byrne, 1988; National Reading Panel, 2000).

Code-Based Instruction Within a Balanced Literacy Program

Most research on the two approaches has consistently shown the advantages of code-

based instruction over the whole language method of teaching reading (Hatcher et al., 1994;

Lovett, Warren Chaplin, Ransby, & Borden, 1990). Significantly, as described previously, while

context may aid readers in deciphering meaning, it does not facilitate word decoding or

identification (Archer & Bryant, 2001). Instead, the essential factor in children's reading

aptitude is phonological knowledge and the ability to decode words out of context (Freebody &

Byrne, 1988; Moats, 2000a, 2000b). In fact, Chapman, Tunmer, and Prochnow (as cited in

Moats, 2000b) found that success in those programs designed in the whole language model

depends on students' initial phonological skills; those students who enter with poor phonological

skills do not improve these skills as a function of the program, nor do they ultimately improve

their reading performance. Similarly, poor phonological awareness and phonological skills

account for the persistent difficulties of adult unskilled readers (Bruck, 1992; Felton et al., 1990;

Shaywitz, Fletcher, Holahan, & Shaywitz, 1992; Snowling et al., 1997). In addition, providing

students with multiple strategies for decoding words, such as through using word families and

analogy of rimes, identifying root words, suffixes, and prefixes, and memorizing "sight words"

(frequently those irregular words whose spellings do not match common grapheme-phoneme

relationships), along with phonological training enhances reading speed, accuracy, and

comprehension (Abbott et al., 1997; Hart et al., 1997; Lovett, Lacerenza et al., 2000; Lovett &

Steinbach, 1997; Lovett, Steinbach, & Frijters, 2000; Pressley, 2002; Pressley, Rankin, & Yokoi,

1996; Wharton McDonald, Pressley, & Hampston, 1998). In general, early "reading readiness"

requires instruction at mainly the phonological level, and other levels or approaches for decoding

or word identification prove beneficial as reading development continues into the second grade

(Lovett, Lacerenza et al., 2000).

All of these code-based components, along with instruction in vocabulary, fluency, and

comprehension, and scaffolded application of these skills in authentic reading and writing

experiences are brought together under the heading of balanced literacy (Pressley, 2002). When

done correctly, this perspective marries what is good about whole language (e.g., authentic

experiences, exemplary children's literature, motivation to read) with the code-based approach

supported by research, essentially ending the dichotomy of literature-based versus skills

instructional approaches. The importance, however, of explicit, systematic, code-based instruction within such an overall balanced program is emphasized, and the question often arises as to whether "balanced" curricula truly incorporate this essential component (Moats, 2000b).

RESEARCH INTO PRACTICE: LEGISLATION

As seen above, there exists a strong research base on the process of reading, reading acquisition, and reading instruction. However, as demonstrated by NAEP and MCAS data, we are still not teaching a great number of children to read during their elementary school years. Is the research influencing educational practice? Educational policies, at both the national and state levels, exert much control over the public education system, and are one arena in which research could be used to ensure best practices in reading instruction.

Federal Policies Affecting Beginning Reading Instruction

Although governance of education is constitutionally left to individual states (who in turn have often left it to local, district control; "Report Card: Reading First," 2003; Valencia & Wixson, 1999), federal legislation can have profound effects on how students are taught in public schools. This is due to the flow of funds within the educational system: local educational agencies (LEAs, i.e., school districts) are partially funded through state educational agencies (e.g., the Massachusetts Department of Education), who, in turn, depend on supplemental funds from the National Department of Education. Policymakers, at either the state or national level, may link the distribution of funds with requirements which recipients are obligated to fulfill, thus effectively legislating educational policies for districts within their jurisdiction. It is in this manner that the federal government can issue national mandates such as the No Child Left Behind Act of 2001 (NCLB; U. S. Department of Education & Office of Elementary and Secondary Education, 2002).

Without a doubt, NCLB, signed on January 8, 2002 by President George W. Bush as the

reauthorization of the Elementary and Secondary Education Act of 1965 (ESEA; McGill-

Franzen, 2000; *No Child Left Behind Act of 2001 [Executive Summary]*, 2001; Rebora, 2004; U.

S. Department of Education, Office of Elementary and Secondary Education, 2002), has

significantly impacted the way all core subjects, including reading, are taught in public schools

across the country. With regard to literacy, NCLB aims to have every child reading on grade

level by the end of third grade (Manzo, 2004; McGill-Franzen, 2000; U. S. Department of

Education, Office of Elementary and Secondary Education, 2002), and seeks to accomplish this

goal with the aid of two major federally-funded initiatives: the Title I program (referred to as

Chapter I of the Education Consolidation and Improvement Act until the first reauthorization of

ESEA in 1994) and the new Reading First program (which replaced the Reading Excellence Act

of 1998). The broader provisions of NCLB, which apply to all public schools, also have

implications for early reading instruction.

Title I

The Title I program distributes federal dollars to local school districts with a high

percentage of economically disadvantaged students in order to raise student achievement,

particularly in the areas of literacy and mathematics (Manzo, 2004; McGill-Franzen, 2000).

Seventy-five percent of Title I funds are used to support students in preschool through sixth

grade, and 58% of public schools receive some type of federal support in this manner. Districts

qualify for Basic Title I funds if more than two percent of their students, aged 5-17, come from

families below the national poverty level (which currently ranges from $12, 682 for a single-

parent, single child household to $18,660 for a two parent, two children household; U. S. Census

Bureau, 2004), or whose family's income depends on public assistance (which may provide an

income above the poverty level; U. S. Department of Education, Office of Elementary and

Secondary Education, 2002). This two percent of students must include at least 10 children in

the district for grants to be awarded. More funding may be provided in the form of

Concentration Grants, given to those districts where either the percentage of eligible children

exceeds 15% of students in the district or the total number exceeds 6,500, or Targeted Grants,

awarded to districts where at least five percent of students are considered eligible, calculated in

the same manner as Basic and Concentration Grants. Unlike Basic and Concentration Grants,

where funding amounts are directly proportional to the number of students living in poverty in

the district, Targeted Grant funding is determined using a weighted formula to give those

districts with a higher percentage of eligible students more money.

Within districts, the appropriation of Title I funds also must depend on the number of

students considered to be from low-income homes; schools with higher percentages of qualifying

students must receive a greater proportion of funds (U. S. Department of Education, Office of

Elementary and Secondary Education, 2002). Schools where less than 40% of students are

considered to live in poverty are designated as having targeted assistance programs under Title I.

These schools can provide Title I services to only low-achieving children (i.e., those failing or

are at-risk of failing to meet state learning standards). Schoolwide programs, in schools where at

least 40% of students qualify, can use Title I funds to improve instruction throughout the entire

school. Both targeted assistance and schoolwide programs are required to use practices validated

by scientifically based research, provide high quality professional development for teachers, and

encourage parental involvement, thus supporting the research into practice process in education.

Reading First

Reading First similarly targets high-poverty districts, stipulating that funding is given to

LEAs with high numbers of both economically-disadvantaged students and students reading

below grade level (Kauerz, 2002; Rudavsky, 2003; U. S. Department of Education, Office of

Elementary and Secondary Education, 2002). Priority in Reading First funding is given to those

districts eligible for Concentration Grants under Title I, meaning the number of students from

low-income families is at least 6,500 or 15%, although the specific funding appropriates are

made by each individual state educational agency. The use of Reading First funds is restricted to

improving instruction, assessment, and teacher quality in kindergarten through third grade (with

the exception of providing professional development to K-12 special education teachers in the

area of reading instruction) and continued funding is contingent upon meeting a specific set of

guidelines. Most importantly, all instructional materials used in Reading First schools must be

supported by scientifically-based reading research (SBRR) and incorporate the essential

components of reading instruction, as found by the National Reading Panel (i.e., phonological

awareness, phonics, vocabulary, fluency, and comprehension; 2000). SBRR is defined by NCLB

as "research that applies rigorous, systematic and objective procedures to obtain valid knowledge

relevant to reading development, reading instruction, and reading difficulties" (U. S. Department

of Education, Office of Elementary and Secondary Education, 2002, p. 3). This includes the use

of empirical experimental or observational research designs, execution of data analysis methods

that adequately tests and supports the hypothesis and any conclusions, demonstration of high

degrees of reliability, and has been either accepted by a peer-reviewed journal or reviewed by an

independent panel of experts. Other Reading First Program requirements include the use of

explicit (i.e., direct) and systematic (i.e., following a well-planned, coordinated sequence)

instruction, an uninterrupted literacy block of no less than 90 minutes per day, and the use of

small, flexible groups for classroom instruction. Schools must also incorporate screening,

diagnostic, and classroom-based assessments into the curriculum, and use the results to guide

both classroom instruction and teacher professional development. Under Reading First,

professional development must align with SBRR, the school's reading program, and state

academic standards. It must also address all five components of effective reading instruction, as

well as the development of reading skill, factors related to reading difficulty, reading

assessments, and English language structure. Professional development needs to consist of

"ongoing, continuous activity, and not... 'one shot' workshops or lectures" (U. S. Department of

Education, Office of Elementary and Secondary Education, 2002, p. 29), and should encourage

the use and/or collaboration of coaches, mentors, colleagues, and experts. Continued funding at

the district level is dependent on meeting the requirements of Reading First as well as

demonstrating increased student achievement in literacy.

Reading First monies are first distributed to state educational agencies (in Massachusetts,

the state Department of Education) in the form of six year grants, who then distribute funds to

districts through a competitive grant process. In order to receive Reading First funds from the

national Department of Education, state agencies must 1) convene a Reading Leadership Team,

including the State Governor, the chief educational officer (the Commissioner of Education in

Massachusetts), members of the State legislature who sit on committees related to state

educational policy, a director of a state or national literacy program, a school administrator and

teacher, and a parent of a school-aged child, to coordinate and oversee the implementation of

Reading First; 2) describe how they will integrate other literacy programs with Reading First

initiatives; 3) participate in the national evaluation of Reading First, if asked; 4) detail the

subgrant process by which funds will be distributed to districts; 5) provide technical support to districts, by helping to identify SBRR instructional programs, materials, and assessments which also align themselves with the five essential components of reading instruction; 6) support high quality professional development, also aligned with SBRR and the essential components of reading instruction; and 7) describe how Reading First will be evaluated at the state, district, and school levels. Continued state support is contingent upon mid-cycle (year 3) evidence that Reading First is being implemented in accordance with the original state plan, and that the number of students reading at grade level or above within the state has significantly improved, a standard which is set by each individual state.

Reading First in Massachusetts. Massachusetts, in particular, has been awarded $91,806,858 to support the implementation of Reading First, and, with the aid of additional state monies, currently funds 70 schools across 44 districts in the state under this grant (Massachusetts Department of Education, 2002c; Office of Reading, Massachusetts Department of Education, 2003). The Massachusetts' Reading First Plan (Massachusetts Department of Education, 2002c) meets all the stipulations of the national policy, and specific eligibility requirements for Massachusetts' six-year grants follow. For LEAs to qualify, they must meet one of the following criteria for student achievement on the reading portion of the MCAS: 50% or more of students are not scoring at proficient levels, 250 or more students are not considered proficient on the test, 10% or more students have received warning scores, or 100 or more students are categorized as scoring at the warning level. In addition, eligible LEAs must meet one of the following criteria for low socioeconomic status of students and their families: status as an Empowerment Zone or Enterprise Community, at least one school qualifying for a Title I schoolwide program, 15% or more students meeting the poverty criteria to be counted under Title I, or at least 1000 students

counted under these Title I requirements. With these two major requirements met, LEAs must further demonstrate their commitment to ensuring quality reading instruction for students in their individual grant proposals to the state Department of Education, including the establishment of an uninterrupted 90-minute block during which reading instruction takes place in small, flexible groups, and the selection of a comprehensive reading program supported by SBRR. Unlike many states, "the [Massachusetts Department of Education] has chosen not to limit the choices of [comprehensive reading] programs to a set list," instead making "every effort to adequately and thoroughly address what such programs look like and why they are important to success in raising reading achievement" (Massachusetts Department of Education, 2002c, p. 39). The selected program must reflect the National Reading Panel's (2000) five essential components for successful reading instruction, and meet the need for explicit, systematic instruction followed by ample practice opportunities with appropriately leveled materials. Supplemental and intervention programs must be similarly aligned (Massachusetts Department of Education, 2002c). Assessment measures need also tap the areas of phonemic awareness, phonics, fluency, vocabulary, and comprehension, and must include the use of a number of specific assessments (e.g., CTOPP, DIBELS, GRADE, and DRP) in order to allow for statewide evaluations and comparisons.

In order to aid with the Reading First and other literacy grant programs, the Massachusetts Department of Education established the Office of Reading in February, 2000. This office is responsible for administration and evaluation of all federal and state literacy grant programs, the integration literacy activities across the various divisions of Department of Education (e.g., Title I, Special Education, Professional Development, Adult Education, Early Childhood Education), and professional development on SBRR and aligned instructional

methods in the form of Department of Education-sponsored summer institutes. These institutes

consist of a four-day workshop on SBRR and supported instructional methodologies and a one-

day workshop on the practice and use of assessments aligned with the five essential components

of reading instruction as found by the National Reading Panel (2000). All teachers in Reading

First schools have undertaken training at these summer academies prior to the 2003-2004 school

year, and, beginning in summer, 2004, this professional opportunity will be opened to other

teachers from high needs schools (D. Earle, personal communication, April 30, 2004;

Massachusetts Department of Education, 2002c). Office of Reading personnel are also

responsible for acting as Department of Education liaisons and monitoring Reading First schools,

thereby providing the state-level technical support called for by the national policy. Further

support will come from regional professional development providers, selected by the Department

of Education, who will conduct no fewer than two site visits a month to each Reading First

school, and the Reading Specialist/Coordinator which the districts are required to hire for each

school receiving these funds.

No Child Left Behind and Standards-Based Reform

The provisions of NCLB center on the principles of systematic standards-based

educational reform, which emphasizes changing instruction as the best means of improving

student achievement. Standards-based reform identifies and sets end goals of the content to be

learned, and then works to align all other aspects of education (e.g., classroom practices and

materials, professional development opportunities, assessment and accountability measures) with

the standards (Valencia & Wixson, 1999; Wixson & Dutro, 1998). Under NCLB and earlier

reauthorizations of the ESEA, then, state educational agencies are expected to have determined

state learning standards for the content areas and require that local districts' curricula align with

these standards (Manzo, 2004; U. S. Department of Education, Office of Elementary and

Secondary Education, 2002). The state must also have developed an accountability system based

on these standards (Education Commission of the States, 2002; Manzo, 2004; U. S. Department

of Education, Office of Elementary and Secondary Education, 2002). The basis for

accountability is a statewide test reflective of the state standards. In the areas of literacy and

math, such testing must occur annually during grades three through eight as of 2005-2006, in

which 95% of all students in the state must participate. NCLB uses this statewide testing to

determine whether adequate progress is being made towards its goal of 100% of students

reaching proficiency by the 2013-2014 school year, including low-income students, students

from major racial and ethnic groups, students with disabilities, and English as a Second-

Language Learners. To this end, testing data must be analyzed as a whole for each school,

district, and state, as well as disaggregated into the above four groups. Official Report Cards

containing this information for each district and state must be created and made publicly

available. Furthermore, based on 2001-2002 test results, states were required to set annual

yearly progress (AYP) goals for each student population, the minimum percentage that must

reach proficiency each year in order to reach 100% by 2013-2014. For schools receiving Title I

funds, failure to meet AYP for two years in a row results in being labeled as "in need of

improvement," requires that the state provide extra technical assistance, and allows students to

have school choice the following year (U. S. Department of Education, Office of Elementary and

Secondary Education, 2002). Continued failure at the school level may result in providing

supplemental educational services to students, changing school curricula and/or staff, extending

the school year, assigning an expert advisor to the school, or changing the organization or

management of the school. After five consecutive years of failing to meet AYP, the school must

be restructured, in that it is taken over by the state, reopened as a charter school, or has all or at least the majority of its staff replaced. Other corrective actions, such as reducing funding, may be taken by the state. Similar sanctions exist for districts that, as a whole, fail to meet AYP, and the federal government can also sanction state educational agencies in states where students are failing to progress in achievement, by removing federal funding.

Massachusetts Education Reform Act of 1993

The Massachusetts Education Reform Act (MERA), signed into law by Governor William F. Weld in June, 1993, actually anticipated many of the provisions of the 2001 NCLB mandate, and minor changes since the enactment of MERA have sought to bring the state further in line with federal education regulations (Assessment Reform Network, n.d.; Education Commission of the States, 2003; Massachusetts Department of Education, 1997). Like NCLB, MERA was premised on standards-based reform, and required statewide academic standards with an accountability system.

In its first year of implementation, MERA identified general educational goals which it expected all students to obtain. The resultant Common Core of Learning, adopted in July, 1994, identified the overarching goal of public education as allowing all students "to lead productive, fulfilling, and successful lives in our complex, diverse, and changing world" (Massachusetts Department of Education, 1994) through the attainment of three major subgoals: the capabilities of 1) thinking and communicating, including the ability to read and write effectively; 2) gaining and applying knowledge; and 3) working and contributing to society both during the student years and after formal education has finished (Massachusetts Department of Education, 1994). With these expectations in mind, state Curriculum Frameworks were developed in each of the content areas (science/technology, mathematics, world languages, the arts, health,

English/language arts, and history/social sciences), which were designed to guide both districts and classroom teachers in preparing curricula as well as to standardize the content of instruction across the state (see following section for information on the English/Language Arts Curriculum Frameworks in particular). These standards were created by committees that included Board of Education members, experts, school administrators, and teachers (R. Antonucci, personal communication, January 7, 2004), reviewed by study groups of 10,000 Massachusetts teachers, and then approved by the Board of Education, including the Commissioner (Massachusetts Department of Education, 1997). Currently, Massachusetts is working to finalize alignment of the Curriculum Frameworks with NCLB by breaking down the grade spans originally given for each standard (e.g., the June, 2001 English/Language Arts Frameworks set objectives for grades preK-2, 3-4, 6-5, 7-8, 9-10, 11-12 which need to be rewritten for each individual grade level; Education Commission of the States, 2003).

MERA also provided Massachusetts with a head start on the accountability system required by NCLB. The Massachusetts Comprehensive Assessment System (MCAS), a mandatory, statewide testing system, was custom-designed based on the Curriculum Frameworks. Independently evaluated for validity and reliability (Education Week, 2004), the MCAS was developed to serve as an accountability measure for all public districts and schools within the state, encouraging them to follow the content of the standards and identifying any curricula areas which may need to be targeted in specific schools (Assessment Reform Network, n.d.). Under MERA, the MCAS was originally administered in grades four, eight, and ten, with the Iowa Test of Basic Skills administered in third grade to measure basic reading skill. Since the implementation of NCLB, however, the state has begun testing during additional grade levels, though not yet meeting the expectation of annual assessment in at least mathematics and

literacy during grades three through eight (Education Commission of the States, 2003). MCAS

has also been adopted as the academic measurement for determining AYP under NCLB.

Although districts and schools deemed to be underperforming on the MCAS were susceptible to

being taken into receivership by the Massachusetts Department of Education under MERA

(Assessment Reform Network, n.d.; Massachusetts Department of Education, 1997), these

regulations have now been expanded to comply with NCLB mandates on AYP and sanctions

(Education Commission of the States, 2003; McQuillan, 2002). Finally, similar changes in

Massachusetts educational policy since MERA has brought the state into alignment with NCLB

on other aspects of AYP, including the requirement of issuing school, district, and state report

cards (Education Commission of the States, 2003).

Massachusetts English/Language Arts Curriculum Framework

The Massachusetts English/Language Arts (ELA) Curriculum Framework currently in

effect is a revised version of the ELA standards first approved by the Board of Education in

January, 1997 (Massachusetts Department of Education, 1997). The revision process included

an initial review by a panel of teachers, administrators, Department of Education workers, and

reading experts, whose suggestions were then sent out for public scrutiny. Taking such public

input into account, the final version of the ELA Curriculum Framework was adopted in June,

2001 by the Board (Massachusetts Department of Education, 2001).

The ELA Framework is broken down into 10 guiding principals, constituting an overall

philosophy regarding ELA instruction, and four content areas: language, reading and literature,

composition, and media. A total of 27 general standards address the skills and concepts that

Massachusetts Public School students should master within the ELA area, and these general

standards are further explained for each grade range, where each span generally encompasses

two grade levels (e.g., PreK-K, 1-2, 3-4) although the levels PreK-2 are sometimes addressed in the same learning standard. In addition to the standards themselves, the ELA Framework document also includes appendices with suggested authors and works, a section describing the relationship between reading and writing, and an appendix on reading research such as the literature reviews conducted by Chall (1967/1983), Adams (1990), and the National Research Council (1998).

Reviews of state standards have generally found Massachusetts' ELA Framework to be among the best in the country (Cross, Rebarber, & Torres, 2004; Stotsky, 1997; 2000); one should note, however, that Sandra Stotsky was one of the original developers of the Massachusetts' ELA standards and her reviews may thus be biased). Stotsky's reviews (1997; 2000) had three main criteria, which the Massachusetts ELA Curriculum Framework was deemed to have met: 1) the standards show a dual focus on explicit, systematic decoding instruction and meaningful reading materials, 2) the document emphasizes reading as a means of promoting understanding and obtaining information, with reading and comprehension skills continuously developing over the span of grade levels in terms of vocabulary, textual features, genres, and reading strategies, and 3) the state, through its standards, does not endorse, either explicitly or implicitly, one particular approach to reading instruction for all teachers and students to follow. Cross, Rebarber, and Torres (2004) also rated the Massachusetts' standards highly, stating that they were clear and understandable, showed good content in terms of skills essential to reading development, and incorporated supporting text to further explain learning standards as necessary.

Wixon and Dutro (1998) also conducted a review of state standards for beginning reading instruction which included the Massachusetts ELA Curriculum Frameworks, although individual

state analyses were not reported. Their review, however, is noteworthy for the manner in which

criteria were established. Prior reviewers had set criteria for judging state standards themselves,

possibly reflecting goals and practices based on personal biases rather than scientifically-based

reading research. The criteria for Wixon and Dutro's (1998) content analysis of various state

standards documents were established by synthesizing the findings reported in four major works

on the development of reading skill: *Becoming a Nation of Readers* (Anderson, Hiebert, Scott, &

Wilkinson, 1985), *Preventing Reading Difficulties in Young Children* (National Research

Council, 1998), *Beginning to Read* (Adams, 1990), and *Improving the Reading Achievement of*

America's Children: 10 Research-Based Principles (Principal investigators of the Center for the

Improvement of Early Reading Achievement, 1998). From these sources, Wixon and Dutro

extracted 14 criteria which were supported by scientific evidence (each appeared in at least three

of the four research reports) and thus should be addressed in state standards. Each of these

components, along with how they are reflected in the Massachusetts ELA Curriculum

Framework, will be described. It should be noted that, in meeting these 14 criteria, the

Massachusetts standards take a balanced approach towards beginning reading instruction,

requiring both systematic, explicit decoding instruction as well as instruction which promotes

reading as a meaning-making activity and incorporates a wealth of authentic literature.

 Experience with text and reading for enjoyment. Wixon and Dutro's (1998) review of the

research literature found ample support for the need to promote a variety of interactions with an

array of texts (a combination of four of the original 14 criteria). Reading, listening, and

responding to texts from a number of genres and perspectives promotes an understanding of

reading as both a means of enjoyment and understanding. Massachusetts addresses this

fundamental need throughout its standards (Massachusetts Department of Education, 2001). It

requires elementary-aged students to experience text through teacher read alouds, whole class

and small group oral readings, individual silent reading, dramatizations, and other expressions of

literature through the arts. Following the ELA Framework exposes children to a number of

genres (poetry, prose, fiction, nonfiction—both informational and expository, and drama), as

well as a diverse body of literature from a range of time periods and cultures. Finally, the

Massachusetts standards specifically instruct teachers to "set aside class time for them to choose

books and to read silently" (Massachusetts Department of Education, 2001, p. 27) and to

"encourage independent reading within and outside of class" (Massachusetts Department of

Education, 2001, p. 4).

Print concepts. Wixon and Dutro identified an understanding of print concepts, the ability

to recognize the "various forms and functions of written language" (Wixson & Dutro, p. 6), as

another important component in early literacy. Correspondingly, Massachusetts ELA standards

requires PreK-K students to master the following: "recognize that printed materials provide

information or entertaining stories," "know how to handle a book and turn the pages," "identify

the covers and title page of a book," "recognize that, in English, print moves left to right…and

from top to bottom," "recognize that written words are separated by spaces," and "recognize that

sentences in print are made up of separate words" (Massachusetts Department of Education,

2001, p. 29). By the end of second grade, students' conceptualizations of print should expand to

understanding that words are made up of individual letters, that sentences form paragraphs, and

the features of both sentences and paragraphs.

Phonemic awareness. Phonemic awareness, defined by Wixson and Dutro as "being

consciously aware that phonemes exist as extractable and manipulable components of spoken

words" (1998), p. 6), is a third area on which to focus instruction at the primary level.

Massachusetts standards recognize phonemic awareness as a purely oral skill, and demonstrate an understanding that phonemic awareness is developed through rhyming and phoneme manipulation such as segmentation, blending, and deletion (Massachusetts Department of Education, 2001). The standards also broaden the concept of phonemic awareness to phonological awareness in requiring that students demonstrate the understanding that words are made up of one or more syllables.

    Letter knowledge. Both the sources in Wixon and Dutro's review (1998) and the Massachusetts ELA Curriculum Frameworks (Massachusetts Department of Education, 2001) highlight letter knowledge as essential for the development of reading skill. Students must be able recite the alphabet and recognize, identify, and write upper- and lower-case letters.

    Spelling-sound word recognition strategies. Wixon and Dutro (1998) combine knowledge of the alphabetic principle, letter-sound correspondences, and phonics into the large category of spelling-sound word recognition strategies. By this label, they are referring to the ability to determine "the spoken language equivalent of a written word using grapho-phonic strategies such as sound-spelling correspondences and common spelling conventions (phonics)" (Wixson & Dutro, 1998), p. 6). The Massachusetts ELA Framework addresses all the above-mentioned components, emphasizing the need for systematic, explicit code-based instruction in its guiding principles (Massachusetts Department of Education, 2001). PreK-K students are expected to understand both the alphabetic principle ("know that there is a link between letters and sounds" and "understand that written words are composed of letters that represent sounds," (Massachusetts Department of Education, 2001, p. 29) and the basic letter-sound correspondences for the 26 letters of the alphabet. The application of such knowledge is then used to decode simple, regular words. Grade 1-2 teachers are expected to build upon this

foundation, teaching all letter-sound correspondences, including consonant blends, vowel digraphs, vowel diphthongs, and r-controlled vowel patterns, and helping students to use letter-sound and word family knowledge to decode regular single- and multi-syllable words. In addition, grade 1-2 students should have knowledge of letter patterns and how they relate to syllable segmentation within words (syllabification rules), and students in grades 1-4 should be familiar with common morphemes (inflections, prefixes. And Greek and Latin roots) to aid with both pronunciation and meaning.

Meaning-based word recognition strategies. As an alternative to spelling-sound decoding strategies, Wixson and Dutro found evidence for "determining the spoken language equivalent of a written word [through] using meaning-based strategies such as contextual analysis" (1998, p. 6). The Massachusetts ELA standards reflect the greater support for spelling-sound word decoding, and use meaning-based strategies such as context cues as an aid during code-based word recognition in predicting the meanings of unknown words (Massachusetts Department of Education, 2001).

Sight words. In order to read irregular words, as well as to increase fluency with high frequency words, the research reviewed by Wixon and Dutro (1998) supported the development of a sight word vocabulary, a goal which is incorporated into the learning standards for Massachusetts grade 1-2 students: "recognize common irregularly spelled words by sight" (Massachusetts Department of Education, 2001, p. 30).

Fluency. Wixon and Dutro define fluency as the ability to read "orally with ease, expressiveness, and appropriate phrasing" (1998, p. 6), which in turn fosters comprehension. Both the definition and learning expectations for fluency development is explicit in the Massachusetts ELA Curriculum Frameworks for grades 1-4, with students in grades 3-4 required

to "read aloud grade-appropriate...text fluently, accurately, and with comprehension, using appropriate timing, change in voice, and expression;" Massachusetts Department of Education, 2001, p. 31).

Prior knowledge and comprehension strategies. The final two criteria identified by Wixon and Dutro (1998) in their review of reading research relate to the ability to construct meaning from print. This requires accessing relevant prior experiential and conceptual knowledge while reading, as well as employing comprehension skills and strategies such as "inferencing, identifying crucial information, monitoring, summarizing, and question generating" (Wixson & Dutro, 1998, p. 6). As the end product of reading is this construction of meaning, these strategies are well addressed by the Massachusetts ELA Curriculum Frameworks. Grade 1-4 students are expected to use prior knowledge in addition to graphical and textual features in order to predict the content of text, identify and summarize main points and events from readings, and generate questions in order to further their reading comprehension.

Conclusion. According to Wixon and Dutro's (1998) review of the literature and subsequent extraction of well-supported literacy practices for inclusion in state standards, Massachusetts fares well. The ELA Framework adequately addresses all 14 criteria within the primary grades, and strikes a balance between reading for meaning and skill development. Although teachers are expected to incorporate explicit, systematic phonics instruction into their beginning reading curriculum, this is not to the exclusion of other, equally important literacy practices. A total curriculum should incorporate a great deal of print exposure and interaction, phonemic awareness activities, word identification skills, vocabulary and fluency development, and comprehension strategies, as well as foster an understanding of the function of reading as one of creating meaning.

As the Wixon and Dutro (1998) criteria are based on SBRR and do include the five essential components identified by the National Reading Panel (2000), implementation of the Massachusetts standards fosters the translation of research to educational practice. Furthermore, the adherence of the Massachusetts ELA Curriculum Frameworks to SBRR-supported practices illustrates the consistency that exists between Massachusetts Department of Education mandates and the provisions of federal educational policies (i.e., NCLB). According to current state and national policy, then, classroom curricula should consist of research-based instructional components and practices, and should thus include the incorporation of a code-based approach.

RESEARCH INTO PRACTICE: TEACHER QUALITY, KNOWLEDGE AND BELIEFS

Regardless of policy, the instructions students actually receive ultimately depends on their teachers. The quality of teaching has a profound effect on student achievement, in reading and other content areas. Students spending three consecutive years with teachers identified as being ineffective have significantly lower levels of achievement compared to students who received instruction from teachers identified to be most effective (Darling-Hammond, 1997). This difference in teacher qualifications can account for 90% of the differences between high and low achieving schools. To be effective in the classroom, teachers must develop domain knowledge of student learning and development, of the subject matter they are teaching, and of both general and subject-matter teaching methodologies. Generally, the more training teachers have in areas such as learning, child development, teaching methods, and curriculum, the more successful their students are. In fact, Greenwald, Hedges, and Laine (1996; as reported in Darling-Hammond, 2000) found that the greatest gains in student achievement were attained by spending $500 on teacher education, as opposed to spending the same amount of money to increase the teaching experience of school faculty, augment teachers' salaries, or decrease the

student-teacher ratio. In her review of the effects of teacher quality, Darling-Hammond (1999)

operationally defined a "well qualified teacher" as one possessing full state certification, to

account for general knowledge of teaching and learning, and having either an undergraduate

major or a master's degree in a relevant specialty area, to account for adequate subject-matter

knowledge. Similar to Greenwald, Hedges, and Laine (1996; as reported in Darling-Hammond,

2000), her analysis of state and national educational statistics showed that teacher quality was the

strongest predictor of student achievement at the state level when compared to other factors such

as student-teacher ratio, teacher salaries, or average class size; 40 to 60% of the total variance in

student reading and mathematics achievement could be accounted for by the number of teachers

in a state 1) meeting the definition of well qualified, 2) holding a master's degree, and 3) not

holding full teaching certification. Thus, the assumption is that requiring teachers to gain full

certification along with demonstrating mastery of subject matter can lead to great improvements

in overall student achievement.

National/State Policy Pertaining to Teacher Quality

No Child Left Behind: Highly Qualified Teachers

In light of these and similar findings, one of the provisions of the No Child Left Behind

Act (NCLB) of 2001 is that all public school teachers teaching core academic subjects (English,

reading, language arts, mathematics, science, foreign languages, civics, government, economics,

the arts, history, and geography) must be "highly qualified" by the year 2006 (Matthews, 2003;

National Education Association & American Federation of Teachers, 2003; Rebora, 2004). In

addition, districts receiving Title I funds must ensure that all core subject teachers hired for the

2002-2003 school year and beyond have already met the law's highly qualified status. Under

federal law, "highly qualified" is defined as 1) obtaining full state certification, including

alternative paths to such certification, or passing a state licensing exam, 2) holding a state

teacher's license, and 3) not having had any certification or licensing criteria waived for

emergency, temporary, or provisional licensing purposes (National Education Association &

American Federation of Teachers, 2003). The law expects that, at the very least, highly qualified

teachers will have earned bachelor's degrees, show mastery in basic skills, and demonstrate

proficiency in both general teaching and subject matter knowledge (*State Requirements Under*

NCLB, 2003). In addition, for teachers to retain their highly qualified status, they are expected to

participate in ongoing, high quality professional development.

For elementary school teachers who, unlike secondary school teachers, are expected to be

generalists, the requirements under NCLB are as follows: 1) holding a bachelor's degree, 2)

obtaining state certification and/or licensure, and 3) demonstrating adequate subject knowledge

and teaching ability in the areas of reading, writing, and mathematics, in addition to other basic

elementary curriculum areas. For newly hired elementary teachers, the subject matter

proficiency requirement is completed through passing a test, often the state's certification or

licensing exam. According to the federal law, veteran teachers may either demonstrate this

competency through passing such a test or through meeting a "high, objective uniform state

standard of evaluation," which is determined at the state level (National Education Association &

American Federation of Teachers, 2003).

Massachusetts Tests for Educator Licensure

The NCLB mandates are reflected at the state level in Massachusetts' licensing and

certification guidelines. Beginning in 1998 as part of the Massachusetts Education Reform Act

(MERA), all educators seeking either an initial license (see section on Massachusetts Licensing

Levels below) or their first license of any type were required to take the Massachusetts Tests for

Educator Licensure (MTEL; Massachusetts Department of Education, 2002b). These tests

address the NCLB's highly qualified teacher requirements of demonstrating competency in basic

skills, general teaching ability, and subject matter knowledge. All tests are criterion-referenced

(i.e. scores are based on objective standards, not the performance of other test takers) and are

aligned with Massachusetts state licensure regulations and the Curriculum Frameworks. For

teachers, the MTEL consists of a Communication and Literacy Skills test, as well as one or more

subject tests. The Communication and Literacy Skills test ensures that all Massachusetts

educators have adequate reading comprehension and analysis, writing ability, and other basic

literacy skills (e.g. vocabulary, grammar, spelling, summarizing) which allow for effective

modeling and communication to students, parents, and colleagues (Massachusetts Department of

Education, 2002b). Subject tests, as one may assume, examine understanding of the relevant

subject area, including conceptual information and knowledge of effective teaching

methodologies. The subject tests which teachers must pass depend on the exact type of licensing

they are seeking, and are taken for both the first provisional or initial level of teacher licensing as

well as when educators seek additional types of licensing. At the elementary level and with

regard to those educators involved in beginning reading instruction, teachers are most likely

licensed as an Early Childhood (PreK-2) teacher, an Elementary (1-6) teacher, a Teacher of

Students with Moderate Disabilities (PreK-8), a Teacher of Students with Severe Disabilities

(PreK-12), or a Reading Specialist (PreK-12) (Massachusetts Department of Education). In

order to be licensed as a general elementary education teacher (including Early Childhood and

Elementary licensure) or to be licensed as a special education teacher for students with moderate

disabilities, candidates are required to pass the Foundations of Reading exam as one of their

subject tests. Objectives of the test include assessing candidates' knowledge of 1) foundational

concepts of reading development, 2) the development of reading comprehension, and 3) methods

of reading instruction and assessment (Massachusetts Department of Education, 2002a).

Understanding of basic concepts related to beginning reading instruction is tested, including

phonological and phonemic awareness, concepts of print, the alphabetic principal, phonics and

word analysis skills, vocabulary development, and comprehension strategies. In addition,

depending on the license sought, teachers in Massachusetts elementary schools may also be

required to take other subject matter tests: the Early Childhood license has its corresponding test

in Early Childhood; the General Curriculum exam is necessary for licensure in Elementary

education, as a Teacher of Students with Moderate Disabilities, or Teacher of Students with

Severe Disabilities; and the Reading Specialist test is administered to all those seeking Reading

Specialist Licensure (Massachusetts Department of Education). Teachers holding licenses to

teach students with disabilities (i.e. Teacher of Students with Moderate or Severe Disabilities)

are also required to undergo a competency review as part of their subject matter testing, to ensure

qualifications as special educators.

Massachusetts Licensing Levels and Recertification

Teachers in Massachusetts may earn one of three levels of licenses: a provisional license,

an initial license, and a professional license (Massachusetts Department of Education, 2001). A

provisional license allows a beginning teacher who has not completed a teacher preparation

program at any level of higher education to teach for five years while continuing to develop

teaching skills and meet requirements for initial licensure. The criteria for a provisional license

in Early Childhood or Elementary education are 1) having a bachelor's degree, 2) passing the

required MTEL exams, including Communication and Literacy test, the Foundations of Reading

test, and the relevant subject matter test, 3) evidence of sound moral character, 4) and

coursework that encompasses the subject areas of reading, English/language arts, and

mathematics, as well as the principles and methodologies for the inclusion of disabled children in

the general education classroom. No credit hour requirements or specific lists of courses in each

area are provided, however.

Initial licenses are granted to teachers holding provisional licenses, candidates who have

completed undergraduate or post-baccalaureate teacher preparation programs, and those who

were prepared or licensed outside of Massachusetts. Teachers holding provisional licenses may

earn initial licensure in one of three ways. They can complete a post-baccalaureate program in

their field providing that the program includes a practicum, a six-month apprenticeship under a

lead teacher holding a professional license, or a year-long teaching assignment in a school

district that includes a professionally-licensed teacher as a mentor. Initial licenses may also be

granted directly, without the need of a provisional license, to candidates who complete an

undergraduate or post-baccalaureate teacher preparation program, both of which must provide a

practicum experience. Although there is no specific coursework listed for the post-baccalaureate

program route to initial licensing or minimum credit hours set for either path, candidates from

undergraduate teacher preparation programs seeking licensure at the elementary level are

required to take courses in the areas of composition, literature, and child development, among

other coursework in areas less related to beginning reading instruction. Teachers prepared or

licensed outside of Massachusetts may earn initial licensure directly through passing the MTEL,

both the Communication and Literacy Skills test and relevant subject test(s), and meeting one of

the following criteria: 1) completed an approved teacher preparation program in a state with

which Massachusetts has a National Association of State Directors of Teacher Education and

Certification (NASDTEC) Interstate Contract (Massachusetts has NASDTEC contracts with 44

states, Washington, D.C., and Guam, with the exclusion of Iowa, Minnesota, Missouri, South

Dakota, and Wisconsin; National Association of State Directors of Teacher Education and

Certification, 2002), 2) completed a teacher preparation program at a National Council for

Accreditation of Teacher Education (NCATE) accredited college or university, 3) was granted a

Northeast Regional Credential (NRC), meaning the candidate had achieved initial licensing in

another northeast state (i.e. Connecticut, Maine, New Hampshire, New York, Pennsylvania,

Rhode Island, Vermont) or Washington, D.C. (New York State Education Department, 1999), or

4) has previously taught for at least three years as a certified teacher in a state with which

Massachusetts has a NASDTEC Interstate Contract (Massachusetts Department of Education,

2001). Initial licenses are granted for a period of five years, during which holders are expected

to meet the requirements to apply for a professional license.

The awarding of a Massachusetts professional license is contingent upon possession of an

initial license. In addition, teachers are expected to 1) have at least three years of experience in

the field, 2) have experienced a year-long induction program with a mentor, and 3) have a

Master's degree or the equivalent in credit hours of advanced coursework in education or the

subject area taught, or complete a Performance Assessment Program as outlined by the State

Department of Education. A major change for Massachusetts public school teachers, as

implemented through MERA (1993) is the end of lifetime certification. Rather, in order to retain

professional licensure, teachers, along with the aid and approval of their respective

administrators, must develop appropriate five-year professional development plans which take

into consideration areas in need of improvement at the teacher, school, and district level

(Massachusetts Department of Education, 2000). Teachers must then target these areas through

professional development opportunities over the five year period for which their license is valid,

states, Washington, D.C., and Guam, with the exclusion of Iowa, Minnesota, Missouri, South

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into consideration areas in need of improvement at the teacher, school, and district level

(Massachusetts Department of Education, 2000). Teachers must then target these areas through

professional development opportunities over the five year period for which their license is valid,

and in doing so, must earn a predetermined minimum of professional development points

(PDPs): 150 PDPs for the primary area of licensure plus 30 PDPs to address the content areas of

each additional license that may be held. Of the total 150 PDPs which need to be earned for each

recertification, 120 of these must be in either the content or pedagogy of the primary area, and no

fewer than 90 PDPs are to address the area's content knowledge. PDPs are awarded for

attending or teaching university courses, Department of Education-sponsored programs, district

in-services, and other sessions offered by professional development providers. Teachers may

also earn PDPs for acting as mentors or peer coaches, presenting at professional conferences, or

participating in school-based activities centered on curriculum development. Typically, one

clock hour of professional development is equivalent to one PDP, with a few exceptions:

participating in Department of Education-sponsored events results in one and a half PDPs for

every clock hour, taking or teaching university courses can earns from seven and a half to 45

PDPs for every semester hour, publishing material merits 15 PDPs for each instructional unit and

30 to 90 PDPs for each written unit, and acting as a professional development provider in an

ongoing manner earns 2 PDPs per clock hour (Massachusetts Department of Education, 2000).

In addition to the criteria mentioned above, the Massachusetts licensure guidelines also

set Professional Standards to be addressed by teacher preparation programs and met by all

teachers, although no specific guidelines are set for how to do so. With regard to classroom

pedagogy, these include using assessments to guide and differentiate instruction, employing a

balanced approach when teaching elementary reading and writing, and drawing on a variety of

teaching methodologies and strategies in order to reach all students. Importantly, teachers are

expected to engage in critical reflection as to the content and execution of their lessons and also

to "maintain interest in current theory, research, and developments," with the ability to discriminate and apply those findings which can improve classroom practices.

Adequacy of Certification/Professional Development Requirements

Although the Massachusetts guidelines for certification and professional development seem to align with the mandates of NCLB, the adequacy of such criteria to ensure that teachers are well qualified, particularly in the area of reading instruction has been debated. In a national survey (Farkas, Johnson, & Duffett, 2003), only 5% of district superintendents and 11% of public school principals believed that teachers holding state certification are guaranteed to be highly qualified. The phrase "highly qualified teacher" is not even defined in any of the Massachusetts legislation, although it may be assumed that educational policymakers equate "highly qualified" with the earning of a professional license and following of the professional standards.

Although the assumption is that passing subject matter tests ensures adequate domain knowledge and teaching skill, these tests cover only a fraction of the coursework required for teachers to be highly qualified. Nor does graduating from an approved teacher preparation program guarantee the depth and breadth of course- and field-work expected in licensure criteria or the professional standards, assuming that such requirements are sufficient for effective teaching (see later section on recommended content knowledge for teachers of reading). As noted previously, Massachusetts licensure policy fails to identify a minimum amount of coursework to be completed in specific subject areas, including the core academic areas in which teachers may be licensed (Education Week, 2004). There are no explicit requirements regarding coursework related to special education; even special education teachers are not required to obtain a degree in special education or complete a minimum amount of coursework in this

specialty field, although they are required to have student teaching experience with disabled

students. As for practica in general, Massachusetts law allows a number of teacher candidates to

earn initial licenses after only approximately five weeks of student teaching, a relatively little

amount of preparation considering that some states require up to 18 weeks of supervised teaching

and the United States norm is 12 to 15 weeks (Darling-Hammond, 1997, 1999; Education Week,

2004)). More importantly than the length of practicum, many student teaching programs are not

set up to provide a good learning experience; 73% of teachers in a national survey (Commeyras

& DeGroff, 1998) reported that their field-work either seldomly or never involved a three-way

collaboration between themselves as students, the supervising classroom teacher, and the

university professor, arguably preventing them from receiving the type of feedback and support

which would improve their teaching skills. Finally, although the Professional Standards reflect

the need for teachers to critically analyze research in order to determine which findings should

guide instruction, there are no requirements for teachers to be schooled in research methods,

design, or interpretation.

Rather than stipulating stringent requirements in its state licensing policy, Massachusetts

relies on the "state-approved" status of teacher preparation programs to provide future teachers

with adequate coursework and field experience. Such programs may acquire state approval in

one of two ways: either applying directly to the state and undergoing a program review or

applying for accreditation through the National Council for Accreditation of Teacher Education

(NCATE), a private organization which evaluates Schools of Education based on an established

set of professional and educational standards. Receiving approval through the state as a program

leading to initial teacher licensure entails documentation of program coursework that addresses:

1) subject matter knowledge requirements, as stipulated for each type of license and tested on the

MTEL subject matter tests, 2) knowledge of the standards in the Massachusetts Curriculum Frameworks, 3) understanding of the Professional Standards, 4) the ability to practically apply knowledge in the classroom, and 5) a supervised practicum experience (Massachusetts Department of Education, 2001). Approval as a program leading to professional licensure (i.e. leading to a Master's degree or the equivalent in coursework) requires documenting that at least half of the program's coursework focuses on either content knowledge or pedagogical knowledge in each of the licensing areas offered. In addition, all state-approved teacher preparation programs must show a minimum aggregate pass rate of 80% for graduates on all MTEL exams, including both the Communication and Literacy test and all subject matter tests. Interestingly, the percentage of state teacher education programs accredited by NCATE can be used as a predictor of overall teacher quality (Darling-Hammond, 1999). However, although the coursework requirements for NCATE accreditation are generally more rigorous than those just described for state program approval, the preparation obtained from NCATE-approved programs may also fail to guarantee highly qualified teachers (Steiner, 2003): On the MTEL's inaugural year, the passing rate on the exams for prospective teachers from NCATE accredited programs was only 35-70%.

In addition to concerns about initial licensure and teacher preparation, the ability of the state to continue to monitor for highly qualified teachers and to provide them with ongoing, high quality support has been questioned. Once the newly hired teachers reach the classroom, with either provisional or initial licensing, Massachusetts leaves the fulfillment of its one-year mentoring policy to individual districts, without providing state funding (Darling-Hammond, 1997; Education Week, 2004). The path to professional licensure does not take into consideration data regarding classroom teaching performance or student achievement, failing to

link knowledge to practice (Education Week, 2004). As for ensuring that teachers remain highly

qualified in their fields, the state has not defined "high quality professional development" in its

legislation (Education Commission of the States, 2003); how can districts comply with the

mandate to spend, at minimum, $125 per pupil on "high quality professional development" when

the state has yet to characterize the term? (Massachusetts Department of Education, 2000). In

truth, the state has only minimal supervision and control of professional development. With the

exception of those opportunities sponsored by the Department of Education along with the

submission and tally of completed PDPs to the agency, the creation, implementation,

supervision, and funding of professional development programs and providers is left to local

districts (2003; Massachusetts Department of Education, 2000). The state itself does not provide

financial assistance to district for professional development (with the exception of some state-run

grant programs that include a professional development component), not does the state require

districts to devote a certain amount of time during the school day to professional development

activities (Education Week, 2004). There is no control over the content of university courses or

district in-services, nor very specific standards for the induction program. Thus, there is no

assurance that the programs teachers complete to earn the requisite PDPs are of high quality;

even if the licensing requirements ensured that teachers had adequate and current knowledge at

the time of their initial licensing, there is no guarantee that their teaching is commiserate with

this knowledge or that they continue to develop their expertise in meaningful ways.

Teacher Knowledge of Reading

Without explicit guidelines for subject-matter knowledge, the area of reading, in

particular, may not be adequately addressed in either teachers' initial preparation or ongoing

professional development. Just as there is a great variety in the general requirements of teacher

education programs, these programs also vary widely in the amount of preparation in reading

instruction that they provide (International Reading Association, 2003). They range from a full

18 hours of coursework in reading to a single three semester course, and can include anywhere

from zero to 60 hours of actual fieldwork or practicum experiences in this area. Furthermore, as

Moats (1999) has noted, the content of coursework that teachers do complete depends largely on

the philosophies of the particular School of Education and its professors, who, in turn, select the

course readings and textbooks. At either level, there is no assurance that either will provide

adequate or accurate exposure to the most current research findings in the field (Bos, Mather,

Dickson, Podhajski, & Chard, 2001; Moats, 1999). In his review of the course syllabi in 14

Schools of Education across the country, Steiner (Steiner, 2003) found a total of 61 courses that

addressed beginning reading instruction in some manner. With the assumption that syllabi

accurately reflect course content, many of these courses were severely lacking in exposing

teachers to the fundamentals, theory, and pedagogy of the reading field. For example, none of

the reading courses required the reading of Jeanne Chall's (1967/1983) or Adams' (1990) work;

the report of the National Reading Panel (2000) or that of the National Research Council (1998)

were each required readings for only two classes. Although 28 of the courses intended for

elementary or early childhood educators claimed to take a balanced approach to literacy and thus

include phonics instruction, the material on phonics was typically covered in only one or two

class meetings, with six sessions being the most exposure teachers received in this area. Of these

courses, the content of 21 could be characterized as taking a primarily whole language approach,

and ten courses at four Schools of Education covered the whole language philosophy of reading

to the exclusion of any other orientations. In all 14 Schools of Education, there were only four

courses exposing teachers to the principles of linguistics. As for assessment abilities, three

Schools taught only whole language-type assessments, three schools provided experience and practice with a variety of assessments, and a mere three courses touched upon the assessment of phonological awareness. Finally, teachers were given very little exposure to any type of commercial reading programs.

It is important to note that teachers themselves have pointed to the inadequacy of their training in the area of reading. In a national survey of teachers and administrators, Baumann and colleagues (2000) found that only 45% of teachers felt that their certification coursework in literacy was either "very good" or "exceptional," while 41% felt that it was merely "adequate" and 14% felt that it was "poor" or even "totally inadequate." Bos and colleagues (2001) found that feelings of underpreparedness to teach reading was not solely relegated to initial coursework; both preservice and inservice teachers, with 77% having 3 years or more experience, reported feeling only somewhat prepared to teach their students to read, using either whole language or code-based approaches. Nor are these inadequacies felt by only general education teachers; in their study, Lyon, Vasssen, and Toomey (1989) found that 50% of special education teachers felt that their undergraduate training left them either completely unprepared or only somewhat prepared to teach reading to their students (58% of general education teachers felt the same) and 28% felt similarly regarding their graduate coursework (compared to 44% of general education teachers). Finally, 97% and 98% of general and special education teachers, respectively, have similar viewpoints on the professional development opportunities they are given by their schools (Lyon et al., 1989), and 50% of educators stating that, in general, professional development resulted in few changes in their teaching abilities (Farkas et al., 2003).

The minimal coursework requirements and offerings, which result in such feelings of inadequacies, most likely reflect the commonly held notions that 1) learning to read is a natural

process (Moats, 1999; see section on whole language) and 2) being literate oneself can be equated with the ability to teach others to read, thus requiring little formal preparation for reading instructors (Bos et al., 2001; Moats, 2002). Rather, the successful teaching of reading requires explicit knowledge of spoken and written language, in addition to effective teaching strategies, especially for those students at risk for reading difficulties (Bos et al., 2001; Moats, 1994). Such domain knowledge encompasses knowledge of the reading process, an understanding of language structure, and the ability to apply such knowledge to teaching (Bos et al., 2001), including familiarity with a number of instructional methodologies and strategies (International Reading Association, 2000; Pressley et al., 1996). Teachers must understand the psychology of reading with adequate exposure to both the theory and research underlying literacy development. Understanding the relationship between written and spoken language is essential, as is an understanding of the general trajectory for the development of each. Teachers need to understand the reading process that good readers use, and how their set of skills differ from poor readers (C. Bos et al., 2001; Moats, 1999). Awareness of the various sources and causes of reading difficulties is also necessary. Another area in which teachers must be fully versed concerns linguistic knowledge of the English language, encompassing phonetics, phonology, orthography, morphology, syntax, text structure, and pragmatics (Bos et al., 2001). Under the umbrella of phonetics, teachers must realize the difference between phonemes and graphemes and the characteristics of phonemes (i.e. they are characterized by how they are articulated in by mouth and their physical, acoustic properties; Moats, 1999). It is important for them to understand the phenomenon of co-articulation and how this affects the variety of sounds that are heard and the ease of classifying them. Knowledge of the levels and units of language (i.e. graphemes, phonemes, morphemes, onsets/rimes, syllables, words) highlights the fact that

English orthography and phonology is highly systematic and thus decodable; whereas an understanding of morphemes often explains "irregular" spellings (Fillmore & Snow, 2000), knowledge of the six syllable types can assist determination of vowel pronunciation, and onsets/rimes facilitate both fluency and spelling skills (Moats, 1999). Finally, teachers need to be able to utilize information such as that described above in practice. This requires knowledge of reading methodologies and activities (e.g. phonics, phonological awareness, and sight word instruction; the use of controlled versus authentic texts), grouping practices, and assessment, for both normally achieving and struggling readers (Bos et al., 2001).

As mastery of such material is relatively difficult for teachers to attain (Moats, 1994), at least one full, semester-long course on the psychology of reading and linguistics during teacher preparation is typically recommended by researchers (Duffy & Atkinson, 2001; Moats, 1994; Moats & Lyon, 1996). Ideally, teachers would follow such coursework by a supervised practicum experience during which they could practice translating their knowledge into classroom applications (Bos et al., 2001; Duffy & Atkinson, 2001). Armed with an adequate understanding of reading and reading instruction, teachers are then better able to 1) interpret and respond to students' errors, 2) choose appropriate instructional strategies and materials, 3) provide suitable examples for demonstrations of particular reading skills, 4) organize and sequence lessons appropriately, and 5) integrate all the various components for complete language arts instruction (e.g. decoding, fluency, comprehension, vocabulary knowledge, writing, spelling; Fillmore & Snow, 2000; Moats, 1994; Moats & Lyon, 1996). In increasing their knowledge of reading, teachers will be empowered as professionals and able to be more successful in adapting and differentiating instruction according to students' needs (Bos et al., 2001; McCutchen & Berninger, 1999). Understanding *what* to teach, *how* this is best taught, and

why it is important to learn (Bos et al., 2001), enables teachers to make effective, informed

decisions regarding reading instruction.

Unfortunately, it seems that many teachers do not have the requisite knowledge for

effectively teaching reading, at either the preservice or inservice levels. Overall, teachers do not

seem to have an adequate grasp of phonological awareness, one of the most important skill sets

for developing readers (see previous section on Phonemic Awareness and Phonics Instruction).

When asked to select the correct definition of the term on a multiple choice item from the

Teacher Knowledge Assessment: Structure of Language (TKA: SL; Mather, Bos, & Babur,

2001)), only 22% of preservice and 36% of inservice elementary school teachers could do so.

Similarly, Troyer and Yopp (1990) found that a full 65% of kindergarten teachers stated that they

were unfamiliar with meaning of the term "phonemic awareness." As for an implicit

understanding of phonological abilities, out of a total of 20 TKA:SL questions on phonological

awareness, 50% or more teachers failed to correctly answer at least four items, corresponding to

a score of 64% or less (Bos et al., 2001). As seen in a number of studies, teachers, and adults in

general, have difficulty distinguishing orthographic from phonological knowledge; they assume

that the number of letters corresponds with the number of sounds in a word (for example,

reporting the number of phonemes in "box" as three, stemming from the three letters "b" "o"

"x," instead of four: /b/ /o/ /k/ /s/; Bos et al., 2001; Mather et al., 2001; Moats, 1994; Moats &

Foorman, 2003; Spear-Swerling & Brucker, 2003). Contributing to their miscounting of

phonemes is teachers' inadequate knowledge of phonics in general (Bos et al., 2001; Mather et

al., 2001), which many could not even define (Bos et al., 2001; Mather et al., 2001). The least

understood concepts in this area included consonant digraphs, consonant blends, and the schwa

vowel sounds (Bos et al., 2001; Moats, 1994; Moats & Foorman, 2003; Spear-Swerling &

Brucker, 2003). During the same administration of the TKA: SL, 50% or more preservice and

inservice teachers scored only 56% correct on the phonics items. Teachers also have difficulty

with discriminating and/or matching phonemes (Bos et al., 2001; Moats & Foorman, 2003), as

well as with blending tasks (Bos et al., 2001), an important skill for "sounding out." They fare

similarly in other important areas of word structure, such as morphology (Moats, 1994; Moats &

Foorman, 2003) and syllable counting (Moats, 1994; Moats & Foorman, 2003; Spear-Swerling

& Brucker, 2003) and identification (Moats & Foorman, 2003), and were generally unfamiliar

with the terminology often used during reading instruction (Mather et al., 2001; Moats, 1994).

Word structure knowledge could not be applied to identifying those words which are truly

irregular in terms of grapheme-phoneme correspondences (Spear-Swerling & Brucker, 2003) or

to accurately assessing student instructional needs (Moats & Foorman, 2003). Finally, teachers

were unaware of the connections between the different components of reading instruction and

those between oral language and reading skills. Although Spear-Swerling and Brucker (2003)

failed to find effects of teaching experience in their study, others (Bos et al., 2001; Mather et al.,

2001) have demonstrated that inservice teachers have slightly more domain knowledge in the

field of reading. This may be due to the fact that inservice teachers have most likely had more

preparation in this area through professional development, leading to more familiarity with

certain concepts and terms (Mather et al., 2001; Spear-Swerling & Brucker, 2003). Similarly,

special education teachers have greater knowledge than regular education teachers (Bos et al.,

2001), although neither group could be described as having adequate content knowledge.

Encouraging, however, is the finding that intensive coursework in the application of linguistics

to reading can significantly improve teacher knowledge (Bos, Mather, Narr, & Babur, 1999;

McCutchen, Abbott et al., 2002; Moats & Foorman, 2003; Spear-Swerling & Brucker, 2003),

which leads to better outcomes in terms of student reading achievement (Bos et al., 1999; McCutchen, Abbott et al., 2002; McCutchen, Harry et al., 2002; Moats & Foorman, 2003).

Teacher Beliefs: Efficacy and Theoretical Orientations

Along with knowledge, teachers' beliefs have great influence on what takes place in the classroom, particularly those beliefs relating to teacher efficacy and instructional orientations.

Teaching efficacy is related to the design and implementation of developmentally appropriate curricula (Buchanan, Burts, Bidner, White, & Charlesworth, 1998) as well as the level of domain knowledge within a particular content area (Bos et al., 2001; Linek et al., 1999). Importantly, teaching efficacy may also be a factor in determining teachers' openness to change, in terms of altering classroom practices. Logically, if a teacher believes that he or she is already effective in meeting the instructional needs of students, there is little motivation for learning or implementing new instructional methods. However, if teachers believe that the instruction they provide significantly impacts the learning of their students and that student needs are not being met, they may be more willing to undertake professional development and use new knowledge to guide their instruction.

Teacher efficacy can be thought of as consisting of two distinct components: 1) general teaching efficacy and 2) personal teaching efficacy (Simmons, Kameenui, & Chard, 1998). General teaching efficacy refers to the effectiveness of instruction overall, without that effectiveness being linked to any particular person or classroom; it refers to an abstract or normative teacher. Personal teaching efficacy, on the other hand, is the belief that oneself, as a teacher, has the ability to promote student learning and achievement and indicates a sense of personal agency. Within the framework of reading, general teaching efficacy can be seen in teachers' beliefs that most, if not all, students can learn to read with the help of instruction.

Unfortunately, as previously noted, many teachers do not believe they are adequately prepared to teach reading at the elementary level (Baumann et al., 2000; Bos et al., 2001; Lyon et al., 1989) and identify the teaching of struggling readers, in particular, as one of the greatest challenges they face (Baumann et al., 2000; Baumann, Hoffman, Moon, & Duffy Hester, 1998; Kavale & Reese, 1991), reflecting low levels of personal teaching efficacy. In addition, teachers may attribute the response to instruction to individual learner characteristics such as general intelligence and motivation, rather than to how content is presented, how instructional materials are adapted, or the amount of time spent learning and/or practicing various skills (Simmons et al., 1998).

Besides believing that the instruction they provide can impact student learning, teachers must also engage regularly in critical reflection on their classroom practices. As seen in the number of teachers who persist in taking an implicit approach to early reading instruction (Bos et al., 2001; Moats, 2000b), teachers' perceptions of efficacy may not always be accurate. Baker and Smith (Baker & Smith, 2001) found that the success ratings that teachers assigned to their classroom reading programs were not correlated with student outcome measures at the end of the school year. Similarly, in Baumann and colleague's (2000) national sample of kindergarten through fifth grade teachers, while teachers gave an average of 24% of their students as reading at least one year below grade level, they consistently ranked their classroom and district reading curricula in the "B" range, on a scale of A through F, and their reading support programs as adequate to very good.

Efficacy is also related to teachers' theoretical orientations, defined as those philosophical beliefs which guide their instructional expectations and decisions (Harste & Burke, 1977; as reported in Deford, 1985). Such beliefs have great influence on student outcomes and

goals, choice of methods and materials for the classroom, use of assessment measures, and the

general learning environment, as well as teachers' assessments of efficacy. One dimension of

teachers' instructional orientations is the degree to which they believe teaching should be explicit

or implicit (largely corresponding to the code-based and literature-based philosophies of reading

instruction, respectively Bos et al., 2001). A favorable disposition towards explicit reading

instruction is associated with greater personal teaching efficacy, while positive regard for

implicit instruction is negatively correlated with efficacy. In general, when differences exist,

experienced teachers tend to take a more explicit approach to reading than preservice teachers

(Bos et al., 2001; Duffy & Anderson, 1984; Mather et al., 2001), as do special educators (Bos et

al., 2001). Reading specialists, however, seem to favor a more implicit approach than their

classroom colleagues (Bursuck, Munk, Nelson, & Curran, 2002), a disturbing finding when

understood in conjunction of the effectiveness of direct, skills-based instruction for struggling

readers (see sections on reading difficulty, reading instruction). Importantly, theoretical

orientations can be changed through professional development (Commeyras & DeGroff, 1998;

Bos, et al., 1999; Linek et al., 1999; Scheffler, Richmond, & Kazelskis, 1993), and a more

explicit approach can be fostered by programs which increase teachers' knowledge of reading

acquisition and linguistics (Bos et al., 1999).

Teacher Change and Professional Development

Various types of professional development can alter teachers' domain knowledge,

theoretical orientations, and classroom practices. As mentioned previously, such changes are not

only possible (Bos et al., 1999; McCutchen, Abbott et al., 2002; Scheffler et al., 1993),

(Commeyras & DeGroff, 1998; Farkas et al., 2003; Moats & Foorman, 2003), but can also

significantly increase student literacy achievement (Baker & Smith, 1999; Bos et al., 1999;

McCutchen, Abbott et al., 2002). As professionals, teachers have opportunities to join various

organizations which seek to increase knowledge on literacy and identify effective means of

literacy instruction, through the dissemination of information in the form of newsletters,

conference proceedings, and scholarly journals. These include professional organizations such

as the International Reading Association, the National Council of Teachers of English, the

National Reading Conference, and others. Commeyras and DeGroff (1998), however, found that

only 21% of a national sample of kindergarten through fifth grade regular education teachers

belonged to such an organization (compared to 82% of reading specialists teaching at the same

grade levels). A greater proportion of teachers tend to utilize university courses to gain

information regarding literacy (55% of teachers in grades K through 5 in another national

sample; (Baumann et al., 2000)), although the efficacy of such coursework in preparing

educators to teach reading has been questioned (Lyon et al., 1989).

Another form of professional development undertaken by teachers is reading of the

professional literature. Baumann and colleagues (2000) reported that 68% of their national

sample of kindergarten through fifth grade teachers read professional magazines and journals. It

is unclear, however, what teachers considered to be included within this category, as it was the

only choice on the survey to demonstrate reading of the professional literature (e.g. Were the

journals practice- or scientifically-oriented? Were they peer reviewed?) Commeyras and

DeGroff (1998), on the other hand, separated the professional literature into a number of

categories, together with examples of each. They found that regular education teachers were

more likely to read magazines, such as *Instructor* or *Teaching K-8*, in order to gain information

on literacy than any other type of literature, with 78% reading such articles regularly (six or more

times a year). Regular education teachers read practitioner journals (e.g. *Language Arts, The*

Reading Teacher, Educational Leadership), educational newspapers (e.g. *Reading Today*), and books on literacy development and instruction to a lesser extent (33%, 24%, and 34%, respectively, read these sources regularly and 45%, 26%, and 54% read them occasionally or one to five times a year). Teachers were unlikely to read literacy articles contained in research journals (e.g. *Reading Research Quarterly, Research in the Teaching of English*), with only 9% reading these sources regularly and 31% reading them occasionally, or use electronic sources to find information (14% used CD-ROMs, the Internet, or databases regularly while 26% employed these means occasionally). Reading specialists also favored practitioner journals (71% read them regularly and 22% read them occasionally), books (52% and 44%), newspapers (45% and 42%), and magazines (40% and 43%) over research journals (22% and 42%), although reading specialists, in general, read more of the professional literature overall. Interestingly, this pattern was replicated with teacher educators, showing not only a common inclination towards practice-oriented readings within the field of education but perhaps an origin of this preference as well.

The most common type of professional development that teachers undertake is to enroll in workshops (99% of K-5 teachers; Baumann et al., 2000), most often in the form of district in-services (Troyer & Yopp, 1990). The traditional, half-day workshop, however, does not promote sustained teacher change, possibly leading to the conclusion of some teachers that in-services lead to little change in their practices (Bursuck et al., 2002; Lyon et al., 1989). Meaningful professional development cannot consist of isolated, one-shot workshops. Rather, it must be ongoing (Bos et al., 2001; Bos et al., 1999; Gersten & Dimino, 2001; Klingner, Vaughn, Tejero Hughes, & Arguelles, 1999) in order to allow teachers to assimilate new knowledge, test new practices in their classrooms, ask questions and solve problems that arise during implementation, and receive specific feedback regarding execution. Some of the most effective professional

development programs last an entire school year or more (Abbott, Walton, Tapia, & Greenwood, 1999; Baker & Smith, 1999; Bos et al., 1999; McCutchen, Abbott et al., 2002)), and involve partnerships between researchers (coaches) and practitioners (teachers; Abbott et al., 1999; Bos et al., 1999; Gersten & Dimino, 2001). Researchers have identified a number of additional components which constitute an effective professional development program. To begin, teachers must see a need for change (Gersten, Vaughn, Deshler, & Schiller, 1997; Schumm & Vaughn, 1995; Simmons, Kuykendall, King, Cornachione, & Kameenui, 2000), whether by agreeing upon a common set of goals for the school community or through individual critical reflection or needs assessment (although teachers are not always accurate in these assessments; see section on teacher efficacy). Understanding that change is necessary and having input into how such change should proceed promotes both commitment to (Simmons et al., 2000) and ownership of (Baker & Smith, 1999; Gersten et al., 1997; Simmons et al., 2000) a professional development program. The most effective programs involve a total school effort, including both administration and faculty, to provide an environment and support network conductive to change (Bos et al., 2001; Gersten et al., 1997; Klingner et al., 1999; Simmons et al., 2000). It is also important that a faculty member or administrator at the school, someone who is both knowledgeable in the targeted area and enthusiastic regarding the goals of the professional development, takes a leadership role in supporting, facilitating, and coordinating the program (Baker & Smith, 1999; Simmons et al., 2000). In addition, teachers must be given opportunities to discuss program's topics and the effects of the changes amongst themselves, and to observe implementation in colleagues' classrooms (Abbott et al., 1999; Bos et al., 2001; Gersten & Dimino, 2001; Gersten et al., 1997; Malouf & Schiller, 1995; Moats, 1999; Schumm & Vaughn, 1995). In terms of content, professional development programs must balance both conceptual

knowledge, those facts and ideas which stem from research, and practical knowledge, including

specific examples of applications of new practices and the incorporation of teachers' experiential

knowledge from their years in the classroom (Baker & Smith, 1999; Bos et al., 1999; Gersten &

Dimino, 2001; Gersten et al., 1997; McCutchen, Abbott et al., 2002; Schumm & Vaughn, 1995;

Vaughn, Schumm, Jallad, Slusher, & et al., 1996). Basically, teachers must understand both *why*

they are implementing a change and *how* to integrate that change into their daily teaching

(Vaughn et al., 1996). Taking into account teachers' own professional and experiential

knowledge, it is important that teachers understand how new practices can be assimilated into

existing classroom curricula (Baker & Smith, 1999; Gersten et al., 1997; Malouf & Schiller,

1995). Teachers' practicality makes students' acceptance of new procedures, the ease of

obtaining materials, and the ability of instructional changes to benefit the majority of the children

in the classroom are additional factors in the success and sustainability of professional

development programs (Gersten et al., 1997; Klingner et al., 1999). Funding, in general, plays a

large role in professional development, as implementation often depends on the availability of

financial resources to purchase needed materials, assessments, technology, and/or curricula, as

well as to pay for technological assistance, training providers, substitute teachers, etc. (Gersten et

al., 1997; Malouf & Schiller, 1995; Simmons et al., 2000). Perhaps the most important factor in

promoting and sustaining teacher change through professional development, however, is the

ability to link progress in student achievement to the instructional changes implemented (Abbott

et al., 1999; Baker & Smith, 1999; Gersten & Dimino, 2001; Klingner et al., 1999; Malouf &

Schiller, 1995; Simmons et al., 2000). If teachers are able to see for themselves, via pre- and

post-assessment data, that the changes that the professional development program has facilitated

in instruction and domain knowledge have proven effective, they are likely to remain committed

to the program and sustain newly implemented practices.

Teacher Attitudes Toward Research

Undertaking professional development in the manner described above helps to combat

the sometimes aversive attitudes teachers have towards research and its application to their

classrooms. It is well documented that educational practitioners, in general, are not always

welcoming towards researchers and their work (Duffy, 1982; Fuchs & Fuchs, 1990, 1998). From

the teachers' perspective, educational research reflects many misconceptions and errors in

thinking on the researchers' part. Researchers, working in their tightly controlled laboratory

settings, have "contributed one dimensional solutions to the problems of classroom reading

instruction" (Duffy, 1982, p. 357); they have not taken into account the complex environment of

both the classroom and the school setting (Fuchs & Fuchs, 1990, 1998; Gersten et al., 1997;

Kamil, 1995; Malouf & Schiller, 1995) and instead have sought a panacea which just does not

exist (Kamil, 1995; Pearson, 1996). Teachers resent what they view as a linear, inflexible model

of translating research to practice; in the usual top-down manner of translating research to

practice, teachers are not recognized as professionals or experts in their own right (Duffy, 1982;

Malouf & Schiller, 1995), capable of making their own decisions when determining what is best

for students. Instead, researchers, "outsiders" from the classroom, are viewed as self-proclaimed

experts whose work should be taken as truth (Fuchs & Fuchs, 1990). Teachers find this lack of

respect evident in the "teacher-proof" curricula and materials which are now marketed (Fuchs &

Fuchs, 1998). Teachers understand that classroom decisions depend on more than merely

applying research-based practices; rather, they are oftentimes based on the immediate needs of

student or class (Duffy, 1982). These immediate needs include managing the 1) social aspects of

the classroom, 2) activity flow throughout the day and curriculum content to be covered, 3)

explicit mandates the teacher is expected to fulfill, such as the need for accountability

assessments, the deliverance of a district- or school-determined curriculum, etc., 4) implicit

mandates placed on all teachers, such as the expectation of an orderly classroom, content

coverage, etc., and 5) various roles that a teacher plays over the course of a school day, including

not only educator, but also substitute caregiver, disciplinarian, janitor, secretary, counselor, and

others (Duffy, 1982; Malouf & Schiller, 1995). In addition, decisions are based on the

availability of funding and materials, and are also impacted by a general lack of preparation time

and/or collaboration time with colleagues. The complexity of classroom decision-making often

relegates theory to the background, and is not necessarily conducive to determining or selecting

"best practices" (Duffy, 1982; Gersten et al., 1997).

Teachers are also often frustrated by research, in that it is not easily understandable

outside of academia. The language can be technical and detached, as well as full of unfamiliar

jargon (Fuchs & Fuchs, 1990). As teachers are not necessarily well versed in research

methodology, they may have difficulty with the traditional ways of presenting research findings

in journal articles or the like. These factors may account for the findings that teachers often do

not read such professional literature (see previous section on Teacher Change and Professional

Development). Instead, teachers have come to rely on sources such as magazine or newspaper

articles or other forms of media which may misrepresent educational research through

oversimplification or adding additional, unfounded ideas, etc. (Billups, 1997; Fuchs & Fuchs,

1990). These practices have not always presented teachers with a means of discriminating

"good" from "poor" research, in terms of validity, and many teachers have thus followed

ineffective "research-based" advice (Gersten, 2001). When such recommendations do not prove

successful, teachers' overall impressions of using research to guide practice may be tainted.

Study Aim

A number of points are evident from the above literature review. First, we are not

effectively teaching all students to read in the early elementary years and this has long-term

consequences for these children. With the multitude of reading research which could be used to

inform and improve beginning reading instruction, specifically through the incorporation of

explicit, systematic, code-based instruction in the classroom, educators should be more

successful in the teaching of reading, particularly if they are aware of the Massachusetts

standards or the call for SBRR-supported practices in NCLB. Yet, although those educational

policies relating to the content and method of reading instruction are well defined, those policies

related to teacher quality are defined to a much lesser extent. Teachers, who ultimately have

control over classroom instruction, thus may not have knowledge and/or beliefs which would

support the implementation of practices aligned with SBRR, therefore hindering the translation

of research to practice in this area. The following study was designed to further explore

Massachusetts public school teachers' knowledge and beliefs regarding beginning reading

instruction, as well as lead to some recommendations for improving this process.

METHOD

Teacher Survey

A teacher survey was designed and administered in order to determine 1) the influences

on teachers' decisions regarding reading instruction, and particularly the role of research in this

process, and 2) teachers' use of scientifically-based reading research practices.

Participants

Participants consisted of educators in Massachusetts public schools who provided

beginning reading instruction to kindergarten through second grade students. This final sample

was obtained over the course of three recruitment phases and the use of both web- and paper-

based survey instruments.

Phase I. An initial database of elementary schools was created based on the criteria that

1) they were located in Massachusetts public school districts and 2) they served students in

kindergarten through grade three. From this population of 279 school districts, a random number

generator selected one school per district which included students in kindergarten through second

grade. If no school in the district served both kindergarten and second grade students, two

schools, one serving each grade level, were randomly chosen. A sample of 302 schools resulted

from this selection process, and the principal of each school was sent a survey packet at the

beginning of December (consistent with the procedure of (Lyon et al., 1989; McCutchen, Abbott

et al., 2002). This packet consisted of a general letter of invitation addressed to the building

principal as well as ten cover letters addressed to the school's teachers. The cover letter to the

principal introduced the researcher and the project, described the online study, and asked that the

accompanying letters be distributed to all classroom teachers, reading specialists, and special

educators in the building who work with kindergarten and/or second grade students. The cover

letters for the teachers addressed these same topics, and also gave the URL and password for the

web-based survey along with consent and confidentiality information. In addition, teachers were

informed that completion of the survey would enter them in a raffle for a gift certificate to

Amazon.com, and asked to respond by mid-January.

Phase II. A limited number of responses by the initial cut-off date prompted an

postponement of this deadline until late February, an extension of the original sample to include

educators of first grade students along with their kindergarten and second grade colleagues, and a

second mailing to the schools originally chosen by the method described above. Follow-up

telephone calls to approximately one-third of the selected schools' principals were conducted in

order to assure the receipt of the survey packets, and also to encourage dissemination of teacher

letters.

Phase III. Again, small sample size ($n = 41$) at the close of the extended deadline

prompted changes in sampling technique. Snowball and convenience sampling methods,

utilizing personal contacts within the field of education, along with the option of completing a

paper-based version of the survey, ensued. Five schools allowed the recruitment of participants

during faculty meetings, and two of these schools allotted time during either a faculty meeting or

teacher common planning time for the completion of surveys. Print-based surveys were also

distributed in an additional three districts by administrators who had direct, personal contact with

the researcher. Participants were given a final deadline of April 1st.

The final sample consisted of 112 public educators from 43 different school districts and

46 various elementary schools across the state of Massachusetts. A breakdown of their students'

socioeconomic status, as reported by the teachers, is displayed in Figure 1. Fifty-five of these

educators identified their primary role as that of a regular classroom teacher, 21 as an inclusion

room teacher, 17 as a reading specialist, 10 as a special education teacher, one as a

speech/language pathologist, and one as a learning specialist/evaluator (self-described). Because

the teachers, particularly the specialists, often reported working with a number of grade levels,

35 worked with kindergarten students, 49 with first grade students, 52 with second grade

students, 28 with third grade students, and 17 with students in fourth grade and above. The

majority (81.0%) held at least a master's degree, and 7.6% held advanced degrees such as a

C.A.G.S., Ph.D., or Ed.D. All of the participants were licensed in Massachusetts at a provisional

(9.7%), initial (4.9%), or professional (85.4%) level. Many teachers (41.7%) had more than one

certification relating to the teaching of reading at the elementary level: 25 reported having

certification in Early Childhood, 85 in Elementary Education, 20 as a Teacher of Students with

Moderate Disabilities, one as a Teacher of Students with Severe Disabilities, 23 as a Specialist:

Reading, and two as a Specialist in Speech, Language, and Hearing Disorders. Teaching

experience ranged from first-year teachers to veterans of 38 years, with a mean of 17 years

experience in education ($SD = 10.57$). Finally, most of the teachers dealt with struggling readers

on a daily basis; all of the specialist teachers (reading specialists, special education teachers,

speech/language pathologist, and learning specialist/evaluator) worked with struggling readers

and only 13.5% of classroom teachers (regular education and inclusion room teachers) reported

not having any students with reading difficulties as part of their classes ($M = 4.53$, $SD = 2.76$;

classroom teachers had an average class size of 19.11 students, $SD = 3.45$). In addition, 80.0%

of specialist teachers reported working with students with formal diagnoses of reading problems

(e.g., dyslexia, specific reading disability), compared to 57.1% of classroom teachers who

reported that students in their classrooms who had such diagnoses ($M = 1.96$, $SD = 2.44$).

Survey Design and Procedure

Questions for the survey instrument were generated from a literature review of relevant

educational policies and research on reading acquisition and instruction. Items were designed to

cover a number of areas: perceived and actual knowledge of policies, reading research,

instructional practices, and English language structure; perceptions of efficacy in teaching

students to read; influences on reading curricula, familiarity with research findings, and

implementation of research-based practices; attitudes toward research and researchers; perceived

and/or actual orientations towards beginning reading instruction at the self, school, district, state,

and university levels; and use of particular practices in the classroom and methods of

professional development. Demographic information, including district and school names (with

the intention of linking survey data with socioeconomic and student achievement data from the

Department of Education database upon analysis), educational background, and current

licensure, certification, and employment status, was also requested. Ultimately, a selection of 38

questions, often consisting of a number of individual items, was chosen, and question formats

included Likert scale, multiple choice, yes/no, and open response (see Appendix A for complete

survey instrument). This final set of questions included the use of two previously published

scales (Bos et al., 2001): the Teachers' Perceptions of Early Reading and Spelling (TPERS) and

the Teachers' Knowledge Assessment: Structure of Language (TKA:SL). The TPERS scale

consists of 15 items to be rated on a six-point Likert scale ranging from (1) strongly agree to (6)

strongly disagree. Six of the items are statements consistent with an explicit, code-based

approach to the teaching of beginning reading, six other items reflect an implicit, meaning-based

instructional approach, and the final three items are neutral statements about best practices in

reading instruction. Internal reliability for the explicit (Cronbach's $\alpha = .73$) and implicit

(Cronbach's $\alpha = .62$) items was relatively good, and consistent with the previously published

results (Cronbach's $\alpha = .70$ and $.50$, respectively). The TKA:SL consists of 20 multiple choice

items which assess word and phoneme level knowledge of the English language, focusing on

teachers' understandings of phonics and phonological awareness. Internal consistency was .58

(Cronbach's Alpha), again consistent with the previously published results (Cronbach's $\alpha = .60$).

Overall content validity of the survey, in terms of adequately addressing the intended topics, was deemed adequate after review by a faculty member involved in scientific reading research, a second faculty member with expertise in reading education, and an expert teacher with over 20 years of experience spanning regular and special education, assessment and evaluation, and Title I programming. Survey items were also critiqued by one districts' third grade teachers ($n = 4$), and minor revisions were made in response to both faculty members' and teachers' comments.

The survey was available in both web- and paper-based formats. The web-based survey was made available online through the QuestionPro.com service and was password protected. In both formats, participants had the option of skipping questions they felt uncomfortable answering, but on the web-based survey, they were unable to return to questions they had previously skipped. Participants generally reported requiring 30 minutes to one hour to complete the survey. Results from the web-based survey were downloaded directly from the QuestionPro.com server while paper-based surveys were returned in prepaid, pre-addressed business reply envelopes. Responses were coded for analysis via SPSS, and the analyses reported here were completed within four months of the initial survey deadline.

Analysis of Survey Data

For the purpose of analyses, those teachers identifying themselves as special education teachers, reading specialists, speech/language pathologists, or learning specialists/evaluators were grouped together as specialist teachers ($n = 29$), and contrasted with regular education and inclusion room teachers, who were considered to be classroom teachers ($n = 76$). Significant differences between these groups are reported where they exist. The limited sample size prevented comparisons among teachers of various grade levels.

Appropriate statistical tests were run using SPSS, and participants with missing data were excluded on an analysis-by-analysis basis. Significance levels were set at $\alpha = .05$, although these were adjusted using the Bonferroni procedure where necessary (Aron & Aron, 2003, pp. 403-404).

Interviews

The purpose of the semi-structured interviews was two-fold. Interviews were conducted in order to gain insight into the educational system, the processes involved in creating policy, developing reading curricula, and making other educational-decisions, and how and where educational research entered this process, thus informing the ongoing literature review. Secondly, interviews allowed for more in-depth exploration of survey topics and responses, and therefore supplemented and aided in interpretation of survey results.

Participants

Snowball and convenience sampling techniques were use to recruit public educators and policymakers ($n = 58$) from across the state of Massachusetts to participate in this study. Initial contacts within a number of districts and the Department of Education were made by the researcher, and these contacts (in the case of educators, typically the district superintendent or building principal) recommended participants within their buildings as well as potential participants in other districts or departments. The final sample included policymakers such as the current and former Commissioners of Education and the Department of Education's Office of Reading staff members ($n = 2$), as well as public educators from eight different districts and nine separate elementary schools in Massachusetts (see Tables 1 and 2 for district and school descriptive data). Every effort was made to interview participants serving in a variety of roles within a school district to allow for within district as well as across district comparisons. The

sample included district superintendents ($n = 5$), elementary school principals ($n = 7$), curriculum and staff development coordinators ($n = 14$), first and second grade teachers ($n = 9$), kindergarten teachers ($n = 7$), special educators ($n = 4$), reading specialists ($n = 7$), and one Title I reading teacher.

Interview Schedule and Procedure

Beginning in late November and running through mid-March, semi-structured interviews were conducted by the researcher at the participants' workplaces, in either an office or other private space. Whenever possible, interviewing was done individually although, in two instances, a pair of participants with highly similar roles were interviewed together, and in one large district, a panel of literacy experts was convened. Although the semi-structured nature of the study allowed for flexibility in questioning, general protocols for each type of interview (educator versus policymaker) were generated from an extensive literature review. Sets of 40 (educators) and 33 (policymakers) open-ended questions resulted (see Appendices B and C for actual protocols), and these items were designed to tap knowledge and beliefs regarding reading instruction, the reading process, research on reading acquisition and instruction, and relevant educational policies (e.g., No Child Left Behind Act, Massachusetts Education Reform Act, Massachusetts English/Language Arts Framework). Also, depending on the relevancy to participants' position (i.e., educator or policymaker), interview questions probed the development and implementation of reading curricula and educational policies. In addition, participants were asked for a brief description of their educational and employment histories. Interviews typically lasted 30 minutes to one hour, and were digitally recorded for later transcription. Print copies of each interview were reviewed and coded by theme/content.

RESULTS

For ease of understanding, survey results are reported in sections addressing four major

questions: 1) What influences classroom reading instruction? 2) To what extent are teachers

aware of research findings? 3) Do teachers see a need to be familiar with research findings and

incorporate these findings into classroom practices? and 4) Do teachers have the means/ability to

use research to guide their classroom practices? Subsections under these headings address the

various topics used to assess these broader constructs. Question numbers (e.g., Q20) refer to the

location of actual survey questions and/or items in Appendix A.

What Influences Classroom Reading Instruction?

When asked to report the extent to which several factors influenced classroom reading

instruction on a scale of (1) no impact to (10) great impact (Q20), teachers ranked individual

student needs as having the most influence ($M = 9.01$, $SD = 1.59$) and parent preferences and/or

recommendations as having the least influence ($M = 3.24$, $SD = 2.18$; see Figure 2 for all means

and standard deviations). Notably, research recommendations was the third least influential

factor, when rank ordered by means ($M = 7.15$, $SD = 2.07$), followed by recommendations from

university/college professors or coursework ($M = 6.69$, $SD = 2.67$). No significant differences

were found between teachers whose districts did or did not employ a reading consultant and/or

coach, thus, with the understanding that only those teachers with access to a consultant and/or

coach contributed to that factor's mean, Figure 2 means reflect a valid pattern for both sets of

teachers.

Replacing the missing values for those teachers without access to consultants and/or

coaches with the overall mean for that factor allowed for additional analyses regarding the

relative influences of the factors. A 2 x 10 mixed ANOVA was carried out to see if the factors

differed from one another as between specialist and classroom teachers (Influencing Factor x

Teacher Type). This revealed a significant main effect for the type of influence, $F(9, 837) = 50.12, p < .001$, and a significant interaction effect between the various factors and specialist versus classroom teachers, $F(9, 837) = 4.88, p < .001$, although there was no difference between teachers as to their overall ratings of influence, $F(1, 93) = .789, p = .37$. Due to the number of potential comparisons, paired t-tests were conducted contrasting only the influences of research recommendations and university/college coursework with the other factors when exploring the main effect. The differences between these factors' influences and that of research recommendations generally approached significance, when using the Bonferroni correction: recommendations from research were less influential than individual student needs, $t(107) = 8.80, p < .001$, reading consultants/coaches (if available), $t(59) = 2.52, p = .018$, personal teaching preferences/experiences, $t(106) = 2.85, p = .005$, building or district level administration/curriculum, $t(106) = 2.05, p = .043$ and $t(107) = 1.86, p = .066$, respectively, Massachusetts Department of Education policy, $t(107) = 1.81, p = .073$, and professional development opportunities, $t(107) = 2.40, p = .018$., while research recommendations were more influential than parent recommendations/preferences, $t(105) = 14.03, p < .001$, and college/university coursework, $t(106) = 1.85, p = .067$. University/college coursework was significantly less influential than student needs, $t(108) = 9.08, p < .001$, reading consultants/coaches (if available), $t(60) = 3.05, p = .003$, personal teaching preferences/experiences, $t(107) = 3.87, p < .001$, building or district administration/curriculum, $t(107) = 3.40, p = .001$ and $t(108) = 3.15, p = .002$ respectively, Massachusetts Department of Education policy, $t(108) = 3.30, p = .001$, and professional development opportunities, $t(108) = 3.35, p = .001$, while significantly more influential than parent preferences/recommendations, $t(106) = 11.39, p < .001$. For the interaction effect, an ANOVA showed significant differences

between specialist and classroom teachers on four factors: building administration, $F(1, 100) = 13.19$, $p < .001$; district administration, $F(1, 101) = 7.42$, $p = .008$; Massachusetts Department of Education regulations/standards, $F(1, 101) = 4.41$, $p = .038$; and research recommendations, $F(1, 90) = 3.81$, $p = .054$. Classroom teachers felt more influenced by building and district administration ($M = 8.21$, $SD = 1.75$ and $M = 8.01$, $SD = 2.02$) and Massachusetts Department of Education policy ($M = 7.87$, $SD = 2.08$) than specialist teachers ($M = 6.48$, $SD = 2.94$; $M = 6.64$, $SD = 2.84$; and $M = 6.82$, $SD = 2.67$, respectively). Specialist teachers reported being slightly more influenced by research recommendations ($M = 7.74$, $SD = 1.87$) than classroom teachers ($M = 6.85$, $SD = 2.08$).

To What Extent Are Teachers Aware of Research Findings?

Teachers' Self-Reported Knowledge of Research

Teachers self-reported having at least adequate knowledge of research findings pertaining to reading acquisition/development (Q13c; $M = 3.85$, $SD = .83$) and reading instruction (Q13d; $M = 3.84$, $SD = .81$) when asked to do so on a scale of (1) no knowledge to (3) adequate knowledge to (5) excellent knowledge. When asked to rate their knowledge of the National Reading Panel's findings on the same scale (Q13j), teachers reported having less knowledge in this area ($M = 2.81$, $SD = 1.18$). An ANOVA showed a significant difference between classroom and specialist teachers, $F(1, 100) = 6.34$, $p = .014$, with specialist teachers reporting more knowledge of the National Reading Panel's findings ($M = 3.25$, $SD = 1.29$) than classroom teachers ($M = 2.62$, $SD = 1.07$). Still, 32.1% of specialists rated themselves as having less than adequate knowledge of this topic (39.3% felt that they had good or excellent knowledge). This is compared to 47.3% of classroom teachers reporting less than adequate knowledge of the National Reading Panel and only 18.9% who felt their knowledge was good or excellent.

Finally, when asked to rate their opinion as to whether they should be more familiar with research regarding reading acquisition and instruction on a (reverse-coded) scale of (1) strongly disagree to (6) strongly agree (Q24h), teachers tended to agree that more knowledge in this area was necessary ($M = 3.55$, $SD = 1.43$).

Teachers' Awareness of the Overall Importance of Code-Based Instruction

Teachers were asked to rate the appropriateness of literature-based (Q16) and code-based (Q15) instructional approaches for both average and poor readers on a scale of (1) extremely inappropriate to (6) extremely appropriate. While 38.9% of teachers felt that a code-based approach was extremely appropriate for struggling readers, 16.7% felt that it was inappropriate for struggling readers. At the same time, 47.3% felt that literature-based methods were an appropriate instructional approach for this group. An analysis of difference scores showed that, while 46.5% of teachers found code-based instruction to be more appropriate than literature-based instruction for struggling readers, 28.7% felt that the two methods were equally effective, and 14.8% felt that a literature-based approach was more appropriate. As for average readers, 38.7% felt that code-based instruction was inappropriate for this group, compared to 85.2% who felt that literature-based instructional methods were appropriate.

A 2 x 2 repeated measures ANOVA comparing instructional approach to student type revealed a significant interaction effect, $F(1, 105) = 108.27$, $p < .001$. Paired t-tests showed that the teachers believed code-based instruction was more appropriate for struggling than average readers, $t(105) = 7.00$, $p < .001$, literature-based instruction was more appropriate for average than struggling readers, $t(107) = 9.79$, $p < .001$, code-based instruction is more appropriate for struggling readers than literature-based instruction, $t(107) = 6.78$, $p < .001$, and literature-based

instruction is more appropriate for average readers than code-based instruction, $t(105) = 5.14$, p < .001.

   Use of Code-Based Practices in the Classroom. Using a (reverse-coded) scale of (1) strongly disagree to (6) strongly agree, teachers reported their agreement that their beginning reading instruction emphasizes the building of successful decoding skills (Q24c; $M = 5.08$, $SD = .874$). Teachers were also asked to report use of specific code-based instructional components and practices in their classroom curricula, responding separately for all their students versus those who struggle with reading (Q18 and Q19). Items required responses on a scale of (1) never to (5) regularly. Teachers tended to respond similarly across all items (Cronbach's $\alpha = .94$). As seen in Figure 3, responses to these questions were positively skewed, with teachers reporting that they regularly incorporated most of the components and practices into their teaching.

   The use of scientifically-based reading research (SBRR) supported curriculum content (Q18) with struggling readers as well as their classmates was analyzed through a 12 x 2 x 2 (Component x Student Type x Teacher Type) mixed ANOVA, to identify any differences in components' use by type of student or teacher. This showed significant main effects for Instructional Component, $F(11, 946) = 4.71$, $p < .001$, and Student Type, $F(1, 86) = 15.38$, $p < .001$, but not for the type of teacher, $F(1, 86) = .007$, $p = .935$. Interaction effects were significant for Student x Teacher Type, $F(1, 86) = 6.58$, $p = .012$, Component x Student Type, $F(11, 946) = 7.58$, $p < .001$, and Component x Student Type x Teacher Type, $F(11, 946) = 2.50$, $p = .004$, but the Component x Teacher Type interaction was not significant, $F(11, 946) = .634$, $p = .800$. The code-based components were used in instructing struggling readers more regularly ($M = 4.45$, $SD = .541$), as compared to the instruction provided to an overall class of students ($M = 4.35$, $SD = .649$). Of main interest with this data was the overall pattern of results (see Figure

4), and, due to the large number of potential comparisons and the fact that visual inspection did not show extreme differences, follow-up t-tests were not conducted on the effect of various components.

To analyze SBRR-supported instructional practices (Q19) in the same manner, an 8 x 2 x 2 (Practice x Student Type x Teacher Type) mixed ANOVA was carried out. Significant effects were found for the use of such practices, and descriptive data for these items is presented in Figure 5. All three main effects were significant: Practice, $F(7, 595) = 20.36$, $p < .001$, Student Type, $F(1, 85) = 26.50$, $p < .001$, and Teacher Type, $F(1, 85) = 8.67$, $p = .004$. Overall, teachers used code-based instructional practices more with struggling students ($M = 4.19$, $SD = .596$) than with the entirety of students in their classrooms ($M = 4.06$, $SD = .679$; note that this pattern is reversed for the use of authentic texts), and classroom teachers tended to use such methods more regularly than specialists ($M = 4.22$, $SD = .596$ and $M = 3.81$, $SD = .638$, respectively). Interaction effects were also significant: Practice x Teacher Type, $F(7, 595) = 2.18$, $p = .034$, Student x Teacher Type, $F(1, 85) = 6.27$, $p = .014$, Practice x Student Type, $F(7, 595) = 12.28$, $p < .001$, and Practice x Student Type x Teacher Type, $F(7, 595) = 2.37$, $p = .021$. Again, with no a priori reasons to conduct specific comparisons among practices, the general pattern of results was of interest. Notably, teachers tended to use authentic texts at least to the same extent as other practices, showing 1) a preference for authentic literature during instruction and 2) the possibility of combining the use of such literature with code-based practices.

Teachers' Actual Knowledge of Research

Teachers were asked to rate their agreement, on a scale of (1) strongly agree to (6) strongly disagree, on a number of statements whose content has been either supported or refuted by research findings (references to the actual questions in Appendix A are reported in Table 3).

Each item was recoded to conform to a scale of one to six, where ratings of one to three indicate

an incorrect response, although a score of three reflects a less confident response than a score of

one, and ratings of four through six indicate a correct response, with scores of six indicating the

most confidence. Thus, a higher score on this new scale indicates more knowledge of research.

Overall, teachers had a mean score of 4.55 ($SD = .52$), and internal reliability for the items was

moderate (Cronbach's $\alpha = .73$). A 15 x 2 mixed ANOVA was run to compare levels of

knowledge across items and between classroom and specialist teachers. This showed a

significant main effect for the item analyzed, $F(14, 1288) = 63.39, p < .001$, and a significant

interaction effect for the item by type of teacher, $F(14, 1288) = 2.23, p = .006$, but no significant

between-participants effect for teacher type, $F(1, 92) = .399, p = .529$. Closer inspection of

mean and frequency data for individual item revealed inconsistencies in teachers' knowledge in

general (see Table 3). Teachers seemed very aware of the importance and use of phonological

awareness and phonics instruction, but the implementation of such practices is called into

question by the teachers' lack of emphasis on letter-level cues and their belief that word

recognition is unrelated to reading and comprehension abilities. Also, while classroom teachers

showed more awareness than specialists to the research-supported practices of teaching phonics

to struggling readers and demonstrating phoneme segmentation for them, $t(102) = 2.46, p = .016$

and $t(102) = 2.20, p = .030$ respectively, specialists showed more knowledge in agreeing that the

use grapheme-phoneme correspondences is more important than context clues in beginning

reading and that word recognition speed (fluency) directly affects comprehension, $t(98) = 2.09, p$

$= .039$ and $t(100) = 2.46, p = .016$ respectively.

Do Teachers See a Need to be Familiar with Research Findings
and Incorporate These Findings into Classroom Practices?

Necessity of Reading Instruction

On an open response item, teachers were asked to estimate the percentages of students who would learn to read on their own and those who required instruction in order to attain proficiency in reading (Q10). They estimated that a mean of 18.1% (SD = 17.28) of school children would learn to read on their own, in the absence of any formal instruction, while a mean of 70.0% (SD = 21.42) of school children needed such instruction to learn to read. In addition, teachers estimated that 25.7% (SD = 11.44) of school children experienced reading difficulties.

Teachers were also asked for their opinions on statements reflecting the extent that students could learn to read (Q22), on a (reverse-coded) scale of (1) strongly disagree to (6) strongly agree. Teachers tended to agree that all students could learn to read (M = 5.06, SD = 1.15), with only 10.8% disagreeing with this assertion. Teachers also tended to agree, to a slightly lesser extent, that this could be accomplished by the end of third grade (M = 4.33, SD = 1.58), although 25.2% disagreed with this goal.

Ability to Identify At-Risk Readers

Teachers self-reported their knowledge of identifying at-risk readers on a scale of (1) no knowledge to (5) excellent knowledge, with a rating of (3) reflecting adequate knowledge (Q13h). In general, teachers rated themselves as having more than adequate knowledge (M = 4.24, SD = .72), with only .9% reporting insufficient knowledge in this area. According to an ANOVA, specialists felt they had more knowledge of identifying at-risk readers than classroom teachers, $F(1, 97)$ = 7.11, p = .009.

When asked to select factors which put students at-risk for reading difficulties (Q11), 68.0% of teachers were able to correctly identify all seven factors and an additional 15.3%

missed identifying only one factor. Table 4 shows the percentage of teachers who correctly identified each risk factor.

Attitude Toward Research/Researchers

Teachers were asked to report their agreement on a number of items concerning their attitude toward research and/or researchers on a six point Likert scale of (1) strongly agree to (6) strongly disagree (Q24k-n). These responses were recoded for each item to reflect a one to six scale where lower scores reflected a negative attitude toward research and/or researchers and higher scores reflected a positive attitude toward researchers. An overall mean of 2.98 ($SD =$ 1.05) was reported on these items, and internal consistency was .87 (Cronbach's alpha). An ANOVA revealed that specialist teachers have a significantly more positive view of research and/or researchers than classroom teachers, $F(1, 100) = 7.15, p = .009$. Teachers tended to believe that research does not reflect teachers' needs (64.4% in agreement) and that research recommendations are unrealistic to implement because they fail to take into account the dynamics of the classroom (82.9% in agreement). Teachers also felt that researchers' work is too narrow in scope (72.6% in agreement) and that researchers do not regard teachers as partners in improving education (68.6% in agreement).

Efficacy in the Teaching of Reading

Teachers rated their knowledge of teaching average readers (Q13a; $M = 4.42, SD = .61$) and struggling readers (Q13b; $M = 4.19, SD = .74$) to read as good on a scale of (1) no knowledge to (5) excellent knowledge, with a rating of (3) reflecting adequate knowledge. Overall, no teachers reported having insufficient knowledge of teaching average readers to read, and only 1.8% rated themselves as having insufficient knowledge of teaching struggling readers. A 2 x 2 mixed (Student Type x Teacher Type) ANOVA showed a significant main effect for

type of teacher, $F(1,101) = 5.99$, $p = .016$, and a significant interaction effect between teacher and student type, $F(1, 101) = 25.05$, $p < .001$, but no main effect for type of student, $F(1, 101) = 1.03$, $p = .312$. Specialist teachers reported more knowledge of teaching students to read than classroom teachers. Paired t-tests showed that this was due in large part to specialist teachers rating themselves as having significantly more knowledge of teaching struggling readers to read than classroom teachers, $t(102) = .46$, $p < .001$, as the teachers did not differ significantly in their knowledge of teaching average readers to read, $t(101) = .46$, $p = .65$.

Teachers were asked to rate the curricula they used to teach reading on a scale of (1) very poor to (5) excellent, with a rating of (3) being satisfactory (Q9). In general, teachers felt that their classroom curricula ($M = 4.14$, $SD = .67$), their schools' regular education reading curricula ($M = 3.97$, $SD = .71$), and their schools' supplemental reading program(s) ($M = 4.00$, $SD = .94$) were good, with only 1.0%, 1.9%, and 9.6%, respectively, rating them as poor.

In addition, teachers reported evaluating the effectiveness of their reading instruction through exploring a variety of approaches (Q24a) and regular student assessment (Q24b), with means of 5.11 ($SD = .81$) and 5.35 ($SD = .65$), respectively, when asked whether they agreed with such statements on a (reverse-coded) scale of (6) strongly agree to (1) strongly disagree.

Limiting Factors. Using a scale of (1) no impact on teaching reading to (10) greatly inhibits the teaching of reading, teachers were asked to rate 17 factors as to whether they adversely affected the teachers' ability to teach all students to read (Q23). In general, teachers did not feel inhibited in their teaching of reading ($M = 4.16$, $SD = 1.99$). A 17 x 2 (Factor x Teacher Type) mixed ANOVA sought to identify differences in how limited specialist versus classroom teachers felt, as well as factors which may have been more limiting than others. This showed a significant main effect for type of factor, $F(16, 1328) = 12.04$, $p < .001$, and an

interaction effect for factor and teacher type which approached significance, $F(16, 1328) = 1.61$, $p = .059$. There was no effect for type of teacher, $F(1, 83) = 1.03, p = .314$. Figure 6 reports individual item means and standard deviations. Importantly, teachers did not report lack of knowledge, either of the reading process ($M = 2.70$, $SD = 2.53$) or effective instructional practices ($M = 2.80$, $SD = 2.51$), as greatly inhibiting their ability to teach students, instead attributing lack of success in this area to factors beyond their control.

Knowledge of Policies

Teachers were asked to report their knowledge of those policies to which adherence would require familiarity with SBRR on a scale of (1) no knowledge to (5) excellent knowledge, where (3) reflects adequate knowledge (Q13k-m). They rated their knowledge as more than adequate on the No Child Left Behind Act ($M = 3.69$, $SD = .83$), Massachusetts English/Language Arts Standards ($M = 3.97$, $SD = .79$), and Massachusetts teacher certification regulations ($M = 3.81$, $SD = .91$). Only 7.1%, 2.7%, and 8.1%, respectively, rated their knowledge of these policies as insufficient. A 3 x 2 (Policy x Teacher Type) mixed ANOVA showed a significant main effect for the particular policy, $F(2, 202) = 5.21, p = .006$, and a significant interaction effect between policy and type of teacher, $F(2, 202) = 5.92, p = .003$. There was no significant effect between classroom and specialists teachers, $F(1, 101) = .475, p = .492$. Paired t-tests showed that the teachers tended to have more knowledge of the Massachusetts standards than the other two policies: its comparison with knowledge of the No Child Left Behind Act was statistically significant, $t(111) = 3.79, p < .001$, and comparison with reported knowledge of Massachusetts teacher certification regulations approached significance, $t(110) = 1.78, p = .077$. There was no difference between teachers' reported knowledge of No Child Left Act and Massachusetts teacher certification regulations, $t(110) = 1.39, p = .167$. Also,

specialist teachers reported more knowledge of the Massachusetts English/Language Arts standards than classroom teachers, $t(102) = 2.28$, $p = .025$, but there were no differences between teachers for knowledge of No Child Left Behind, $t(102) = .968$, $p = .335$, or Massachusetts teacher certification regulations, $t(101) = 1.32$, $p = .191$.

Philosophy of Beginning Reading Instruction

Self report. Teachers were asked to self-report their orientation towards beginning reading instruction, on a scale of (1) strongly literature-based to (5) strongly code-based, with (3) representing a balanced approach (Q12e). Teachers reported favoring a balanced approach, with a mean of 3.11 ($SD = .70$). An ANOVA showed that there was a significant difference between the types of teachers, $F(1,99) = 9.56$, $p = .003$, with specialists favoring a slightly more code-based approach ($M = 3.44$, $SD = .80$) than classroom teachers ($M = 2.97$, $SD = .64$). In terms of the three approaches, 7.4% of specialist teachers reported having a literature-based philosophy towards beginning reading instruction, 51.9% were balanced, and 40.7% had a code-based orientation. For classroom teachers, 16.2% had a literature-based orientation, 70.3% were balanced, and 13.6% reported a code-based philosophy.

Teachers' Perceptions of Early Reading and Spelling (TPERS). On the TPERS scale (Q17a-o), teachers tended to agree with both code-based/explicit and meaning-based/implicit items ($M = 5.40$, $SD = .51$, Cronbach's $\alpha = .62$ and $M = 4.00$, SD .68, Cronbach's $\alpha = .73$, respectively; see Table 5 for items' codings and the percentage of teachers agreeing with each), consistent with previous administrations of the scale (Bos et al., 2001; Bos et al., 1999; Mather et al., 2001). A 2 x 2 (Teacher Type x Instructional Approach) ANOVA showed significant main effects for type of teacher, $F(1, 102) = 4.35$, $p = .039$, and approach, $F(1, 102) = 165.13$, $p < .001$, but no interaction effect, $F(1, 102) = .003$, $p = .955$. Classroom teachers ($M = 4.75$, $SD =$

.34) were slightly more agreeable than specialists ($M = 4.58$, $SD = .43$) across all items. Also, as seen in the means reported above, teachers tended to agree more with code-based/explicit items as compared to meaning-based/implicit items, with no differences between classroom and specialist teachers.

Do Teachers Have the Means/Ability to Use Research to Guide Their Classroom Practices?

Access to Research Findings

Using a (reverse-coded) scale of (1) strongly disagree to (6) strongly agree, teachers felt that research needs to be more accessible (Q24i; $M = 4.57$, $SD = 1.14$). Only 13.1% of teachers disagreed with this statement.

Limiting factors. Teachers rated a number of factors on a scale of (1) does not limit to (10) strongly limits their ability to become familiar with research (Q25). Means and standard deviations are reported in Figure 7. A 5 x 2 (Factor x Teacher Type) mixed ANOVA revealed a significant main effect for the factors, $F(4, 368) = 43.02$, $p < .001$, but no interaction effect between factors and type of teacher, $F(4, 368) = .665$, $p = .617$. The effect of teacher type approached significance, $F(1, 92) = 3.02$, $p = .086$, with classroom teachers generally feeling more limited than specialist teachers ($M = 5.43$, $SD = 2.06$ and $M = 4.79$, $SD = 2.09$, respectively). Having no a priori reasons for running particular t-tests, the main effect for factors was not analyzed further than noting that teachers reported being extremely limited in their familiarity with research by time and resource constraints (see Figure 7).

Familiarity with SBRR terms. Teachers were asked to rate their familiarity with a number of terms used in reading research using a scale of one to five (Q14). The scale ranged from (1) unaware of term to (3) aware of term but unable to define to (5) very familiar with term and able to define accurately. Means, standard deviations, and the percentage of teachers

unaware of each term are displayed in Table 6. A 8 x 2 (Term x Teacher Type) ANOVA

revealed significant main effects for Term, $F(7, 651) = 24.21, p < .001$, and Teacher Type, $F(7,$

$651) = 2.50, p = .016$, as well as a significant interaction effect, $F(1, 93) = 4.85, p = .030$.

Overall, specialist teachers ($M = 4.65, SD = .425$) were more familiar with the terms than

classroom teachers ($M = 4.40, SD = .515$). T-tests showed that specialists were significantly

more familiar with four of the terms, when compared to classroom teachers: systematic phonics

instruction, $t(93) = 2.55, p = .013$, explicit phonics instruction, $t(93) = 2.14, p = .035$,

phonological awareness, $t(93) = 2.30, p = .025$, and sound-symbol correspondences, $t(93) = 2.73$,

$p = .008$.

Professional development opportunities. Teachers reported their use of a variety of types

of professional development activities on a 5 point Likert scale from (1) never to (5) regularly

(Q28). Means and standard deviations are reported in Figure 8. A 13 x 2 (Professional

Development Source x Teacher Type) mixed ANOVA revealed only a significant main effect for

activity, $F(12, 1080) = 67.71, p < .001$; there was no effect for type of teacher, $F(1, 90) = 1.37, p$

$= .244$ and no interaction effect, $F(12, 1080) = 1.48, p = .125$. Due to the large number of

potential comparisons, paired t-tests were used to compare subsets of variables: teachers'

opportunities to have information presented to them and teachers' choice of reading materials.

Significance levels were adjusted to reflect the number of planned comparisons, and t-test results

are listed in Table 7 for the ease of reporting. Teachers utilized the various opportunities to gain

information in the following, statistically significant, order: (1) attend workshops, inservices, or

staff development sessions, (2) attend teaching conferences and/or enroll in university/college

courses, with attendance at teaching conferences more likely as this difference approached the

adjusted significance level of .008 ($p = .010$), and (3) attend research conferences. Teachers

reporting reading the various print sources in the following, statistically significant, order: (1) practitioner magazines or journals and/or popular press materials, (2) professional handbooks, and (3) scholarly, peer-reviewed research journals and/or reports.

Teachers were also asked whether they held membership in a number of professional organizations (Q29). Although Table 8 presents the percentages of teachers involved in all of the different organizations, membership in five of the professional organizations will be highlighted here, due to these organizations' involvement in utilizing SBRR to improve reading instruction: the International Reading Association (23.8%), the Massachusetts Reading Association (16.8%), the International Dyslexia Association, formerly the Orton Dyslexia Society (2.0%), the National Council of Teachers of English (5.0%), and the National Reading Conference (0%). Also, although classroom and specialist teachers tended to belong to the same number of professional organizations, $F(1,99) = 3.38, p = .069$, specialists were more likely to belong to those organizations listed above as being directly involved in improving reading instruction, $F(1, 99) = 13.81, p < .001$.

Ability to Implement a Code-Based Approach

Teacher preparation. Teachers reported, on a five point scale of (1) strongly literature-based to (3) balanced to (5) strongly code-based, that they were generally prepared in programs with a literature-based orientation (Q12h; $M = 2.61, SD = 1.10$). Overall, 42.2% of the teachers stated that their initial teacher preparation program took a literature-based approach, 41.0% reported their program as balanced, and 16.8% said the program had a code-based philosophy.

Knowledge of instructional methodologies. When asked to self-report their knowledge of using code-based instructional methods to teach beginning reading on a scale of (1) no knowledge to (5) excellent knowledge, with a rating of (3) reflecting adequate knowledge

(Q13f), teachers felt they had a good deal of knowledge in this area ($M = 4.10$, $SD = .86$). Only

3.7% of teachers felt that they lacked knowledge of code-based teaching methodologies.

Teachers self-reported having similar levels of knowledge of literature-based methodologies

(Q13g; $M = 4.16$, $SD = .74$), with .9% reporting less than adequate knowledge of such practices.

Knowledge of English language structure. Knowledge of the structure of English was

assessed by both a self-report measure (Q13i) and the Teacher Knowledge Assessment: Structure

of Language (TKA:SL; Q27). On a scale of (1) no knowledge to (5) excellent knowledge with

(3) reflecting adequate knowledge, teachers reported having more than adequate knowledge of

linguistics/English language structure ($M = 3.98$, $SD = .76$). Only 1.8% of the teachers stated

that their knowledge of this topic was insufficient.

On the TKA:SL with a possible range of zero to 20 correct, the teachers had an average

score of 13.51 ($SD = 2.78$) or 67.5% correct, and internal reliability was .58 (Cronbach's Alpha).

These results are consistent with previously published results (e.g., $M = 12.0$, Cronbach's α =

.60; Bos et al., 2001; Bos et al., 1999). As Figure 9 shows, 0% of teachers answered all the

questions correctly, 27.7% received a score greater than or equal to 80% correct, and 32.4%

scored less than or equal to 60% correct. An ANOVA revealed that specialists received

significantly higher scores than classroom teachers, $F(1,100) = 6.11$, $p = .015$. Individual items

and percentage of teachers answering them correctly are reported in Table 9. In general, teachers

did not demonstrate knowledge of the definitions of phonics or phonological awareness and

showed poor phonemic awareness, in their confusion of the number of phonemes versus letters

in words. These findings are similar to what has been reported in the literature on teacher

linguistic knowledge (e.g., Bos et al., 2001; Bos et al., 1999; Mather et al., 2001; McCutchen,

Abbott et al., 2002; McCutchen, Harry et al., 2002; Moats, 1994; Spear-Swerling & Brucker, 2003).

Factors Limiting the Implementation of SBRR-Supported Practices

Teachers rated a number of factors on a scale of (1) does not limit to (10) strongly limits their use of scientific findings to guide classroom reading instruction (Q26). Means and standard deviations are reported in Figure 10. A 11 x 2 (Factor x Teacher Type) mixed ANOVA revealed main effects for Factor, $F(10, 830) = 10.04$, $p < .001$, and Teacher Type, $F(1, 83) = 4.62$, $p = .035$, but no interaction effect, $F(10, 830) = .519$, $p = .878$. Classroom teachers ($M = 5.22$, $SD = 2.05$) reported feeling more limited in their ability to implement research-based practices in the classroom as compared to specialists ($M = 4.21$, $SD = 2.16$). Again, with no a priori reasons to look at specific contrasts for the various factors, follow-up t-tests were not conducted. Rather, the pattern illustrated in Figure 10 was of importance. Teachers, particularly classroom teachers, seemed to feel most limited by time and resource constraints, as well as the presence of a mandated curriculum. They also felt limited by their perceived lack of consensus among research findings, and lack of demonstrations and/or examples of how to apply SBRR to their classrooms.

DISCUSSION

Conclusions

Although the teachers rated themselves as effective in teaching their students to read, the fact that approximately 27,000 public education students across the state of Massachusetts were not reading on grade level on last year's third grade MCAS reading test (Massachusetts Department of Education, 2003) tells another story. We are not translating all that we know from SBRR into educational practices well enough to allow these children to be successful as

they begin reading, and are thus less effective than we should be in preventing reading difficulties and the consequences of such problems. Within the context of the myriad of factors which impact classroom reading instruction, recommendations from research was the third least influential factor on classroom instruction. This lack of translation of research to practice is due to a number of factors.

Teachers Are Less Aware of SBRR Than They Think

Despite their own self-reports of knowledge of research, teachers showed that they are not as familiar with SBRR or SBRR-supported practices as one would hope. Teachers were very unlikely to read scholarly journals or research reports, similar to previous findings (Commeyras & DeGroff, 1998), and rated themselves as having insufficient knowledge of the National Reading Panel's (2000) findings. Significantly, almost 50% of teachers felt that a literature-based approach was appropriate for struggling readers, and 16.7% felt that a code-based approach was entirely inappropriate for this group! Also, in their agreement with a literature-based approach as appropriate for other students in the classroom (85.2%) and belief that code-based instruction may be inappropriate for average readers (38.7%), teachers are not giving all students the ability to break the code, thus preventing reading difficulties which often do not surface until second or third grade. Even those teachers who were aware of the importance of a code-based approach and reported teaching their students accordingly, failed to demonstrate knowledge of the significance of emphasis letter-level cues or word recognition abilities. Teachers, then, may overestimate their level of knowledge of SBRR, and this has two main consequences: believing they already possess adequate knowledge of research, teachers may have little motivation to pursue more such knowledge, and code-based practices, when used, may not be implemented correctly. The latter point is further supported by the teachers' own lack of

phonological awareness (or their confusion between sounds and spellings), as well as their

limited knowledge of other aspects of English language structure.

Teachers Do Not Necessarily See a Need For Familiarity with Research Findings

Teachers have little motivation to become familiar with research findings. As stated

above, teachers already believe that they have adequate knowledge in this area, and also feel that

the instruction they currently provide is effective. Lack of success in teaching all of their students

to read was attributed to factors beyond the teachers' control, such as class size or student ability

and/or motivation, and not to teachers' knowledge of the reading process or how this should be

taught. In some cases, the practices supported by SBRR may be at odds with teachers' personal

philosophies of beginning reading instruction (i.e., the 16.2% of classroom teachers and 7.4% of

specialists who identified themselves as having a literature-based orientation). Furthermore,

teachers were not convinced that the research that is conducted is entirely applicable to the

classroom and believed there to be little consensus among the SBRR literature. As a second

grade teachers said, "Research is very subjective a lot of the time, even if you have, you know,

your data...it's how you interpret it. So I think a lot of it is beneficial, but I do think there's a lot

of extra out there that's really not relevant to what we're doing." Many teachers expressed

frustration that "research changes every ten minutes" and that they felt misled when previous

attempts to improve instruction by following research recommendations failed. Overall, the

teachers had a negative attitude toward research and/or researchers, consistent with previous

research literature (Duffy, 1982; Fuchs & Fuchs, 1990, 1998).

Teachers Are Limited in Their Access to Research

Although teachers felt that they were capable of understanding research and research

findings, they tended to feel that this needed to be more accessible. As a kindergartner teacher

lamented, "But it's very difficult...as a practicing teacher to get to that information. You are so overwhelmed with just keeping your class going." Teachers reported not having enough time to seek out or read sources, as well as being limited in their ability to afford subscriptions to journals, conference fees, etc. Nor were their choices of professional development activities especially conducive to acquiring knowledge of research findings: Workshops, the most frequent professional development activity (Baumann et al., 2000), as well as teacher conferences, professional magazines, and popular press materials, may not accurately reflect research findings. Also, in congruence to what Commeyras and DeGroff (1998) found, the majority of teachers were not members of professional organizations whose mission it is to improve the teaching of reading through incorporation of SBRR-supported practices, meaning they did not have access to these organizations' resources (newsletters, conferences, professional contacts, etc.).

Teachers Are Limited in Their Ability to Implement SBRR-Supported Practices

In general, teachers reported that it was difficult to implement research-based practices because of lack of time, resource constraints, and the presence of mandated curricula, which perhaps do not afford teachers the opportunity to supplement instruction with other practices. Importantly, teachers also reported difficulty in interpreting research findings and integrating them into classroom practices; as one reading specialist commented, "while the research is there, it takes a long time to get from that to, ok, this is how I'm going to apply it to my classroom."

Specifically addressing their ability to implement code-based instructional methods, teachers reported that they did have adequate knowledge of code-based methods of beginning reading instruction, although these were not necessarily taught in the context of their initial teacher preparation programs. As discussed both above and in the literature (Bos et al., 2001;

Bos et al., 1999; Mather et al., 2001; McCutchen, Abbott et al., 2002; McCutchen, Harry et al., 2002; Moats, 1994; Moats & Foorman, 2003; Spear-Swerling & Brucker, 2003), however, teachers' lack of knowledge concerning SBRR, particularly the need to emphasize letter-level cues and early word recognition skills, combined with limited knowledge of English language structure (as seen in the results from the TKA:SL), questions their ability to implement these practices effectively. Without attention to the structure of words, struggling and average readers alike will not develop the strong links between words' orthographies and pronunciations which allow for quick, automatic access to the mental lexicon. As Moats (1994, p. 85) points out, teachers require a good foundation in English language structure "to present linguistic concepts accurately and with appropriate examples, and will be able to assess and interpret a student's stage of reading and spelling development based on direct observation of his or her performance.

Classroom Versus Specialist Teachers

It is important to note that specialist teachers reported being significantly more influenced by research than their classroom colleagues. Specialists also felt significantly less limited in their ability to implement SBRR-supported practices and took a more positive view of research and/or researchers. This is most likely due to specialists' increased reading of scholarly journals and research reports and tendency to belong to professional reading organizations, leading them to feel less limited in their access to research findings as well. Because specialists, by definition, are not generalist teachers, the increased knowledge of reading acquisition and research could be attributed to their ability to focus much of their professional development in this area. The possibility also exists, however, that a difference in training and teacher preparation leads specialist teachers to be more open to findings of research.

Implications and Recommendations

As seen in the course of the literature review, the process of translating research to practice in the area of beginning reading instruction does not seem to breakdown at the policy level, at least in those policies which are related to the content of such instruction. Both the provisions of NCLB and the standards set forth in the Massachusetts ELA Curriculum Framework are supportive of integrating SBRR into the classroom. Instead, the breakdown perhaps lies in 1) the dissemination of policy information to teachers and 2) initial teacher education.

Teachers' Knowledge, Use, and Attitudes Toward Educational Policy

Although teachers stated that they had at least adequate knowledge of NCLB and the Massachusetts standards, they may not be accurate in their self-assessment, as seen with their reports of knowledge of current research findings and structure of English, and/or they may not use these policies to guide their decisions in the classroom. True awareness of NCLB, as it relates to reading, would include familiarity with and use of the findings of the National Research Panel (2000), an area in which teachers felt they had insufficient knowledge. Furthermore, over the course of the interviews, it became apparent that many teachers were not directly aware of the Massachusetts ELA standards. Rather, the process seems to be one in which the standards are interpreted at the district level and then incorporated into district and/or building curricula: Teachers are then expected to meet the requirements of this curriculum through their daily lesson plans. There is no direct check of alignment between district and/or building curricula and state standards, however, and as one superintendent stated, "I can honestly say that I don't live by them (the ELA standards)." Teachers' interpretations and use of district curricula also varies. One teacher commented on the lack of such alignment in her school:

"(school district) has their district curriculum, which is outlined, and for each component that's

taught in the manual, it aligns itself to the state frameworks. No one references that though."

And even in those schools where teachers are required to use the frameworks directly, teachers

may feel that they are not able to incorporate all the standards, instead choosing particular

aspects to focus on: "I mean, you obviously aren't going to hit every strand. You can, you can

try, and obviously that is the goal." For these teachers, both limited instructional and planning

time, as well as confusion as to how individual benchmarks are best met, played a role in their

use of the ELA frameworks. Many suggested that the role of the Department of Education must

be expanded to include more support for teachers, in familiarizing them with the underlying

research and goals of the ELA standards as well as providing aid in determining effective

methods of instruction for meeting the standards. As a kindergarten teacher recommended, "I

think what they can do is identify best practices. They have this framework of what kids need to

know and be able to do, and then, so here are the best practices that we have identified to help,

you know, enable people to get that to kids." Very few of the study's interview participants felt

that the Department of Education provided much support for teachers, in terms of educational

leadership, and many expressed a desire for more professional development opportunities

through the Department.

In addition, teachers' use of policies and standards, similar to their use of research, may

be mediated by these views of the policymakers and their agendas. Many teachers felt that those

creating the policies are too far removed from the classroom and do not take into account the

complicated dynamics of a classroom, echoing their concerns with academic research. With

respect to policymakers and/or legislators in general, one reading specialist said, "I feel like they

really need to come into more classrooms and to actually see what's going on. I think that they

hear these buzz words coming out and just jump on them," while a kindergarten teacher, when asked for her opinion of the Massachusetts Department of Education, replied, "Do I really have to answer that? I don't have a lot of faith in them." This negative view of policymakers, and thus of the policies they create, is not conducive to motivating teachers to follow such educational mandates. It is interesting, however, to note that the Department of Education makes every attempt to involve educators (teachers as well as administrators) in the creation of policy, and that policies are released for public comment before brought before the Board of Education (R. Antonucci, personal communication, Januray 7, 2004; D. Driscoll, personal communication, February 13, 2004). In fact, those educators who had contact with Department of Education employees had a much more positive view of the policy-making process, "They allow for tremendous teacher input...The people who say there was not allowance for input, impact from the field, it simply isn't true...They were very good to work with, they were very responsive," and tended to attribute the faults of policies to financial and resource constraints. As one superintendent, who had served on a number of Department of Education committees, including a review panel for the ELA Curriculum Framework said:

> The Department of Ed, itself, I think, is in the same boat we are. They're not given the resources they need to be supportive. They've been cut back far more grievously than any other school district has. They're limping along. They simply don't have the manpower to deliver on what school districts expect, and so there's a tremendous amount of frustration in school districts. I think the DOE gets a bad rap. I think it's undeserved. I think they are undermanned, they're underfinanced...I think they're doing as best they can under the circumstances.

Thus, a solution in which the Department of Education provides more professional development on state and national policies, as well as how these mandates are best met, would serve to further teachers' use of SBRR-aligned policies in a number of ways. First of all, teachers who are more aware of not only policy content, but also its intent, will be more likely to fully implement policy provisions, whether this is through the use of district and/or building curricula or is left as the individual classroom teachers' responsibilities. Secondly, professional development sessions sponsored by the Department of Education could include suggestions as to best practices for translating the policy into classroom practices, relieving teachers of this burden, and again, increasing the likelihood that the methods teachers' use in their classrooms are truly aligned with policy and SBRR. Finally, contact with the Department of Education can increase educators' familiarity with the process of creating policies, promoting both a more positive attitude toward policy and/or policymakers and consequently more motivation to utilize such policies.

Teacher Education

Evidence from this and other studies (Baumann et al., 2000; et al., 2001; Bos et al., 1999; Commeyras & DeGroff, 1998; Lyon et al., 1989; Mather et al., 2001; McCutchen, Abbott et al., 2002; McCutchen, Harry et al., 2002; Moats, 1994, 2002; Moats & Foorman, 2003; Moats & Lyon, 1996; Spear-Swerling & Brucker, 2003; Steiner, 2003) suggest that teachers are not receiving sufficient training to implement a code-based approach to beginning reading instruction. In fact, most interview participants stated that they were not prepared to teach reading as a result of their initial teacher education. For example, to the question of whether their teacher preparation was adequate, one reading specialist replied, "My early instruction, very truthfully, I just that I, I know I wasn't prepared," and another stated, "As an undergraduate,

absolutely, unequivocally not. Not even close." As seen in the survey data, teachers reported a

large proportion of their initial teacher preparation programs as taking a more literature-based

approach, and not necessarily supplying them with knowledge and methods for teaching in a

code-based manner, evident in the teachers' TKA: SL scores. Many teachers reported not having

any coursework in the area of phonology, an obviously critical component for code-based

instruction. Others lamented a lack of methods courses, as teacher education programs are now

often found within liberal arts colleges. As a second grade teacher reported, "We had our

literature classes where we read children's books and things like that but never the idea, ok,

when you walk into a classroom and you're expecting these children to figure out sound and

symbol relation, this is what we're going to do. Never happened." A third concern with teacher

preparation was a lack of application of coursework to the actual classroom, recalling teachers'

difficulty in integrating research into classroom practices: "I think what the downfall for teachers

of young children is the time they get to actually be in classrooms, to apply it," as a staff and

curriculum coordinator commented. Teachers' frustration with their initial preparation programs

most likely reflects the lack of explicit guidelines for the content of such programs in

Massachusetts (Education Week, 2004; Massachusetts Department of Education, 2001), as well

as the fact that, in this state, an initial teaching license may be earned after only five weeks of

student teaching (Education Week, 2004). Either such policy must be made more demanding

and explicit, or teacher preparation programs need to take more responsibility for properly

preparing preservice teachers. This would require aligning themselves with the Massachusetts

ELA standards and ensuring that they are adequately preparing educators to teach in a manner

consistent with the SBRR-supported approach that this policy sets forth. This would include not

only methodological preparation based on SBRR-identified best practices, but also coursework

in 1) the psychology of reading acquisition, 2) the process of reading and the differences which

exist between skilled and unskilled readers, and 3) linguistic knowledge of the English language,

including phonetics, phonology, orthography, and morphology (Bos et al., 2001; Brady & Moats,

1997; Moats, 1994, 1999; Moats, 2000a). Such extensive preparation will inform teachers of the

necessity of incorporating a code-based approach within a comprehensive reading curriculum,

and will also empower teachers as professionals, allowing them to make truly informed decisions

regarding best practices.

In addition, initial teacher preparation programs need to do more to familiarize teachers

with research itself, in its design, its findings, and its use in informing instruction, as the

incorporation of such content is currently questionable (Steiner, 2003). By aligning themselves

with the Massachusetts ELA Curriculum Framework and providing instruction in the content

mentioned above, teacher education programs would already be supporting SBRR, but they also

need to make teachers explicitly aware of the research behind the curriculum standards and

methods they are learning. An understanding of the science of research, such as through a course

in research methodology, would serve two purposes. With an appreciation of the research

process, teachers would hopefully value its findings to a greater degree. Also, a research

methods course will allow teachers to confidently discriminate which research implications

should be followed, combating the perception that there is no consensus in reading research and

preventing teachers from being misled by findings from improperly designed studies, which may

lead to a general mistrust of research overall. This coursework could be underscored by

encouraging teachers to engage in their own action research, because, as one reading specialist

said, "That's probably one of the most useful things that you can do in a teacher prep

program...Because then I think they really, really get it."

Additional Implications for All Involved in Education

Policymakers. Current educational policies regarding reading instruction, at both the

state and federal levels, are supportive of SBRR. Since teachers may not have direct knowledge

of research findings but are likely to be influenced by educational policies, it is extremely

important that policies continue to be aligned with research. However, funding for policy

implementation must be provided, and this requires supporting educators as they try to align

themselves with regulations. Funds must also be provided to purchase or update materials, as

lack of resources was a major limitation in teachers' ability to implement SBRR practices.

Secondly, policy regarding teacher preparation and quality should be reviewed and

revised, as necessary. Teachers do not have the prerequisite knowledge for teaching reading

when they graduate from teacher preparation programs, a fact which they readily admit. In

Massachusetts, it remains to be seen whether the new licensing exams will lead to more

alignment among teachers education programs, ELA standards, and research.

District/school administrators. District and school administrators are responsible for

interpreting educational policies correctly, and making sure that district and/or building curricula

are reflective of SBRR-supported practices and that these guidelines are followed within the

classroom. Some teachers resent such a top-down approach, from policy to administration, to

them and their classrooms, evident both over the course of this study's interviews as well as in

the literature (Duffy, 1982; Malouf & Schiller, 1995). They would prefer to be treated as the

professionals they are, capable of making their own instructional judgments. Yet, as seen in this

study, teachers do not have the time to research which practices are most effective, or, most

likely, to interpret policy. They also expressed difficulty with translating research findings into

practical classroom applications. Thus, as the educational system now functions, responsibility

for ensuring the quality of curricula falls to administration. To combat resentment stemming from the top-down approach, administrators must be sure to involve teachers in all aspects of curriculum development and to give them conceptual and/or theoretical knowledge as to why certain practices are important. The latter needs to be done through ongoing, high quality professional development which also provides teachers with practical applications for research findings, to facilitate their incorporation into classroom instruction. Seeing teachers' lack of knowledge of English language structure and/or linguistics as well as the fact that this is not often addressed in teacher preparation programs, this professional development may need to include targeting teachers' domain knowledge of this subject matter, as its explicit knowledge is essential to successfully utilizing a code-based approach. The hiring of a reading consultant or coach to present material, give classroom demonstrations, and provide support and feedback to teachers seems particularly effective and influential, as seen in the literature (Abbott et al., 1999; Baker & Smith, 1999; Bos et al., 1999; Gersten & Dimino, 2001) as well as this particular study. As one teacher stated, "And I think, again, having this consultant that comes and works with us, she's been very resourceful...Personally, I don't find that, without that, I don't know how much I...would have access to or I would actually initiate the research-base part of it." In addition to providing a consultant or professional development through inservices, administration could promote familiarity with, use of, and a positive attitude toward research through making sources of research more accessible to teachers. Resource libraries which include scholarly, peer-reviewed journals, professional handbooks, and other quality SBRR sources could be created at the district or building level, thus lessening teachers' burdens to find and pay for sources. Finally, administrators must heed teachers' desire for more time to meet and collaborate with colleagues, in order to encourage the use of new practices and the sharing of information.

Teacher educators. As discussed previously, teacher educators must ensure that elementary school teachers have the prerequisite knowledge for engaging in explicit, systematic code-based instruction. Teachers themselves must have high levels of phonological awareness as well as knowledge of phonetics, phonology, morphology, and orthography, as used in the English language. Teachers need to know why a code-based approach is effective, motivating them to change their practice and then sustaining this change. They then need to be supplied with methods courses which interpret SBRR into classroom practices. Such a strong background will empower teachers as professionals, and ease resentment towards the top-down flow of policy to curriculum by demonstrating the efficacy of highly qualified teachers.

Teacher education is also a place to promote a positive view and use of research. An understanding of the science of research, together with exposure, will empower teachers to discriminate those research studies which are of good quality and applicable to their classrooms, thus allowing them to determine those research implications which should be followed. Teacher education programs perhaps need to incorporate research methods coursework, as well as more readings of primary sources. They could also engage teachers in action research, and involve teachers in translating research findings to practical classroom applications.

Teachers. Teachers have an obligation to engage in more self-reflection and evaluation, and they must do so realistically and accurately; they must look beyond their own personal preferences and experiences to find what is best for students, remaining open to new practices. Teachers need to undertake professional development to further their knowledge in those areas which they feel they are lacking, making sure that an adequate chunk of their 120 PDPs address beginning reading instruction (Massachusetts Department of Education, 2000). Because professional development sessions are not necessarily regulated and in the absence of district or

Department of Education endorsement, teachers themselves must assess the quality and research base of presented information.

Teachers must also be realistic in that, although they are the ones with the everyday classroom experience, as the educational system now stands, they do not necessarily have the time to interpret policy and/or research. They thus must be willing to trust and fully implement the policy and curricula they receive from policymakers or administrators, which is already based on SBRR. Similarly, teachers must work with researchers over the course of an educational study, as they are the ones with classroom experience but without the time or training to conduct research. Such collaboration will lead teachers to understand and value research more while also making research more applicable to the classroom.

Researchers. Researchers also have responsibilities in translating research to educational practices. They need to make sure they treat teachers as partners in improving reading instruction, valuing their concerns and input. Inservice teachers' expertise should be obtained both during the design and interpretation of educational studies. Researchers should also be familiar with the dynamics of schools and individual classrooms, spending considerable time at least observing teachers in action, in order to ensure that their results will be applicable to the classroom setting. Finally, researchers need to make themselves, their expertise, and their research findings more accessible to educators. Partnerships could be formed between universities and school districts, providing both professional development and research opportunities. Given teachers' time constraints, particular emphasis needs to be put on making research sources of research more reader-friendly for teachers, without oversimplifying or otherwise limiting the validity of the study.

Project Limitations and Future Research

The major limitation of the present study is the generalizability of its findings to the entire population of Massachusetts public elementary school teachers. Due to access issues, participants for interviews were selected through snowball and convenience sampling, and represented mainly small, middle class districts in Central Massachusetts. For the teacher survey, although an attempt was made to obtain a truly random sample, representative of teachers from schools of various demographics (e.g., urban, suburban, and rural communities; high and low poverty areas), the low response rate also necessitated the use of convenience and snowball sampling techniques. Thus, teachers who did respond to the survey were highly motivated to do so, possibly because of their interest in either reading or the translation of research to practice, and their responses may not represent those of the majority of teachers across the state. However, due to such high interest, those teachers who did respond may also have more knowledge of reading instruction and/or research, or more positive attitudes towards research. Their results may thus represent a best-case scenario in terms of teachers' knowledge and use of, as well as attitude toward, research. Results obtained from a more diverse sample might show less favorable findings. Future studies should perhaps use a stratified sampling technique to adequately represent all Massachusetts public elementary school teachers.

The sample was also limited in its size. Planned comparisons among all four types of teachers (regular education, inclusion room, special education, reading specialists) could not be conducted, and teacher type was condensed into two groups: classroom versus specialist teachers. Even with these two groups, the small sample of specialists means that small differences between individual specialist teachers had more of an effect than the same differences within the sample of classroom teachers. Furthermore, the specialist group consisted

mainly of reading specialists, perhaps influencing this group's greater knowledge and use of

research. In the future, a greater attempt should be made to have not only a larger overall sample

size, but equivalent sizes across teacher groups as well.   Other analyses which could not be run

due to the small sample size included looking at the relationship among teachers' beliefs and

knowledge regarding reading acquisition and research and 1) school and/or district enrollment

and achievement data, and 2) the number of courses and professional development sessions on

various topics that participants attended.

Many factors may have contributed to the low response rate, including survey length, the

online format, the method of survey distribution, and the timing of the study. As teachers

reported time constraints as a major limiting factor, many most likely did not want to devote an

extra 30 to 45 minutes of their time to fill out a survey. Other teachers may not have had access

to the survey in its initial form as an online questionnaire; although all schools have internet

access, teachers may not have computers in their individual classrooms or feel comfortable with

an internet format. Distribution of information regarding the surveys through principals may

mean that a good proportion of teachers never received this information, and thus could not

respond. Unfortunately, the Department of Education only supplied names, mailing addresses,

and email addresses for district superintendents and building principals, preventing contacting

individual teachers directly. Finally, the first mailing of the survey packets occurred in early

December, when the holiday season and school vacation may have influenced teachers'

decisions or abilities to respond, while the second mailing in January corresponded with the busy

time of report cards and the third in February ran into school vacation time again.

In addition to addressing the limitations above, many other possibilities for future

research exist. Administration of the survey could be done in conjunction with observations of

teachers, allowing for better assessment of what truly takes place in the classroom. As Moats (2000b) cautioned, many teachers may claim to take a balanced or code-based approach without understanding what such instruction really entails. The survey could also be given to building and district administrators, allowing for comparison of these groups to teachers, and also allowing comparisons across the hierarchy within individual districts. It would be interesting to see the opinions of and familiarity with research of those who are in-charge of interpreting educational policies and making district- and/or building-wide curricula and professional development decisions. Before any additional surveys are administered, however, restructuring should take place. Self-report items should be replaced with measures of actual teacher knowledge, and items showing little variability or ability to differentiate among teachers should be deleted. Another area which deserves more attention is why specialist teachers had a more favorable view of research, and a comparison of specialist versus classroom teacher training could be undertaken. Finally, a number of additional analyses are still planned for the existing data set, particularly regression analyses to identify those factors which predict positive views, high levels of knowledge, and more use of research findings.

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Appendix A

1) School: _____

2) School district: _____

3) Grade level(s) currently teaching (circle all that apply):   K   1   2   3   4 and/or above

4) What percent of your students would you categorize as (must total 100%):
   Low/working class: _____%   Middle class: _____%   Upper class: _____%

5) Average number of students in your class: _____

6) Circle the number of aides present for the entire duration of reading instruction.   0   1   2   3 or more

7) Number of students in your classroom receiving supplemental instruction for reading difficulties (e.g., Title I, special needs, reading support, etc.): _____

8) Number of students in your classroom who have diagnosed reading difficulties (e.g., dyslexia, specific reading disability, etc.): _____

9) Rate the following.

	Very Poor	Poor	Satisfactory	Good	Excellent
a) Your total classroom reading instruction/curriculum	1	2	3	4	5
b) Your school's regular education reading curriculum	1	2	3	4	5
c) Your school's supplemental reading program(s)	1	2	3	4	5

10) What percentage of school children in the United States would you estimate:
   a) Learn to read on their own?   _____%
   b) Learn to read with the aid of formal reading instruction?   _____%
   c) Have reading difficulties?   _____%

11) Which of the following are risk factors for reading difficulty? Check all that apply.
   a)_____ Poverty   e)_____ Phonological deficits
   b)_____ Speech/hearing impairment   f)_____ Rapid naming/processing deficits
   c)_____ Low parent/caregiver reading ability   g)_____ Limited exposure to print materials
   d)_____ Low IQ

12) How would you describe the following individual/group's approaches to beginning reading instruction?
   If you feel that any of the following cannot be categorized along the continuum, mark "N/C" for "no consensus."

	Strongly literature-based		Balanced		Strongly code-based	N/C
a) District administration	1	2	3	4	5	N/C
b) Building administration	1	2	3	4	5	N/C
c) General education teachers in your school	1	2	3	4	5	N/C
d) Special education/specialist teachers in your school	1	2	3	4	5	N/C
e) Yourself	1	2	3	4	5	N/C
f) Massachusetts Department of Education	1	2	3	4	5	N/C
g) State educational policies	1	2	3	4	5	N/C
h) Initial teacher preparation programs	1	2	3	4	5	N/C

3) Rate your knowledge of the following.

	None	Insufficient	Adequate	Good	Excellent
a) Teaching average readers to read	1	2	3	4	5
b) Teaching struggling readers to read	1	2	3	4	5
c) Current research findings pertaining to reading acquisition and development	1	2	3	4	5
d) Current research findings pertaining to reading instruction	1	2	3	4	5
e) Children's development of reading skills	1	2	3	4	5
f) Code-based instructional methods of teaching beginning reading	1	2	3	4	5
g) Literature-based instructional methods of teaching beginning reading	1	2	3	4	5
h) Identifying at-risk readers	1	2	3	4	5
i) Linguistics and the structure of the English language	1	2	3	4	5
j) The findings of the National Reading Panel	1	2	3	4	5
k) The standards for Beginning Reading in the Massachusetts Curriculum Frameworks for English/Language Arts	1	2	3	4	5
l) The No Child Left Behind Act	1	2	3	4	5
m) Massachusetts teacher licensing regulations	1	2	3	4	5

4) How familiar are you with the following terms?

	Unaware of term		Aware of term but unable to define		Very familiar with term & able to define accurately
a) Systematic phonics instruction	1	2	3	4	5
b) Explicit phonics instruction	1	2	3	4	5
c) Whole language	1	2	3	4	5
d) Phonological awareness	1	2	3	4	5
e) Alphabetic principle	1	2	3	4	5
f) Sound-symbol correspondences	1	2	3	4	5
g) Decodable text	1	2	3	4	5
h) Predictable text	1	2	3	4	5

5) How appropriate is code-based instruction for:

	Extremely inappropriate					Extremely appropriate
a) Average readers	1	2	3	4	5	6
b) Poor readers	1	2	3	4	5	6

6) How appropriate is literature-based instruction for:

	Extremely inappropriate					Extremely appropriate
a) Average readers	1	2	3	4	5	6
b) Poor readers	1	2	3	4	5	6

17) Indicate whether and to what extent you agree or disagree with the following statements.

	Strongly agree	Agree	Mildly agree	Mildly disagree	Disagree	Strongly disagree
a) K-2 teachers should know how to assess and teach phonological awareness (i.e., knowing that spoken language can be broken down into smaller units, words, syllables, phonemes).	1	2	3	4	5	6
b) Literacy experiences in the home contribute to early reading success.	1	2	3	4	5	6
c) Controlling text through consistent spelling patterns (The fat cat sat on a hat.) is an example of an effective method for children who struggle to learn to identify words.	1	2	3	4	5	6
d) Poor phonemic awareness (awareness of the individual sounds in words) contributes to early reading failure.	1	2	3	4	5	6
e) Materials for struggling readers should be written in natural language with little regard for the difficulty of vocabulary.	1	2	3	4	5	6
f) Time spent reading contributes directly to reading improvement.	1	2	3	4	5	6
g) Learning to use context clues (syntax and semantics) is more important than learning to use grapho-phonic cues (letters and sounds) when learning to read.	1	2	3	4	5	6
h) If a beginning reader reads "house" for the written word "home," the response should not be corrected.	1	2	3	4	5	6
i) Children should read different types of text for different instructional purposes.	1	2	3	4	5	6
j) K-2 teachers should know how to teach phonics (letter/sound correspondences).	1	2	3	4	5	6
k) Picture cues can help children identify words in the early stages of reading.	1	2	3	4	5	6
l) It is important for teachers to demonstrate to struggling readers how to segment words into phonemes when reading and spelling.	1	2	3	4	5	6
m) Adult-child shared book reading enhances language and literacy growth.	1	2	3	4	5	6
n) Phonic instruction is beneficial for children who are struggling to learn to read.	1	2	3	4	5	6
o) All children can learn to read using literature-based, authentic texts.	1	2	3	4	5	6
p) Explicit, systematic phonics instruction should take place during resource room/supplemental reading interventions.	1	2	3	4	5	6
q) Explicit, systematic phonics instruction should take place in the context of the regular classroom.	1	2	3	4	5	6

18) Indicate whether and to what extent you teach the following as components of your classroom reading curriculum, 1) for all students in your classroom and 2) for those students who are struggling readers.

Do you explicitly teach your students:	Never	Rarely	Occasionally	Frequently	Regularly	Unfamiliar with practice
a) To hear the syllables in words (i.e., segmenting syllables).						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
b) To hear the individual sounds in words (i.e., segmenting phonemes).						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A

(Continued)	Never	Rarely	Occasionally	Frequently	Regularly	Unfamiliar with practice
c) To manipulate the sounds in words (i.e., addition/deletion of phonemes).						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
d) Letter names.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
e) That sounds/phonemes correspond with letters/symbols.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
f) That different letters can represent the same sound and the same letter(s) can have different sounds (i.e., no one-to-one mapping).						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
g) How specific sounds/phonemes are represented by letters.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
h) Phonics rules.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
i) Syllabification rules.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
j) Initial consonant sounds.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
k) Final consonant sounds.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A
l) Vowel sounds.						
ALL STUDENTS:	1	2	3	4	5	N/A
STRUGGLING READERS:	1	2	3	4	5	N/A

19) Answer the following for 1) all students and 2) struggling readers.

In your classroom, do you:	Never	Rarely	Occasionally	Frequently	Regularly	Unfamiliar with practice
a) Use rhyming activities.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
b) Use other oral language activities.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A

(Continued)	Never	Rarely	Occasionally	Frequently	Regularly	Unfamiliar with practice
c) Deliberately teach all the sound-letter(s) correspondences.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
d) Use phonics worksheets.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
e) Use phonogram cards.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
f) Use phonics games/puzzles.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
g) Use texts whose phonics/spelling patterns are controlled (i.e., decodable texts).						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A
h) Use authentic texts/trade books.						
WITH ALL STUDENTS:	1	2	3	4	5	N/A
WITH STRUGGLING READERS:	1	2	3	4	5	N/A

20) Indicate whether and to what extent the following influence the reading instruction that takes place in your classroom (e.g., curriculum, material, activity decisions, etc.).

	No influence									Great influence
a) Parent preferences/recommendations	1	2	3	4	5	6	7	8	9	0
b) Individual student needs	1	2	3	4	5	6	7	8	9	0
c) Personal teaching preferences/experiences	1	2	3	4	5	6	7	8	9	0
d) Building-level administration/curriculum	1	2	3	4	5	6	7	8	9	0
e) District-level administration/curriculum	1	2	3	4	5	6	7	8	9	0
f) Massachusetts Department of Education regulations/standards	1	2	3	4	5	6	7	8	9	0
g) Recommendations from researchers	1	2	3	4	5	6	7	8	9	0
h) Recommendations from professional development providers	1	2	3	4	5	6	7	8	9	0
i) Recommendations from college/university professors and/or coursework	1	2	3	4	5	6	7	8	9	0
j) Recommendations from reading consultant/coach employed by school or school district (if not applicable, please leave blank)	1	2	3	4	5	6	7	8	9	0

21) Do you use any commercial reading programs in your classroom?   Yes   No

If yes:

b) Please specify any commercial reading programs that you use in your classroom which are mandated by either your building or district administration.

_____

c)   If you use commercial reading programs which are mandated by your building or district administration, rate the effectiveness of these programs.   __ Very Poor   __ Poor   __ Satisfactory   __ Good   __ Excellent

d) Please specify any commercial reading programs that you use in your classroom of your own personal choice.

_____

22) Indicate whether and to what extent you agree or disagree with the following statements.

	Strongly agree	Agree	Mildly agree	Mildly disagree	Disagree	Strongly disagree
a) The goal of having every child reading by the end of third grade is realistic.	1	2	3	4	5	6
b) I believe that all students can learn to read.	1	2	3	4	5	6

23) Indicate whether and to what extent the following adversely impacts your success in teaching all of your students to read.

	No impact on my teaching of reading or N/A									Greatly inhibits my teaching of reading
a) Inadequate resources for materials	1	2	3	4	5	6	7	8	9	0
b) Lack of preparation time	1	2	3	4	5	6	7	8	9	0
c) Lack of parental support	1	2	3	4	5	6	7	8	9	0
d) Lack of support from building administrators	1	2	3	4	5	6	7	8	9	0
e) Lack of support from district administrators	1	2	3	4	5	6	7	8	9	0
f) Lack of opportunity to collaborate with colleagues	1	2	3	4	5	6	7	8	9	0
g) Limited knowledge of the process of reading	1	2	3	4	5	6	7	8	9	0
h) Limited knowledge of effective instructional practices for the teaching of reading	1	2	3	4	5	6	7	8	9	0
i) Classroom management problems	1	2	3	4	5	6	7	8	9	0
j) Lack of adequate instructional time devoted to reading	1	2	3	4	5	6	7	8	9	0
k) Wide variance in student ability levels within the classroom	1	2	3	4	5	6	7	8	9	0
l) Low student ability	1	2	3	4	5	6	7	8	9	0
m) High number of children in the classroom	1	2	3	4	5	6	7	8	9	0
n) Mandated use of specific commercial reading program(s)	1	2	3	4	5	6	7	8	9	0
o) Mandated use of particular reading curriculum	1	2	3	4	5	6	7	8	9	0
p) Lack of student motivation to read	1	2	3	4	5	6	7	8	9	0
q) MCAS preparation	1	2	3	4	5	6	7	8	9	0

24) Indicate whether and to what extent you agree or disagree with the following statements.

	Strongly agree	Agree	Mildly agree	Mildly disagree	Disagree	Strongly disagree
a) I explore a variety of approaches/methods to teaching a reading concept before settling on the most effective.	1	2	3	4	5	6
b) I evaluate the effectiveness of my classroom reading instruction through regular assessment of students.	1	2	3	4	5	6
c) My beginning reading instruction focuses on building successful decoding skills.	1	2	3	4	5	6
d) The ability to read single, isolated words is simply "word calling" and is completely unrelated to true reading ability.	1	2	3	4	5	6
e) Speed of word recognition does not affect comprehension.	1	2	3	4	5	6
f) IQ is the best predictor of later reading skill.	1	2	3	4	5	6
g) The ability to read single, isolated words predicts later reading and comprehension skill.	1	2	3	4	5	6
h) I should be more familiar with current research relevant to reading acquisition and instruction.	1	2	3	4	5	6

(Continued)	Strongly agree	Agree	Mildly agree	Mildly disagree	Disagree	Strongly disagree
i) Research findings need to be more accessible to teachers.	1	2	3	4	5	6
j) I prefer to use commercial reading programs rather than my own lesson plans.	1	2	3	4	5	6
k) Researchers often fail to recognize the complicated dynamics of the classroom, which makes many of their instructional recommendations unrealistic to implement.	1	2	3	4	5	6
l) Researchers are too focused on narrow research topics and miss the larger picture.	1	2	3	4	5	6
m) Researchers do not see/treat teachers as partners in improving education.	1	2	3	4	5	6
n) Researchers' work does not reflect the needs of teachers.	1	2	3	4	5	6
o) I would take advantage of an opportunity to collaborate with a researcher.	1	2	3	4	5	6

25) To what extent do the following limit your knowledge of research findings?

	Does not limit									Strongly limits	
a) Lack of interest	1	2	3	4	5	6	7	8	9	0	N/A
b) Unaware of sources of research findings	1	2	3	4	5	6	7	8	9	0	N/A
c) Lack of time (e.g., to read, attend conferences, etc.)	1	2	3	4	5	6	7	8	9	0	N/A
d) Inadequate resources for obtaining sources of research (e.g., journal subscriptions, conference fees, books, etc.)	1	2	3	4	5	6	7	8	9	0	N/A
e) Difficulty in understanding research articles/reports	1	2	3	4	5	6	7	8	9	0	N/A
f) Lack of background in research design/methods	1	2	3	4	5	6	7	8	9	0	N/A
g) Belief that research findings are irrelevant to my ability to teach reading	1	2	3	4	5	6	7	8	9	0	N/A

26) Indicate whether and to what extent the following limit your incorporation of scientific findings in classroom reading instruction.

	Does not limit									Strongly limits	
a) Lack of familiarity with research findings	1	2	3	4	5	6	7	8	9	0	N/A
b) Difficulty in applying research findings to classroom practices	1	2	3	4	5	6	7	8	9	0	N/A
c) Difficulty in discriminating "good" from "bad" research (i.e., difficulty in determining which research recommendations should be followed)	1	2	3	4	5	6	7	8	9	0	N/A
d) Lack of time to implement new practices	1	2	3	4	5	6	7	8	9	0	N/A
e) Lack of resources to implement new practices	1	2	3	4	5	6	7	8	9	0	N/A
f) Lack of support from building administration	1	2	3	4	5	6	7	8	9	0	N/A
g) Lack of support from district administration	1	2	3	4	5	6	7	8	9	0	N/A
h) Lack of support from colleagues	1	2	3	4	5	6	7	8	9	0	N/A
i) Presence of mandated curriculum	1	2	3	4	5	6	7	8	9	0	N/A
j) Lack of specific examples and demonstrations of how to apply research findings	1	2	3	4	5	6	7	8	9	0	N/A
k) Lack of consensus among research findings	1	2	3	4	5	6	7	8	9	0	N/A
l) Other factor, not specified above	1	2	3	4	5	6	7	8	9	0	N/A
Specify:											

27) The following is an attempt to develop a better understanding of teachers' underlying linguistic knowledge. Please check the correct response for each question.

a) Which word contains a short vowel sound?
_____ treat
_____ start
_____ slip
_____ cold
_____ point

b) A phoneme refers to:
_____ a single letter
_____ a single speech sound
_____ a single unit of meaning
_____ a grapheme

c) A pronounceable group of letters containing a vowel sound is a:
_____ a phoneme
_____ a grapheme
_____ a syllable
_____ morpheme

d) If "tife" were a word, the letter "i" would probably sound like the "i" in:
_____ if
_____ beautiful
_____ find
_____ celling
_____ sing

e) A combination of two or three consonants pronounced so that each letter keeps its own identity is called a:
_____ silent consonant
_____ consonant digraph
_____ diphthong
_____ consonant blend

f) Example of a voiced and unvoiced consonant pair would be:
_____ b--d
_____ p--b
_____ t--f
_____ g--j
_____ c--s

g) Two combined letters that represent one single speech sound are a:
_____ schwa
_____ consonant blend
_____ phonetic
_____ digraph
_____ diphthong

h) How many speech sounds are in the word "eight?"
_____ two
_____ three
_____ four
_____ five

k) What type of task would this be: "Say the word 'cat.' Now say cat' without the /c/ sound."
_____ blending
_____ rhyming
_____ segmentation
_____ deletion

l) What type of task would this be: "I am going to say some sounds that will make one word when you put them together. What does /sh/ /oe/ say?"
_____ blending
_____ rhyming
_____ segmentation
_____ deletion

m) Mark the statement that is false:
_____ Phonological awareness is a precursor to phonics.
_____ Phonological awareness is an oral language activity.
_____ Phonological awareness is a method of reading instruction that begins with individual letters and sounds.
_____ Many children acquire phonological awareness from language activities and reading.

n) What is the second sound in the word "queen?"
_____ u
_____ long e
_____ k
_____ w

o) A reading method that focuses on teaching the application of speech sounds to letters is called:
_____ phonics
_____ phonemics
_____ orthography
_____ phonetics
_____ either phonics or phonetics

p) A soft "c" is in the word:
_____ Chicago
_____ cat
_____ chair
_____ city
_____ none of the above

q) Identify the pair of words that begins with the same sound.
_____ joke - goat
_____ chef - shoe
_____ quiet - giant
_____ chip - chemist

The next two items involve saying a word and then reversing the order of the sounds. For example, the word "back" would be "cab."

r) If you say the word, and then reverse the order of the sounds, "ice" would be:
_____ easy
_____ sea
_____ size
_____ sigh

i) How many speech sounds are in the word "box?"	s) If you say the word, and then reverse the order of the sounds, "enough" would be:
_____ one	_____ fun
_____ two	_____ phone
_____ three	_____ funny
_____ four	_____ one
j) How many speech sounds are in the word "grass?"	t) All of the following nonsense words have silent letters, except:
_____ two	_____ bamb
_____ three	_____ wrin
_____ four	_____ shipe
_____ five	_____ knam
	_____ phop

28) Indicate whether and to what extent you use the following methods of furthering your professional knowledge and skills in the teaching of reading.

	Never	Rarely	Occasionally	Frequently	Regularly
a) Attend workshops, inservices, or staff development sessions	1	2	3	4	5
b) Attend teaching conferences	1	2	3	4	5
c) Attend research conferences	1	2	3	4	5
d) Enroll in college/university courses (other than in a degree program)	1	2	3	4	5
e) Reading teaching/professional/instructional magazines or journals	1	2	3	4	5
f) Read popular press materials dealing with topics in education or literacy (e.g., books, magazines, newspapers, etc.)	1	2	3	4	5
g) Watch and/or listen to television or radio broadcasts dealing with education/literacy	1	2	3	4	5
h) Read scholarly, peer-reviewed journals that report outcomes of psychological research in reading or reading education	1	2	3	4	5
i) Read articles in professional handbooks	1	2	3	4	5
j) Collaborate with researchers/universities	1	2	3	4	5
k) Utilize personal contacts with specialists in the field (e.g., consultants)	1	2	3	4	5
l) Read reports about reading acquisition from research or governmental agencies	1	2	3	4	5
m) Utilize the "What Works Clearinghouse"	1	2	3	4	5

29) Are you currently a member of any of the following professional organizations? Check all that apply.

a) _____ International Reading Association
b) _____ International Dyslexia Association
c) _____ Massachusetts Reading Association
d) _____ National Association for the Education of Young Children
e) _____ National Council of Teachers of English
f) _____ National Education Association
g) _____ National Federation of Teachers
h) _____ National Reading Conference
i) _____ The Council for Exceptional Children
j) _____ Other (please specify): _____

30) Indicate each degree that you hold by entering the year in which it was awarded.
    a) B.A./B.S.   _____
    b) M.A./M.S.   _____
    c) M.Ed./M.A.T.   _____
    d) C.A.G.S.   _____
    e) Ph.D.   _____
    f) Ed.D.   _____

31) How many college/university courses have you taken in the following areas?

	Total:	Since June 2001:
Child Development	a) _____	b) _____
Linguistics/Psycholinguistics	c) _____	d) _____
Research Methods/Design	e) _____	f) _____
Language Development	g) _____	h) _____
Literacy Instruction	i) _____	j) _____

32) How many of the above college/university courses have dealt with the prevention of and /or interventions for reading difficulties (including dyslexia)?
    a) Total: _____
    b) Since June 2001:   _____

33) How many professional development sessions have you attended that addressed the following areas?

	Total:	Since June 2001:
Child Development	a) _____	b) _____
Linguistics/Psycholinguistics	c) _____	d) _____
Research Methods/Design	e) _____	f) _____
Language Development	g) _____	h) _____
Literacy Instruction	i) _____	j) _____

34) How many of the above professional development sessions have dealt with the prevention of and/or interventions for reading difficulties (including dyslexia)?
    a) Total: _____
    b) Since June 2001:   _____

35) In what capacity do you currently teach?
    a) _____ Regular/General Education Classroom Teacher
    b) _____ Inclusion Classroom Teacher
    c) _____ Special Education Teacher
    d) _____ Reading Specialist
    e) _____ Speech or Language Specialist
    f) _____ Other (please specify): _____

36) How many years have you taught:
    a) In your current capacity?   _____
    b) Overall?   _____

37) What is your current level of licensing?
    a) _____ Provisional
    b) _____ Initial
    c) _____ Professional
    d) _____ Temporary
    e) _____ Not licensed

38) What type(s) of license(s) do you currently hold? Check all that apply.
    a) _____ Early Childhood
    b) _____ Elementary
    c) _____ Teacher of Students with Moderate Disabilities
    d) _____ Teacher of Students with Severe Disabilities
    e) _____ Specialist: Reading
    f) _____ Specialist in Speech, Language, and Hearing Disorders
    g) _____ Other (please specify): _____

Appendix B

Educator Interview Protocol
Objectives:
> Understand educators' views of policy and research
> Understand the process of and influences on curriculum development
> Understand educators' knowledge/beliefs about reading instruction
> Understand factors that inhibit teaching all children to read
> Understand factors that lead to the research-to-practice gap

How long have you been in the field of education, and in what capacities?
What experiences led you to work in this field?

How would you define "reading?"
How would you describe the process of reading (i.e. how does one get from print to meaning)?
How do you think reading should be taught (i.e. what are the essential components of reading
> instruction)? Why do you support these methods?
Why do some children struggle with learning to read? How would you classify a struggling
> reader?
Should reading instruction differ for average versus struggling readers? In what way(s)?
Are you aware of the so-called "reading wars" or "great debate" in reading? What is your
> understanding of code-based instruction? Of literature-based instruction? Where do you
> stand on the issue of code-based versus literature-based instruction?
What/who has influenced the way you think about beginning reading instruction (i.e. initial
> teacher preparation, professional development or university courses, colleagues, etc.)?
> Do you feel pressured to take any particular approach to reading instruction?
Where/how do you get your information regarding reading and reading instruction?
How influential have professional development opportunities and/or initial teacher preparation
> programs been on how you think about reading? What could to improve teacher
> education and thus improve beginning reading instruction?
What role do administrators have in improving beginning reading instruction?
What role do teachers have in improving beginning reading instruction?
Could you lead me through the process of establishing or changing reading curricula? How
> much freedom do teachers have over the reading instruction that takes place in their
> classrooms? How do you feel about who makes instructional decisions and how these are
> made?
What guidance, if any, do you receive from the Massachusetts Department of Education
> regarding reading instruction?

What is your opinion of the current state of reading instruction in Massachusetts? Is it adequate?
> Explain.
What factors prevent teachers and others in the educational system from ensuring that all
> children learn to read? What could be done to allow both educators and students to be
> more successful?

What is your opinion of academic research and its application to education?

Do you feel that it is important for educators to have knowledge of such research?

Do you think that educators, including yourself, currently have adequate knowledge of such research? What factors do you feel limit educators' familiarity with or use of research findings and scientifically based instructional methods? What would encourage educators to not only become more aware of such information, but be willing to implement it in classrooms?

What role do legislators/policymakers have in improving early reading instruction? Do you feel that it is appropriate for policymakers to make educational decisions?

How has NCLB affected reading instruction in Massachusetts, and in your district/classroom in particular (including teacher preparation, etc.)? What is your opinion of NCLB and these changes?

How have the Massachusetts Curriculum Frameworks affected reading instruction in Massachusetts? What is your opinion of the Massachusetts Curriculum Frameworks and its standards? Do the standards adequately address what and how beginning reading should be taught? How effective have the standards been in improving reading instruction in Massachusetts? What limits their effectiveness?

Could you describe any other recent educational policies, or changes in existing policies, which affect beginning reading instruction in Massachusetts?

Finally, could you briefly describe your educational background?

Appendix C

Policymakers Interview Protocol
Objectives:

Understand process of creating/implementing educational policies
Understand how this process is influenced by research
Understand legislators' knowledge/beliefs about reading
Determine how/where legislators obtain information regarding reading
Understand factors which inhibit success in teaching children to read
Understand factors which create the research-to-practice gap

How would you define "reading?"

How would you describe the process of reading (i.e. how does one get from print to meaning)?

How do you think reading should be taught (i.e. what are the essential components of reading instruction)? Why do you support these methods?

Why do some children struggle with learning to read? How would you classify a struggling reader?

Should reading instruction differ for average versus struggling readers? In what way(s)?

Are you aware of the so-called "reading wars" or "great debate" in reading? What is your understanding of code-based instruction? Of literature-based instruction? Where do you stand on the issue of code-based versus literature-based instruction?

What is your opinion of the current state of reading instruction in Massachusetts? Is it adequate? Explain.

What factors prevent teachers and others in the educational system from ensuring that all children learn to read? What could be done to allow both educators and students to be more successful?

What is your opinion of academic research and its application to education?

Do you feel that it is important for educators to have knowledge of such research?

Do you think that educators currently have adequate knowledge of such research? What factors do you feel limit educators' familiarity with or use of research findings and scientifically based instructional methods? What would encourage educators to not only become more aware of such information, but be willing to implement it in classrooms?

What role do legislators/policymakers have in improving early reading instruction? Do you feel that it is appropriate for policymakers to make educational decisions?

Could you lead me through the process of creating and implementing educational policies, specifically mentioning where research is used to inform such policies?

How do you, personally, arrive at decisions regarding educational policies? Where do you get information to support your decisions? To what extent do personal views affect the development of policy?

How well do you feel you understand significant and/or current issues affecting beginning reading instruction?

Could you describe the provisions of NCLB (No Child Left Behind) that affect reading instruction in Massachusetts (including teacher preparation, etc.)? What is your opinion of NCLB? How has it changed beginning reading instruction in Massachusetts?

Could you describe the Massachusetts Curriculum Frameworks, in terms of its purpose,
    development, and effect on beginning reading instruction? What is your opinion of the
    Massachusetts Curriculum Frameworks and its standards? How has it changed beginning
    reading instruction in Massachusetts? How would you rate its effectiveness in improving
    beginning reading instruction?
Could you describe any other recent educational policies, or changes in existing policies, which
    affect beginning reading instruction in Massachusetts?

Finally, could you briefly describe your educational background, and how you achieved your
position as _____?

Table 1

Descriptive Data for Districts Participating in Interview Study

:rict	Student Enrollment: Total	K	1	2	3	% Free or Reduced Lunch	% SpEd	MCAS Gr.3 Reading Test: % Proficient	% Needs Improvement	Warning	2001 Per Pupil Expenditur
1	2314	128	189	188	181	7.3	14.1	73	26	1	$5,6C
2	2104	123	197	193	197	9.1	16.4	76	21	3	$5,05
3	1222	98	103	99	97	4.3	14.6	73	25	3	$6,15
4	2450	237	204	218	207	2.5	9.4	79	19	2	$4,61
5	1928	146	129	139	130	10.7	13.9	72	27	1	$5,59
6	5318	408	442	483	442	5.0	13.7	76	20	4	$5,53
7	25712	2073	2050	1981	1991	56.3	17.1	50	41	9	$5,75

: Statistics											
lean	3275.13	243.73	259.63	259.30	261.57	15.13	14.39	73.79	22.85	3.39	$6,2
Min.	50	3	4	4	4	0	1.5	29	0	0	$4,1
Max.	61552	3917	4579	4544	4866	80	26.2	100	54	23	$14,4

rce: Massachusetts Department of Education. (n.d.). School and District Profiles/Directory [Database].
iilable from MA DOE Web site, http://profiles.doe.mass.edu.

Table 2

Descriptive Data for Schools Participating in Interview Study

District	School	Student Enrollment:					% Free or Reduced Lunch	% SpEd	MCAS Gr.3 Reading Test:		
		Total	K	1	2	3			% Proficient	% Needs Improvement	Warning
1	A	462	62	51	56	48	8.2	15.6	67	30	2
2	B	311	106	104	101	0	7.7	10.9	(No third grade enrollment)		
3	C	790	98	103	99	97	4.2	15.2	66	32	2
4	D	1040	50	39	127	207	3.6	6.9	79	20	1
5	E	607	146	129	139	130	13.5	13.7	64	33	3
6	F	903	0	127	211	187	4.8	9.5	73	24	3
7	G	349	48	41	38	46	28.4	13.5	71	27	2
7	H	218	33	31	31	27	82.6	15.6	11	44	44

State Statistics											
Mean	3275.13	243.73	259.63	259.30	261.57	15.13	14.39	73.79	22.85	3.3
Min.	50	3	4	4	4	0	1.5	29	0	
Max.	61552	3917	4579	4544	4866	80	26.2	100	54	2

Source: Massachusetts Department of Education. (n.d.). School and District Profiles/Directory [Database]. Available from MA DOE Web site, http://profiles.doe.mass.edu.

Table 3

Item Analysis of Teachers' Actual Knowledge of Research

Item	Mean (SD)	Correct Responses
K-2 teachers should know how to assess and teach phonological awareness. (Q17a)	5.81 (.436)	100.0%
Poor phonemic awareness contributes to early reading failure. (Q17d)	5.18 (.784)	98.2%
It is important for teachers to demonstrate to struggling readers how to segment words into phonemes when reading and spelling. (Q17l)	5.49 (.801)	97.2%
K-2 teachers should know how to teach phonics. (Q17j)	5.78 (.479)	100.0%
Explicit, systematic phonics instruction should take place in the context of the regular classroom. (Q17q)	4.94 (.980)	93.7%
Phonic instruction is beneficial for children who are struggling to learn to read. (Q17n)	5.45 (.733)	98.2%
Learning to use context clues is more important than learning to use grapho-phonic cues when learning to read. (Q17g)	3.65 (1.30)	49.1%
Controlling text through consistent spelling patterns is an example of an effective method for children who struggle to learn to identify words. (Q17c)	4.69 (1.20)	87.5%
If a beginning reader reads "house" for the written word "home," the response should not be corrected. (Q17h)	3.36 (1.34)	38.5%
All children can learn to read using literature-based, authentic texts. (Q17o)	4.05 (1.45)	64.0%
IQ is the best predictor of later reading skill. (Q24f)	4.26 (1.08)	73.3%
The ability to read single, isolated words is simply "word calling" and is completely unrelated to true reading ability. (Q24d)	3.81 (1.37)	55.8%
Speed of word recognition does not affect comprehenison. (Q24e)	4.51 (1.32)	76.6%
The ability to read single, isolated words predicts later reading and comprehension skill. (Q24g)	2.71 (1.16)	26.4%

Notes. Italicized items reverse-coded. Means represent scores on a scale of (1) incorrect to (6) correct.

Table 4

Percentage of Teachers Correctly Identifying Risk
Factors for Reading Difficulty

Factor	Correctly Identified
Poverty	92.4%
Speech/Hearing Impairments	97.2%
Low Parent/Caregiver Reading Ability	95.3%
Low IQ	93.2%
Phonological Deficits	99.1%
Rapid Naming/Processing Deficits	91.3%
Limited Exposure to Print Materials	97.2%

Table 5

Item Analysis for Teachers' Perceptions of Early Reading and Spelling

Item	Code	Mean (SD)	Agreement
K-2 teachers should know how to assess and teach phonological awareness (i.e., knowing that spoken language can be broken down into smaller units, words, syllables, phonemes).	CB	5.81 (.436)	100.0%
Literacy experiences in the home contribute to early reading success.	N	5.84 (.369)	100.0%
Controlling text through consistent spelling patterns (The fat cat sat on a hat.) is an example of an effective method for children who struggle to learn to identify words.	CB	4.69 (1.20)	87.5%
Poor phonemic awareness (awareness of the individual sounds in words) contributes to early reading failure.	CB	5.20 (.781)	98.2%
Materials for struggling readers should be written in natural language with little regard for the difficulty of vocabulary.	MB	2.77 (1.33)	25.5%
Time spent reading contributes directly to reading improvement.	MB	5.43 (.911)	95.5%
Learning to use context clues (syntax and semantics) is more important than learning to use grapho-phonic cues (letters and sounds) when learning to read.	MB	3.35 (.1.29)	50.0%
If a beginning reader reads "house" for the written word "home," the response should not be corrected.	MB	3.64 (1.34)	61.5%
Chidlren should read different types of text for different instructional purposes.	N	5.36 (.864)	96.4%
K-2 teachers should know how to teach phonics (letter/sound correspondences).	CB	5.78 (.479)	100.0%
Picture cues can help children identify words in the early stages of reading.	N	5.79 (.468)	100.0%
It is important for teachers to demonstrate to struggling readers how to segment words into phonemes when reading and spelling.	CB	5.49 (.794)	97.3%
Adult-child shared book reading enhances language and literacy growth.	MB	5.80 (.442)	100.0%
Phonic instruction is beneficial for children who are struggling to learn to read.	CB	5.45 (.733)	98.2%
All children can learn to read using literature-based, authentic texts.	MB	2.96 (1.45)	36.0%

Notes. Code refers to the coding of individual items as code-based/explicit instructional

approach (CB), meaning- or literature-based/implicit instructional approach (LB), or neutral (N).

Means represent scores on a scale of (1) strongly disagree to (6) strongly agree.

Table 6

Teachers' Familiarity with Reading Terms

Term	Mean (SD)	Unable to Define Term
Systematic phonics instruction	4.35 (.867)	13.4%
Explicit phonics instruction	4.32 (.924)	15.2%
Whole language	4.62 (.557)	3.6%
Phonological awareness	4.72 (.480)	0.9%
Alphabetic principle	3.62 (1.29)	43.0%
Sound-symbol correspondences	4.71 (.562)	5.4%
Decodable text	4.75 (.528)	4.5%
Predictable text	4.76 (.619)	6.3%

Note. Higher means reflect more familiarity.

Table 7

Summary of Paired T-Tests for Professional Development (PD) Activities

Activity	Comparison	t(99) value	p level
A) Attend workshops/inservices/staff development	PD Opportunities		
B) Attend teaching conferences	A*B	9.40	< .001
C) Attend research conferences	A*C	20.61	< .001
D) Enroll in college/university courses	A*D	10.09	< .001
E) Read teaching/professional magazines	B*C	13.66	< .001
F) Read popular press materials	B*D	2.65	.010
G) Read scholarly, peer-reviewed research journals	C*D	8.40	< .001
H) Read professional handbooks	Print Sources		
I) Read research reports	E*F	0.600	.550
	E*G	10.23	< .001
	E*H	6.85	< .001
	E*I	10.78	< .001
	F*G	9.19	< .001
	F*H	6.12	< .001
	F*I	10.16	< .001
	G*H	3.85	< .001
	G*I	1.55	.124
	H*I	5.30	< .001

Note. Significance levels set at $\alpha = .008$ for PD Opportunities and $\alpha = .005$ for Print Sources.

Table 8

Percentage of Teachers Belonging to Professional Organizations

Organization	% Holding Membership
National Education Association	61.4%
International Reading Association	23.8%
Massachusetts Reading Association	16.8%
National Association for the Education of Young Children	16.0%
The Council for Exceptional Children	5.9%
National Council of Teachers of English	5.0%
National Federation of Teachers	4.0%
International Dyslexia Association	2.0%
National Reading Conference	0.0%

Table 9

Percentage of Teachers Answering Teacher Knowledge Assessment: Structure of Language Items Correctly

Item	% Correct
Which word contains a short vowel sound? (treat, start, *slip,* cold, point)	98.1%
A phoneme refers to: (a single letter, *a single speech sound,* a single unit of meaning, a grapheme).	93.1%
A pronounceable group of letters containing a vowel sound is a: (phoneme, grapheme, *syllable,* morpheme).	82.8%
If "tife" were a word, the letter "i" would probably sound like the "i" in: (if, beautiful, *find,* ceiling, sing).	100.0%
A combination of two or three consonants pronounced so that each letter keeps its own identity is called a: (silent consonant, consonant digraph, diphthong, *consonant blend*).	82.4%
Example of a voiced and unvoiced consonant pair would be: (b--d, *p--b,* t--f, g--j, c--s).	35.7%
Two combined letters that represent one single speech sound are a: (schwa, consonant blend, phonetic, *digraph,* diphthong).	75.2%
How many speech sounds are in the word "eight?" *(two,* three, four, five)	98.1%
How many speech sounds are in the word "box?" (one, two, three, *four*)	9.5%
How many speech sounds are in the word "grass?" (two, three, *four,* five)	47.1%
What type of task would this be: "Say the word 'cat.' Now say 'cat' without the /c/ sound." (blending, rhyming, segmentation, *deletion*)	69.6%
What type of task would this be: "I am going to say some sounds that will make one word when you put them together. What does /sh/ /oe/ say?" (*blending,* rhyming, segmentation, deletion)	87.4%
Mark the statement that is false: (Phonological awareness is a precursor to phonics. Phonological awareness is an oral language activity. *Phonological awareness is a method of reading instruction that begins with individual letters and sounds.* Many children acquire phonological awareness from language activities and reading.).	39.8%
What is the second sound in the word "queen?" (u, long e, k, *w*)	19.4%

(table continues)

Percentage of Teachers Answering Teacher Knowledge Assessment: Structure of Language Items Correctly

Item	% Correct
A reading method that focuses on teaching the application of speech sounds to letters is called: (*phonics,* phonemics, orthography, phonetics, either phonics or phonetics).	50.0%
A soft "c" is in the word: (Chicago, cat, chair, *city,* none of the above).	85.6%
Identify the pair of words that begins with the same sound. (joke--goat, *chef--shoe,* quiet--giant, chip--chemist)	96.1%
If you say the word, and then reverse the order of the sounds, "ice" would be: (easy, sea, size, *sigh*).	81.7%
If you say the word, and then reverse the order of the sounds, "enough" would be: (fun, phone, *funny,* one).	88.2%
All of the following nonsense words have silent letters except: (bamb, wrin, shipe, knam, *phop*).	55.7%

Notes. Answer choices follow items in parentheses. Correct answers in italics.

Figure Captions

Figure 1. Survey respondents' estimates of student socioeconomic (SES) status.

Figure 2. Influences of various factors on reading instruction for classroom and specialist teachers. Higher means reflect greater impact. Error bars represent +1 SD.

Figure 3. Teachers' reported use of instructional components and practices; frequency of responses. Response categories include (1) never to (5) regularly.

Figure 4. Frequency that classroom and specialist teachers provide instruction in various curriculum components for all and struggling students. Higher means represent more frequent instruction. Error bars represent +1 SD.

Figure 5. Frequency that classroom and specialist teachers instruct using various instructional practices for all and struggling students. Higher means represent more frequent instruction. Error bars represent +1 SD.

Figure 6. Factors adversely impacting classroom and specialist teachers' abilities to teach all students to read. Higher means reflect a greater degree of negative impact. Error bars represent +1 SD.

Figure 7. Factors limiting classroom and specialist teachers' familiarity with research findings. Higher means reflect a greater degree of limitation. Error bars represent +1 SD.

Figure 8. Frequency of classroom and specialist teachers' use of various sources of professional development. Higher means reflect more regular use. Error bars represent +1 SD.

Figure 9. Teachers' scores on the Teachers' Knowledge Assessment: Structure of Language (TKA:SL).

Figure 10. Factors limiting classroom and specialist teachers' use of research to guide classroom practices. Higher means reflect a greater degree of limitation. Error bars represent +1 SD.

Figure 1
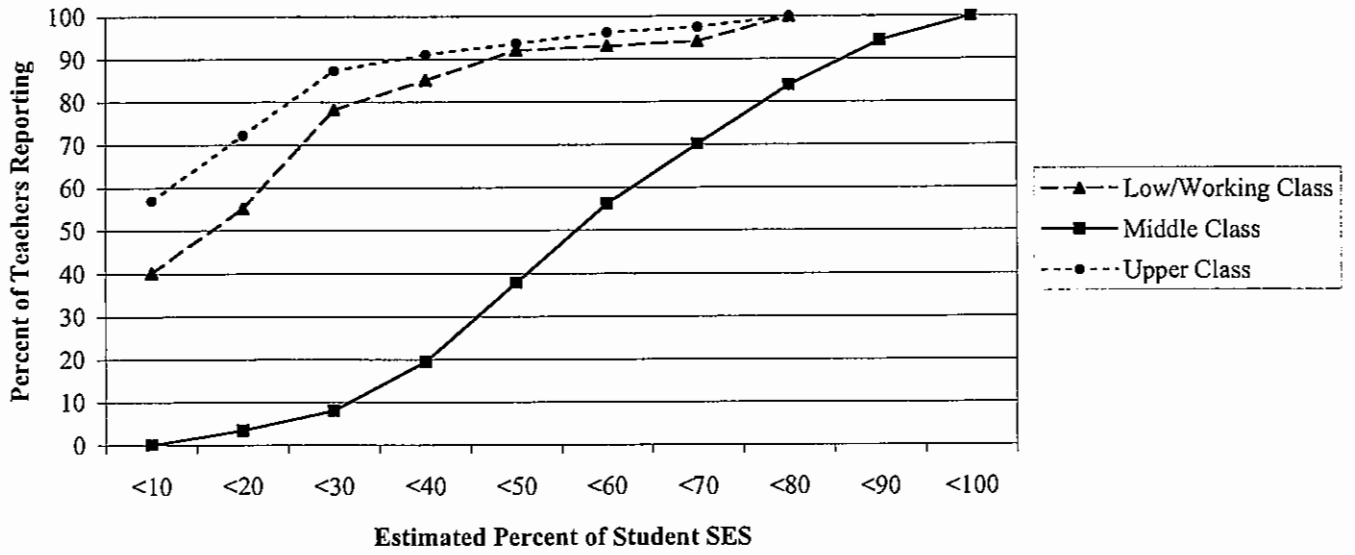
Figure 2

Figure 3

Figure 4

ALL STUDENTS

Legend: ☐ Classroom Teachers ■ Specialists

Instructional Component	Specialists	Classroom Teachers
Vowel Sounds	4.41	4.53
Final Consonant Sounds	4.23	4.36
Initial Consonant Sounds	4.18	4.37
Syllabification Rules	4.00	3.91
Phonics Rules	4.09	4.39
Grapheme-Phoneme Correspondences	4.27	4.58
Concept of Deep Orthography	4.38	4.48
Alphabetic Principle	4.43	4.43
Letter Names	4.05	3.97
Phoneme Manipulation	3.86	4.25
Phoneme Segmentation	4.23	4.53
Syllable Segmentation	4.55	4.41

Frequency of Instruction

STRUGGLING READERS

Legend: ☐ Classroom Teachers ■ Specialists

Instructional Component	Specialists	Classroom Teachers
Vowel Sounds	4.61	4.54
Final Consonant Sounds	4.64	4.47
Initial Consonant Sounds	4.71	4.53
Syllabification Rules	3.89	3.76
Phonics Rules	4.18	4.36
Grapheme-Phoneme Correspondences	4.61	4.66
Concept of Deep Orthography	4.48	4.40
Alphabetic Principle	4.75	4.56
Letter Names	4.39	4.12
Phoneme Manipulation	4.50	4.28
Phoneme Segmentation	4.64	4.74
Syllable Segmentation	4.70	4.46

Frequency of Instruction

Figure 5

ALL STUDENTS

Legend: □ Classroom Teachers ■ Specialists

Instructional Practice	Specialists	Classroom Teachers
Authentic Texts	4.36	4.72
Decodable Texts	2.82	3.76
Phonics Games/Puzzles	3.18	3.99
Phonogram Cards	2.89	3.39
Phonics Worksheets	3.05	3.97
Grapheme-Phoneme Correspondences Instruction	4.14	4.32
Oral Language Activities	4.45	4.73
Rhyming Activities	3.82	4.49

Frequency of Instruction (1.00 – 7.00)

STRUGGLING READERS

Legend: □ Classroom Teachers ■ Specialists

Instructional Practice	Specialists	Classroom Teachers
Authentic Texts	4.07	4.53
Decodable Texts	3.68	4.11
Phonics Games/Puzzles	3.71	4.05
Phonogram Cards	3.50	3.61
Phonics Worksheets	3.18	4.08
Grapheme-Phoneme Correspondences Instruction	4.61	4.45
Oral Language Activities	4.50	4.73
Rhyming Activities	4.14	4.57

Frequency of Instruction (1.00 – 7.00)

Figure 6

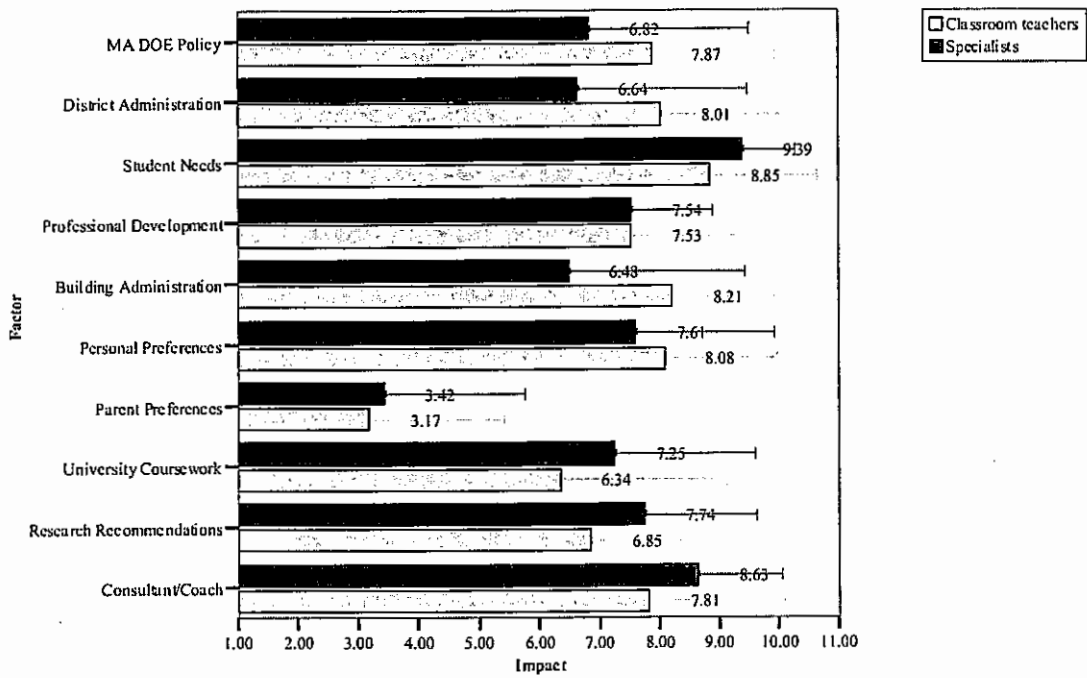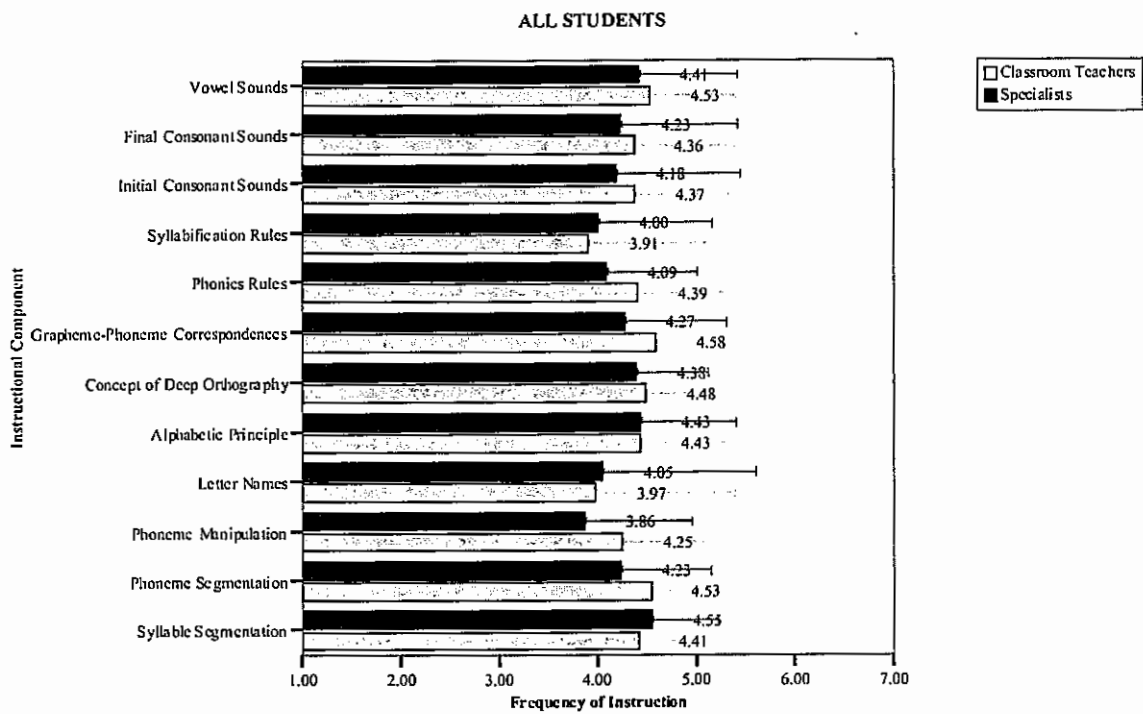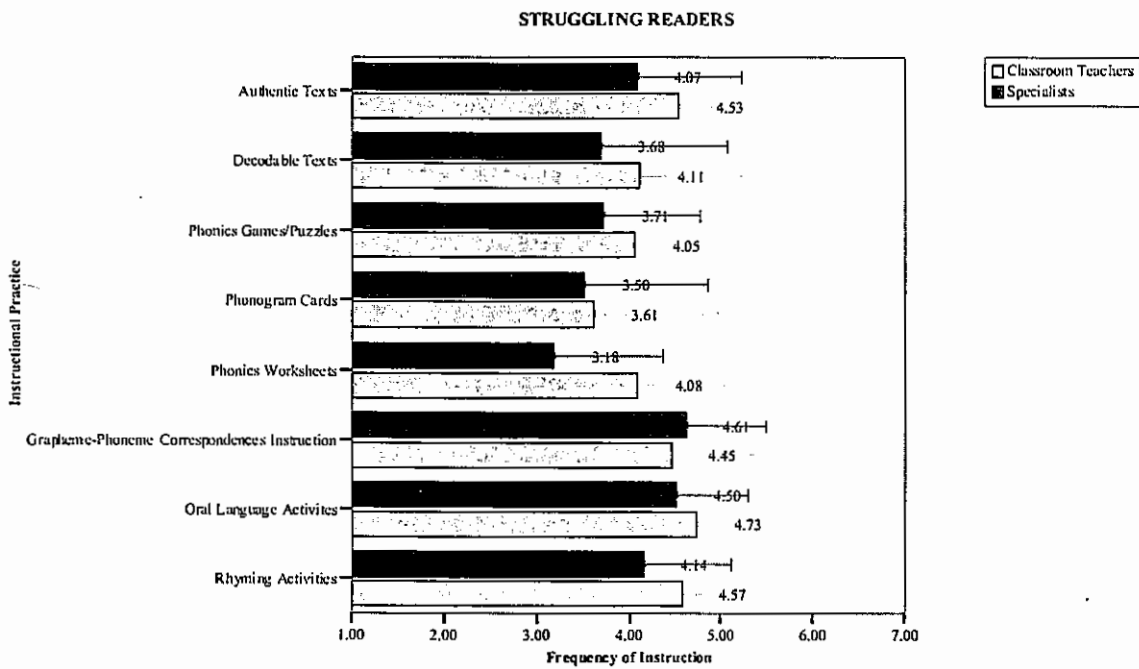| Factor	
MCAS Preparation	3.78 / 3.66
Lack of Student Motivation	4.46 / 4.18
Mandated Reading Curriculum	2.79 / 4.35
Mandated Commerical Reading Program	2.71 / 4.38
Large Class Size	3.43 / 5.19
Low Student Ability	3.89 / 4.47
Wide Variety in Student Abilities	4.29 / 5.45
Lack of Instructional Time	4.29 / 3.93
Classroom Management Problems	3.04 / 3.68
Limited Knowledge of Teaching Methods	2.57 / 3.00
Limited Knowledge of Reading Process	2.54 / 2.88
Lack of Collaboration with Colleagues	4.86 / 5.75
Lack of Support (District Admin.)	3.07 / 3.96
Lack of Support (Building Admin.)	3.14 / 3.88
Lack of Support (Parents)	4.46 / 4.58
Lack of Preparation Time	5.13 / 6.05
Inadequate Resources	4.18 / 5.08

Degree of Negative Impact

☐ Classroom teachers
■ Specialists

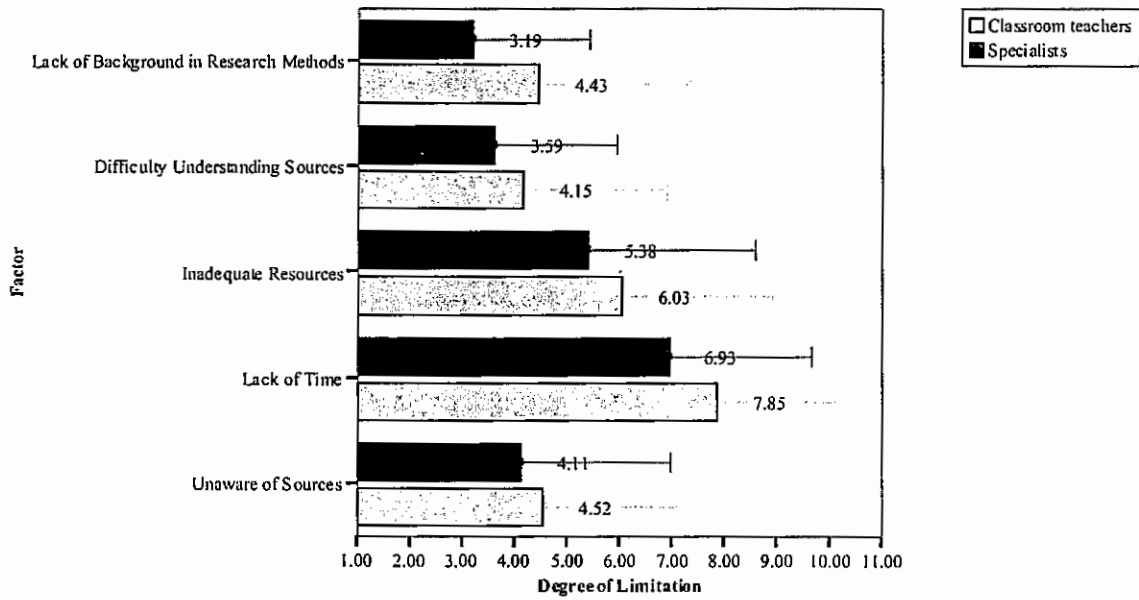Figure 7

Figure 8

Figure 8 is a horizontal bar chart. The y-axis is labeled "Professional Development Source" and the x-axis is labeled "Frequency of Use" ranging from 1.00 to 5.00. The legend indicates white bars represent "Classroom teachers" and black bars represent "Specialists."

Professional Development Source	Specialists	Classroom teachers
What Works Clearinghouse	1.25	1.29
Research Reports	2.75	2.12
Consultants/Specialists	3.11	3.00
Collaboration with Researchers	1.78	1.63
Professional Handbooks	2.93	2.82
Scholarly Journals	2.79	2.32
TV/Radio	3.07	2.97
Popular Press Materials	3.71	3.46
Professional Magazines	3.61	3.34
University Coursework	2.71	2.95
Research Conferences	1.92	1.87
Teaching Conferences	3.37	3.20
Workshops/Inservices	4.18	4.28

Figure 9

Figure 10