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A Graphophonic Investigation of Beginning Level Texts

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A GRAPHOPHONIC INVESTIGATION OF BEGINNING LEVEL TEXTS

by

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ABSTRACT

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This study attempted to provide a systematic framework for phonics instruction for beginning readers in literature-based classrooms based on relative frequency of phoneme-grapheme occurrences found in three distinct corpora. The first corpus contained an academic word list. The second corpus contained the running text from 363 books identified as first grade literature using the searchable online quiz database maintained by Renaissance Learning, Inc. (Renaissance Learning, 2009). The final corpus consisted of running text from 130 decodable readers that accompany *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003). Each corpus was analyzed for graphophonic content in order to establish frequency distributions for 190 phoneme-grapheme correspondences. Instructional sequences were established for each corpus according to descending frequencies of the 190 correspondences. The instructional sequences were then statistically compared using a series of Spearman rank order correlations. It was found that a large significant correlation exists between the graphophonic distributions of the academic word list and the running text from first grade literature ($r_s = .80$, $p < .05$, $N = 190$), as well as between the running text of first grade literature and the running text from decodable phonics readers ($r_s = .955$, $p < .05$, $N = 190$). The conclusions supported by the findings are as follows: (a) an alternate sequence for teaching phoneme-grapheme correspondences is not supported based on

frequency alone, (b) reading teachers adhering to an interactive approach to beginning reading instruction could theoretically use either literature or phonics text type to support early reading development, and (c) first graders need to be introduced to more phoneme-grapheme correspondences in order to be successful readers of first grade literature. The implications for practice which stemmed from these conclusions are twofold: (a) the leveling of texts should be fluid rather than stagnant, and (b) if reading development is dependent upon a student's ability to practice what has been taught and if the leveling of texts can only be done by human decision rather than by computer calculation, then teachers need expert training in the examination of curricular scope and sequences and matching texts to adopted curricula.

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CHAPTER I

INTRODUCTION

Over a decade ago, Snow, Burns, and Griffin (1998) called for an end to the “reading wars.” “Reading wars” is the term used to describe the relationship that exists in the reading research community between the opposing theoretical/philosophical views of pedagogy. While the evidence presented in their seminal publication, *Preventing Reading Difficulties in Young Children*, may have quieted what has been called a raging battle between the phonics and whole language proponents, it has by no means halted all conflict related to reading pedagogy. Nonetheless, this publication, along with countless others from the research community (Adams, 1990; Anderson, Hiebert, Scott, & Wilkinson, 1985; Australian Government [AG], 2005a, 2005b; Bond & Dykstra, 1967; Chall, 1967; National Early Literacy Panel [NELP], 2008; National Reading Panel [NRP], 2000; Rose, 2006) as well as the popular press (Connor, Morrison, & Katch, 2004; Gill, 2005; Kim, 2008; Pearson, 2004; Smydo, 2007; Snow & National Education Association, 1998; Wren, 2003), is helping the reading community move from an either/or to a both/and stance on reading instruction. Even with this philosophical shift in reading pedagogy, disagreement still exists over how much phonics instruction should occur, when it is most useful, in what order it should be presented, and what instructional strategies should be used (Wren, 2003). In essence, the argument is no longer “Should we teach phonics?” but rather “How do we best teach phonics?” These questions cannot be answered until the complexity of the reading process situated in an English language context has been examined. It is also important to know what has been previously done in this line of research in order to know in what direction the research is heading.

The English Language Context

While a complete and exhaustive history of the development of the English language is beyond the scope of this study, its direct and profound impact on English orthography cannot be denied. Therefore, a brief treatment of the topic is both beneficial and enlightening.

Linguists and etymologists firmly place English on the Germanic branch of the language family tree. Stockwell and Minkova (2001), however, assert this is no longer a correct placement. While English may have been derived from Germanic parent languages, “English has changed its vocabulary so dramatically that in terms of word stock it can no longer be considered Germanic” (Stockwell & Minkova, 2001, p. 30). The very historical influences that have made such a statement about English vocabulary viable have also had great impact on its orthographic system. At every turn in its development, spoken English has assimilated or merged loanwords from other languages into its own linguistic system (Beason, 2006). While such an inclusive policy/process for language development has certainly been beneficial to the survival and usage of the language, English has included loanwords to such an extent that it has caused enormous difficulties for those concerned with transcribing spoken language into its written form. For most languages, the invention of some form of mass printing device was the solidifying force in the language’s orthography. For English, however, this was not the case. The standardization of English orthography began in the hands of Chancery scribes who spelled words in their spoken language according to three different systems—Old English, Anglo-Norman, and French. To further complicate English's beginning orthography, "spelling was becoming standardized at a time when speech patterns were still changing" (Beason, 2006, p. 70). Thus, there were often different spellings according to dialectical differences. Even still, English orthography was pretty much solidified by the mid-late 1700s even though grapheme-phoneme standardization seemed rather elusive. Several dictionaries of the English language were published between 1700-1755—of which Dr. Samuel Johnson's influential *Dictionary of the English Language (1755)* was the most comprehensive. While Johnson admitted his underlying premise at the onset of developing the dictionary was to standardized the spelling of the English language, he could not tackle the complexity of the spelling system which grew out of the preceding Renaissance period—the practice of spelling a word so that it reflected the language of origin. Thus, "British dictionaries mirrored the major spellings already in use, rather than reforming the many errant spellings of the language" (Beason, 2006, p. 112).

The Reading Process in a Deep Orthography

All of these linguistic contributions and more resulted in a very complex, opaque orthography. In alphabetic languages, orthographies that have a fairly consistent grapheme-phoneme correspondence are classified as shallow or transparent (Gholomain & Geva, 1999). While no natural language demonstrates one-to-one correspondence between its graphemes and phonemes one hundred percent of the time, several languages come close—including Spanish, Hungarian, and Finnish (Beason, 2006). In other languages, however, such as Hebrew and English, the one-to-one correspondence of grapheme to phoneme breaks down for various reasons. The greater the ratio between a particular phoneme and its number of representative graphemes, the more opaque—or deep—the orthography becomes (Geva & Wang, 2001). While English may not have the deepest orthography of all alphabetic languages, because it is the most widely used language with a deep orthography, it is the most cited example of an opaque orthography. To illustrate the point, in English, one phoneme may have up to 15 different grapheme correspondences (Fry, 2004). Granted, when multitudinous graphemes correspond to a single phoneme, they are most often representations of vowels. Consonants, too, however, can present problems (Stockwell & Minkova, 2001). All told—excluding occurrences of less than ten percent—the approximately 44 individual phonemes of the English language are represented by approximately 192 different graphemes using only 26 letters—some of which have no unique phonemic counterpart (Fry, 2004). What this means for beginning readers is that they have a myriad of phonemes from which to choose when confronted with an unknown word or grapheme. In essence, until reading becomes somewhat automated, the young reader can easily be baffled by a reading process based on trial and error. It is, in many instances, essentially a guessing game. In fact, orthographic depth may partially account for why "the rate of learning to read in English [is] more than twice as slow as in the other orthographies" (Ellis et al., 2004, p. 441).

Systematic, Synthetic Phonics Instruction

To combat the complex writing-reading system that has developed in the English language, reading researchers and curriculum specialists have developed various phonics programs (Juel, 2006). At the charge of the federal government, the National Reading Panel (NRP) released a seminal work entitled *Teaching Children to Read* (NRP, 2000). While the full scope of the document addresses instructional practices spanning alphabetics, fluency, and comprehension, one of the major subgroup reports deals specifically with phonics instruction. In order to better manage their meta-analysis of experimental reading research regarding phonics, the NRP divided phonics instructional methods into three different categories: synthetic phonics instruction, cluster phonics instruction, and miscellaneous.

The first and largest body of evidence centered on the synthetic phonics approach (NRP, 2000). Synthetic phonics programs usually begin by introducing graphemes in their simplest form—i.e. one letter—and build to more complex graphemic representations using various letter combinations, blends, and clusters (Harris & Hodges, 1995; NRP, 2000). After the core grapheme-phoneme correspondences have been taught to the student, they practice putting them together to form whole words. In addition to teaching grapheme-phoneme correspondences, synthetic phonics programs also focus on teaching when certain graphemes pair with particular phonemes. These are known as phonic generalizations or spelling rules (Harris & Hodges, 1995). The method is not without its drawbacks (NRP, 2000). For instance, children exposed to synthetic phonics programs demonstrated problems in blending tasks that require the deletion of the schwa sound associated with certain consonants. Also, when these tasks required the blending of letter sequences greater than 2-3 graphemes, ordering of the sounds became problematic (NRP, 2000).

The second category of phonics instruction—cluster phonics—emphasizes phonograms (NRP, 2000). Cluster phonics programs are usually built around onset-rime instruction in with the goal that once students have mastered a particular vowel-coda combination, they can then automate the combinations in increasingly fluent reading. In cluster phonic programs, rimes are the essential unit of analysis (Harris & Hodges, 1995). Because these units are larger than a single grapheme and require that the student recognize vowel-consonant sequences as a unit, the problems of ordering and schwa deletion are minimized in theory (NRP, 2000). Often, these programs present the most common phonograms and spelling patterns first (Wylie & Durrell, 1970) and children are taught to read by analogy—from known to unknown (NRP, 2000).

The third category of phonics instruction fits neither of the above categories and was labeled miscellaneous (NRP, 2000). Because the instructional methods under investigation were varied and because the studies comprising this group were small in number, a description of this category's contents is beyond the scope of this study.

After examining all the studies that met the inclusion criteria, the NRP concluded that all three major categories of phonics instruction investigated were effective in improving beginning reading (NRP, 2000). Furthermore, the NRP stated the studies which included systematic introduction of the phonic unit produced greater effects than nonsystematic instruction. Therefore, "Systematic and explicit phonics instruction is more effective than non-systematic or no phonics instruction" (Armbruster, Lehr, & Osborn, 2003, p.13). These findings are supported by findings from national meta-analyses of the scientific literature regarding beginning reading instruction in both Australia (AG, 2005a) and the United Kingdom (Rose, 2006). Furthermore, the meta-analysis of research released by the Department for Education and Skills in the United Kingdom states, “There is much convincing evidence to show from the practice observed that, as generally understood, ‘synthetic’ phonics is the form of systematic phonic work that offers the vast majority of beginners the best route to becoming skilled readers” (Rose, 2006, p. 19). Critics of the national reports, however, cite that (a) study selection criteria were such that the meta-analyses excluded important studies that could have affected the overall outcomes, (b) that the studies included in the meta-analyses were biased toward synthetic phonics instruction, and (c) that readers of the documents focused on phonics instruction sections of the reports disregarding each document’s insistence that systematic phonics instruction should occur within balanced instructional approaches and literature rich classrooms (Camilli, Vargas, & Yurecko, 2003; Camilli, Wolfe, & Smith, 2006; Coles, 2001; Cooper, 2005; Kim, 2008; Pearson, 2004; Wyse & Styles, 2007). While arguments abound as to the appropriateness of the reports’ methodologies, conclusions, and the implementation of their findings, the political impact of the reports cannot be denied (Mesmer & Griffith, 2006). Therefore, if systematic instruction proves to be more effective than nonsystematic instruction, and if synthetic phonics instruction produces the greatest impact on reading growth, then sequencing of grapheme introduction within the synthetic phonics curriculum becomes paramount (Fry, 2004).

Using Frequency Distributions for Curriculum Development

Researchers have long recognized the value in creating curriculum sequences for beginning reading instruction based on frequency of occurrence within the English language. The unit of analysis may change from grapheme to syllable to morpheme or to word depending on the instructional approach of choice or the philosophical orientations of the developer. However, the assumption that the most prevalently occurring unit is the most relevant to the reader remains constant as does the idea that the most relevant units should be taught first and least relevant last (Fry, 1964). Therefore, instructional sequences have often been created based simply on relative frequency of a unit within some larger element of text.

For Thorndike and Lorge (1944) the unit of analysis was the whole word in running academic text. The result was a comprehensive word list that could be useful for teachers when developing their lessons at any given grade level. Even when the same unit of analysis is used, however, results are often quite dissimilar. Dolch (1948) and Fry et al. (1993) for example, also chose to use the word as the unit of analysis when developing their respective high frequency word lists for young readers. While both were reportedly developing lists of the most common words that young readers encounter, differences between their lists exist. These differences may be accounted for by the fact that they did not use the same criteria for measuring the appropriateness of the text for young readers. In other words, the texts they examined varied from one another in their readability levels. Another stark difference exists between the work of Dolch and Fry. While Dolch (1948) simply compiled a list of high frequency words, Fry et al.

(1993) sequenced his list into groups of words by order of frequency. Thus, list one would contain the most commonly words found, list two the next most commonly found words, so on and so forth.

Other researchers such as Wylie and Durrell (1970) have attempted to identify the most common spelling patterns or phonograms. Their work, similar to Dolch’s, resulted in an unordered list of most commonly occurring phonograms. Others working with frequency of phonogram occurrence, such as Cunningham have attempted, like Fry, to order the phonograms in order from most common to least common to make it more useful and relevant for the classroom teacher and to promote the fluency of the youngest of readers.

Finally, some researchers have endeavored to create frequency distributions for grapheme-phoneme correspondences. However, a departure in methodology exists here. Whereas most of the above studies examined running text in order to create lists, the studies examining grapheme-phoneme correspondences have examined lists to create their frequency distributions. To begin, Hanna, Hanna, Hodges, and Rudorf (1966) examined a modified version of Thorndike’s earlier word list. This complex study counted not only frequency of grapheme-phoneme correspondences, but also where correspondences were within a word and whether or not the syllable in which it occurred was stressed. Whereas Hanna et al.'s (1966) study is considered pivotal, its 1700+ pages make it of limited use by the average reading teacher. In a similar study, Venezky and Weir (1966) also counted the relative frequencies of grapheme-phoneme correspondences again from word list containing over 20,000 words. Bishop (1986) analyzed both Hanna et al.’s and Venezky’s results to write a comprehensive volume outlining the frequency of specific spelling patterns and phonic generalizations. Although Bishop intended her work to benefit the teacher of reading in the preparation of reading curriculum by outlining important phoneme-grapheme correspondences as well as their relative frequencies, she did not specifically suggest the sequence in which to teach the correspondences. Not until 2004, did Fry reexamine Hanna et al.'s original work. His purpose was to re-organize it so that it was user-friendly for the classroom teacher. In addition, in this publication, Fry (2004) intentionally suggests a phonics instructional sequence based on relative frequency of occurrence. However, in the same article, he also suggests that the next step in research concerning the development of phonics curriculum is that relative frequency needs to be examined in running texts at given grade levels.

Theoretical Framework

Dobson and Dobson (1983) suggest that there should be congruency between what a teacher believes and how the teacher delivers instruction. If this is so, then reading teachers have several key decisions to make in order for their pedagogy to be optimally effective. These decisions should be based on the nature of the curriculum development, the nature of the reading process within the English orthographic system, and how these two processes work together and change depending on the developmental level of the students in their classrooms. With this in mind, the proposed study will be based on the following models.

A Research Based Theoretical Curriculum Model

In 2003, the Mid-Continent Research for Education and Learning (McREL)—one of ten research centers dedicated to improving the quality of education in the United States—released a report detailing the process for developing a standards-based instructional unit (Dean & Bailey, 2003). This report claims that while the government and public press for educational reform, schools and teachers lack the training to implement comprehensive reform due to a deficit in professional development dealing with standards-based reform. To combat this problem, the report offered direction on how to implement standards-based reform in the classroom.

Based heavily on Marzano's work (Kendall & Marzano, 2000; Marzano, 2003; Marzano & Kendall, 1996; Marzano, Pickering, & Pollock, 2001), the McREL's model suggests that classroom instruction must progress from the specific to the general (Dean & Bailey, 2003). Inductive reasoning of this type states that before students can construct and use knowledge, there must be some foundational information in place. In other words, higher-order thinking—to some degree—cannot take place until certain lower order thinking skills have been mastered. This part-to-whole method of curriculum development is based on the idea that "careful attention to classroom curriculum design — the sequencing and pacing of learning experiences — decreases the likelihood that there will be breakdowns in student learning" (Dean & Bailey, 2003, p. 2). While initial examination of the model may lead one to believe that this curriculum alignment method is deeply rooted in the behaviorist movement which governed educational philosophy in the U.S. for over 50 years, a closer examination of the full document indicates that the role of the teacher is more than just a disseminator of discrete skill sets. Rather, teachers should be deliberate in “selecting instructional strategies that help students acquire and integrate knowledge by accessing prior knowledge, making connections, organizing information, seeing patterns, and learning the steps of a process or skill” (Dean & Bailey, 2003, p. 1).

In this regard, McREL’s Model for Curriculum Development is very compatible to the Interactive Reading Instructional Model outlined by Yopp and Singer (1994). They contend that the teacher’s role in executing the curriculum in the early stages of reading is one of a mediator of the reading experience by initially providing the linguistic and metalinguistic resources for young students while simultaneously helping the students develop their own linguistic and metalinguistic resources necessary for independent reading. Thus, the effective reading teacher for young students must know when to manipulate the demands of the reading task, the resources of the reader, and the required level of learning, to what degree this manipulation should occur, and for which students. In order to attain such a high level of expertise, the effective reading teacher should not only know what a young reader should know and how to facilitate the learning process, but he/she should also have a firm command of the reading process.

Two other factors in effective curriculum development, however, must also be considered: the amount of information to be processed by the learner and the pacing of skill introduction, practice, and assessment of the presented information. First, there is the issue of amount of information to be presented at a given time. The works of Hirsch (1996), Brophy and Everston (1976), and Ausubel (1969) all suggest that information is best processed when presented in small portions. Furthermore, Rosenshine and Stevens (1986) and Brophy and Everston (1976) argue that these small portions of information are best presented in an incremental fashion.

Second, pacing instruction, practice, and assessment are key components to curriculum development. How quickly should these small portions of information be presented? How often should the students practice and apply the information? How often should the students be held accountable for mastery of the information? Dempster and Farris (1990) suggest that content presented to students should be spaced out over time rather than massed into one presentation. English, Wellburn, and Killian (1934) reported that such spacing of material results in increased retention. Glenberg (1979) and Hintzman (1974) found that spacing of instruction also affected the recall of information presented as well. The distribution of the material however, is not the only consideration. Hirsch (1996) suggests that students need enough time and practice with the information to understand it before new information should be presented. Therefore, between presentations of new information, there should be periods of review and practice. Ornstein (1990), Dhaliwal (1987), and Hardesty (1986) all concluded that continual review and practice of information leads to higher achievement and performance via quicker skill acquisition. Klapp, Boches, Trabert, and Logan (1991) further argue that review and practice increases automaticity—one of the hallmarks of a fluent reader. The final mark of effective curriculum practices is how and how often the students are held accountable for the information presented to them. According to Marzano (2003), assessment is a key informant to the instructional process. Without it, teachers cannot diagnose student learning deficiencies, celebrate student learning efficiencies, or plan effectively for future instruction. Taking a diagnostic and prescriptive stance on student learning is characteristic of the effective reading teacher (Wren, 2003). Furthermore, Peckham and Roe (1977) found that those students who were assessed regularly and frequently ultimately performed better on standardized tests than those who were not. These differences may be accounted for due to testing familiarity or increases in positive affect regarding testing situations (Cotton, 2001), or due to the expert role of the teacher in knowing where the student currently is and where the student needs to go next. Regardless, frequent assessment generally leads to higher achievement (Dempster, 1991).

A Reading Process Model

While reading process models abound in the literature, a good number of them have grown out of the Cognitive Psychology movement (Ruddell & Unrau, 2004). While there is much discussion about exactly what components should be included in a model in order to explain succinctly and intelligibly the various perceptual and cognitive processes that theory and research indicate are operating during the act of reading, there is one common thread among all of them: The reading process begins when the reader perceives and attends to graphemic input (Adams, 1990, 1994; Just & Carpenter, 1980; Kintsch, 2004; Rumelhart, 1994; Samuels, 1994; van den Broek, Young, Tzeng, & Linderholm, 1999). Nonetheless, the models that have grown out of the cognitive psychology movement can be classified as one of two types: bottom-up or interactive.

For instance, Gough's model (1972) of the reading process and the LaBerge-Samuel's model (1974) of the reading process have been seen traditionally as bottom-up models of reading (Rumelhart, 1994). They are labeled such because the flow of information is initiated from the printed page without initially engaging higher cognitive functions (Ruddell & Unrau, 2004). The flow of information continues on a linear path until the reader translates the perceptions into meaning. Others are considered interactive models because the flow of information is both bottom-up and top-down simultaneously. Two interactive models which must be considered are Rumelhart's (1994) interactive model of the reading process and Adams's (1990, 1994) parallel distributed processing model of reading.

Working from the earlier Rumelhart and Siple (1974) model of the reading process, Rumelhart's (1994) interactive model of reading suggests that readers pull from multiple knowledge sources when they encounter graphemic input. Information does not flow in a linear path from the page to the reader's message center. Rather, syntactic knowledge, semantic knowledge, orthographic knowledge and lexical knowledge all converge in the pattern synthesizer to render the most probable interpretation of the graphemic input for the reader. Therefore, each of the knowledge centers communicate with each other via the pattern synthesizer with information flowing back and forth until the reader can make sense of what is being read. Rumelhart (1994) notes that the orthographic knowledge center can be broken down into constituent parts: featural knowledge, letter-level knowledge, and letter-cluster knowledge.

Adams's (1990, 1994) parallel distributed processing model attempts to further develop the role of the orthographic processor in the reading act. Adams first offered this interactive model of the reading process to the reading community in 1990. Adams' model, based on connectionist theory, identifies four processors—the orthographic processor, the phonological processor, the meaning processor, and the context processor—which work independently as well as collaboratively and, once the reading process becomes automated, virtually simultaneously (Adams, 1990, 1994).

In beginning reading instruction, however, the reading process has not yet become automated. Ehri and McCormick (1998) suggest that readers progress through five phases of word learning: (a) the pre-alphabetic phase, (b) the partial-alphabetic phase, (c) the full-alphabetic phase, (d) the consolidated-alphabetic phase, and (e) the automatic-alphabetic phase. Students do not have enough working knowledge of the alphabetic system or its graphophonic code to begin increasing their fluency until the final two phases (Ehri & McCormick, 1998). Therefore, the simultaneity of the processors' functioning has not yet become fully apparent during the first three phases. In fact, the LaBerge-Samuels model (1974) suggests that the young reader must constantly switch attention back and forth between the decoding mechanism which combines the phonological and the orthographic processors and the comprehension mechanism which combines the meaning and context processors (LaBerge & Samuels, 1974; Samuels, 1994). This process of switching will continue until particular grapheme-phoneme correspondences are so engrained in the reader that the association between the letter (or letter cluster) and the appropriate sounds are no longer laborious. After enough associations have been made, fluency begins to build. That is, the reader no longer needs to devote great amounts of attention to decoding, but rather devotes the greatest amount of cognitive energy to comprehension. Fluency, however, is generally thought to begin rapid growth in the second grade (Ehri & McCormick, 1998). Because of the orthographic processor's prominent role in beginning reading instruction, the function of this particular processor must be further developed at this juncture.

At its most basic level of processing, the orthographic processor receives the graphemic input from the printed page (Adams, 1990, 1994). This occurs at two levels—the word level and the letter level—simultaneously. However, its processing function does not stop there. Instead, once the other processors have been activated from this initial stimulation, they constantly and interdependently make decisions about meaning and context based on information that the orthographic processor supplies. The information supplied by this processor includes not only word and letter level information, but also graphic features that distinguish one letter from another as well as information regarding regular and irregular letter sequences. Since most of the information gained from the orthographic processor is related to the letter, Adams suggests that it is the fundamental unit of analysis for this processor. From this essential information, the orthographic processor supports a reader's ability to break polysyllabic words into smaller syllable units for the purposes of decoding. The ability to break long words into smaller decodable units often marks the difference between skilled and unskilled readers (Bhattacharya & Ehri, 2004; Diliberto, Beattie, Flowers, & Algozzine, 2009; Mewhort & Campbell, 1981). From a comprehensive meta-analysis of research literature related to instructional practices which support the development of the beginning reader's orthographic awareness and knowledge, Adams (1990) identifies writing, spelling, and phonics instruction to be key elements of an effective early reading program.

An Early Reading Curriculum Model

While Whitehurst and Lonigan (2001) intended their structural model of emergent literacy development to be a picture of what occurs in preK-2nd grades, it also presents a curriculum map of when and what types of emergent literacy skills should be introduced and mastered. It follows that if curriculum should reflect the developmental stage of the child, then the Whitehurst and Lonigan's (2001) Structural Model of the Development of Emergent Literacy should reflect an appropriate curriculum map for beginning reading instruction. Their pivotal study revealed that the greatest predictors of later elementary reading ability were the children's phonological awareness and letter recognition abilities in preschool and kindergarten. These inside-out skills—traditionally associated with bottom-up views on the learning process—were strongly related to outside-in skills—traditionally associated with top-down views on the learning process—during the preschool year and to a lesser extent the kindergarten year. However, the outside-in skills failed to be significant predictors of reading success in first and second grade. In fact, according to Whitehurst and Lonigan, the impact of outside-in skills in first grade "does not directly help a child learn to read. The influence of [outside-in skills] is indirect and mediated by the child's earlier acquisition of inside-out skills" (Whitehurst & Lonigan, 2001, p. 21). If phonological awareness and letter recognition are essential to preschool and kindergarten literacy curriculum, what then are essential components of first grade curriculum?

Pinnell and Fountas' (2007) Continuum of Literacy Learning suggests the answer. While not directly based on The Structural Model of the Development of Emergent Literacy, Pinnell and Fountas' sequence of essential skills during the kindergarten year mimics the essential skills proposed by Whitehurst and Lonigan. That is, among the skills that kindergarteners should master before the year's end, are (a) the ability to distinguish word units, (b) the ability to name all letters—both capital and uppercase, (c) the ability to manipulate phonemes in various ways, and (d) the ability to "understand that there is a relationship between sounds and letters" (Pinnell & Fountas, 2007, p. 69) especially the basic sounds represented by the consonants. Certainly, these skills fall firmly into the inside-out category of emergent literacy skills described by Whitehurst and Lonigan (2001).

While The Structural Model of the Development of Emergent Literacy (Whitehurst & Lonigan, 2001) does not define specifically which inside-out skills are essential to first grade curriculum, The Continuum of Literacy Learning (Pinnell & Fountas, 2007) does. Building upon previously mastered skills in the kindergarten year, Pinnell and Fountas (2007) suggest that first graders should continue growing in their understanding of grapheme-phoneme correspondences by mastering basic consonant blends and digraphs as well as long and short vowel sounds, vowel digraphs, and diphthongs. While Pinnell and Fountas provide a detailed scope for literacy curriculum development throughout the early grades, they fail to provide a sequence for said curriculum development. For example, while they delineate what should be taught at the first grade level, they do not say what order each of the skills should be introduced or mastered. What is needed, then, to follow this literacy development—that occurs naturally in children and artificially in curriculum—is a scope and sequence which details specifically which grapheme-phoneme correspondences should be taught and when they should be introduced.

Statement of the Problem

Since evidence indicates that both literature-rich environments and phonics instruction are necessary for successful development of reading skills in young readers (AG, 2005a, 2005b; Gay & Ivey, 1997; NELP, 2008; NRP, 2000; Rose, 2006), educators, theorists, and curriculum specialists are now exploring how to best integrate these two components of a balanced reading approach (Wren, 2003). As Pearson et al. (2007) point out, a balanced approach to reading instruction encompasses more than mixing components from the phonics and whole language approaches. Rather, it is an entirely new philosophical and theoretical orientation which calls teachers to take into account the ecological nature of reading instruction. Specifically, teachers must balance context and content. Context includes authenticity, classroom discourse, teachers' roles, and curricular control. Content includes skill contextualization, text genres, text difficulty, reader response to literature, subject-matter emphasis, balancing the language arts, and balancing components of reading instruction (Pearson et al., 2007). Management of the balanced reading classroom can be complex and overwhelming (Reutzel, 2007).

Furthermore, because phonics instruction is so intricately tied to the use of controlled, decodable readers, it seems illogical and mismatched to offer phonics instruction using literature as the reading material. Literature uses natural language patterns and may or may not offer the needed practice on a recently taught decoding skill. Fry (1964, 2004) suggests, however, that instruction based on frequency of occurrence may offer a key to exacting this balance. He claims that frequency substitutes for relevancy because the most frequently occurring words or grapheme-phoneme correspondences are most relevant for the reader to master for fluent reading and successful comprehension. Fry is not the only reading researcher to promote the idea of frequency as a key element in curriculum development. In fact, researchers have analyzed (a) the frequency of words in academic reading materials ranging from kindergarten through twelfth grade and beyond (Carroll et al., 1971; Dolch, 1948; Leech, Rayson, & Wilson, 2001; Thorndike & Lorge, 1944; Zeno, 1995), (b) the frequency of consistent phonic generalizations (Abbott, 2000; Bailey, 1967; Clymer, 1963; Emans, 1967), (c) the frequency of phonograms in written texts (Wylie & Durrell, 1970), and the (d) the consistency of phoneme-grapheme correspondences (Fry, 2004; Hanna, Hanna, Hodges, & Rudorf, 1966; Venezky & Weir, 1966) in an effort to inform curriculum development and the sequencing reading instruction. However, all previous studies have failed to distinguish between the frequencies of grapheme-phoneme correspondences found in literature versus the grapheme-phoneme correspondences found in controlled phonics texts. This important distinction may prove to be the key to merging phonics instruction with literature based reading materials.

Purpose of the Study

Knowing that the orthographic processor must be supported in its development within the English language context and that literature-rich environments are important to developing comprehension abilities, curriculum frameworks that merge the best of both instructional approaches must be developed. Therefore, this study attempted to provide a systematic framework for phonics instruction for beginning readers in literature-based classrooms based on relative frequency of phoneme-grapheme occurrences. This purpose lent itself to the following research question, research objectives, and hypotheses.

Research Question

While grapheme-phoneme correspondence frequencies have been established in a number of studies, these studies have not yet examined the frequency distributions as they apply to specific types of text written for beginning readers. Balanced literature and phonics instruction cannot occur until the differences between specific text types have been identified. Therefore, this study sought to describe the unique grapheme-phoneme distributions in various beginning reader text types by answering the following research question: "What is the topography of grapheme-phoneme correspondences in reading material appropriate for beginning readers?"

Research Objectives

To fully investigate the answer to the research question, this study established certain frequencies of grapheme distribution in various types of text including literature-based text and phonics-based texts. In addition, comparisons were made between the grapheme distributions found within each type of text.

To this end, this study focused on three research objectives. First, the study sought to describe the distribution of grapheme-phoneme correspondences in first grade literature. Second, the study sought to describe the distribution of grapheme-phoneme correspondences in first grade controlled phonics readers. Third, the study sought to compare the frequency distributions of grapheme-phoneme correspondences from various bodies of text.

Hypotheses

Whereas some may argue that teachers of young readers need to know how various beginning text types differ, the proposed study sought to illuminate similarities. Therefore, the following hypotheses were devised for statistical testing.

H_1. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to an academic word list as represented by Fry's (2004) revised phoneme-grapheme frequency count.

H_2. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003).

Delimitations

1. The academic word list grapheme-phoneme distribution for this study was Hanna et al.'s (1966) list as reported in Fry's (2004) revised phoneme-grapheme frequency count.

2. The Advanced TASA-Open Standard (ATOS) Readability Formula was used to assign a readability level of first grade to the literature chose for examination.

3. *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003) was used as the published systematic, synthetic phonics curriculum.

4. The study did not examine the conditions which apply to the use of specific grapheme-phoneme correspondences. That is, the study dealt only with frequency of grapheme-phoneme correspondences and not with phonic generalizations.

5. The study was limited to the categories of grapheme-phoneme correspondences suggested by Fry (2004).

Limitations

The first limitation to the present study is concerned with the equality of the three corpora. Whereas, the corpora for literature and phonics text were created in the same manner, the corpus representing an academic word list was not. Rather than identifying high-frequency word books and analyzing their running text, a pre-existing academic word list was examined. While this list has been used in many previous studies, it is not an accurate or current representation of running text from high-frequency word books used in first grade. In addition, the academic word list corpus contained mainly root words. While a few derived words occurred, the degree to which they appeared was significantly less than the literature and phonics corpora.

The second limitation is concerned with the phonemic proofing. Because pronunciations change over time, and because systems for coding pronunciations change over time, the pronunciation schemes present in *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002) varied from those used by Hanna et al. (1966). A better plan would have been to use the original dictionary used by Hanna et al. (1966) to code the words not found in the pre-existing database. An alternative plan would have been to recode all the words from the Hanna et al. (1966) database with the new pronunciation guides listed in the *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002). Regardless, a fully consistent pronunciation guide should have been used across all three corpora.

The third limitation is concerned with the books chosen for the study. The books used for the creation of the literature corpus were sampled from a database that is constantly growing. It is possible that over time, the books selected for the present study may no longer be representative of the first grade database overall. In addition, the books chosen for the creation of the phonics corpus came from only one synthetic phonics programs and may not be truly representative of all decodable text types. Texts from analytic phonics programs, analogic phonics programs, or even from other synthetic phonics programs may vary in graphophonic content producing alternate frequency distributions.

Definition of Key Terms

In an effort to establish clarity among readers, the following terms will be defined.

1. *Academic Word List* was defined as a list of words deemed appropriate and relevant for study in an academic setting (Thorndike & Lorge, 1944). This list should be compiled based on word-frequency in appropriate

reading materials for academic disciplines (Harris & Hodges, 1995). That is, the most frequently occurring words are given more attention during instructional periods than the least frequently occurring words.

2. *Corpus* was defined as “a systematic collection of texts which documents the usage features of a language” (Hartmann & James, 1998, p. 30).
3. *Grapheme* was defined as “a written or printed representation of a phoneme” (Harris & Hodges, 1995, p. 101).
4. *Grapheme-Phoneme Correspondence* was defined as “the relationship between a grapheme and the phoneme(s) it represents” (Harris & Hodges, 1995, p. 101).
5. *Instructional Sequence* was defined as “a curriculum plan…in which a range of instructional…skills…is organized according to the successive levels at which they are taught” (Harris & Hodges, 1995, p. 227).
6. *Literature* was defined as “a book published for sale to the general public” (Harris & Hodges, 1995, p. 258). However, for the purposes of this study, literature did not include controlled readers developed for synthetic phonics programs.
7. *Orthographic Depth* occurs on a continuum from transparent, or shallow, to opaque, or deep. Transparent orthographies are those “that have a direct and consistent grapheme to phoneme correspondence” (Geva & Wang, 2001, p. 183). In contrast, opaque orthographies are those “such as English, where the mapping of letters to sounds is less consistent” (Geva & Wang, 2001, p. 183).

8. *Orthography* was defined as “the set of norms that regulate spelling conventions in a particular language, and the basis for codifying linguistic units” (Hartmann & James, 1998, p. 104).
9. *Phoneme* was defined as “a minimal sound unit of speech that, when contrasted with another phoneme, affects the meaning of words in a language” (Harris & Hodges, 1995, p. 183).
10. *Phonic generalizations* were defined as “statement(s) or rule(s) that indicate under which condition(s) a letter or group of letters represent a particular sound or sounds” (Harris & Hodges, 1995, p. 186).
11. *Phonics* was defined as “a way of teaching reading and spelling that stresses symbol-sound relationships, used especially in beginning instruction” (Harris & Hodges, 1995, p. 186).
12. *Running Text* was defined as “an uninterrupted series of words in a text” (Harris & Hodges, 1995, p. 223).
13. *Synthetic Phonics* was defined as “a part-to-whole phonics approach to reading instruction in which the student learns the sound represented by letters and letter combinations, blends these sounds to pronounce words, and finally identifies which phonic generalizations apply” (Harris & Hodges, 1995, p. 250).
14. *Systematic Phonics Instruction* “clearly identifies a carefully selected and useful set of letter-sound relationships and then organizes the introduction of these relationships into a logical instructional sequence” (Armbruster et al., 2003, p. 16).

15. *Topography* was defined as “a study or detailed description of the various features of an object or entity and the relationships between them” (Microsoft Corporation, 2003b).

Summary

To conclude, because of its long and amalgamated history, the English language has developed a complex orthography that complicates beginning reading instruction. Systematic, synthetic phonics instruction has been developed to give young readers the tools needed to decipher this opaque orthography. Though phonics curricula have been sequenced according to the relative frequency of words and phonograms in running text as well as the relative frequency of grapheme-phoneme correspondences in word lists, as of yet, no one has developed an instructional sequence for phonics curriculum based on the relative frequency of grapheme-phoneme correspondence found in running text of beginning literature. It is essential that researchers and curriculum specialists identify the grapheme-phoneme correspondence that will be most encountered by the young reader while reading.

The remainder of this dissertation is organized in the following manner. Chapter II presents the pertinent historical, theoretical, and empirical literature related to the variables present in the study. Among the topics included are three models of reading instruction. A discussion of each model includes sections on the role of the teacher, the responsibilities of the learner, the organization of the lesson, the materials associated with the model, how text is deemed developmentally appropriate for the reader, and empirical evidence of the model’s effectiveness. Inherent in the discussion are critiques of each model.

Subsequently, Chapter III discusses the proposed methodological design, the population and the sampling technique used, as well as the measurement of essential variables and the analysis of collected data. The procedures for data collection and analysis are also discussed.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

While different groups within the reading community may be able to agree on the definitions of key terms such as *grapheme* and *phoneme*, much controversy still exists over the role such entities play during the reading and instructional processes. The popular press often tries to claim that the “reading wars” are being rekindled, but many within the reading community recognize they have never really ended. Arguments some would consider new and novel are considered simply further developments of the arguments that have existed in one form or another within the reading community since the 1920s (Chall, 1992; Pearson, Raphael, Benson, & Madda, 2007). The argument then and now revolves around two opposing approaches to reading instruction: the phonics approach and the whole language approach (Alexander & Fox, 2004; Chall, 1992; Pearson, 2004; Pearson et al., 2007; Wren, 2003). Those who support the phonics approach believe that early reading instruction should focus mainly on the consistent sound-symbol relationships within the printed English language (Alexander & Fox, 2004; Pearson, 2004; Weaver, 1994; Wren, 2003). Their instructional approach of choice focuses on the young reader learning increasingly complex decoding skills through explicit, systematic phonics instruction (Alexander & Fox, 2004; Henry, 1997; Moats, 2000).

Alternatively, there are those in the reading community who claim early reading instruction should follow as natural a path of development as possible (Alexander & Fox, 2004; Pearson, 2004; Weaver, 1994; Wren, 2003). These scholars suggest that because language development is socially-mediated learning, reading development should be as well. Their instructional approach of choice focuses on developing the young reader's meaning-making capabilities through whole language methods and materials (Alexander & Fox, 2004; Weaver, 1994).

Those involved in the debate among these differing points of view have been challenged by colleagues and governmental agencies alike to bring the reading community into a state of balance (Adams, 1990; Alexander & Fox, 2004; Australian Government [AG], 2005a, 2005b; Graves, 1998; Johnson, 1999; McIntyre & Pressley, 1996; National Early Literacy Panel [NELP], 2008; National Reading Panel [NRP], 2000; Pearson et al., 2007; Rumelhart, 1994; Snow, Burns, & Griffin, 1998). These scholars cite emerging research showing that children need aspects from both approaches to reading instruction to become efficient readers. The research community is now faced with determining how much of each of the approaches is necessary (Pearson et al., 2007; Wren, 2003), during what phase of development each of the components is most beneficial (Goswami, 2005), and how instruction should be sequenced for optimal benefit for the majority of children (Fry, 1964, 2004; Wren, 2003). The purpose of the study was to further inform a balanced approach to early reading instruction by defining a new instructional sequence for phonics instruction developed from first grade literature.

With this in mind, this chapter discusses the models, processes, roles, methods, and materials pertinent to each of the three groups within the reading community. In addition, evidence from research is examined as to the effectiveness of each model. First, information about the phonics approach is presented under the heading *A Transmission Model of Reading Instruction*. Second, information about the whole-language approach is presented under the heading *A Transaction Model of Reading Instruction*. Third, information about the balanced approach is presented under the heading *An Interactive Model of Reading Instruction*. Finally, this chapter presents previous research focused on developing instructional sequences for early reading instruction based on relative frequency under the heading *Toward a New Instructional Sequence for Beginning Readers*.

A Transmission Model of Reading Instruction

The transmission model of reading instruction is generally associated with the behaviorist school of thought in psychology (Alexander & Fox, 2004; Weaver, 1994). This type of reading instruction dominated U. S. classrooms in the period following World War II primarily as a result of Rudolph Flesch's (1955) *Why Johnny Can't Read—And What You Can Do* (Alexander & Fox, 2004). In this seminal publication, Flesch claimed that phonics instruction had been missing from the previous look-say method of reading instruction. As a result, a generation of American youth could not read with great efficiency because of the lack of decoding skills (Flesch, 1955). This claim coupled with aspects of Skinnerian behaviorism, led the majority of the reading community to the conclusion that reading was a perceptual process (Pearson & Stephens, 1992) and that reading instruction was most efficiently carried out with methods and materials which emphasized practice, reinforcement, task analysis, structure, and control (Alexander & Fox, 2004; Weaver, 1994). Because instruction in the transmission model is focused on discrete skills following a logical sequence, it is curriculum-controlled rather than child-centered and quite often results in mass instruction rather than individualized instruction (Pearson et al., 2007).

The Reading Process in a Transmission Model

The reading process in a transmission model is labeled as bottom-up (Alexander & Fox, 2004). This means that the reading process originates from the print on the page (Gough, 1972; LaBerge & Samuels, 1974). In order to be a successful reader, the beginning student must be able to recognize letters based on distinguishing features (Gough, 1972; LaBerge & Samuels, 1974; Vacca et al., 2003). The beginning reader must associate the primary sounds for each letter. Furthermore, the beginning reader must understand how letters combine to represent “hidden” phonemes in print—those sounds not directly represented by a single letter (Moats, 2000). Practice in increasingly difficult letter-sound relationships helps a student increase reading fluency which thereby increases reading comprehension. Pearson et al. (2007) argue that the formula for the reading process in a bottom-up approach is simplistic in nature and can be summed up in the following manner: “reading comprehension = decoding x listening comprehension” (Pearson et al., 2007, p. 32). In other words, in the transmission model “[reading] was thought of as a perceptual process that, when accompanied by a translation process, produced a linguistic code which was treated by the brain as a language process” (Pearson & Stephens, 1992, p. 5).

Instructional Practices in a Transmission Model

Reading instruction in a pure transmission model is curriculum driven and follows an incremental, orderly progression (Weaver, 1994). This type of controlled instruction lends itself to mass instruction based on developmental levels of typically developing readers. In light of this information, a deeper exploration of the teacher's role, the nature of the learner and learning, and the lesson in a transmission model of reading education is in order.

The teacher's role. According to Weaver (1994), the teacher is seen as holder and disseminator of information about how to read. Therefore, it is the teacher's responsibility to decide what information will be dispensed at any given time and in what order it is most relevant. It is also the teacher's responsibility to understand the hierarchical order of the information to be presented so that he/she may present the information in a logical incremental fashion (Henry, 1997; Moats, 2000). Finally, the teacher must offer sufficient practice in each discrete skill taught to ensure that children will be successful at the current and following stages of reading instruction (Alexander & Fox, 2004). All aspects of decision making such as activity selection, task analysis, pacing, relevancy to the learner, and issues of correctness rests with the teacher since the beginning reader does not yet have sufficient information about the reading process to make such informed decisions.

The nature of the learner and learning. Because of the way in which the learner and the learning process are viewed in the behaviorist perspective, a tremendous responsibility rests with the teacher in the transmission model of reading instruction. Behaviorist philosophy dictates that the learner is born "tabla rasa," or blank slates ready to be written upon (Weaver, 1994). In other words, at the beginning of any instructional process, learners know nothing about the new process except what they are taught about that process from their teachers. After sufficient information is gained about the new process, students can begin to apply that information to their own unique decision-making process. However, because formal reading instruction is generally viewed as beginning at entry into school, young readers are seen as knowing little to nothing about the reading process and must be instructed in the process explicitly and sequentially. In addition, because reading is seen as a print-based, perceptual process (Pearson & Stephens, 1992), appropriate instruction for beginning readers includes explicit, sequential information about how to decipher the print code (Moats, 2000; Pearson et al., 2007). It is therefore the learner's responsibility to practice and master the skills taught and to accumulate information in order to be successful at integrating the information into later stages of instruction (Weaver, 1994). Learners are seen as passive receptors of knowledge which is taught through repeated drills until mastered (Weaver, 1994) then integrated into increasingly difficult instructional sequences (Heald-Taylor, 1989). In addition, because much emphasis at the beginning stages of reading is placed on breaking the code, students are encouraged to use grapheme-phoneme correspondence cues almost exclusively for making meaning (Vacca et al., 2003). Students are considered successful readers when they are able to accurately and efficiently decode each word in a passage with the ultimate goal of comprehension.

The lesson. For those that follow a transmission model of reading instruction, early reading instruction is generally preceded by a period of preparation known as reading readiness (Weaver, 1994). The readiness period usually includes instruction in alphabetic knowledge, vocabulary, concepts of print, phonemic awareness, and memory (NELP, 2008). Formal reading instruction begins after the readiness period.

The lesson in a transmission model of reading instruction is shaped by the roles of the teacher and the student as described previously as well as the nature of curriculum development in general. The curriculum is generally determined by extrinsic forces such as curriculum guides, standards, or published developmental sequences (Weaver, 1994). This approach to curriculum lends itself to the development of published, scripted, commercial programs because it is believed that every learner is in need of the same information and must progress from the discrete to the abstract. Therefore, information is generally disseminated in a part-to-whole fashion with great emphasis being placed in beginning reading on graphemes and grapheme-phoneme correspondences (Vacca et al., 2003). The presentation and sequencing of instructional information is generally the result of implementing plans based on task analysis done by the teacher and/or publisher (Neisworth & Buggey, 2005).

While a complete discussion of behaviorist principles and practices are beyond the scope of this literature review, a brief discussion of the strategies that apply to reading instruction is provided. Six key strategies have been identified as essential to the reading lesson: shaping, sequencing, modeling, prompting, behavior rehearsal, and discrimination training (Neisworth & Buggey, 2005). According to Neisworth and Buggey (2005), shaping is the term used to indicate the positive reinforcement that the teacher gives the student for successive approximations toward the end goal. Chaining, also known as sequencing, is how the steps within the task are ordered. In behaviorism, two types of chaining exist. Forward chaining is when the teacher allows the child to perform the first step in the new task at hand while the teacher completes the rest of the tasks in the sequence. Backward chaining is when the teacher completes all of the beginning steps in the sequence and allows the child to complete the final step of the sequence. In either forward or backward chaining, the goal is for the teacher to gradually release all responsibility to the student, thereby making the child independent of the adult's help until the next, more difficult task is assigned (Neisworth & Buggey, 2005). Modeling refers to the teacher explicitly explaining or performing the task for the child to imitate. Prompting occurs when the teacher cues the learner while he or she is working independently. Behavior rehearsal is when the teacher provides ample opportunity to practice the new skill that has been taught before chaining it to subsequent behaviors. Discrimination training is when a teacher instructs students on distinguishing between two closely associated items. Inherent in the idea of discrimination training is that students should make decisions about appropriateness/correctness based on the identification of distinctive features of items or situations (Neisworth & Buggey, 2005). As a result of these six key strategies, skills are taught explicitly in a pre-determined order in an instruct-practice-assess format (Weaver, 1994).

Assessment of students in the beginning stages of reading is generally limited to students' knowledge about the phonics code and ability to decode words accurately (Heald-Taylor, 1989; Vacca et al., 2003; Weaver, 1994). This assessment may come in the form of one-to-one interviews with developmental checklists, but is more likely to be consistent with the idea of mass instruction by utilizing programmatic skill tests, worksheets, basal level tests, and/or standardized tests (Heald-Taylor, 1989).

Instructional Materials in a Transmission Model

Reading materials that are used within a transmission model of reading instruction reflect the principles and practices of the behaviorist model of education in that they are, in some manner, controlled, highly structured, and progress from the simple to the complex. Controlled vocabulary texts, basal readers, and phonics booklets with artificial language are the mainstays of early reading material in the transmission model (Heald-Taylor, 1989; Weaver, 1994). These reading materials usually correspond with sight words or grapheme-phoneme correspondences already explicitly taught (Hiebert & Martin, 2001; Weaver, 1994). The idea behind these types of reading materials is that they offer the students the most practice in the decoding skills that they have already been taught. In addition, because experiences with text are controlled, the beginning reader will more likely be successful in reading the text (Hiebert & Martin, 2001; Neisworth & Buggey, 2005). By progressively integrating more phonics skills and sight words, the texts become successively longer until the student can graduate to independent reading on texts of their choosing. However, phonics programs that offer their own beginning reading material exist on a continuum. Some programs allow students to do reading practice on any text while assessment and major practice is limited to the materials that correspond to the instruction. Other phonics programs encourage students to read nothing but the text provided by the program until they reach a certain level of reading within the program at which time they are allowed to begin reading other texts (Wyse & Styles, 2007).

Selecting reading material. As with many aspects of the transmission model of reading instruction, the teacher is usually in charge of selecting and assigning the reading material for the students at the earliest levels of reading development (Heald-Taylor, 1989; Weaver, 1994). The selection and assignment of reading materials is dependent upon two things: the student's mastery level (Vacca et al., 2003) and the progression of the reading curriculum (Heald-Taylor, 1989). This means that students may be asked to continue practicing reading materials within a phonics program at a particular level until they are able to successfully decode the words at that level and comprehend the text. Once the student's assessments indicate mastery of the present level, then the teacher allows the student to begin reading/practicing the skills at the next level in the program. Again, students must demonstrate a certain level of skill attainment before they are considered ready for advancement (Vacca et al., 2003). Since the sequence and the reading material are pre-determined in the transmission model, advancement usually means moving up to the next level within a program (Heald-Taylor, 1989)—not necessarily to free, independent reading.

Judging the appropriateness of text. Because the transmission model is based on the presentation and mastery of discrete skills, text is often judged appropriate for reading based on how closely it matches what has already been taught within the reading program (Beck & Juel, 1995; Hiebert & Martin, 2001; Weaver, 1994). For some reading teachers using a transmission model, the texts are predetermined by the program that has been purchased. However, other teachers teach phonics systematically with programs that do not have their own published decodable texts. For these teachers, readability formulas provide answers as to the appropriateness of the text for the reader. Readability formulas are quantitative in nature and therefore lend themselves to counting discrete variables (Mesmer, 2008). The two variables most often incorporated into readability formulas have to do with semantics (word difficulty) and syntax (sentence complexity) (DuBay, 2004; Mesmer, 2008; Renaissance Learning, 2007). While these two variables have been measured differently by different formulas, they have been consistently used to measure distinguishing text features throughout different readability formulas. Researchers have found that while measuring items beyond these two variables may increase accuracy in leveling texts, it does so at an inefficient and disproportionate rate to the effort put into the calculation (Mesmer, 2008).

Readability formulas have been classified as either first generation or second generation (Mesmer, 2008). First generation readability formulas include the New Dale-Chall readability formula, the Fry readability graph, the Flesch formulas, the Spache formula, and the Primary Readability formula. While each of these first generation readability formulas provides teachers with efficient ways of leveling texts with consistent results, as a group they vary greatly in their validity, accuracy, and ease of application (Mesmer, 2008). In addition, even though some were developed or expanded specifically to include the primary grades (DuBay, 2004), none of the first generation readability formulas are sensitive enough for distinguishing between texts at the very earliest stages of reading. Mesmer (2008) cites a lack of attention to other features—such as picture support, decodability, familiarity, and predictability—as a limitation of many first generation readability formulas.

Second generation readability formulas refer to Lexiles, Degrees of Reading Power, and the ATOS readability system. These readability formulas make use of computer technology to increase the "power, speed, and sampling of text analysis, making [them] more thorough and efficient" (Mesmer, 2008, p. 57). In addition, second generation formulas provide many levels across ranges of texts rather than texts just being at a particular grade level (Mesmer, 2008). Each of the second generation formulas also provides assessments for the readers as well as the leveling of the text. This means that teachers are more likely to match texts to readers appropriately since the student assessment systems and text leveling systems are based on the same formulas. While the second generation formulas are much more complex in nature than their traditional counterparts, they are nonetheless, essentially the same for beginning readers. While they may be statistically better at leveling texts for early readers, they still do not take into account all of the features that those in the earliest stages of reading rely upon.

The Effectiveness of Reading Instruction in a Transmission Model

Research on the effectiveness of reading instruction in a transmission model has been broad and deep. It has covered many diverse topics including explicit, systematic instruction in phonological awareness, morphemes, syllabication, grapheme-phoneme correspondences, phonemic awareness, phonics instruction, and other areas of interest associated with the alphabetic principle. This research has been both primary in nature as well as secondary as in the case of numerous statistical meta-analyses of reading research (Adams, 1990; Anderson, Hiebert, Scott, & Wilkinson, 1985; AG, 2005a, 2005b; Bond & Dykstra, 1967; Chall, 1967; NELP, 2008; NRP, 2000; Snow et al., 1998). The review of this literature suggests that explicit, systematic instruction in decoding and encoding for a period of time during the early stages of reading development is beneficial to the majority of children learning to read and to their subsequent overall reading achievement regardless of socio-economic status (AG, 2005; Ayers, 1998; Chall, 1992; Ehri, 2003, 2005; Ehri & McCormick, 1998; Kjeldergaard & Frankenstein, 1967; Manset-Williamson & Nelson, 2005; NELP, 2008; NRP, 2000; Peterson & Haines, 1998; Rose, 2006; Share, 2004; Stahl & Miller, 2006; Steinheiser, Jr. & Guthrie, 1978; Torgerson, Hall, & Brooks, 2006; Wise, Sevcik, Morris, Lovett, & Wolf, 2007; Ziegler & Goswami, 2005). In addition, from their meta-analysis of research relating to text type and young readers, Hiebert and Martin (2001) suggest that decodable, phonics text offers beginning readers the support they need to be successful. Specifically, decodability of phonics texts significantly correlates with reading success. Furthermore, the frequency of particular graphemic units—whether at the grapheme or phonogram level—within text enhances a child's acquisition of the unit. There seems to be mixed evidence, however, concerning which type of phonics instruction is best (Goswami, 2005; Rose, 2006; Torgerson et al., 2006; Wylie & Durrell, 1970), how long phonics instruction should last (Hiebert & Martin, 2001; NRP, 2000), and in what phase of early reading phonics instruction should occur (Ehri, 2005; Ehri & McCormick, 1998; Goswami, 2005; Goswami, Ziegler, Dalton, & Schneider, 2003; Stahl & Miller, 2006; Ziegler & Goswami, 2005). Nonetheless, the evidence suggests that systematic phonics instruction should be a part of a comprehensive early reading program.

Opponents often cite the shortcomings of phonics instruction. These shortcomings include the lack of motivation for students and teachers (NRP, 2000; Weaver, 1994), the lack of relevance and authenticity for the students (Weaver, 1994), and the abuse of heavy phonics instruction (Rose, 2006). Furthermore, critics claim that explicit phonics instruction is too teacher-directed and curriculum-controlled (Heald-Taylor, 1989). Also, some argue that the overemphasis of discrete skills and facts leads to a narrowing of the curriculum which can result in students learning to focus on details rather than identifying themes and relationships (Mesmer, 2008). In addition, critics of the major meta-analyses of reading research often cite that (a) study selection criteria were such that the meta-analyses excluded important studies that could have affected the overall outcomes, (b) the studies included in the meta-analyses were biased toward phonics instruction, and (c) readers of the documents focused on phonics instruction sections of the reports disregarding each document's insistence that systematic phonics instruction should occur within balanced instructional approaches and literature rich classrooms (Camilli, Vargas, & Yurecko, 2003; Camilli, Wolfe, & Smith, 2006; Cooper, 2005; Kim, 2008; Pearson, 2004; Wyse & Styles, 2007). The opponents to a transmission model of early reading instruction have traditionally followed more of a transactional model.

A Transaction Model of Reading Instruction

The second view of reading instruction is often termed the transaction model (Weaver, 1994). It is strongly associated with the constructivist view of learning (Alexander & Fox, 2004; Pearson & Stephens, 1992). The constructivist view of learning was profoundly influenced by two individuals: Piaget and Vygotsky (Kostelnik, Soderman, & Whiren, 2007). Piaget states that learning during the primary grades should be concrete and active (Piaget & Inhelder, 1969). In his view, children are not yet capable of mentally manipulating abstract thought. Instead, they must actively construct their own knowledge. Piaget recognized that children's minds were not "table rasa" as the behaviorists indicated, but rather processed information in light of their unique experiences and understandings (Piaget & Inhelder, 1969). Therefore, young children must discover and rediscover the meaning of things on their own if they are to become "future individuals…who are capable of production and creativity and not simply repetition" (Piaget, 1972, p. 20).

While Piaget's work focused mainly on how children mature in their understanding, Vygotsky focused on children using social interactions to construct meaning (Mooney, 2000). Because social interactions were highlighted in the learning process, Vygotsky's (1962) saw the learning environment as a place that could accelerate the learning process. If care was taken by the teacher to scaffold children's learning within their zone of proximal development, then learning could be maximized (Vygotsky, 1978).

Specifically, the transaction model of reading instruction has its roots in the mid-1960s at which point a growing group in the reading community had become rather dissatisfied with what they felt was a simple view of reading proliferated in part by Skinnerian behaviorism. This new model of reading instruction began with Fries's publication of *Linguistics and Reading* (Pearson &

Stephens, 1992). In this book, the argument was made that reading was a language process rather than a perceptual one. If language is meaning based, and reading is a language process, then reading is a meaning based process, too. Over the next several decades, linguists, psycholinguists, and sociolinguists further developed the idea that reading is a language process which is best examined as idiosyncratically developing within a social context (Pearson & Stephens, 1992; Stephens, 1991). The resulting transaction model of reading instruction assumes that learning to read is a natural process that parallels oral language development (Alexander & Fox, 2004). As such, reading instruction should be as relevant and individualized to the child as the child’s oral language development is (Pearson et al., 2007; Weaver, 1994). That is, reading development should be rooted in experiences of the child and the understanding the child has of those experiences. Initially, this type of reading instruction was seen in classrooms that followed the tenets of the progressive education movement (Edelsky, Altwerger, & Flores, 1991). Later, specific ideas about reading and writing were developed into instructional methods known as language experience approaches (Edelsky, Altwerger, & Flores, 1991). The most developed framework for teaching in the transaction model is known as whole language (Edelsky, Altwerger, & Flores, 1991).

The Reading Process in a Transaction Model

The reading process in a transaction model is considered a top-down process with “the process of translating print to meaning [beginning] with the reader’s prior knowledge” (Vacca et al., 2003, p. 23). While several top-down models have been developed, the one most closely associated with the transaction model of reading instruction is the one presented by Rosenblatt in her books *Literature as Exploration* (Rosenblatt, 1938/1976) and *The Reader, the Text, the Poem* (Rosenblatt, 1978). While Rosenblatt is attributed with applying the transactional model of reading to literacy instruction, she readily admits that many of the ideas were present in the pragmatist writings of John Dewey (Rosenblatt, 1994) and more specifically in the work of Charles Sanders Peirce (1933, 1935). Pierce is considered by many to be the father of semiotics which is the study of relationships between sign and symbol or object.

According to Weaver's (1994) interpretation, the transactional model of literacy requires that the reader brings his/her own unique meaning to a unique text in a unique time and space in order to glean a unique meaning from the text which may or may not be replicable under different circumstances. Goodman (1994) suggests that in a transactional model, readers actively participate in the reading process in their attempts to make meaning of the text with which they are transacting. Several principles have been outlined that pertain to the transactional model of reading (Weaver, 1994). First, words are often ambiguous in meaning. Second, these meanings are dependent upon context as well as situation. Third, meaning is subjective and is never fully shared or transmitted through the author-text-audience medium. Fourth, readers uniquely interpret text according to their past knowledge and experience (schema). Fifth, meaning making is an emergent process that occurs within and is partly dependent upon a specific situational context. These principles have relevance to instructional practices and materials within the transaction model of reading instruction.

Instructional Practices in a Transaction Model

The shift from the behaviorist view to the linguist view of reading and the development of the transaction model of reading instruction has impacted the reading classroom in several specific ways (Pearson & Stephens, 1992). First, the ideas of explicit instruction and exhaustive practice were devalued because reading was seen as a meaning making process rather than a process of establishing appropriate behaviors. Second, the transaction model insists that teachers examine text types for meaning and naturalness of the language and select them according to the idiosyncratic developmental needs of the reader (Pearson & Stephens, 1992; Weaver, 1994). Third, reading errors were no longer seen as negative behaviors to be isolated and fixed (Pearson & Stephens, 1992) but as generative because they provided a window into the reader's individual reading process. These changes led to reading instruction becoming more child-centered and individual in nature (Pearson et al., 2007). In light of this information, a deeper exploration of the teacher's role, the nature of the learner and learning, and the lesson in a transaction model of reading education is in order.

The teacher's role. In a transactional model of reading instruction, the teacher "serves as a master craftsperson, mentor, role model, demonstrating what it is to be a literate person and lifelong learner" (Weaver, 1994, p. 343). As master craftsperson, the teacher is in charge of creating a learning community (Alexander & Fox, 2004; Weaver, 1994) which is rich in literature and which nurtures literacy development (Shapiro, 1991). Within this community, curricular decisions are shared and are dictated by interests, relevancy, and experiences rather than curriculum scopes and sequences (Weaver, 1994). As mentor, the teacher values the knowledge and experiences that the student brings to the act of reading. The teacher must be able to assess the child's strengths and weaknesses in knowledge and/or experiences and then scaffold the child to greater heights of accomplishment (Vygotsky, 1978). For maximum benefit, this scaffolding is done within the child's zone of proximal development. The child's zone of proximal development is the distance between what a child can do independently and what the child can do with assistance from a more experienced person. During scaffolding, the teacher employs strategies such as invitations, discussions, and affirmations of successive approximations (Heald-Taylor, 1989; Weaver, 1994) to encourage students to take risks and formulate their own hypotheses about the way reading works (Weaver, 1994). Finally as model, the teacher must show the students that they too actively use reading/writing skills and strategies (Shapiro, 1991; Weaver, 1994). This is done by modeling the reading process from whole to part (Heald-Taylor, 1989) as well as using rich language experiences focused on the natural uses of receptive and expressive language in all of its forms (Shapiro, 1991).

The nature of the learner and learning. The learner in a transactional model of reading instruction is seen as an active participant in the construction of meaning from text (Alexander & Fox, 2004; Weaver, 1994). The reader's comprehension of text is based greatly upon the prior knowledge and experience that he/she brings to the text (Alexander & Fox, 2004). This knowledge can be either general world knowledge of the schooled and unschooled type as well as specific knowledge about the reading process itself. Because readers are seen as knowledgeable contributors, they are considered capable of comprehending text even when full decoding has not yet been accomplished (Vacca et al., 2003). This is because they rely on multiple meaning-making strategies including semantics, syntax, and grapheme-phoneme correspondences along with individual knowledge of the world to make sense of the text (Goodman, 1994). The learning process itself is facilitated by a safe, secure, homelike environment (Shapiro, 1991) where learners are free to experiment without fear of harsh or negative feedback (Weaver, 1994). Also, because learning to read is seen as a language process, its development is facilitated in social contexts where collaboration and group effort are valued.

The lesson. For those that follow a transactional model of literacy instruction, there is no period of time known as reading readiness (Weaver, 1994). This is because teachers in a transactional model view the classroom as a place for literacy development rather than reading instruction. Therefore, time is not allotted for learning foundational skills to be used later during the reading act. Instead, all literacy instruction/learning is part of the actual reading process itself (Weaver, 1994).

Because the learner's prior knowledge and experiences are critical components of the learning process in this model, proponents of the transactional model contend that the best reading instruction emerges from the readers' attempt to make (and make sense of) meaningful written communication (Weaver, 1994). A transactional teacher sees all of these attempts as reading rather than preparation for reading. Reading becomes a continuous process which is further honed and developed by experiential relevant learning linking and developing reading, writing, speaking, and listening simultaneously (Alexander & Fox, 2004; Shapiro, 1991). In addition, reading development is considered best facilitated through collaborative and cooperative learning experiences (Alexander & Fox, 2004; Weaver, 1994). Such experiences are thought to provide prime opportunities for building upon and expanding a student’s knowledge base and reading ability (Shapiro, 1991). This process is often called scaffolding (Pearson et al., 2007; Weaver, 1994) and is done by anyone with more knowledge and skills than the learner—whether teacher, peer, or parent. While multiple strategies and methods abound within the transactional model, Heald-Taylor (1989) and Weaver (1994) identify the following as being mainstays in the whole language approach: book talks, choral reading, drama, individualized and independent reading, journals and learning logs, language experience activities, listening to literature, discussions, novel and author studies, dictation, research, shared reading experiences, and storytelling.

If the reading act is extremely personal in nature, and methods of reading instruction should be idiosyncratic to the learner, then so, too, should be the assessment method of choice within this model. Two major forms of assessment are used in the transactional model: miscue analysis (Goodman, 1994; Pearson & Stephens, 1992) and portfolio assessment (Weaver, 1994). Both assessment types emphasize the wholeness of language and revolve around student attempts to construct meaning—essential concepts in a transactional model (Vacca et al., 2003). Miscues are the errors that the reader makes during the reading process (Goodman, 1994; Harris & Hodges, 1995). It is assumed by the transactional model that miscues do not happen by chance alone but are the result of the reader's effort to make sense of the text. Rather than being seen as mistakes, they are seen as sources of analyzable information (Harris & Hodges, 1995). By analyzing a reader's miscues, a teacher is able to identify strengths and weaknesses peculiar to the reader's world knowledge and language ability (Harris & Hodges, 1995). Because all strands of language arts are inextricably united in the transaction classroom, portfolio assessment is an appropriate way to show growth in a child's reading, writing, and speaking abilities (Harlin, Lipa, & Lonberger, 1991; Weaver, 1994). Another reason that portfolio assessment is valued in the transactional classroom is because it is typically collaborative in nature and is concerned with the whole learner—rather than just development of particular reading skills (Harlin, Lipa, & Lonberger, 1991; Weaver, 1994). Furthermore, portfolios are thought to lend themselves to ongoing, contextual assessment and can be crafted to showcase the unique accomplishments of the portfolio's creator (Harlin, Lipa, & Lonberger, 1991; Weaver, 1994). Finally, since portfolio assessment is formative in nature, it can be a rich source for goal-setting for both teachers and students.

Instructional Materials in a Transaction Model

Reading materials that are used within a transaction model of reading instruction reflect the principles and practices of the constructivist theory in that they are in some manner relevant to the learner, experiential in nature, and mimic natural language patterns (Heald-Taylor, 1989; Weaver, 1994). Unabridged, quality children's literature (Shapiro, 1991) in a variety of sizes from pocket books to big books are used to provide the transactional student with a range of reading experiences—from independent reading, to paired reading, to whole-class shared reading experiences (Heald-Taylor, 1989; Weaver, 1994). In addition, Heald-Taylor (1989) suggests that other text forms might include "predictable texts; literature, dictated stories, sentence strips, pattern books, student published material, trade books, novels, and factual books" (p. 14).

Selecting reading material. Reading material in the transactional is selected based on individual interests and needs (Chow, Dobson, Hurst, & Nucich, 1991). For instance, children may select their own reading material based on individual interests for independent reading. Pairs or groups of children may also collaboratively select reading material based on interests or relationship to the theme or assignment (Chow et al., 1991; Weaver, 1994). The teacher assists students in their selection and may guide them to specific pieces of text (Chow et al., 1991) based on the needs of the student generated from an analysis of his/her miscues (Chow et al., 1991; Goodman, 1994). During thematic or author studies, the teacher may limit reading material within the classroom environment to topics and titles relevant to the study at hand. In this way, both teacher and student decide what is read: the teacher provides the options, and the students get to choose from those options (Harlin et al., 1991).

Judging the appropriateness of text. As noted earlier, readability formulas are limited in their abilities to distinguish between texts at the very earliest stages of reading development (Mesmer, 2008). For this reason, many educators that follow a transactional model of reading instruction utilize qualitative leveling systems to help them guide children to appropriate texts. Consistent with transactional model philosophy, qualitative leveling systems assign labels holistically and take into account many factors that are not readily quantified.

Depending on the leveling system used, these factors may include motivation of students, predictability of plot and text, organizational patterns, style and sentence complexity, familiarity of content, genre, and vocabulary difficulty (Mesmer, 2008). In addition, qualitative leveling systems take into account formatting issues such as print, typeface, layout and illustrations or picture support. Selected texts are tested firsthand with readers. Adjustments are then made to subsequent selection of reading materials based on the success of the student at reading the text (Mesmer, 2008). After books are rated holistically they are usually put along a difficulty continuum and usually labeled with letters. This continuum, however, suggests that gradients exist within text difficulty and are thus ordinal in nature rather than interval (Mesmer, 2008). This is uniquely representative of the notion in the transactional model that reading development is a continuous process rather than divided into levels or stages that must be mastered before progressing to more difficult levels (Weaver, 1994). The most prominent qualitative leveling systems in use in the United States today include Reading Recovery levels (Peterson, 1988, 2001), Fountas and Pinnell's guided reading levels (1996, 1999, 2002, 2006), and Developmental Reading Assessment (DRA) levels (Beavers, 1997).

The Effectiveness of Reading Instruction in a Transaction Model

The transactional model is supported by theorists/researchers such as Louise Rosenblatt (1976), Constance Weaver (1994), Ken Goodman (1965, 1967), and Frank Smith (1971). More recent researchers such as Schraw and Bruning (2000) have concluded that following a transactional model for literacy increases motivation, promotes critical responses to literature, and causes deeper processing strategies to be used. Stephens (1991) and Stahl and Miller (2006) contend that the lack of whole language research cited in the politically influential statistical meta-analyses is because it is more often carried out with qualitative methodology consistent with whole language's instructional practices. This type of research is often seen as non-generalizable to US classrooms at large and thus excluded from the research database when the meta-analyses are conducted. By excluding such research, however, whole language proponents argue that valuable information is never reported to the general public. Regardless of methodology, however, whole language classrooms tend to have higher scores in aesthetic and efferent abilities (Stephens, 1991) such as being more actively involved as readers, having higher confidence and motivation levels, having higher levels of print concepts/awareness, and being adept at selecting reading strategies for meaning. In addition, Hiebert and Martin (2001) suggest that the predictable texts found in transactional classroom enhance the beginning reader's success in terms of fluency. However, they point out that the pattern may offer the support to the reader rather than the text itself. The rereading of familiar words within the predictable text, however, generally lead to the children in transactional classrooms performing better than their transmission peers on measures of word recognition (Hiebert & Martin, 2001). In addition, the invented spellings which are encouraged in the transactional classroom have been found to encourage beginning readers to analyze words down to the phoneme level (Graham, 2007; Treiman, 1992). This type of word analysis is useful in learning the grapheme-phoneme correspondences in which one letter represents one sound. Beyond these simple relationships, however, invented spelling cannot account for complex consonant and/or vowel digraphs (Graham, 2007; Treiman, 1992). The use of invented spellings also allows the children to develop as writers and risk-takers (Clarke, 1988; Weaver, 1994). They concentrate on the message they are writing rather than the conventions of orthography. Less clear from the evidence is whether or not the effects of whole language instruction is significantly better at increasing reading ability in young readers than a phonics approach (Stahl & Miller, 2006).

An Interactive Model of Reading Instruction

For over 40 years, a growing group within the reading community has called for a balance between the phonics and whole language approaches to reading instruction. This group has gained momentum and support historically from six major publications ranging from 1967-2000 (AG, 2005b). These documents include *The Cooperative Research Program in First Grade Reading Instruction* (Bond & Dykstra, 1967), *Learning to Read: The Great Debate* (Chall, 1967), *Becoming a Nation of Readers: The Report of the Commission on Reading* (Anderson et al., 1985), *Beginning to Read: Thinking and Learning about Print* (Adams, 1990), *Preventing Reading Difficulties in Young Children* (Snow et al., 1998), and *Teaching Children to Read* (NRP, 2000). Each of these studies was broad in scope and synthesized the reading research prevalent at the time (AG, 2005b). Because each of the studies was supported by national professional organizations, each had influential impact on the reading community at large. Most importantly, however, each of these publications showed value in certain aspects from each side of the reading war. Thus, each called in its own way—and some more emphatically than others—for a balanced approach to literacy instruction.

Specifically, the interactive model of reading instruction calls for a balanced approach to literacy instruction. While some see it as growing out of the "back-to-basics" movement, others claim that it is an eclectic melding of different components from both the phonics and whole language approaches (Vacca et al., 2003). Still others claim that a balanced approach is neither, but instead a unique philosophical perspective (Fitzgerald, 1999) about reading instruction that developed out of connectionist theory in cognitive psychology (Adams, 1990, 1994). Pearson et al. (2007) claim the following:

> Balance is not an external construct achieved by coordinating phonics and whole-language components. Rather, achieving balance is a complex process that requires flexibility and artful orchestration of literacy's various contextual and conceptual aspects. Reconceptualizing balance requires attention to the wide array of the components at work, to their interconnectedness and to the contextual elements that influence how balance manifests itself in today's classroom (p. 33).

This shift in the view of the role of reading instruction has called on researchers and practitioners alike to identify and provide the best possible experiences and interactions (Graves, 1998; Strickland, 1996) aimed at making all students competent readers (Alexander & Fox, 2004; Graves, 1998; Strickland, 1996).

The Reading Process in an Interactive Model

The interactive model of reading instruction assumes that meaning is gleaned from print because of the interaction between the graphic features of print as well as the prior knowledge and experiences of the reader. In this way, the interactive model supports certain aspects of both the transmission model and the transaction model. The difference with this model is that comprehension does not lie solely in the print or the reader's prior knowledge, but in the interaction between the two. This interpretation of the reading process challenges the reading community to shift from either/or thinking to both/and thinking. This shift in thinking has also been heralded in the developmentally appropriate practice movement within early childhood education (Bredekamp & Copple, 1997). Several interactive models have been developed by reading researchers in an effort to explain what happens during the reading process. Most notable are Rumelhart's (1994) interactive model of reading and Adams's (1990, 1994) parallel distributed processing model of reading.

Rumelhart's (1994) interactive model of reading suggests that readers pull from multiple knowledge sources when they encounter graphemic input. Information does not flow in a linear path from the page to the reader's message center. Rather, syntactic knowledge, semantic knowledge, orthographic knowledge and lexical knowledge all converge in the pattern synthesizer to render the most probable interpretation of the graphemic input for the reader. Therefore, each of the knowledge centers communicate with each other via the pattern synthesizer with information flowing back and forth until the reader can make sense of what is being read. Rumelhart (1994) notes that the orthographic knowledge center can be broken down into constituent parts: Featural knowledge, letter-level knowledge, and letter-cluster knowledge.

Adams's (1990, 1994) parallel distributed processing model attempts to further develop the role of the orthographic processor in the reading act. Adams first offered this interactive model of the reading process to the reading community in 1990. Adams' model, based on connectionist theory, identifies four processors—the orthographic processor, the phonological processor, the meaning processor, and the context processor—which work independently as well as collaboratively and, once the reading process becomes automated, virtually simultaneously (Adams, 1990, 1994).

In beginning reading instruction, however, the reading process has not yet become automated. Students do not have enough working knowledge of the alphabetic system or its graphophonic code to begin increasing their fluency until second grade and beyond (Ehri & McCormick, 1998). Therefore, the simultaneity of the processors' functioning does not typically become fully apparent during kindergarten and first grade. In fact, the LaBerge-Samuels model (1974) suggests that the young reader must constantly switch attention back and forth between the decoding mechanism which combines the phonological and the orthographic processors and the comprehension mechanism which combines the meaning and context processors (LaBerge & Samuels, 1974; Samuels, 1994). This process of switching will continue until particular grapheme-phoneme correspondences are so engrained in the reader that the association between the letter (or letter cluster) and the appropriate sounds are no longer laborious. After enough associations have been made, fluency begins to build. That is, the reader no longer needs to devote great amounts of attention to decoding, but rather devotes the greatest amount of cognitive energy to comprehension. Because of the orthographic processor’s prominent role in beginning reading instruction, the function of this particular processor must be further developed.

At its most basic level of processing, the orthographic processor receives the graphemic input from the printed page (Adams, 1990, 1994). This occurs at two levels—the word level and the letter level—simultaneously. However, its processing function does not stop there. Instead, once the other processors have been activated from this initial stimulation, they constantly and interdependently make decisions about meaning and context based on information that the orthographic processor supplies. The information supplied by this processor includes not only word and letter level information, but also graphic features that distinguish one letter from another as well as information regarding regular and irregular letter sequences. Since most of the information gained from the orthographic processor is related to the letter, Adams suggests that it is the fundamental unit of analysis for this processor. From this essential information, the orthographic processor supports a reader’s ability to break polysyllabic words into smaller syllable units for the purposes of decoding. The ability to break long words into smaller decodable unit often marks the difference between skilled and unskilled readers (Bhattacharya & Ehri, 2004; Diliberto, Beattie, Flowers, & Algozzine, 2009; Mewhort & Campbell, 1981).

Regardless of the exact processes occurring during the reading act, these interactive models agree that the reading act is complex and multidimensional in nature with processors acting independently of and interdependently with other processors virtually simultaneously (Adams, 1990, 1994; Alexander & Fox, 2004; Weaver, 1994).

Instructional Practices in an Interactive Model

With calls from the reading community and national agencies to balance reading instruction, it is crucial that researchers begin to ask which components of the phonics and whole language approaches are most effective and how can these components be integrated into new instructional methods and strategies (Wren, 2003). Pearson et al. (2007) have identified as many as seven different elements which must stay in balance within the interactive reading classroom in order for optimal achievement to occur. They claim that balance should be maintained in skill contextualization, text genres, text difficulty, student response to literature in regards to motivation and interpretation, between the various strands of language arts, and within the various components reading instruction. In addition, Manset, St. John, and Simmons (2000) found that balanced reading instruction could manifest itself in a multitude of strategies and approaches including connected text approaches, explicit-direct approaches, child-centered expressive approaches, ability group-pull out approaches, and trade book approaches. While much is still under investigation with the hope of new revelations about curriculum, instruction, and assessment in an interactive model, many things have already been supported by experimental evidence. Therefore, it is important at this point in the discussion to examine the teacher's role, the nature of the learner and learning, and the lesson as they are viewed in an interactive model of reading instruction.

The teacher's role. Combining key aspects from both previous models, the teacher in an interactive model is both an expert in curricular alignment as well as in educational diagnosis and prescription (Starrett, 2007). In addition, the interactive teacher should be fully versed in both phonetic principles and whole-language concepts in order to make optimal use of their diagnostic and prescriptive abilities (Pressley, 1996; Starrett, 2007). The interactive teacher, then, is one who constantly monitors student progress, responds to student needs and successes, understands the reading process, and is capable of modeling and explaining all of these processes and principles with much patience as they relate to individual learners (Gay & Ivey, 1997; Pressley, 1996). The teacher assumes many roles throughout the day which range from facilitator of the learning process to participant in the learning process (McIntyre & Pressley, 1996). Yopp and Singer (1994) suggest that the interactive reading teacher must mediate the reading experience for novice readers—providing information and support to them and gradually releasing the responsibility of fluent reading to them when their linguistic and metalinguistic abilities have matured. In order to do this successfully, the reading teacher must have a deep knowledge of when to manipulate the demands of the reader, to what degree, and for which students. This gradual release of responsibility, however, does not necessarily follow a systematic pattern (Rodgers, 2004). Interactive reading teachers must vary the amount of support based on their perception of the learner's needs. In this way, interactive reading instruction mimics the idiosyncrasy of the reader's learning path. In short, Au and Raphael (1998) purport that the teacher's role in an interactive reading instruction model should be characterized by the amount of teacher control and student activity. They argue that interactive teachers flow in and out of the following five roles: (a) explicitly instructing, (b) modeling, (c) scaffolding, (d) facilitating, and (e) participating.

The nature of the learner and learning. Because the interactive model of reading instruction insists on balance, the learner is seen as both a decoder and a meaning maker (Vacca et al., 2003)—each of these processes being dependent upon one another (Adams, 1990, 1994; Weaver, 1994). The reader, then, is both holder of knowledge and seeker of knowledge (Alexander & Fox, 2004). Thus, they interpret text by using multiple cues and strategies (Goodman, 1994; Vacca et al., 2003) in individually, idiosyncratic ways (Alexander & Fox, 2004). Their reading development is enhanced by instruction in both skills and strategies—all of which is set in meaningful, relevant contexts (Vacca et al., 2003). Pearson et al. (2007) comment on the authenticity of context that is needed in interactive reading instruction stating that the control of the classroom discourse must fluctuate between students and teachers and that it is best if both schooled and unschooled knowledge are valued and utilized efficiently.

The lesson. Lessons in the interactive classroom are as individualistic as the learner and the learning process (Gambrell, 2007). While whole group instruction does occur, it is carefully planned to meet the needs of the majority of the students in the room. Much of the instruction in an interactive reading model, however, is small group oriented and emphasizes the full gamut of reading instruction including alphabetics, comprehension, vocabulary development, and fluency (Morrow & Tracey, 2007). Reading is taught from part-to-whole and whole-to-part depending on the objective of the lesson and the need of the learner (Morrow & Tracey, 2007). Thus, words may be taught in isolation or in context—the means being accurate word identification with the end being comprehension (Vacca et al., 2003). According to Vacca et al. (2003), reading methods or programs such as Cunningham's Four Blocks (Cunningham, Hall, & Sigmon, 1999) or Fountas and Pinnell's Guided Reading (Fountas & Pinnell, 1996) are models of interactive reading instruction. Components of programs such as these generally consist of some forms of interactive/guided reading followed by independent reading. Writing is generally also taught through interaction/guidance and then practiced independently. In addition, there is usually a phonics component taught during the primary years (Cunningham et al., 1999; Fountas & Pinnell, 1996). Again, these models mirror the fluctuating nature of responsibility for learning in an interactive classroom. Though not conclusive or exhaustive, Guthrie, Schafer, and Huang (2001) attempted to identify effective instructional strategies from studies conducted using NAEP reading assessment data. They found that across studies, instructional strategies that increased reading achievement included "a) direct instruction in comprehension strategies, b) extensive reading in narrative and informative texts, c) extended writing about texts, and d) self-selected reading from a variety of genres and difficulty levels matched to student ability" (p. 47).

Instructional Materials in an Interactive Model

Reading materials in an interactive reading classroom are as varied as the learners themselves. Decodable text, literature, and student-generated materials are all used as complements and supplements to one another (Fitzgerald, 1999). In addition, with the advent of technology, the interactive teacher must also provide readers with alternative texts such as nonlinear formats and hypertexts

(Alexander & Fox, 2004). Text sets are also popular in the interactive classroom. These sets come in one of two forms: thematic or leveled. In thematic text sets, various books are provided for the readers to choose from (Mathis, 2002; Opitz, 1998; Richison, Hernandez, & Carter, 2002; Roe, Stoodt-Hill, & Burns, 2007). These books vary in the information presented and in the difficulty of the text itself. However, they are all related to the thematic study at hand. That way, no matter which book is selected, each student can make a unique contribution to the discussion without his/her reading level being known. An alternative to the thematic text set is the leveled text set. Leveled text sets consist of the same book written to different levels of difficulty (Multilevel Books, 2009). They are also known as multilevel books. While the covers, illustrations, and general information are identical, the sentence length, word length, and vocabulary difficulty differ. Again, struggling readers can participate in discussion of the reading material knowledgeably without their reading level being revealed to their peers.

Selecting reading material. Just as classroom topics and turns within the classroom discourse should be controlled by both teachers and students (Pearson et al., 2007) selection of reading material should be also. Teachers have the responsibility to match students to texts that are at the appropriate levels of reading difficulty and encapsulate pertinent information or offer appropriate practice (Pearson et al., 2007). However, it is in the student’s best interest to self-select reading materials as it tends to promote reading motivation and time spent in direct reading (Pierce & Kalkman, 2003; Walker, 2003). Therefore, it is suggested that the selection of reading material should be a collaborative effort between teacher and student based on needs of the curriculum as well as the needs and wants of the students.

Judging the appropriateness of text. In interactive reading instruction, the appropriateness of the text selected for a reader is judged in light of the reader's unique abilities and interests (Pearson et al., 2007). While this may sound no different than judging the appropriateness of text in other models of reading instruction, it differs in that both teacher and student pull from a myriad of resources to make the best possible judgments about the appropriateness of the text selected to read (Mesmer, 2008). This means that the interactive reading teacher does not rely solely on a child's reading level in the curriculum or the reading scores they received from a second generation readability assessment system. Instead, teacher and student take into account all information available from standardized test scores, daily performance in the classroom, reading level in the curriculum or from a readability assessment system, as well as the student's interest level and motivation level when judging whether a particular text is appropriate for instruction or not. In fact, some of the most successful matches of students to texts have been made by teachers using multiple leveling systems simultaneously (Mesmer, 2006). Successful primary school teachers in interactive classrooms seem to understand that these different leveling systems can coexist (Heibert, Martin, & Menon, 2006; Hoffman, Roser, Salas, Patterson, & Pennington, 2001) as long as there is a clear understanding of the benefits and weakness of each type of leveling system in matching texts to readers (Mesmer, 2008).

The Effectiveness of Reading Instruction in an Interactive Model

Research about the effectiveness of reading instruction within an interactive model does not have the lengthy history that its transmission and transaction counterparts do (Guthrie et al., 2001). The research that does exist, however, indicates that in order to maximize benefits balanced reading instruction must be matched to the needs of the students (Connor, Morrison, & Katch, 2004; Manset et al., 2000) and be offered within a framework where a literature-rich environment is in harmony with contextual instruction in both skills and strategies (Gay & Ivey, 1997). This type of balanced reading instruction often accelerates the acquisition of reading skills (Donat, 2006) and is useful in closing the reading achievement gap between second language learners and their first language peers (Lesaux, 2003) as well as between lower and upper socioeconomic groups (Donat, 2006). While much more research is needed in the effectiveness of reading instruction in an interactive classroom, the national governments of the United States (Armbruster, Lehr, & Osborn, 2003; NELP, 2008; NRP, 2000), the United Kingdom (Rose, 2006), and Australia (AG, 2005a, 2005b) are all currently supporting a balanced approach to reading instruction.

Toward a New Instructional Sequence for Beginning Readers

Since evidence indicates that both literature-rich environments and phonics instruction are necessary for successful development of reading skills in young readers (AG, 2005a, 2005b; Gay & Ivey, 1997; NELP, 2008; NRP, 2000; Rose, 2006), educators, theorists, and curriculum specialists are now discussing how to best integrate these two components of a balanced reading approach (Wren, 2003). Given that phonics instruction is so intricately tied to the use of controlled, decodable readers it seems illogical and mismatched to offer phonics instruction using literature as the reading material. Literature uses natural language patterns and may or may not offer the needed practice on a recently taught decoding skill. Fry (1964, 2004) suggests, however, that instruction based on frequency of occurrence may offer a key to exacting this balance. He claims that frequency substitutes for relevancy because the most frequently occurring words or grapheme-phoneme correspondences are most relevant for the reader to master for fluent reading and successful comprehension. Fry is not the only reading researcher to promote the idea of frequency as a key element in curriculum development. In fact, researchers have analyzed (a) the frequency of words in academic reading materials ranging from kindergarten through twelfth grade and beyond (Carroll, 1971; Dolch, 1948; Leech, Rayson, & Wilson, 2001; Thorndike & Lorge, 1944; Zeno, 1995), (b) the frequency of consistent phonics generalizations (Abbott, 2000; Bailey, 1967; Clymer, 1963; Emans, 1967), (c) the frequency of phonograms in written texts (Wylie & Durrell, 1970), and the (d) the consistency of phoneme-grapheme correspondences (Fry, 2004; Hanna, Hanna, Hodges, & Rudorf, 1966; Venezky & Weir, 1966) in an effort to inform curriculum development and the sequencing reading instruction. However, all previous studies have failed to distinguish between the frequencies of grapheme-phoneme correspondences found in literature versus the grapheme-phoneme correspondences found in controlled phonics texts. This important distinction may prove to be the key to merging phonics instruction with literature based reading materials.

Summary

This chapter reviewed pertinent theoretical and research literature in an effort to illuminate the historical influences impacting the reading community's current state of interactive reading theory and balanced reading instruction. Specifically, this chapter presented information on three types of reading instruction models: (a) the transmission model of reading instruction associated with the phonics approach, (b) the transaction model of reading instruction associated with the whole-language approach, and (c) the interactive model of reading instruction associated with a balanced approach. The roles of the teacher and the student within each model, as well methods and materials associated with each model were described under the appropriate headings. In addition, the process of selecting appropriate reading materials and matching those materials to the readers were also discussed. This chapter ends with a discussion of research that has been done in the area of cataloguing various frequencies pertinent to early reading curriculum development. This final section was particularly concerned with the fact that no research has been conducted to date to compare the grapheme-phoneme frequencies found in literature-based reading materials and controlled phonics text. Chapter III presents the methodology and procedures used to conduct the study's research.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Theories about curriculum development, the reading process, and the peculiarities of reading in the English language all contribute to the need for further research informing the reading community about the interactive model of reading instruction. The introduction to this chapter presents the rationale for conducting the study along with supporting theory. Subsequent sections describe the problem studied, the purpose of the study, as well as the research question, objectives, and hypotheses. Chapter III also discusses the methodological design, the population and the sampling technique used, as well as the collection and measurement of essential variables. The procedures for data preparation and analysis are also discussed. Thus, Chapter III is organized according to the following major section headings: (a) Introduction, (b) Problem and Purposes Overview, (c) Research Objectives, Questions, and Hypotheses, (d) Research Design, (e) Population and Sample, (f) Data Collection and Instrumentation, (g) Data Analysis, and (h) Summary.

Introduction

As outlined in Chapter II, several major points regarding curriculum development were relevant to the study. Theory and research suggests that effective instruction is an outcome of curriculum development in regards to the amount of information being presented, the spacing of the presentations, the amount of review and practice between the presentations, and the types and frequency of assessment. Specifically, the research literature suggests that information should be presented in small portions (Ausubel, 1969; Brophy &

Everston, 1976; Hirsch, 1996). Presentation of these small portions of information should be distributed across time (Dempster & Farris, 1990) with intervening sessions of practice and review (Dhaliwal, 1987; Hardesty, 1986; Klapp, Boches, Trabert, & Logan, 1991; Ornstein, 1990). Finally, frequent assessments should lead to higher achievement and performance (Peckham & Roe, 1977). Also, the assessments of student learning should inform subsequent curriculum and instruction development (Dean & Bailey, 2003).

While the community of reading researchers has yet to define conclusively what takes place during the reading process, the majority of models present in the literature has grown out of cognitive processing theory (Ruddell & Unrau, 2004). Even within this category of models, many differences exist in the interpretation of the reading process. One common thread throughout the models, however, is that the reading process begins when graphemic input is received (Adams, 1990, 1994; Just & Carpenter, 1980; Kintsch, 2004; Rumelhart, 1994; Samuels, 1994; van den Broek, Young, Tzeng, & Linderholm, 1999). This input is initially interpreted by the orthographic processor. The orthographic processor functions both independently and collaboratively with other reading processors to glean meaning from the text being read (Adams, 1990, 1994). Because the amount of cognitive energy expended on deciphering graphic input during the beginning stages of reading far outweighs the amount of cognitive energy expended by the other processors (Samuels, 1994), the orthographic processor assumes prominence during this developmental period.

To further complicate matters in beginning reading instruction, the orthography of English is complicated. While some argue that English is highly consistent in grapheme-phoneme correspondence once students have received appropriate instruction in various levels of orthography (Moats, 2000), there is general agreement that the rules which govern when to use particular graphemes to represent certain phonemes are quite cumbersome (Abbott, 2000; Bailey, 1967; Clymer, 1963; Emans, 1967). Too, one must question how many of these phonic generalizations the beginning reader must be responsible for learning. In transparent orthographies, the development of the orthographic processor is supported because grapheme-phoneme correspondences remain consistent throughout texts encountered. In English, however, young readers must first master initial grapheme-phoneme correspondences, and then master the conditions which apply to the correspondence. No phonic generalization in English is 100% consistent throughout texts. It is precisely these inconsistencies that have plagued the young at-risk reader for decades (Adams, 1990, 1994).

Problem and Purposes Overview

In developing reading curriculum and instructional units for the young reader, the key problems encountered are grapheme-phoneme correspondence selection and instructional sequencing (Fry, 2004). Because of this, the curriculum developer must decide which grapheme-phoneme correspondences support the development of the orthographic processor in young readers of English and in what order those units should be presented (Fry, 2004). With this in mind, the purpose of the study was to identify a systematic framework for phonics instruction in literature-based classrooms for beginning readers based on frequency of phoneme-grapheme correspondences.

Research Question, Objectives, and Hypotheses

This study sought to describe the unique grapheme-phoneme distributions in various beginning reader text types. To this end, the following research question was explored:

What is the topography of grapheme-phoneme correspondences in reading material appropriate for beginning readers?

To fully investigate this question, the study sought to establish and describe frequencies of grapheme distribution in various types of text by focusing on three research objectives. First, the study sought to describe the distribution of grapheme-phoneme correspondences in first grade literature. Second, the study sought to describe the distribution of grapheme-phoneme correspondences in first grade controlled phonics readers. Third, the study sought to compare the frequency distributions of grapheme-phoneme correspondences from various bodies of text.

Consistent with the research question and the third research objective, the study tested the difference in grapheme-phoneme correspondence frequency in various text types using the following hypotheses:

H_1. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to an academic word list as represented by Fry's (2004) revised phoneme-grapheme frequency count.

H_2. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003).

Research Design

Creswell (2005), Leedy and Ormrod (2005), as well as Shavelson (1996) all confirm that when the intent of a study is to “[identify] the characteristics of an observed phenomena” (Leedy & Ormrod, 2005, p. 179) as it is, or to summarize data for variables within a study (Shavelson, 1996) then descriptive research is in order. Therefore, the study followed a descriptive design with the addition of one non-parametric analysis and borrowed methodological procedures from the fields of quantitative content analysis and computational linguistics. According to Neuendorf, “the goal of any quantitative analysis is to produce counts of key categories” (Neuendorf, 2002, p. 14). The study sought to do that. The difference, however, between the analysis of content that the study sought to do and the Neuendorf’s content analysis design is in the unit of analysis. Traditionally, in content analysis design, the message is being analyzed. This may be done by counting frequency of themes, phrases, words, or even morphemes (Neuendorf, 2002). However, the morpheme is the smallest unit of analysis generally considered appropriate in content analysis since it is the smallest unit of meaning within a given language (Harris & Hodges, 1995). The present study analyzed a unit smaller than the morpheme—the grapheme—which does not inherently carry any meaning. With this important distinction clarified, the study followed Neuendorf's (2002) suggested content analysis process with the exceptions of two deletions and one addition. Steps six and eight from Neuendorf’s process were deleted because both are related to intercoder reliability. This was not applicable to the study since the researcher alone coded the data. Furthermore, the study added the step of creating corpora as suggested by Meyer (2002) from the field of computational linguistics. Previously, no corpora existed which were appropriate for the study. Therefore, a need existed to create them for analysis.

Population and Sample

A graphophonic analysis of three text types was conducted. More detailed information about the identification, collection, and preparation of these data is provided in the following sections. Within the study, the population was conceptualized as text appropriate for first graders. Within this population, samples were drawn from three types of text typically used when teaching students in the first grade to read. It is necessary to examine the distinguishing features of each text type before proceeding with an explanation of the measurement of the frequency of grapheme-phoneme correspondences within each text type.

Text from an Academic Word List

For the purposes of this study, an academic word list was defined as a list created from reading material relevant to various disciplines in the classroom. For the first corpus to be investigated in the proposed study —an academic word list—the list already identified and compiled successively by Thorndike and Lorge (1944), Hanna et al. (1966), and most recently by Fry (2004) was used. Whereas Thorndike's original corpus contained 30,000 words, Hanna et al.'s updated version of the corpus contained only 17,310 words. To revise, update, or otherwise modify the existing list was beyond the scope of the study. Therefore, the researcher accepted Fry's grapheme-phoneme frequency counts as representative of the first corpus and as appropriate for inclusion in the study.

Although academic word lists usually imply some sort of sequence based on frequency of word occurrence in running text, the study used the Hanna, Hanna, Hodges, and Rudorf (1966) list which no longer reports this type of frequency. In the academic word list's original form (Thorndike & Lorge, 1944) frequency was reported. However, during the updating and revising process, Hanna et al. (1966) did not retain this information. Frequency of word occurrence in running text was not essential information to their study.

Text from Literature

While literature can be defined in many different ways, for the purpose of this study, literature included running text contained within first grade level trade books identified through the Renaissance Learning Quiz database (Renaissance Learning, 2009). This literature comprises the second corpus in the study and was used to create a frequency distribution of grapheme-phoneme correspondences found in running text from first grade literature that was leveled using the ATOS readability formula.

In order to identify the population, the researcher used the searchable online quiz database maintained by Renaissance Learning, Inc (2009). Whereas this database may include synthetic phonics books as well, every effort was made by the researcher to exclude such texts in the literature corpus. Included in this online database are the book's bibliographic information, a brief summary/description of each book, and other information relevant to the Accelerated Reader program such as point value and reading level. Using the

“Advanced Search” feature in the online “Quiz Store,” the total number of first grade titles appropriate for analysis in this study was determined by entering the following search criteria: Quiz Type = all, Topic = all, Interest level = lower grade, Book level = 1.0-1.9, and Language = English. While the number of texts included in this database continually grows, as of February 26, 2009, the list of first grade texts created by using the above criteria consists of 6,132 titles (Renaissance Learning, 2009). Subsequently, the researcher created a new database using Microsoft Excel to house the titles—and other pertinent information such as author and ATOS reading level—generated from said search. This database was used to randomly select 363 titles for the creation of the second corpus. Sampling procedures are discussed in a subsequent section of the same name.

Text from Systematic, Synthetic Phonics Controlled Readers

The third type of text to be examined for grapheme-phoneme frequency was that of the controlled readers found in synthetic phonics programs. This group comprised the third corpus included in the study which was used to create a frequency distribution of grapheme-phoneme occurrences in running text in controlled readers from a systematic, synthetic phonics program. Because the controlled reader titles included in *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003) only number 130 (Saxon Publishers, 2009), a census of the entire population was done. No sample was drawn. The selection criteria and justification for inclusion of Saxon materials is presented later in the section titled *Phonics Corpus*. A census of text was taken from four sources within the program: the decodable readers, the easy level fluency readers, the average level fluency readers, and the advanced level fluency readers. The text from each of the series has been controlled by the publisher to match what has been introduced during explicit synthetic phonics instruction.

Sampling Procedure

Three distinct populations corresponding with the three corpora were considered for this study. Whereas a census was completed for corpora one and three, corpus two is of such magnitude (6000+ titles) that a census of its texts was beyond the scope of the study. Therefore a random selection technique was employed to select a sample from the total population of books.

Censuses were completed for the corpora containing the word list and the phonics text. However, in order to ensure a representative sample of first grade literature texts for the second corpus, 363 titles were randomly selected from the researcher-created Excel database described above. According to Orchowsky (1982), with alpha set at .05 and 95% confidence intervals, 363 titles were sufficient to generalize the findings to a finite population of 6500. This figure was double-checked using the sample size calculator for finite populations provided as an online tool by the National Statistical Service of the Australian Bureau of Statistics (National Statistical Service, 2009).

The random selection of texts was done according to the following procedure. First, the Excel file containing the book list was sorted alphabetically by title and then by the author's surname. Second, using the "fill series" feature in Excel (step = 1), an identification number was assigned to each book using numbers 1-6132 consecutively. Third, after selecting and formatting the database cells to return whole numbers only, a random number list was generated by

Excel using the formula, =RAND()*6133. This formula produces random whole numbers between and including 0 and 6133 (Microsoft Corporation, 2003a). This formula was used to ensure that every identification number will have an equal opportunity of being produced in the random numbers list. Excel's "fill down" feature was then used to generate a list of 363 random numbers. Finally, titles were selected by matching their unique identification numbers to the subsequent random numbers produced by the Excel formula. Books were excluded from the sample if they were known to be a controlled phonics reader or a part of a phonics reading series. This designation was determined by examining the book's summary/description information provided by the Renaissance Learning, Inc in their online quiz database (Renaissance Learning, 2009). The random selection process was repeated in order to select replacements for books excluded from the original selection until a total of 363 titles were identified.

Data Collection and Instrumentation

This section is organized according to the following headings: (a) *Identifying and Creating Corpora*, (b) *Coding Schemes*, and (c) *Coding Procedures* and (d) *Readability Level*.

Identifying and Creating Corpora

Meyer (2002) warns that before creating a corpus for analysis, two key considerations must be answered. First, what size should the overall corpus be? Second, what types of texts should be included in the corpus? Regardless of the answers to these questions, "decisions concerning the composition of a corpus will [ultimately] be determined by the planned uses of the corpus" (Meyer, 2002, p. 30). Because the proposed study sought to answer questions about the frequency of grapheme-phoneme correspondences in three different types of text, three different corpora were considered.

Word List Corpus. The first corpus considered was the one referred to by Fry in his 2004 publication of a revised grapheme-phoneme count. Because Fry summarized the work of Hanna et al. (1966) in his publication in a usable manner for the proposed study—namely grapheme-phoneme correspondence frequency from an academic word list—there was no need to create the first corpus. However, it might prove beneficial to discuss the content of the original and subsequent modified corpora in an effort to support its inclusion in the proposed study. Fry's Revised Count (2004) has a long history dating back to 1944 when Thorndike and Lorge published *The Teacher's Word Book of 30,000 Words*. This book was published with the express intent on being a resource for teachers of reading and language. It was created by examining running text from then-current reading material considered useful to elementary and high school students and teachers in the U.S. The book also contains the frequency of each word listed in an effort to emphasize which words should become "a permanent part of [students'] stock of word knowledge" (Thorndike & Lorge, 1944, p. xi). It was a modified and much smaller version of this original corpus that Hanna et al. (1966) analyzed to publish their original grapheme-phoneme frequency count for academic reading material. Their revised corpus contained only 17,310 words. This was because they deleted words deemed archaic from the original corpus. In addition they updated the list by scouring new reading material and the Merriam-Webster dictionary. Furthermore, it was from this dictionary series that they adopted the original grapheme-phoneme correspondence categories. Their study, however, was to such a magnitude that it proved of very little benefit to the classroom teacher (Fry, 2004). Their investigation spanned not only the frequency count of each grapheme-phoneme correspondence, but also the syllable in which it was contained and whether or not that syllable was stressed or unstressed (Hanna et al., 1966). Because their study focused on improving spelling instruction, they were not concerned with the frequency of occurrence in running text of each word on the list. It was at this time that the frequency count was lost. Fry (2004), seeing the value in their work for the classroom teacher as well as for phonics/spelling curriculum developers, endeavored to make the Hanna et al. study more user-friendly. In doing so, he collapsed some of the more obscure categories into larger ones, and published only the new categories' frequency counts. Fry recognized that while his revision makes useful some much needed information for phonics curriculum and instruction, future research should examine the grapheme-phoneme correspondence frequency in the context of running text rather than from a word list. It is precisely because of his recommendation and because of its long history related to U.S. classroom reading material that the grapheme-phoneme frequencies from this academic word list was used for analysis in the study.

Literature Corpus. The second corpus of the study, the literature corpus, was created. It contained only first grade literature and did not contain running text from controlled readers from synthetic phonics programs. Since Carroll (1971) published an exhaustive word list—including word frequency—which could in essence be used to create the second corpus, his work was initially considered for inclusion in the proposed study. However, because the reading material used to develop Carroll's *Word Frequency Book* ranged from third grade through eighth grade readability, his work was deemed inappropriate for the proposed study because the reading process has become automated for most readers by third grade and systematic, synthetic phonics instruction is no longer an emphasis. A second work was also considered for this corpus. Zeno (1995) published *The Educator's Word Frequency Guide* which contained words gathered from analyzing 18 million words of running text spanning all disciplines and genres of reading materials found in classrooms from kindergarten through twelfth grade in the United States. While this is certainly a comprehensive and useful reference, it did not exclude the running text of controlled readers from synthetic phonics program. Since phonics text is the third type of text under consideration, and because Neuendorf (2002) suggests that concepts should be mutually exclusive, the proposed study will not use Zeno's work. Rather, in an effort to control bias and in order to make the corpora distinct bodies of text, this corpus excluded any text from systematic, synthetic publications because such text was used for the analysis. The second corpus contained the running text from 363 books deemed literature by the standards set forth in the above definition. Orchowsky (1982) and the National Statistical Service of the Australian Bureau of Statistics (National Statistical Service, 2009) confirm that 363 books is a sufficient sample size to generalize findings to a finite population of 6500. These 363 books were randomly sampled from the more than 6000 books with ATOS reading levels between 1.0 and 1.9 (Renaissance Learning, 2009). Furthermore, the corpus did not make distinctions between genres. That is, it contained the contents of texts across disciplines and fictional status.

Phonics Corpus. The third corpus included in the proposed study, the phonics corpus, was constructed using controlled readers found in a synthetic phonics program. No known corpus had been created previously for this purpose. While controlled readers are included in several commercially-available, synthetic phonics programs, only controlled readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003) were used to create the third corpus of the study. Selection of the phonics program was dependent upon several criteria. First, the phonics program needed to be both systematic and synthetic in composition. Second, the phonics program needed to include leveled, controlled readers. Third, the pacing of the instruction needed to be incremental with intervening periods of practice before assessing the children on the information. Saxon is an exemplar of each of these criteria reporting that it aligns with all of the best practices in curriculum development previously outlined (Saxon Publishers, 2004). That is, care was taken during the development stages of the Saxon curriculum to make sure that the approach systematically introduces small portions of information over time with review and practice intervening between instructional periods. In addition, the Saxon curriculum supports frequent assessment with appropriate remediation and includes acceleration strategies suggested depending on student performance. Furthermore, the four levels of controlled readers found in this program is evidence of Saxon's recognition that readers vary in ability within one classroom and are in need of different materials (Saxon Publishers, 2004). Therefore, *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003) was deemed representative of synthetic phonics programs and appropriate for examination in the study.

Within the *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003) curriculum, there are a total of 130 titles spanning four groups of readers. Specifically, 26 titles exist in each of the following categories: easy fluency readers, average fluency readers, and challenging fluency readers. In addition, 52 decodable readers exist (Saxon Publishers, 2009). While readability for these texts was not determined by the ATOS readability formula, the readers were considered appropriate texts because they are intended for use with a systematic, synthetic first grade phonics program. The idea is that if the children have mastered the material in the program, then they should be able to read the text in the controlled readers. Similar to the second corpus, the third corpus contained titles that span all first grade disciplines and are both fictional and nonfictional in type. Unlike the second corpus, however, no sampling was necessary as a complete census of all text was done.

Procedures for creating needed corpora. Creating the second and third corpora was done according to the following procedures. To begin, the researcher and a trained assistant entered the text from the selected books into Microsoft Word via manual typing. The training information for the assistant can be found in Appendix A: Data Entry Protocol. Second, the researcher and assistant checked the input for accuracy against the original texts. Third, the researcher converted the Word files into a single Excel database for coding. Individual words within the corpus were assigned to individual cases in the Excel file, while one column was assigned to each of the grapheme-phoneme correspondence categories.

Coding Schemes

The primary variable that was investigated by the study was grapheme-phoneme correspondence. Regardless of type of text analyzed, a common thread among them all is grapheme-phoneme correspondence because it is inherent to some degree in the orthography in all alphabetic writing (Harris & Hodges, 1995). In addition, it is precisely these correspondences that beginning readers struggle with the most in the English language.

Neuendorf (2002) suggests that the researcher develop a coding scheme for the text to be analyzed before data collection begins. The codes need to be directly related to the constructs being investigated. She also suggests that care be taken to make sure that the codes represent categories that are completely independent of one another and exhaustive in nature. With this in mind, the researcher developed a coding scheme based on Fry's (2004) revised phoneme-grapheme categories.

The coding scheme was developed by first listing the phoneme followed by the grapheme representing it. The two sub-codes were separated by an underscore. Because Fry (2004) deleted any correspondences that had a frequency of less than ten, the potential exists for some grapheme-phoneme correspondences to appear in the corpora for which Fry did not account in his publication. For these correspondences, the researcher created the category "other." The *a priori* coding scheme developed by the researcher from Fry's

(2004) phoneme-grapheme correspondence categories can be found in Appendix B: *A Priori* Coding Scheme.

Coding Procedures

Using the Excel file containing the first grade literature corpus, the researcher parsed each word into grapheme-phoneme correspondence units. Since each word was considered a separate case, each case could have had multiple codes assigned to it. For instance, the word *cat* may be present in the cell farthest to the left on a given row. For this word, the researcher would have placed a 1 in each of the columns corresponding to the categories *K_C*, *Ashort_A*, and *T_T*. Thus, *cat* was assigned three codes because each of the correspondences were different. In order to account for frequency in running text, the researcher then used the “fill down” feature in Excel to code each occurrence of *cat* in the same manner each time it appeared in the literature corpus. This assumed that the corpus has been sorted alphabetically. The same procedure was followed to code the phonics text corpus.

In order to ensure accuracy of grapheme-phoneme classification, the researcher first consulted the original coding of the words in Hanna et al.’s study. If words in the created corpora could not be located in this original code, then the pronunciation guides from *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002) were used for phonemic proofing. This dictionary was used for several reasons. Most importantly, it is the latest and most comprehensive edition from the same family of dictionaries from which the original and subsequent authors have checked for phonemic accuracy (Hanna et al., 1966; Thorndike & Lorge, 1944). In addition, the CD-ROM format of the dictionary interfaces with the Microsoft programs being used for data entry which simplifies the process of phonemic proofing (Merriam-Webster, 2002). The same procedure was used to create a frequency distribution of grapheme-phoneme correspondences from running text present in controlled readers from the synthetic phonics program— *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003). Because Fry (2004) has already published the frequency with which grapheme-phoneme correspondences occur in an academic word list, it was unnecessary for the researcher to create a third frequency distribution.

Readability Level

While readability was not a variable being measured directly by the study, care was taken when judging the appropriateness of text for first grade. The researcher did not calculate the reading level of the text, but rather used the Advanced TASA-Open Standard (ATOS) reading levels of 1.0-1.9 assigned to the titles by the Renaissance Learning, Inc. Company (Renaissance Learning, 2007). ATOS for Books is based on the ATOS for Text formula which is an open, computer-calculated, full-text readability formula which takes into account three variables traditionally associated with readability formulas: “number of words per sentence, average grade level of words, and average characters per word” (Milone, 2008, p. 11). In addition to the ATOS for Text formula, however, the ATOS for Books formula adjusts to compensate for the length of the book and for extreme sentence length (Milone, 2008). While many formulas exist for leveling text, the ATOS formula is perhaps the most comprehensive and complex of all (Renaissance Learning, 2007). Certainly, with over 63,000 U.S. schools currently using the Accelerated Reader program (What Works Clearinghouse, 2008), it is by far the most widely-used leveling system in U.S. classrooms. Because the study used the ATOS formula for text leveling, it might have yielded a productive phonics sequence for classroom teachers wishing to use literature in their classrooms.

Data Analysis

The Excel file containing the coded data was exported to SPSS, v. 16—a software program commonly used for statistical analysis. The first research objective stated that the study sought “to describe the distribution of grapheme-phoneme correspondences in first grade literature.” In order to answer this objective, the researcher created a frequency distribution. Neuendorf (2002) suggests several options for reporting frequencies including tabular, numeric form. Because this form of reporting was consistent with the data reported by Fry (2004) from his examination of Hanna et al.'s (1966) earlier work, it was used to report the frequencies identified in the literature corpus. The second research objective stated that the study sought “to describe the distribution of grapheme-phoneme correspondences in first grade controlled phonics readers.” Because this second objective was similar to the first, a second frequency distribution was reported. These frequencies were analyzed and reported first because without them, the rest of the statistical analyses could not have been performed.

The third research objective stated that the study sought “to compare the frequency distributions of grapheme-phoneme correspondences from various bodies of text.” In order to fully investigate this objective, two hypotheses were in order. The first hypothesis associated with this research question stated, “There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to an academic word list as represented by Fry's (2004) revised phoneme-grapheme frequency count." Data from the literature corpus and the word list corpus was examined in order to test this hypothesis. In order to answer this question, the raw frequency data was transformed to relative frequencies. Because the data were categorical in nature, Creswell (2005) suggests that nonparametric statistics be used. Beyond frequency information, the study was also concerned with optimal instructional sequence, as sequences suggest that order exists (Harris & Hodges, 1995). Therefore, the categorical data collected from both the literature corpus and the word list corpus was assigned rank order according to increasing frequency (Field, 2009). Leedy and Ormrod (2005) suggest that when a study seeks to compare two groups where "both variables involve rank-ordered data" (p. 266) that the appropriate nonparametric statistic of choice is the Spearman rank order correlation. In addition, they suggest that both the direction and strength of the relationship should be reported. Furthermore, Field (2009) suggests that the researcher should report the significance value as well.

The second hypothesis associated with the third research objective stated, "There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003)." The data collected to test this second hypothesis was similar to the data collected to answer H_1. Therefore the same preparation of the data, statistical treatment, and reporting procedures were used.

Summary

In summary, the study analyzed the text from three corpora for frequency of grapheme-phoneme correspondence. These corpora represented three different types of text—an academic word list, first grade literature, and first grade controlled readers. Categorical frequencies were determined and reported in tabular form for the literature corpus and the phonics corpus. These categorical frequencies were used to determine ordinal status based on increasing frequency. Subsequently, the ordinal data was used to examine the relationship in grapheme distribution between corpora using two Spearman rank order correlations. The direction, strength, and significance of the correlations were reported.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The purpose of the study was to further inform a balanced approach to early reading instruction by determining if an alternate sequence for phonics instruction developed from first grade literature is warranted. Because phonics instruction is based mainly on phoneme-grapheme correspondences, these correspondences were the major unit of measure in this study. Before creating this alternate instructional sequence based on phoneme-grapheme distribution in running text from literature, it was necessary to first determine if such a sequence was justified based on the variability of phoneme-grapheme distributions across text types. That is, if the relative frequencies of phoneme-grapheme correspondences remain consistent across text types, then a new sequence should not be created based on frequency alone. Therefore this study investigated the degree to which the distributions of phoneme-grapheme correspondences across three distinct corpora were similar. The three corpora represented an academic word list, running text from literature, and running text from phonics decodable readers.

Chapter IV discusses the data that were collected during the course of this study along with the results of the data analysis. Therefore, it is organized according to the following major section headings: (a) organization of data analysis, (b) presentation of descriptive characteristics of corpora, (c) research question, objectives, and hypotheses, (d) analysis of data, and (e) summary.

Organization of Data Analysis

This section presents a description of the three corpora examined in the study. This description includes information about the development of each corpus as well as appropriate descriptive statistics. Following this description, the research question and its related objectives and hypotheses are reviewed. Data for the first and second research objectives are reported in tabular form. The third research objective is answered via statistical testing of two hypotheses. The results from these tests are reported using scatter plots, correlation matrices, and appropriate inferential statistics.

Descriptive Characteristics of Corpora

The three text types examined in this study were an academic word list, literature text, and phonics text. In order to investigate phoneme-grapheme distributions in each text type, a corpus representing each text type had to be examined. Whereas a corpus representing an academic word list was identified for the study, the other two corpora had to be created for analysis. A description of each of these corpora follows.

An Academic Word List

The first corpus was an academic word list originally developed by Hanna, Hanna, Hodges, and Rudorf (1966). It is the same corpus that Fry (2004) examined when he published his phonics instructional sequence based on frequency of phoneme-grapheme correspondence. Because Fry’s sequence is the one being used for comparison in this study, the same original data source was used in this study as well. The academic word list began with 19,440 words originally taken from the text of books deemed appropriate by Thorndike and

Lorge (1944) for elementary and high school regardless of discipline and genre. Hanna et al. (1966), however, deleted 4,156 words classified as (a) abbreviations, (b) archaic words, (c) contractions, (d) foreign words, (e) hyphenated words, (f) proper names, (g) rare words, (h) slang or dialect, (i) trade names, and (j) words with no pronunciations given in the dictionary of choice. In addition to this core list of 15,284 words, Hanna et al. (1966) added 2,026 words deemed appropriate for their study based on four criteria: (a) words would be added to the list if they were new to the American English lexicon as indicated by the dictionary of choice, (b) words that were originally excluded from the Thorndike-Lorge list would be added if the frequency of usage had increased a substantial amount, (c) derived or inflected words would only be added to the list if the derivation or inflection caused a phonological shift in pronunciation, and (d) words unique to professional disciplines would be added to the list only if the researchers thought they were prevalent enough to be considered part of a common core vocabulary for the average educated American citizen. As a result, a total of 17,310 words were used to create this first corpus for the present study.

The Literature Corpus

A corpus representing running text from first grade literature was created for use in this study by the researcher. The literature corpus contains the running text from 363 books. Each book was selected randomly from the Renaissance Learning Quiz database (Renaissance Learning, 2009) of Accelerated Reader book titles. Two criteria were used for identifying appropriate books within the database. Books were deemed appropriate (a) if their reading levels were from 1.0 through 1.9 and (b) if they had lower grade interest levels. The database yielded 6,132 titles matching said criteria. Some books that were originally chosen for the literature corpus were excluded because (a) the Renaissance Learning Quiz database indicated they were decodable phonics readers (and therefore, for this study, should not be included in the literature corpus) or (b) the university library loan services indicated that all possible lending sources had been exhausted and the requested items were not available. When this occurred, the researcher replaced it using the next random number generated by Excel. In all, only 11 titles had to be replaced. Once 363 books had been identified, the researcher collected the books using local lending institutions and the interlibrary loan system in place at the university where the research was conducted. A complete list of the books used to create the literature corpus can be found in Appendix C: Literature Books in Study. Text from each book was then typed into Microsoft Word documents and transferred to a Microsoft Excel database for coding. The researcher then coded the database for each of the 190 phoneme-grapheme correspondences used by Fry (2004). The codebook used for this procedure is found in Appendix B: *A Priori* Coding Scheme. The accuracy for coding the phoneme-grapheme correspondences for each word was checked using the Hanna et al. (1966) codes used in their original study. Words that were not listed in their database were then checked for pronunciation in *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002). Any words not found in the original database or in the chosen dictionary were excluded from the database. A total of 4,307 cases were excluded from coding based on these criteria. The excluded cases included Arabic numerals, titles, abbreviations, contractions, dialect, and single letters. In all, 5,588 individual words occurring a total of 88,245 times were coded for analysis. A complete list of the words analyzed as well as their frequencies can be found in Appendix E: Words Analyzed in Study.

The Phonics Corpus

The researcher also created the corpus representing running text from phonics decodable readers. The decodable phonics readers used in this corpus were published as part of *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003). All books in the decodable reader series, as well as the easy, average, and challenging reader series were used to create this corpus. Random selection was not necessary because a census of all phonics readers (N=130) in the first grade curriculum series was used. A complete list of the books used to create the phonics corpus can be found in Appendix D: Decodable Phonics Readers Included in Study. Text was processed and coded using Microsoft Word and Excel as outlined in the above section entitled *The Literature Corpus*. Individual cases were eliminated from the coding process for the same reasons that cases were excluded in the literature corpus. A total of 675 individual cases were excluded from coding based on the same criteria. In all, 2,175 individual words occurring 19,110 were coded for the phonics corpus. These words and their frequencies within the corpus can be found in Appendix E: Words Analyzed in Study.

Research Question, Objectives, and Hypotheses

Although grapheme-phoneme correspondence frequencies have been established in a number of studies, these studies have not yet examined the frequency distributions as they apply to specific types of text written for beginning readers. Therefore, this study sought to describe the unique grapheme-phoneme distributions in various beginning reader text types by answering the following research question: "What is the topography of grapheme-phoneme correspondences in reading material appropriate for beginning readers?" This question was explored through several research objectives and hypotheses.

Research Objectives

To fully investigate the research question posed, it was necessary for the study to establish certain frequencies of grapheme distribution in various types of text including literature-based text and phonics-based texts. In addition, a comparison was made between the grapheme distributions found within each type of text. To this end, the study focused on three research objectives.

RO_1. The study seeks to describe the distribution of grapheme-phoneme correspondences in first grade literature.

RO_2. The study seeks to describe the distribution of grapheme-phoneme correspondences in first grade controlled phonics readers.

RO_3. The study seeks to compare the frequency distributions of grapheme-phoneme correspondences found in texts from an academic word list, first grade literature, and first grade controlled phonics readers.

Hypotheses

The following two hypotheses were devised for statistically testing the third research objective.

H_1. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature

when compared to an academic word list as represented by Fry's (2004) revised phoneme-grapheme frequency count.

H_2. There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003).

Analysis of Data

The first two research objectives are similar in nature. First, the proposed study sought to describe the distribution of grapheme-phoneme correspondences in first grade literature. Second, the proposed study sought to describe the distribution of grapheme-phoneme correspondences in first grade controlled phonics readers. Both of these research objectives demand frequency data. Results for the top 20 most occurring phoneme-grapheme correspondences can be viewed in Table 1: Twenty Most Frequently Occurring Correspondences. A full report for all 190 phoneme-grapheme correspondences can be found in Appendix F: Relative Frequencies and Ranks of Phoneme-Grapheme Correspondences across Three Text Types. The third research objective states that the proposed study sought to compare the frequency distributions of grapheme-phoneme correspondences from various bodies of text.

Table 1

Twenty Most Frequently Occurring Correspondences

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
R	R	.085	.064	.056	190	189	188
T	T	.070	.065	.073	189	190	190
N	N	.069	.059	.058	188	188	189
I short /i/	I	.050	.045	.049	187	186	186
L	L	.046	.030	.031	186	182	181
S	S	.043	.044	.051	185	185	187
A short /a/	A	.039	.035	.043	184	184	184
D	D	.034	.046	.046	183	187	185
K	C	.032	.016	.016	182	171	169
E short /e/	E	.031	.022	.024	181	179	178
M	M	.031	.032	.031	180	183	182
P	P	.031	.022	.027	179	178	179
B	B	.021	.021	.022	178	177	177
Schwa R & Short U + R	Er	.018	.014	.011	177	167	165
O long /ō/	O	.017	.011	.008	176	163	161
U Short and schwa /u/ & /ə/	O	.017	.004	.003	175	140	133.5
E long /ē/	Y	.017	.002	.001	174	123	112.5
E long /ē/	E	.016	.014	.012	173	168	166
F	F	.015	.017	.018	172	172	173
O short /o/	O	.015	.017	.020	171	173	176

Note. PH = Phoneme, GR = Grapheme. These figures were rounded to the nearest thousandths. The table in Appendix F contains expanded figures.

Hypotheses

The comparison of frequency distributions of various text bodies as stated in the third research objective was investigated by testing two hypotheses, the first of which stated, “There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to an academic word list as represented by Fry’s (2004) revised phoneme-grapheme frequency count.” The first hypothesis was tested using a Spearman rank order correlation. The frequency data from Fry's (2004) publication and the frequency data collected by the researcher from the literature corpus were converted to relative frequencies and then ranked. Following these transformations, SPSS v. 16 was used to analyze the data. The scatter plot as seen in Figure 1 was used to check the data visually before running the analysis.

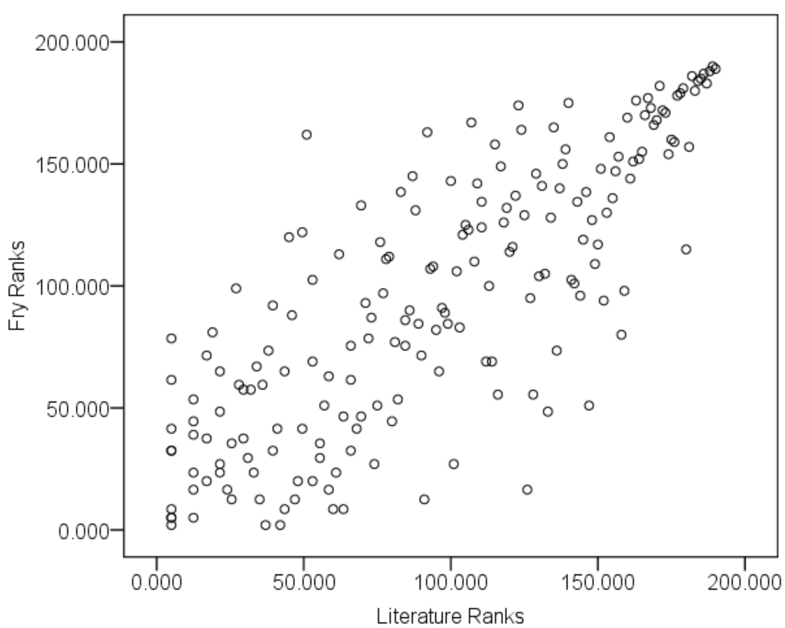

Figure 1. Scatter plot of phoneme-grapheme correspondence ranks from academic word list corpus and literature corpus.

A visual examination of this scatter plot indicates a positive, linear movement. However, because the dots are scattered loosely, a moderate correlation was assumed. No extreme points of data were located. The researcher followed this visual examination of the data by running a Spearman Rank Order Correlation using SPSS, v. 16. The correlation matrix from this analysis is given in Table 2.

Table 2

Correlation Matrix for H_1

	Variables	
Variables	Fry	Literature
Fry	1.000	.800*
Literature	.800*	1.000

*. Correlation is significant at the 0.01 level (2-tailed).

As indicated in the above correlation matrix, there is a large significant relationship between Fry's published distribution of phoneme-grapheme correspondences from a word list and the distribution phoneme-grapheme correspondences found in running text from first grade literature, $r_s = .80$, $p < .05$, $N = 190$. The evidence lends support for the first hypothesis.

The second hypothesis stated, "There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003)." The data collected for the second hypothesis was similar in nature to that collected for the first hypothesis. Therefore, similar treatment and analyses were conducted. The second hypothesis was tested using a Spearman rank order correlation. The frequency data collected by the researcher from both the literature and phonics corpora were converted to relative frequencies and then ranked. Following these transformations, SPSS v. 16 was used to analyze the data. The scatter plot as seen in Figure 2 was used to check the data visually before running the analysis.

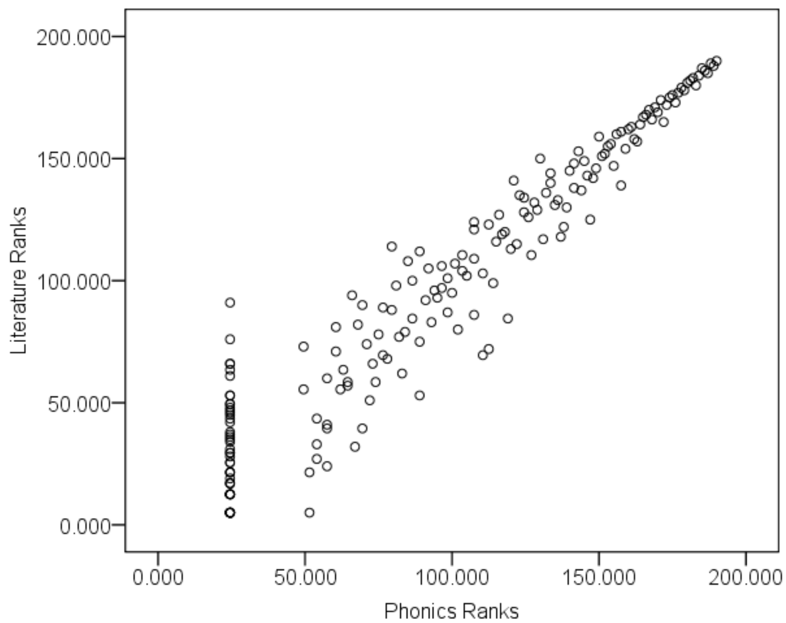

Figure 2. Scatter plot of phoneme-grapheme correspondence ranks from literature corpus and phonics corpus.

A visual examination of this scatter plot indicates a positive, linear movement for most of the data. However, a vertical line at approximately point 25 on the X axis was located indicating something unusual about the data distribution. The researcher then checked the raw frequency data and established that within the phonics database, 48 of the 190 phoneme-grapheme correspondences had a frequency of zero. Because this study was rooted in frequency data, the researcher decided to continue with the analysis without deleting these points even though they had a frequency of zero. Other than this vertical line, no other extreme points of data were located. In fact, the rest of the data points visually indicated a strong positive relationship. The researcher followed this visual examination of the data by running a Spearman Rank Order Correlation using SPSS, v. 16. The correlation matrix from this analysis can be viewed in Table 3.

Table 3

Correlation Matrix for H_2

	Variables	
Variables	Literature	Phonics
Literature	1.000	.955*
Phonics	.955*	1.000

*. Correlation is significant at the 0.01 level (2-tailed).

As indicated in the above correlation matrix, there is a large, significant relationship between the distribution of phoneme-grapheme correspondences found in running text from first grade literature and the distribution of phoneme-grapheme correspondences in running text from first grade phonics decodable readers, r_s = .955, $p < .05$, $N = 190$. The evidence lends support for the second hypothesis.

Wilcoxon signed rank tests were used as follow up tests to confirm the findings for the Spearman rank order correlations that were used to test the hypotheses. The results of the Wilcoxon signed rank test for the first hypothesis indirectly confirmed the findings of the first Spearman rank order correlation by indicating that the phoneme-grapheme distribution in the academic word list corpus and the literature corpus were not significantly different, $T = .551$, $p > .05$, $N = 190$. The second Wilcoxon signed rank test, however, found that the literature corpus and the phonics corpus were significantly different in their phoneme-grapheme distributions, $T = .008$, $p < .05$, $N = 190$. These findings are in opposition to those found by the Spearman rank order correlation. Shavelson (1996) notes, however, that the Wilcoxon signed rank test is useful only if “the two populations have identical shapes or are both symmetric” (p. 589). Otherwise, the test can indicate significant differences based on shape or central tendency rather than on true differences. Therefore, the researcher trimmed the data, excluding those phoneme-grapheme correspondences which created the vertical line in the scatter plot (see Figure 2), and retested the second hypothesis using the Wilcoxon signed rank test. The results from the subsequent test did indeed support the findings of the second Spearman rank order correlation in that the phoneme-grapheme distributions of the two corpora were not significantly different, $T = .172$, $p > .05$, $N = 142$.

Summary

This chapter reviewed the purpose and problem investigated in this study. It subsequently presented the research question and its related research objectives and hypotheses. Furthermore, it described the populations under study as well as the data collection and coding processes. Finally, it reported the results of the data analysis. The final chapter discusses the implications of these results as well as suggests directions for future research.

CHAPTER V

FINDINGS, CONCLUSIONS, AND IMPLICATIONS

According to Leedy and Ormrod (2005), ethical researchers report the results of their studies in a manner consistent with their discipline. That is, disseminating findings from research studies is an integral part in the research cycle. The purpose of this chapter, therefore, is to inform the reading research community of the findings from the research conducted during this study. In addition, this chapter briefly reviews the research problem, questions, objectives, and hypotheses. Furthermore, the conclusions indicated by the results, as well as the implications these conclusions have on current practice, are discussed. Finally, recommendations for future research and an overall summary are presented. The major section headings for Chapter V are as follows: (a) Review of the Study, (b) Findings, (c) Conclusions, (d) Implications for Practice, (e) Recommendations for Future Research and f) Summary.

Review of the Study

The nature of written English is such that there is not a one-to-one correspondence between the sounds of the language and the symbols that represent those sounds (Gunning, 2010). In fact, English has one of the more difficult orthographies of the alphabetic languages (Geva & Wang, 2001). Because the orthographic system is complicated, reading instructors have divergent views as to how to best teach their students to read. Traditionally, two major philosophical views have emerged in the reading community (Alexander & Fox, 2004; Chall, 1992; Pearson, 2004; Pearson et al., 2007; Wren, 2003). The whole language community believes that reading development should occur in the same manner in which language acquisition occurs (Alexander & Fox, 2004; Pearson, 2004; Weaver, 1994; Wren, 2003). The reading materials developed by those adhering to this philosophical viewpoint have natural language vocabulary and patterns tending to use repeated text patterns in beginning level texts (Heald-Taylor, 1989; Weaver, 1994). Phoneme-grapheme correspondences in the whole language classroom are not taught systematically or intensively. Rather these correspondences are taught as the need arises in order to make particular texts accessible to specific students (Weaver, 1994).

Those who disagree with this philosophy often belong to the phonics community. They believe that beginning reading is best taught by exposing students to phoneme-grapheme correspondences explicitly and systematically (Alexander & Fox, 2004; Pearson, 2004; Weaver, 1994; Wren, 2003). The scope and sequence of the reading curriculum becomes paramount. Beginning level texts often used by reading instructors who follow this philosophic view are known as decodable readers (Heald-Taylor, 1989; Weaver, 1994). The text of these readers match those phoneme-grapheme correspondences previously taught in the curriculum (Hiebert & Martin, 2001; Weaver, 1994). As the students learn more correspondences, the vocabulary in the decodable readers becomes correspondingly more difficult. Much of the text in decodable readers has been labeled *artificial* by those who oppose such text because the vocabulary pool for the development of the readers is limited to words that can be made with only those phoneme-grapheme correspondences previously taught in the curriculum (Weaver, 1994). Therefore, beginning readers often encounter words such as “prod” because each of those phoneme-grapheme correspondences have been taught even though such words are not generally part of the first graders expressive or receptive vocabularies.

A third philosophical viewpoint, often referred to as *interactive*, has recently emerged within the reading community at large (AG, 2005b). This growing group has called for a balance between the phonics and whole language approaches to reading instruction. From this viewpoint, success depends on a knowledgeable teacher who can meld strengths from opposing views into a cogent, student-centered, reading pedagogy using appropriate materials and strategies (Starrett, 2007).

Whereas Fitzgerald (1999) indicates that this type of reading teacher develops as the result of a third, distinctly different philosophical viewpoint, it is yet unclear if this means that methods and materials must also emerge as distinctly new and different. That is, can reading instructors who adhere to an interactive philosophical viewpoint merge the methods and materials used by both the whole language and phonics communities? Rather, it may be reasoned that a new philosophical view demands new methods and materials (Pearson et al., 2007). Therefore, the purpose of this study was to further inform such an interactive approach to early reading instruction by defining a new instructional sequence for the introduction of phoneme-grapheme correspondences developed from first grade literature.

Based on Fry's (2004) suggestions, the first step in developing the new instructional sequence was to identify how frequently specific phoneme-grapheme correspondences occurred in running text from first grade literature. An instructional sequence then could be developed by arranging the phoneme-grapheme correspondences in decreasing frequency. The second step, then, was to determine how similar the resulting sequence was to existing published sequences and sequences developed from running text from decodable readers. These steps based in curriculum development theory led to the research question, “What is the topography of grapheme-phoneme correspondences in reading material appropriate for beginning readers?” Whereas studies had been conducted gathering frequency information on graphophonic content in academic texts (Fry, 2004; Hanna, Hanna, Hodges, & Rudorf, 1966; Venezky & Weir, 1966), no study specifically looked at the graphophonic content found in beginning level texts nor did any study compare the graphophonic content found across three major text types developed for and used to teach beginning readers. Therefore, the research question posed led to the development of the two research objectives designed to develop a description of the distribution of grapheme-phoneme correspondences in first grade literature and first grade controlled phonics readers, respectively. Through the third research objective, the frequency distributions of grapheme-phoneme correspondences from various bodies of text were compared. The final research objective was tested using two hypotheses, the first of which stated that a statistically significant relationship would exist between the ranked positions of grapheme-phoneme correspondences from first grade literature and the ranked of positions of the same correspondences from an academic word list. The second hypothesis was similar to the first, stating that a significant relationship would exist between the ranked positions of grapheme-phoneme correspondences from first grade literature and the ranked positions of the same correspondences from decodable phonics readers.

In order to test these two hypotheses, frequency data were collected for each of the 190 phoneme-grapheme correspondences outlined by Fry (2004). Three corpora containing text from the three beginning level text types were used to collect the needed frequencies. The first corpus was originally developed by Hanna, Hanna, Hodges, and Rudorf (1966) for their study investigating spelling improvement. The development of this corpus, however, began much earlier with Thorndike and Lorge in 1944. Originally, the corpus contained over 19,000 words found in academic texts for all elementary grades. The list had been compiled based on frequency of occurrence and was deemed useful for developing curriculum for all elementary grades. Hanna et al. (1966), however, made significant changes to the original corpus through deletions and additions based on criteria specific to their research. Thus, the resulting corpus contained a total of 17,310 individual words deemed representative of the English language. This corpus was later examined by Fry (2004) in order to develop a phonics instructional sequence for beginning readers. Fry's published data served as the standard for the frequency distribution for phoneme-grapheme correspondences found in an academic word list. The second corpus was created specifically for this study to represent running text found in beginning level literature. The development of this corpus began with the random selection of 363 books from the Renaissance Learning Quiz database (Renaissance Learning, 2009) which totaled 6,132 appropriate titles at the time the research was conducted. The text from each of these books was entered in to an Excel database for coding and subsequent analysis. After words were excluded from the database because their pronunciations could not be located in the Hanna et al. (1966) database or in the chosen dictionary, the literature corpus contained 5,588 individual words that occurred 88,245 times. The third corpus was also developed for the study and included running text from 130 decodable phonics decodable readers that accompany *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003). Again, the text was entered into an Excel database for coding and subsequent analysis. After words were excluded from the database because their pronunciations could not be located in the Hanna et al. (1966) database or in the chosen dictionary, the phonics corpus contained 2,175 individual words that occurred 19,110 times. Because the individual corpora were not of equal sizes, relative frequencies were calculated for each of the 190 phoneme-grapheme correspondences across all three text types. SPSS, v. 16 was then used to test the two hypotheses using Spearman rank-order correlations for each.

Findings

After completing the analysis of data, the researcher was then able to establish and compare instructional sequences developed from three distinct text types. This section presents the instructional sequences found as well as the results of the comparisons made. In addition, current findings are compared to previous findings and ancillary findings are presented.

Establishing Instructional Sequences

The first two research objectives were descriptive in nature establishing frequency distributions for 190 distinct phoneme-grapheme correspondences found in running text from both literature and phonics decodable readers. The resulting instructional sequences were developed based on decreasing frequency. The first 20 items in the literature instructional sequence and the phonics instructional sequence can be found in Table 4. The complete instructional sequence for each text type, including Fry's academic word list sequence, can be found in Appendix G: Instructional Sequences Based on Three Text Types.

Comparing Instructional Sequences

Once three distinct instructional sequences from three text types were established, steps were taken to determine how closely related each of the sequences were statistically. In order to do this, two hypotheses were devised for statistical testing. The first hypothesis proposed that "There will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to an academic word list as represented by Fry's (2004) revised phoneme-grapheme frequency count." A Spearman rank order correlation was performed to see to what extent the two sequences were similar. It was determined that a large significant relationship existed between Fry's published distribution of phoneme-grapheme correspondences from a word list and the distribution phoneme-grapheme correspondences found in running text from first grade literature. A Wilcoxon signed rank test was then used to confirm the findings of the Spearman rank order correlation. As was expected, a significant difference between these two text types could not be found thereby indirectly supporting the findings of the first Spearman rank order correlation as well as the first hypothesis in general.

Table 4

First Twenty Correspondences in Two Instructional Sequences

	Literature Sequence		Phonics Sequence	
Order	Grapheme	Phoneme	Grapheme	Phoneme
1	T	T	T	T
2	R	R	N	N
3	N	N	R	R
4	D	D	S	S
5	I	I short /i/	I	I short /i/
6	S	S	D	D
7	A	A short /a/	A	A short /a/
8	M	M	TH	TH voiced
9	L	L	M	M
10	S	Z	L	L
11	TH	TH voiced	S	Z
12	E	E short /e/	P	P
13	P	P	E	E short /e/
14	B	B	B	B
15	H	H	O	O short /o/
16	E	U Short and schwa /u/ & /ə/	H	H
17	W	W	E	U Short and schwa /u/ & /ə/
18	O	O short /o/	F	F
19	F	F	K	K
20	C	K	W	W

In other words, findings suggest that the graphophonic distribution within running text from first grade literature is equivalent to the graphophonic distribution within an academic word list.

A study directly comparing the phoneme-grapheme content of high-frequency texts and literature-based texts could not be located. However, the current findings are in contrast to previous findings of studies comparing these two text types with a unit of analysis other than phoneme-grapheme correspondences. Hiebert (1998) compared the contents of high-frequency texts and literature-based texts using whole words as the unit of analysis rather than the phoneme-grapheme correspondence. She found that the ratio of unique to total words (word density) in an instructional unit for high-frequency texts was 1:21. A ratio such as this suggests a high degree of repetition of only a few words. By contrast, she found that the word density ratio for literature-based texts was 1:4. That is, many more words were used at much lower levels of repetition in the literature-based texts. Knowing that approximately 40% of the highest frequency words have (a) uncharacteristic pronunciations, (b) irregular observance of phonic generalizations or are (c) multisyllabic (Hiebert & Martin, 2001), previous research suggests that the running text of high-frequency texts should differ greatly from literature texts in phoneme-grapheme correspondence distributions. Present findings, however, did not support these assumptions. It must be noted, however, that the corpus representing high-frequency text did not account for running text. Future research that accounts for this discrepancy may indicate contrasting results more consistent with previous research.

The second hypothesis was much like the first, stating that "there will be a statistically significant relationship in the ranked positions of grapheme-phoneme correspondences from first grade literature when compared to first grade controlled phonics readers from *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003)." Another Spearman rank order correlation was conducted to determine the extent to which the literature instructional sequence and the phonics instructional sequence were similar. According to the results, these two instructional sequences were even more strongly correlated than the Fry (2004) sequence and the literature sequence. It was determined that a large significant relationship existed between the two tested sequences. Again, a Wilcoxon signed rank test was conducted as a follow up measure to confirm the relationship indicated by the Spearman rank order correlation. The data for this Wilcoxon signed rank test, however, was trimmed to exclude a large number of phoneme-grapheme correspondences which remained unrepresented in the phonics corpus. This was done to account for a difference in the shape of the distributions (Shavelson, 1996). Following this data trimming, the results of the second Wilcoxon signed rank test showed no significant difference between the literature and the phonics text types. Thus, the second Wilcoxon signed rank test indirectly supported the findings of the second Spearman rank order correlation as well as the second hypothesis in general. In other words, findings suggest that the graphophonic distribution within running text from first grade literature is essentially the same as the graphophonic distribution within running text from first grade decodable phonics readers.

Again, a study using phoneme-grapheme correspondences as the unit of analysis to compare literature and phonics text types could not be located. However, Martin and Hiebert (1999) and Menon and Hiebert (2000) used rimes as the unit of analysis to compare text types from various published programs. A rime is a unit larger than a phoneme-grapheme correspondence consisting of both a vowel (peak) and a final consonant (coda). While some rimes are whole words in themselves, (the *–at* rime is the same as *at* as a word), most rimes are used to form other words, such as *–ot* being used to form *lot*, *cot*, *hot*, etc. The findings of these two studies suggest that the texts of phonics program and literature programs did not differ in their rime content. In fact, “the average number of rimes within…the Literature Core program and the Phonics Core program were identical: 28” (Hiebert & Martin, 2001, p. 404). The current findings support their previous findings but at a unit of analysis smaller than the rime—the phoneme-grapheme correspondence.

Ancillary Findings

Whereas the original research proposal did not set out to record the number of phoneme-grapheme correspondences found in each text type, it is imperative to note several ancillary findings. Fry's (2004) published sequence contained 190 phoneme-grapheme correspondences found from academic texts throughout the elementary and high school grades. The literature corpus in this study, however, drew only from texts deemed to be appropriate for first grade. Thus, the literature corpus represented a much smaller scope of study than did the corpus representing the academic word list. Even though this narrowing of scope occurred, 182 (96%) of the 190 phoneme-grapheme correspondences were still present in the literature corpus. Of the 182 phoneme-grapheme correspondences present in the first grade literature corpus, 163 (86% of 190) occurred 10 times or more. Similarly, of the original 190 phoneme-grapheme correspondences identified by Fry (2004), 143 (75%) were present in the phonics decodable reader corpus. Of the 143 correspondences present in the phonics corpus, 128 (67%) occurred at a frequency of 10 times or greater. Whereas a frequency of 10 times or greater seems rather arbitrary, it is the same guideline used by Fry (2004) for his inclusion of a phoneme-grapheme correspondence in his instructional sequence. Those correspondences occurring less than 10 times were not considered for inclusion in his published instructional sequence.

Whereas the original research proposal intended to compare phoneme-grapheme distributions between (a) the academic word list corpus and the literature corpus as well as (b) the literature corpus and the phonics corpus, a third relationship existed which needed to be examined. Therefore, the researcher examined the relationship between the phoneme-grapheme distributions found in the academic word list corpus and the phonics corpus using the identical statistical analyses that had been used for both H_1 and H_2. The Spearman rank order correlation indicated that the distributions in this third relationship were significantly correlated to a large degree, $r_s = .787$, $p < .05$, N = 190, suggesting that the rank orders were not significantly different. The Wilcoxon signed rank test confirmed these results, $T = .688$, $p > .05$, N = 190. This suggests that phoneme-grapheme distributions are similar across text types within first grade reading material.

Conclusions

The overarching question which guided this research study was, “What is the topography of grapheme-phoneme correspondences in reading material appropriate for beginning readers?” This research question, combined with the study’s purpose—to further inform a balanced approach to early reading instruction by defining a new instructional sequence for phonics instruction developed from first grade literature—guided the researcher’s interpretation of the findings.

The first conclusion supported by the findings is that an alternate sequence for teaching phoneme-grapheme correspondences is not supported based on frequency alone because the sequences were not statistically different in rank order. Therefore, Fry's (2004) published sequence for phoneme-grapheme correspondence introduction is upheld by this study’s findings. Furthermore, whereas frequency of word occurrence was accounted for in the literature and phonics corpora, it was not accounted for in the academic word list corpus. That is, each word in the academic word list corpus only appeared one time rather than multiple times as would be expected in running text from a book. Therefore, the findings indicate that graphophonic content of an academic word list is not significantly different from the graphophonic content of running text even though running text accounts for multiple encounters with specific words and the use of inflected endings such as *–s*, *-ed*, and *–ing*. The findings, however, do suggest that some phoneme-grapheme correspondences occur much more frequently than others, implying the relative importance of certain phoneme-grapheme correspondences. It follows that the most frequently occurring correspondences should be taught first, the less frequently occurring correspondences should be taught next, and possibly some correspondences should not be taught at all at the beginning reading level. However, decisions regarding how many of the 190 phoneme-grapheme correspondences should be taught, their specific order of introduction, and the length of time needed to teach all appropriate correspondences cannot be concluded by this study's findings.

The second conclusion supported by the findings is that reading teachers adhering to an interactive approach to beginning reading instruction could theoretically use either literature or phonics text type to support early reading development because the graphophonic content does not differ significantly. Therefore, there is immediate benefit for this newly developed section of the reading community to use materials already developed by the whole language and phonics sections of the community. Selection of materials, however, should not be done haphazardly. Rather selection should be guided by expert opinion and pre-selected criteria. That is, the texts selected for beginning reading instruction should be deemed appropriate based on several key factors including the curriculum sequence in place for introducing the phoneme-grapheme correspondences (Hoffman, Sailors, & Patterson, 2002) as well as the individual instructional needs and interests (Weaver, 1994) of the student learning to read. If, however, as Fitzgerald (1999) suggests, the interactive reading community is truly a new philosophical orientation to reading instruction, then it may not be appropriate for this new section of the reading community to rely long-term on materials developed by other sections within the reading community. Therefore, the interactive section within the reading community would do well to develop materials based on key components of those materials developed by their forerunners. That is, those preparing these new materials should be cognizant of such text characteristics as repeated language patterns, supportive illustrations, natural language sentence structures, size and layout of print, amount of text on page, overall length of text, and child-friendly vocabulary while paying attention to the decodability of the text (Fountas & Pinnell, 1996; Hiebert, 1998).

The third conclusion is supported by the ancillary findings from this study. That is, if beginning level reading students are expected to successfully read first grade material, then it is logical to state that they need to be introduced to more phoneme-grapheme correspondences than many currently are. It must first be understood that not all of the 190 phoneme-grapheme correspondences are appropriate for instruction. For example, the list of 190 correspondences is greatly reduced by teaching several highly usable phonics generalizations such as the double consonant generalization. This generalization states that when a consonant is doubled in a word, the consonant is sounded only one time. Therefore, by teaching the generalization, the instructor eliminates the need to teach secondary correspondences. That is, a reading instructor would explicitly teach the /b/ = *b* correspondences, but not necessarily the /b/ = *bb* correspondence. This one rule alone eliminates 12 of the 190 correspondences. Other phonic generalizations have similar effects on the original list of 190 correspondences. Nevertheless, Fry (2004), in his phonics sequence suggested that a minimum of 17 vowel phonemes represented by 58 different graphemes and 26 consonant phonemes represented by 41 graphemes were appropriate for inclusion in phonics instructional sequences. This is a total of 43 phonemes corresponding to 99 graphemes. Whereas Fry does not suggest the period of time over which these correspondences should be taught, knowing that the current study found 96% of the original 190 correspondences (86% if counting those correspondences with frequencies of 10 or greater) present in first grade literature, it may be safe to assume that somewhere between 85-95 of the correspondences suggested by Fry should be taught during the first grade year. In contrast, Gunning (2010) proposed a generic sequence for phonics instruction based on a review of all major basal reading program sequences. His sequence suggests that only 58 phoneme-grapheme correspondences should be taught during the first grade year. It should be noted that the suggestions made by both Fry (2004) and the present researcher are made strictly from mathematical logic and does not take into account other factors such as rate of learning or child development. The optimal number of phoneme-grapheme correspondences to be taught during the first grade year may best be determined through experimental rather than descriptive research.

Implications for Practice

The first implication for practice is that the leveling of text should be fluid rather than stagnant. This means that a particular text would not be given a specific, unchanging level of readability as many readability formulas produce. Rather, a particular text could change position in readability level depending upon the text's match with what has already be taught in the curriculum. A generic method such as the one suggested by Gunning (2010) could be used in classrooms to level texts accordingly. In Gunning's method of leveling, the person responsible for leveling texts for beginning readers rate the words according to his predetermined decodability scheme. Because many curricula have been written for beginning reading instruction, however, Gunning suggests that his a priori leveling system based on decodability should be adapted by the teacher for use within a particular curriculum. By making adaptations based on particular curriculum sequences, text levelers are actually adhering to a second type of decodability text-difficulty scheme (Hiebert & Mesmer, 2006). This second type, proffered by Hoffman, Sailors, and Patterson (2002) is known as an instructional consistency scheme. These schemes are specific to the curriculum being taught and rely on human leveling rather than computer calculation of length of word and length of sentences. They take into account only measurable text features such as percentage of words matching curricular scope and sequence and possible word density. However, instructional consistency schemes do not take into account qualitative text features which support beginning reading development as suggested by Fountas and Pinnell (1996). Nonetheless, instructional consistency schemes have been used for textbook adoption mandates in both Texas and California (Hiebert & Mesmer, 2006). If other states follow suit, it will be imperative for those responsible for leveling texts within this type of scheme to first be responsible for examining the scope and sequence of the adopted reading curriculum. Only then can texts be leveled appropriately.

The second implication for practice stems from the first. If reading development is dependent upon a student’s ability to practice what has been taught and if the leveling of texts can only be done by human decision rather than by computer calculation, then teachers need expert training in the examination of curricular scope and sequences and matching texts to adopted curricula. This refers to curricula adopted across domains and not just the reading curriculum. Training needs to begin during the teacher preparation phase of their career at the university. However, training in the matching of texts to the curriculum and the matching of texts to readers must continue through professional development once teacher candidates transition to the classrooms. This should be especially true of those in kindergarten-third grade positions. In addition, ongoing, in-depth professional development focusing on text leveling based on instructional consistency schemes should be offered to experienced teachers.

It is important to note that this study dealt only with quantitative text features and neither supports nor denies claims in the literature regarding qualitative text features. The researcher recognizes the importance and rationale behind qualitative leveling systems such as Guided Reading Levels (Fountas & Pinnell, 1996). However, measurement and impact of such features were beyond the scope of this study. Thus, discussion of such features in conjunction with implications was precluded.

Recommendations for Future Research

The recommendations for future research can easily be broken into two categories: replication research to improve the design and implementation of the current study and experimental research generated from the present findings. The first category of recommendations includes suggestions for studies which would replicate the present research while controlling for design flaws. First, the researcher recognizes that the content of the literature and phonics corpora could be improved. Opinions within the reading community abound in regards to texts that actually represent literature. However, for the purposes of this study, the definition of literature was delimited making the study more manageable. Future research might broaden the concept of literature and include text from other appropriate sources. Similarly, only one leveling system was used to identify beginning level texts. Again, multiple leveling systems, using both decodability formulas such as ATOS as well as Lexiles and qualitative leveling systems such as guided reading framework (Fountas & Pinnell, 1996, 1999, 2002, 2006) should be used to identify books appropriate for reading at the beginning levels of reading development. The same is true of the phonics corpus. Again, the corpus was limited to text found only in *Saxon Phonics 1: An Incremental Development* (Simmons & Calvert, 2003). This program was chosen because it met the present design's criteria. However, synthetic phonics programs are not the only phonics programs currently produced, nor is *Saxon Phonics 1: An Incremental Development* representative of all synthetic phonics programs. Therefore, the phonics corpus should be expanded to include the text from decodable readers found in multiple synthetic phonics programs as well as the text from analytic and analogic phonics programs. In addition, care should also be taken to make both the literature corpus and the phonics corpus more equal in size.

Second the researcher recognizes that there were certain discrepancies regarding the coding of the phoneme-grapheme correspondences. In order to make the coding as consistent as possible, individual words were first compared to the coding found in Hanna et al.'s (1966) original corpus. However, not every word in the new corpora could be located in the Hanna et al.'s (1966) corpus.

When a word did not exist with the original coding, it was then located in the *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002). This dictionary was chosen because it is the most recent publication within the same family of dictionaries as the original dictionary used in the Hanna et al.'s (1966) research. However, this presented the researcher with a problem. Language usage and pronunciation change over time. Thus, the pronunciation guides found in the original dictionary of choice did not match the pronunciation guides found in the current dictionary of choice. Therefore, the researcher aligned the pronunciation guides which undoubtedly included error. This alignment can be viewed in Appendix H: Pronunciation Guide Alignment. This problem should be corrected in one of two ways and the research replicated. First, only words found in the original Hanna et al.'s (1966) coding publication could be used to build the new corpora. Whereas this would reduce coding error based on coding inconsistencies with the new dictionary, it would also delete a substantial number of words in each of the databases, possibly leading to spurious results. The second way to counter this problem is to recode the words in the Hanna et al.'s (1966) corpus according to those pronunciations found in *Webster's Third New International Dictionary, Unabridged CD-ROM* (Merriam-Webster, 2002). Whereas this would certainly increase coding consistency between all three corpora, it could also cause Fry's (2004) published sequence to be re-ordered because his publication was based in the Hanna et al.'s (1966) original coding scheme.

The second category of recommendations for future research includes experimental designs aimed at further investigating the impact of the findings from the present study. Ultimately, finding similarities/differences in graphophonic content between various text types does not equate developmental reading support. Therefore, a need exists to conduct experimental studies examining reading development in different groups using the same instructional sequence but measuring the amount and types of texts used and the impact these factors have on beginning reading development. These studies should be conducted within the confines of interactive reading classrooms because studies conducted in either whole language or phonics classrooms could be biased by the philosophical views to which the reading instructors adhere. Similarly, experimental studies may be designed comparing early reading development and the type of text leveling system used in the classroom. With the scope and sequence remaining continuous throughout groups, the researchers should have a minimum of four experimental groups representing (a) classrooms that strictly use texts leveled with a readability formula, (b) classrooms that strictly use texts leveled with a qualitative leveling system, (c) classrooms that strictly use texts leveled by expert teachers trained in using an instructional consistency scheme, and (d) a control group. Finally, experimental studies should be designed comparing the level of teacher expertise in fluid text leveling schemes and students' overall reading development.

Summary

This study endeavored to further inform a balanced approach to early reading instruction by defining a new instructional sequence for phonics instruction developed from first grade literature. After a sequence was identified from first grade literature, it was statistically compared to both a published instructional phonics sequence as well as a sequence developed from a decodable reader corpus. The findings from the statistical comparisons indicated that each text type contained similar graphophonic content. Based on these findings, the researcher concluded that reading instructors adhering to an interactive approach could theoretically use any of the three text types because they do not statistically differ from one another in graphophonic content. In addition, the researcher concluded based on mathematical logic alone, that current first grade instructional sequences from basal programs do not introduce enough phoneme-grapheme correspondences for first graders to be successful readers of the literature at their grade level. Suggestions for improved replication research as well as subsequent experimental research based on the researcher's implications for practice were also included.

APPENDIX A

DATA ENTRY PROTOCOL

The research assistant responsible for entering running text from literature books and decodable books into Word files will adhere to the following procedures:

1. First, create a Word file.
    a. Use the title of the book as the filename.
    b. Please leave *a*, *an*, and *the* intact at the beginning of the filename.
    c. To distinguish literature from phonics files, the phonics' filenames will be preceded by a code. This code can be found in the first chart at the bottom of this document.
2. Second, enter the running text from the book.
    a. Type the title of the book on the first line of the document.
    b. Double space and begin typing the text from the book
3. Third, proofread the text you have entered.
    a. Go back to the beginning of the document and read what you have typed to make sure it is what is found in the book.
    b. Errors in punctuation, spacing, indentation, etc. do not matter except where they affect pronunciation.
    c. Make sure that words are spelled *exactly* as they are found in the running text of the book.
    d. Ambiguous words should be followed by an Arabic numeral to indicate their pronunciation in running text. No space should separate the word and the numeral. For instance, the *read* can be pronounced /rĕd/ or /rēd/ depending on context. If *read* is

pronounced /rĕd/ it should be typed as *read1* according to the chart below. If, however, *read* is pronounced /rēd/, then it should be typed as *read2* in the document. Please use the second chart to code ambiguous words appropriately.

4. Save and close document.
5. Repeat steps one through four with a different book.

Chart 1: Codes for Phonics Reader Filenames

Code	Title	Author
3CFR5	A Big Thank You	Donovan, Barbara
0DR24	A Day at the Fair	Shulman, Lisa
0DR37	A Drawing Just for Me	Rose, Emma
0DR51	A Fable About A Mouse and a Cow	Robert, Emily N.
0DR16	A Get Well Wish	Ross, Linda
0DR33	A Hobgoblin Saves the Atlantic	Benjamin, Cynthia
2AFR19	A Ride in Pig's Boat	Rose, Emma
2AFR2	A Sprint to the Frog Pond	Paulson, Stephen
3CFR1	A Top and an Ant	Donovan, Barbara
2AFR11	A Trip to a Candy Shop	Eisenstark, Reyna
2AFR17	Alberto Goes to the Beach	Ross, Linda
3CFR19	All Kinds of Boats	Rose, Emma
1EFR23	All Wet	Donovan, Barbara
1EFR20	At the Animal Refuge	Woods, Chuck
1EFR6	At the Duck Pond	Waters, Carrie
0DR30	Away at Day Camp	Ross, Linda
3CFR15	Baby's Sunny Room	Ross, Linda
3CFR7	Be Safe on Your Bike	Clendaniel, Morgan
2AFR14	Birds, Birds, Birds	Lewis, Kathryn
0DR21	Bunny's Funny Hat	Roberts, Leya
1EFR17	By the Blue Sea	Ross, Linda

Code	Title	Author
2AFR21	Camping in July	Ross, Linda
1EFR26	Camping with Patch and Roy	Donovan, Barbara
3CFR3	Cat's Skit	Donovan, Barbara
1EFR10	Come and Meet Pebble	Robert, Emily N.
3CFR18	Country Sounds, Town Sounds	Donovan, Barbara
3CFR2	Dog's Plan	Ryan, Dorothy
2AFR1	Dolls Spin	Donovan, Barbara
0DR36	Explore our Country	Donovan, Barbara
0DR19	Fiddle Time	Donovan, Barbara
1EFR9	Five in a Van	Giglio, Judy
0DR15	Fox, not Ox	Burton, Marilee
0DR4	Frog and the Figs	Goldish, Meish
0DR20	Fun with Uncle Steve	Donovan, Barbara
2AFR26	Get Out!	Donovan, Barbara
0DR18	Go Into a Cave	Donovan, Barbara
0DR49	Greedy King Phinny	Benjamin, Cynthia
0DR3	Hal Has a Pal	Goldish, Meish
3CFR24	Helpful Animals	O'Brien, Debbie
0DR14	Here Comes Pete the Pig	Melton, Holly
2AFR22	How to Make a Pie	Eisenstark, Reyna
1EFR12	I Bring the Mail	Eisenstark, Reyna
0DR8	I Pick Zack	Benjamin, Cynthia

Code	Title	Author
3CFR21	Ice Skates for Suzett	Ross, Linda
1EFR19	In a Boat at Dawn	Rose, Emma
0DR22	It Helps to Have a Big Brother	Roberts, Leya
0DR48	It's Time to Unpack	Ross, Linda
0DR31	Jack and the Great Bean Plant	Sharp, Katie
3CFR16	Joy's Trip to the Toy Shop	O'Brien, Debbie
0DR17	Just Jump	Ross, Linda
1EFR8	Let's Go to School	Singer, Irma
1EFR14	Let's Look for Birds	Lewis, Kathryn
2AFR13	Life on a Farm	Lewis, Kathryn
3CFR13	Lost on a Farm!	Lewis, Kathryn
1EFR21	Mark Writes a Letter	Ross, Linda
2AFR4	Matt, a Cat, and Me	Daniels, Paul
2AFR8	Meet Miss Shine	Singer, Irma
0DR7	Men from Smog	Burton, Marilee
0DR46	Ms. Keith's New Hat	Floyd, Lucy
3CFR11	My Brother's Candy	Eisenstark, Reyna
2AFR9	Off We Go in a Jet	Giglio, Judy
1EFR7	One Bike and One Trik	Clendaniel, Morgan
0DR35	Our Friend, the Little Brown Bat	Benjamin, Cynthia
1EFR15	Painting to Music	Ross, Linda
3CFR8	Pet Time at School	Singer, Irma

Code	Title	Author
0DR40	Phil the Gerbil	Goldish, Meish
0DR10	Pigs Can Sleep	Benjamin, Cynthia
0DR2	Plan and Toss	Rose, Emma
0DR1	Pop It, Toss It	Dobeck, Maryann
0DR28	Princess Cindy on Her own	Melton, Holly
0DR44	Robbie's Apple Pie	Floyd, Lucy
0DR32	Roy's Best Toy	Benjamin, Cynthia
1EFR11	Sandy's Crispy Candy	Eisenstark, Reyna
0DR41	Signs to Know	Goldish, Meish
2AFR15	Simon Paints a Fence	Ross, Linda
0DR23	Something Grand	Burton, Marilee
3CFR12	Something Odd	Donovan, Barbara
1EFR18	Sounds Around You	Donovan, Barbara
1EFR1	Spin, Spin	Donovan, Barbara
1EFR25	Sports	Shulman, Lisa
2AFR6	Stu Duck at the Pond	Waters, Carrie
0DR25	Such Good Bugs	Burton, Marilee
0DR34	Sue's Blue Marble	Benjamin, Cynthia
2AFR5	Thanks to Moms and Dads	Donovan, Barbara
1EFR5	Thanks, Miss Long	Donovan, Barbara
0DR13	The Bake Sale	Shulman, Lisa
0DR43	The Best Fudge	Burton, Marilee

Code	Title	Author
0DR6	The Big Pig	Burton, Marilee
2AFR7	The Bike Meet	Clendaniel, Morgan
3CFR25	The Bike Race	Shulman, Lisa
0DR5	The Cat Cap	Burton, Marilee
2AFR20	The Donkey in the Chimney	Woods, Chuck
0DR11	The Flu Bug	Shulman, Lisa
3CFR20	The Gentleman and the Eagle	Woods, Chuck
0DR52	The Gingerbread Man	Dobeck, Maryann
3CFR23	The Halls' Yard Sale	Donovan, Barbara
3CFR14	The Hurt Bird	Lewis, Kathryn
3CFR26	The Joy of Camping	Donovan, Barbara
0DR9	The King's Thanks	Shulman, Lisa
2AFR10	The Little Riddle Book	Dellies, Margaret
3CFR6	The Picnic at the Pond	Waters, Carrie
3CFR22	The Pie Contest	Eisenstark, Reyna
1EFR22	The Pie Thief	Eisenstark, Reyna
1EFR3	The Skit	Donovan, Barbara
2AFR25	The Soccer Player	Shulman, Lisa
0DR26	The Storm	Shulman, Lisa
0DR38	The Three Billy Goats Gruff	Shulman, Lisa
1EFR16	The Toys' Picnic	O'Brien, Debbie
0DR27	The Turtle and the Bird	Melton, Holly

Code	Title	Author
0DR12	The Twins Swim	Shulman, Lisa
2AFR12	The Waiting Game	Eisenstark, Reyna
2AFR23	The White Box	Donovan, Barbara
3CFR4	They Help Me	Orford, Caroline
0DR29	Tiny Plants, Big Plants	Melton, Holly
3CFR9	To Val from Jen	Giglio, Judy
0DR50	Tory's Wonderful Surprise	Benjamin, Cynthia
0DR42	Tough Enough	Burton, Marilee
2AFR16	Troy's Toy	O'Brien, Debbie
0DR39	Two Animals to Study	Shulman, Lisa
3CFR10	Uncle Bill and the Snake	Faye, Ann
3CFR17	Under the Big Blue Sea	Ross, Linda
0DR45	Water, Water	Floyd, Lucy
1EFR13	What Can You See on a Farm?	Lewis, Kathryn
2AFR3	What Is a Skit?	Donovan, Barbara
1EFR24	What Is My Job?	O'Brien, Debbie
2AFR18	What Made That Sound?	Donovan, Barbara
1EFR4	Who Helps?	Menzies, Ellen
1EFR2	Who Is Fast?	Crockett, Laura E.
0DR47	Why Cubs Have Shorter Tails	Floyd, Lucy
2AFR24	Workers Come to School	O'Brien, Debbie

Chart 2: Codes for Ambiguous Words

Word	Pronunciation	Numeric Code
bow	/bō/	1
	/bau̇/	2
clever	/klēvər/	1
	/klĕvər/	2
close	/klōz/	1
	/klōs/	2
contest	/kon’test/	1
	/kontest’/	2
house	/hau̇s/	1
	/hau̇z/	2
lead	/lĕd/	1
	/lēd/	2
live	/lĭv/	1
	/līv/	2
lives	/lĭvz/	1
	/līvz/	2
minute	/mĭnət/	1
	/mīnūt/	2
mouth	/mau̇th/	1
	/mau̇<u>th</u>/	2
object	/ob’jĕkt/	1

Word	Pronunciation	Numeric Code
	/objĕkt'/	2
present	/prĕzənt/	1
	/prēzənt/	2
read	/rĕd/	1
	/rēd/	2
row	/rō/	1
	/raů/	2
use	/ūz/	1
	/ūs/	2
wind	/wĭnd/	1
	/wīnd/	2

APPENDIX B

A PRIORI CODING SCHEME

Phoneme	Grapheme	Walker Code
A long /ā/	a	Along_a
A long /ā/	a-e	Along_a_e
A long /ā/	ai	Along_ai
A long /ā/	ay	Along_ay
A long /ā/	e	Along_e
A long /ā/	ea	Along_ea
A long /ā/	ei	Along_ei
A long /ā/	eigh	Along_eigh
A long /ā/	ey	Along_ey
A short /a/	a	Ashort_a
A short /a/	a-e	Ashort_a_e
AR /â/	air	ARcarat_air
AR /â/	ar	ARcarat_ar
AR /â/	are	ARcarat_are
AR /â/	ear	ARcarat_ear
AR /â/	ere	ARcarat_ere
AR /ä/	a	ARbroad_a
AR /ä/	a(r)	ARbroad_ar

Phoneme	Grapheme	Walker Code
AR /ä/	ar-e	ARbroad_ar_e
AR /ä/	ea(r)	ARbroad_ea_r
B	b	B_b
B	bb	B_bb
CH	ch	CH_ch
CH	t	CH_t
CH	tch	CH_tch
CH	ti	CH_ti
D	d	D_d
D	dd	D_dd
E long /ē/	e	Elong_e
E long /ē/	ea	Elong_e_e
E long /ē/	ea-e	Elong_ea
E long /ē/	ee	Elong_ea_e
E long /ē/	e-e	Elong_ee
E long /ē/	ei	Elong_ei
E long /ē/	ey	Elong_ey
E long /ē/	i	Elong_i
E long /ē/	ie	Elong_i_e
E long /ē/	i-e	Elong_ie

Phoneme	Grapheme	Walker Code
E long /ē/	ie-e	Elong_ie_e
E long /ē/	y	Elong_y
E short /e/	e	Eshort_e
E short /e/	ea	Eshort_e_e
E short /e/	e-e	Eshort_ea
F	f	F_f
F	ff	F_ff
F	ph	F_ph
G	g	G_g
G	gg	G_gg
G	gh	G_gh
G	gu	G_gu
G	gue	G_gue
H	h	H_h
I long /ī/	i	Ilong_i
I long /ī/	ie	Ilong_ie
I long /ī/	i-e	Ilong_i_e
I long /ī/	igh	Ilong_igh
I long /ī/	y	Ilong_y
I long /ī/	y-e	Ilong_y_e

Phoneme	Grapheme	Walker Code
I short /i/	a-e	Ishort_a_e
I short /i/	ai	Ishort_ai
I short /i/	ei	Ishort_ei
I short /i/	i	Ishort_i
I short /i/	i-e	Ishort_i_e
I short /i/	ui	Ishort_ui
I short /i/	y	Ishort_y
J	d	J_d
J	dge	J_dge
J	g	J_g
J	gi	J_gi
J	j	J_j
K	c	K_c
K	cc	K_cc
K	ch	K_ch
K	ck	K_ck
K	k	K_k
K	que	K_que
/ks/	cs	KSunvoiced_cs
/ks/	x	KSunvoiced_x

Phoneme	Grapheme	Walker Code
/kw/	qu	KW_qu
/kz/	x	KZvoiced_x
L	el	L_el
L	l	L_l
L	le	L_le
L	ll	L_ll
M	lm	M_lm
M	m	M_m
M	mb	M_mb
M	mm	M_mm
N	en	N_en
N	gn	N_gn
N	kn	N_kn
N	n	N_n
N	nn	N_nn
N	on	N_on
NG	n	NG_n
NG	ng	NG_ng
O broad /ô/	a	Obroad_a
O broad /ô/	au	Obroad_au

Phoneme	Grapheme	Walker Code
O broad /ô/	augh	Obroad_augh
O broad /ô/	aw	Obroad_aw
O broad /ô/	o	Obroad_o
O broad /ô/	o(r)	Obroad_o_r
O broad /ô/	o-e	Obroad_o_e
O broad /ô/	ough	Obroad_ough
O long /ō/	o	Olong_o
O long /ō/	oa	Olong_oa
O long /ō/	oe	Olong_oe
O long /ō/	o-e	Olong_o_e
O long /ō/	ou	Olong_ou
O long /ō/	ou-e	Olong_ou_e
O long /ō/	ow	Olong_ow
O short /o/	a	Oshort_a
O short /o/	o	Oshort_o
O short /o/	o-e	Oshort_o_e
OI diphthong /oi/	oi	OIdipthong_oi
OI diphthong /oi/	oy	OIdipthong_oy
OO short /oo/	o	OOshort_o
OO short /oo/	oo	OOshort_oo

Phoneme	Grapheme	Walker Code
OO short /oo/	u	OOshort_u
OO short /oo/	u-e	OOshort_u_e
OU diphthong /ou/	ou	OUdipthong_ou
OU diphthong /ou/	ow	OUdipthong_ow
P	p	P_p
P	pp	P_pp
R	r	R_r
R	rh	R_rh
R	rr	R_rr
R	wr	R_wr
S	c	S_c
S	ps	S_ps
S	s	S_s
S	ss	S_ss
Schwa R & Short U + R /ə/ & /u/	ar	SchwaShortU_R_ar
Schwa R & Short U + R /ə/ & /u/	ear	SchwaShortU_R_ear
Schwa R & Short U + R /ə/ & /u/	er	SchwaShortU_R_er
Schwa R & Short U + R /ə/ & /u/	er-e	SchwaShortU_R_er_e
Schwa R & Short U + R /ə/ & /u/	ir	SchwaShortU_R_ir
Schwa R & Short U + R /ə/ & /u/	or	SchwaShortU_R_or

Phoneme	Grapheme	Walker Code
Schwa R & Short U + R /ə/ & /u/	our	SchwaShortU_R_our
Schwa R & Short U + R /ə/ & /u/	ur	SchwaShortU_R_ur
SH	ch	SH_ch
SH	ci	SH_ci
SH	s	SH_s
SH	sh	SH_sh
SH	si	SH_si
SH	ssi	SH_ssi
SH	ti	SH_ti
SH	tion	SH_tion
T	bt	T_bt
T	ed	T_ed
T	t	T_t
T	tt	T_tt
TH voiced	th	THvoiced_th
TH voiceless	th	THunvoiced_th
U long OO long /ū/ and / o͞o /	eu	U_OOlong_eu
U long OO long /ū/ and / o͞o /	ew	U_OOlong_ew
U long OO long /ū/ and / o͞o /	o-e	U_OOlong_o_e
U long OO long /ū/ and / o͞o /	oo	U_OOlong_oo

Phoneme	Grapheme	Walker Code
U long OO long /ū/ and / o͞o /	oo-e	U_OOlong_oo_e
U long OO long /ū/ and / o͞o /	ou	U_OOlong_ou
U long OO long /ū/ and / o͞o /	u	U_OOlong_u
U long OO long /ū/ and / o͞o /	ue	U_OOlong_ue
U long OO long /ū/ and / o͞o /	u-e	U_OOlong_u_e
U Short and schwa /u/ & /ə/	a	UshortSchwa_a
U Short and schwa /u/ & /ə/	u	UshortSchwa_u
U Short and schwa /u/ & /ə/	e	UshortSchwa_e
U Short and schwa /u/ & /ə/	e-e	UshortSchwa_e_e
U Short and schwa /u/ & /ə/	eo	UshortSchwa_eo
U Short and schwa /u/ & /ə/	i	UshortSchwa_i
U Short and schwa /u/ & /ə/	ie	UshortSchwa_ie
U Short and schwa /u/ & /ə/	o	UshortSchwa_o
U Short and schwa /u/ & /ə/	o-e	UshortSchwa_o_e
U Short and schwa /u/ & /ə/	oo-e	UshortSchwa_oo_e
U Short and schwa /u/ & /ə/	ou	UshortSchwa_ou
U Short and schwa /u/ & /ə/	u-e	UshortSchwa_u_e
U Short and schwa /u/ & /ə/	y	UshortSchwa_y
V	v	V_v
W	u	W_u

Phoneme	Grapheme	Walker Code
W	w	W_w
WH /hw/	wh	WH_HW_wh
Y	i	Y_i
Y	y	Y_y
Z	es	Z_es
Z	s	Z_s
Z	ss	Z_ss
Z	z	Z_z
Z	zz	Z_zz
ZH	g	ZH_g
ZH	s	ZH_s
ZH	si	ZH_si

APPENDIX C

LITERATURE BOOKS INCLUDED IN STUDY

Title	Author
About Birds: A Guide for Children	Sill, Cathryn
Addie Meets Max	Robins, Joan
Addie's Bad Day	Robins, Joan
Admitting Mistakes	Amos, Janine
Aggie and Will	Brimner, Larry Dane
Airedale Terriers	Rake, Jody Sullivan
Airplanes	Saunders-Smith, Gail
All About Light	Trumbauer, Lisa
Altoona Baboona	Bynum, Janie
Amazon Sun, Amazon Rain	de la Piedra, Ximena
Amelia Bedelia Goes Camping	Parish, Peggy
Animal Hours	Manning, Linda
Ant Plays Bear	Byars, Betsy
Apple Pie Tree, The	Hall, Zoe
Apples and More Apples	Smith, Michael K.

Title	Author
Are We There Yet?	Mackall, Dandi Daley
At the Barbershop	Porter, Gracie R.
At the Crossroads	Isadora, Rachel
Away Go the Boats	Hillert, Margaret
Babar's Picnic	Brunhoff, Laurent de
Babies Can't Eat Kimchee!	Patz, Nancy
Babies on the Go	Ashman, Linda
Baby Duck and the Bad Eyeglasses	Hest, Amy
Badgers	Murphy, Patricia J.
Baghead	Krosoczka, Jarrett J.
Band of Dirty Pirates, A	Harvey, Damian
Barbie as the Island Princess	Alberto, Daisy
Barn Owls	Whitehouse, Patricia
Beaks and Feet	O'Neil, Sarah
Bear Dreams	Cooper, Elisha
Bear's Christmas Star	d'Allancé, Mireille

Title	Author
B. Bears and the Missing Dinosaur Bone, The	Berenstain, Stan
Berry Big Storm, The	Bryant, Megan E.
Best Vacation Ever, The	Murphy, Stuart
Big Bad Wolf	Masurel, Claire
Big Brother Little Brother	Dale, Penny
Big Honey Hunt, The	Berenstain, Stan
Big Race, The	Minden, Cecilia
Big Wooly Sweater, The	Harvey, Damian
Birds' Nests	Noonan, Diana
Birthday Dog	Cowley, Joy
Biscuit's Graduation Day	Capucilli, Alyssa Satin
Biscuit's New Trick	Capucilli, Alyssa Satin
Boa Constrictors	Frost, Helen
Bounce	Cronin, Doreen
Bug, a Bear, and a Boy, A	McPhail, David
Buz	Egielski, Richard

Title	Author
Camping Trip	Jones, Christianne C.
Carrots	Saunders-Smith, Gail
Cat and Mouse: A Delicious Tale	Oh, Jiwon
Changing Caterpillar, The	Shahan, Sherry
Charles M. Schulz	Carlson, Cheryl
Chickens	Macken, JoAnn Early
Christmas is Here!	Ciminera, Siobhan
Christmas Mice!	Roberts, Bethany
Circus Animal Acts	Jordan, Denise M.
City Animals	Costain, Meredith
Class Play with Ms. Vanilla, A	Ehrlich, Fred
Clever Penguins, The	Randell, Beverley
Clifford's Tricks	Bridwell, Norman
Cluck, Cluck Who's There?	Mayhew, James
Cock-a-Doodle-Moo!	Most, Bernard
Cold Days	Burke, Jennifer S.

Title	Author
Colors	Granowsky, Alvin
Come Fly with Me	Ichikawa, Satomi
Come on, Tim	Giles, Jenny
Communities	Saunders-Smith, Gail
Coral Reefs	Macken, JoAnn Early
Cori Plays Football	Florie, Christine
Costumes	Schaefer, Lola M.
Country Bear's Good Neighbor	Brimner, Larry Dane
Crickets	Coughlan, Cheryl
D.W. All Wet	Brown, Marc
Dad's Dinosaur Day	Hearn, Diane
Day Mom Finally Snapped, The	Temple, Bob
Day with a Doctor, A	Kottke, Jan
Deer and the Crocodile, The	Traill, Leanna
Did You See Chip?	Yee, Wong Herbert
Digby	Hazen, Barbara Shook

Title	Author
Dog, The	Ward, Laura
Dora's Magic Watering Can	Rao, Lisa
Dragonfly Returns	Hartley, Linda
Dragsters	Werther, Scott P.
Dreams	Keats, Ezra Jack
Eels	Rake, Jody Sullivan
Elephants Swim	Riley, Linda Capus
Elk	Macken, JoAnn Early
Eloise and the Very Secret Room	Weiss, Ellen
Eloise Decorates for Christmas	McClatchy, Lisa
Eloise Has a Lesson	McNamara, Margaret
Enjoy! Enjoy!	Prince, Sarah
Farmers Market	Parks, Carmen
Fire Engine Man	Zimmerman, Andrea
Fireflies	Coughlan, Cheryl
Five Little Monkeys Sitting in a Tree	Christelow, Eileen

Title	Author
Fix-It	McPhail, David
Flannel Kisses	Brennan, Linda Crotta
Flip Flop	Rice, R. Hugh
Fran's Flower	Bruce, Lisa
Friend for Minerva Louise, A	Stoeke, Janet Morgan
Fright in the Night, A	Hunt, Roderick
Froggy's Baby Sister	London, Jonathan
Gaspard in the Hospital	Gutman, Anne
Geraldine's Blanket	Keller, Holly
Gingerbread Boy, The	Ziefert, Harriet
Go Away, Dog	Nodset, Joan L.
God's Quiet Things	Sweetland, Nancy
Goggles!	Keats, Ezra Jack
Good Dog, Daisy!	Kopper, Lisa
Good-Bye Book, The	Viorst, Judith
Good-bye Summer, Hello Fall	Singer, Irma

Title	Author
Goodnight Moon	Brown, Margaret Wise
Gossie and Gertie	Dunrea, Olivier
Grandpa's Candy Store	Podoshen, Lois
Green Foods	Whitehouse, Patricia
Grub E. Dog	Newman, Al
Hair	Schaefer, Lola M.
Halloween	Behn, Harry
Halloween Mice!	Roberts, Bethany
Happy Birthday, Danny and the Dinosaur!	Hoff, Syd
Happy Birthday, Monster!	Beck, Scott
Happy Thanksgiving, Biscuit!	Capucilli, Alyssa Satin
Harry, I Need You!	Chwast, Seymour
Has Anyone Seen My Emily Greene?	Mazer, Norma Fox
Hattie and the Fox	Fox, Mem
Hello Creatures!	Garland, Peter
Hello Toes! Hello Feet!	Paul, Ann Whitford

Title	Author
Help	Riley, Susan
Henny-Penny	Ziefert, Harriet
Hi, Fly Guy!	Arnold, Tedd
Hold Tight!	Prater, John
Hop on Pop	Seuss, Dr.
House on the Hill, The	Randell, Beverley
Hungry Monster, The	Root, Phyllis.
Hush! A Gaelic Lullaby	Gerber, Carole
I Am a Good Citizen	Salzmann, Mary Elizabeth
I Am an Apple	Marzollo, Jean
I Am Generous	Schuette, Sarah L.
I Am Snow	Marzollo, Jean
I Can Ice Skate	Eckart, Edana
I Can Tell the Truth	Guntly, Jenette Donovan
I Feel Happy	Bryant-Mole, Karen
I Feel Happy	Doudna, Kelly

Title	Author
I Hate to Go to Bed!	Davis, Katie
I See the Moon	Appelt, Kathi
I Swapped My Dog	Ziefert, Harriet
I'll Do It Later	Tidd, Louise Vitellaro
I'm Good at Making Music	Day, Eileen M.
In the Ring with Goldberg	Payan, Michael
In the Tall, Tall Grass	Fleming, Denise
Inch by Inch	Lionni, Leo
Is That You, Winter?	Gammell, Stephen
Is Your Mama a Llama?	Guarino, Deborah
It's a Beautiful Day!	Haddon, Jean
It's Library Day	Stoeke, Janet Morgan
Jasper's Beanstalk	Butterworth, Nick
Jen Plays	Blackaby, Susan
Joseph Had a Little Overcoat	Taback, Simms
Julius's Candy Corn	Henkes, Kevin

Title	Author
Just a Baseball Game	Mayer, Gina
Just a New Neighbor	Mayer, Gina
Just Camping Out	Mayer, Mercer
Just Shopping with Mom	Mayer, Mercer
Kate Skates	O'Connor, Jane
Katie Did It	McDaniel, Becky
Keep Your Distance!	Herman, Gail
Kick, Pass, and Run	Kessler, Leonard
Kids Like Us	Schaefer, Carole Lexa
Kiss for Little Bear, A	Minarik, Else
Kitten Book, The	Pfloog, Jan
Koalas	Pohl, Kathleen
Krong!	Parsons, Garry
Leo the Late Bloomer	Kraus, Robert
Leon and Bob	James, Simon
Let's Get Ready for Valentine's Day	Douglas, Lloyd G.

Title	Author
Let's Go by Train	Hanson, Anders
Let's Go to a Baseball Game	Hill, Mary
Let's Go to a Play	Hill, Mary
Let's Go, Froggy!	London, Jonathan
Let's Look at Animal Feathers	Perkins, Wendy
Let's Play Baseball!	DeGezelle, Terri
Life Cycle of a Frog, The	Trumbauer, Lisa
Life Cycle of a Turtle, The	Trumbauer, Lisa
Life Cycles: From Caterpillar to Butterfly	Hewitt, Sally
Lightning Liz	Brimner, Larry Dane
Little Cloud	Carle, Eric
Little One, We Knew You'd Come	Lloyd-Jones, Sally
Little Red Hen, The	Ziefert, Harriet
Living on a Mountain	Winne, Joanne
Lost Ball, The	Reiser, Lynn
Magic Porridge Pot, The	Ziefert, Harriet

Title	Author
Magic Rabbit, The	Watson, Richard Jesse
Making Butter	Feely, Jenny
Mama Cat Has Three Kittens	Fleming, Denise
Mama Zooms	Cowen-Fletcher, Jane
Marco Flamingo	Jarkins, Sheila
Marvin K. Mooney Will You Please Go Now!	Seuss, Dr.
Meat	Klingel, Cynthia
Messy Bessey's Closet	McKissack, Patricia C.
Mike's Night-Light	Kalz, Jill
Milk and Cheese	Klingel, Cynthia
Missing Mittens	Murphy, Stuart J.
Mo and Jo: Fighting Together Forever	Haspiel, Dean
Mole Sisters and the Question, The	Schwartz, Roslyn
Molly's Store	Sweeney, Jacqueline
Monk Camps Out	McCully, Emily Arnold
Monster Math	Miranda, Anne

Title	Author
Monster Under the Bed, The	Eaton, Deborah
Months	Rondeau, Amanda
Moon (Revised Edition) , The	Rustad, Martha E.H.
Moon Jump: A Countdown	Brown, Paula
More Spaghetti, I Say!	Gelman, Rita Golden
Mouse Shapes	Walsh, Ellen Stoll
Mr Gumpy's Motor Car	Burningham, John
Mr. Gumpy's Outing	Burningham, John
Mucky Duck	Grindley, Sally
My Best Friend Is out of This World	Albee, Sarah
My Brother, the Pest	Bernstein, Margery
My Bunny and Me	George, Lindsay Barrett
My Dog Toby	Zimmerman, Andrea
My Five Book (My Number Books)	Moncure, Jane Belk
My Sister June	Eaton, Deborah
My Two Book (My First Step to Math)	Moncure, Jane Belk

Title	Author
My Very Big Little World	Reynolds, Peter H.
Nana's Place	Gibson, Akimi
Naughty Puppy, The	Powell, Jillian
Never Say Goodbye	Gant, Lea Gillespie
New Kid in Town	Mayer, Mercer
Nina, Nina Star Ballerina	O'Connor, Jane
No Monsters Here	Jennings, Sharon
No More Bottles for Bunny!	Ford, Bernette
No More Diapers for Ducky!	Ford, Bernette
No More Monsters for Me	Parish, Peggy
No, No, Titus!	Masurel, Claire
Octopuses	Schaefer, Lola M.
Off to Bethlehem!	Mackall, Dandi Daley
Old Black Fly	Aylesworth, Jim
Olivia Saves the Circus	Falconer, Ian
On a Wintry Morning	Chaconas, Dori

Title	Author
On the Launch Pad	Dahl, Michael
One Gorilla	Morozumi, Atsuko
One Happy Classroom	Simon, Charnan
P.J. Funnybunny Camps Out	Sadler, Marilyn
Peedie	Dunrea, Olivier
Pelicans	Pohl, Kathleen
Penrod's Pants	Christian, Mary Blount
Percy the Mailman	Graves, Sue
Pianos (Child's World)	Klingel, Cynthia
Pigs in the Mud in the Middle of the Rud	Plourde, Lynn
Pillow Fight	Rossi, Rich
Pine Trees	Freeman, Marcia S.
Place for Nicholas, A	Floyd, Lucy
Plants	Feely, Jenny
Police Officers Protect People	Greene, Carol
Policeman Small	Lenski, Lois

Title	Author
Potty!	Freeman, Mylo
Princess and the Pea, The	Ziefert, Harriet
Prodigal Son, The	Amery, Heather
Pssst!	Rex, Adam
Pudgy: A Puppy to Love	Goodhart, Pippa
Pup and Hound Hatch an Egg	Hood, Susan
Pup and Hound Move In	Hood, Susan
Pup and Hound Stay Up Late	Hood, Susan
Puppies and Piggies	Rylant, Cynthia.
Pup's Prairie Home	Redmond, Shirley Raye
Pushing	Whitehouse, Patricia
Quick as a Cricket	Wood, Audrey
Quick, Quack, Quick!	Arnold, Marsha
Quotation Marks	Salzmann, Mary Elizabeth
Rabbit's Party	Bunting, Eve
Railroad Toad	Schade, Susan

Title	Author
Rain Romp: Stomping Away a Grouchy Day	Kurtz, Jane.
Ready, Alice?	Haley, Amanda
Rectangles	Burke, Jennifer S.
Red Foxes	Levine, Michelle
Ringo Saves the Day!	Clements, Andrew
Roast and Toast	Farber, Erica
Rockheads	Ziefert, Harriet
Royal Broomstick, The	Amery, Heather
Royal Goose, The	Rothman, Cynthia
Ruby's Dinnertime	Rogers, Paul
Sam's Pet	Simon, Charnan
Saturn	Adamson, Thomas K.
Scruffy	Parish, Peggy
Sea Horses (Capstone)	Schaefer, Lola M.
Sebastian's Special Present	Prince, Sarah
Setting the Turkeys Free	Nikola-Lisa, W.

Title	Author
Seven Blind Mice	Young, Ed
Shape of Me and Other Stuff	Seuss, Dr.
Shark Pup Grows Up, A	Zollman, Pam
Sheep out to Eat	Shaw, Nancy
Shintaro's Umbrellas	Jackson, Marjorie
Simon's Disguise	Tibo, Gilles
Sir Mike	Black, Robyn Hood
Skateboard Fun	Caitlin, Stephen
Skin	Klingel, Cynthia
Snow	McKié, Roy
Snow Day Dance	Hubbell, Will
Snowballs	Ehlert, Lois
Snowplows	Randolph, Joanne
Someone Says	Schaefer, Carole Lexa
Someone Special Died	Prestine, Joan Singleton
Sounds Like Fun	Rau, Dana Meachen

Title	Author
Special Day for Mommy, A	Andreasen, Dan
Springs	O'Neil, Sarah
Squids	Rake, Jody Sullivan
Star Spangled Banner, The	Lilly, Melinda
Starfish	Douglas, Lloyd G.
Stella, Star of the Sea	Gay, Marie-Louise
Storms!	Editors of Time for Kids
Strongest Animal, The	Boland, Janice
Sunshine, Moonshine	Armstrong, Jennifer
Supertwins and Tooth Trouble	James, Brian
Ten Little Fish	Wood, Audrey
Ten, Nine, Eight	Bang, Molly
Thanksgiving Is Here!	Goode, Diane
There's a Monster Under My Bed	Howe, James
This Is Baseball	Blackstone, Margaret
This Little Piggy's Book of Manners	Allen, Kathryn Madeline

Title	Author
Thomas Had a Temper	Saltis, Nicki
Three by the Sea	Marshall, Edward
Three Little Kittens	Galdone, Paul
Tidy Titch	Hutchins, Pat
Tiger Can't Sleep	Fore, S.J.
To the Beach!	Ashman, Linda
To the Rescue	Hughes, Monica
To the Tub	Anderson, Peggy Perry
Tomás Rivera	Medina, Jane
Tortoise and the Baboon, The	Howell, Gill
Touching	Frost, Helen
Tough Boris	Fox, Mem
Trains	Hill, Lee Sullivan
Trees Are Terrific!	Trumbauer, Lisa
Trouble on the T-Ball Team	Bunting, Eve
Tuckerbean	Kalz, Jill

Title	Author
Turkeys Together	Wallace, Carol
Ugly Duckling, The	Ziefert, Harriet
Uncles (Revised Edition)	Schaefer, Lola M.
Unicorn Wings	Loehr, Mallory
Very Best Doll, The	Noonan, Julia
Visiting Langston	Perdomo, Willie
Wake Up, Sun	Harrison, David
Warthogs in the Kitchen	Edwards, Pamela Duncan
Watch out for the Chicken Feet in Your Soup	De Paola, Tomie
Watch out for Whales	Holden, Pam
Waving Sheep, The	Randell, Beverley
Welcome to the Circus!	Jordan, Denise M.
We're Going on a Bear Hunt	Rosen, Michael J.
What Can I Hear?	Barraclough, Sue
What Do You Dream?	Kimmel, Elizabeth Cody
What Is a Wheel and Axle?	Douglas, Lloyd G.

Title	Author
What's That Noise?	Edwards, Michelle
When Poppy and Max Grow Up	Gardiner, Lindsey
When Sophie Gets Angry--Really, Really, Angry	Bang, Molly
When the New Baby Comes, I'm Moving Out	Alexander, Martha G.
Where Robins Fly	Holmes, Anita
Who Hoots?	Davis, Katie
Who'll Pull Santa's Sleigh Tonight?	Rader, Laura
Why We Have Thanksgiving	Hillert, Margaret
Will Goes to the Beach	Landström, Olof
Willy and Hugh	Browne, Anthony
Winners Never Quit!	Hamm, Mia
Winter	Thayer, Tanya

APPENDIX D

DECODABLE PHONICS READERS INCLUDED IN STUDY

Title	Author
Alberto Goes to the Beach	Ross, Linda
All Kinds of Boats	Rose, Emma
All Wet	Donovan, Barbara
At the Animal Refuge	Woods, Chuck
At the Duck Pond	Waters, Carrie
Away at Day Camp	Ross, Linda
Baby's Sunny Room	Ross, Linda
Bake Sale, The	Shulman, Lisa
Be Safe on Your Bike	Clendaniel, Morgan
Best Fudge, The	Burton, Marilee
Big Pig, The	Burton, Marilee
Big Thank You, A	Donovan, Barbara
Bike Meet, The	Clendaniel, Morgan
Bike Race, The	Shulman, Lisa
Birds, Birds, Birds	Lewis, Kathryn

Title	Author
Bunny's Funny Hat	Roberts, Leya
By the Blue Sea	Ross, Linda
Camping in July	Ross, Linda
Camping with Patch and Roy	Donovan, Barbara
Cat Cap, The	Burton, Marilee
Cat's Skit	Donovan, Barbara
Come and Meet Pebble	Robert, Emily N.
Country Sounds, Town Sounds	Donovan, Barbara
Day at the Fair, A	Shulman, Lisa
Dog's Plan	Ryan, Dorothy
Dolls Spin	Donovan, Barbara
Donkey in the Chimney, The	Woods, Chuck
Drawing Just for Me, A	Rose, Emma
Explore our Country	Donovan, Barbara
Fable About A Mouse and a Cow, A	Robert, Emily N.
Fiddle Time	Donovan, Barbara

Title	Author
Five in a Van	Giglio, Judy
Flu Bug, The	Shulman, Lisa
Fox, not Ox	Burton, Marilee
Frog and the Figs	Goldish, Meish
Fun with Uncle Steve	Donovan, Barbara
Gentleman and the Eagle, The	Woods, Chuck
Get Out!	Donovan, Barbara
Get Well Wish, A	Ross, Linda
Gingerbread Man, The	Dobeck, Maryann
Go Into a Cave	Donovan, Barbara
Greedy King Phinny	Benjamin, Cynthia
Hal Has a Pal	Goldish, Meish
Halls' Yard Sale, The	Donovan, Barbara
Helpful Animals	O'Brien, Debbie
Here Comes Pete the Pig	Melton, Holly
Hobgoblin Saves the Atlantic, A	Benjamin, Cynthia

Title	Author
How to Make a Pie	Eisenstark, Reyna
Hurt Bird, The	Lewis, Kathryn
I Bring the Mail	Eisenstark, Reyna
I Pick Zack	Benjamin, Cynthia
Ice Skates for Suzett	Ross, Linda
In a Boat at Dawn	Rose, Emma
It Helps to Have a Big Brother	Roberts, Leya
It's Time to Unpack	Ross, Linda
Jack and the Great Bean Plant	Sharp, Katie
Joy of Camping, The	Donovan, Barbara
Joy's Trip to the Toy Shop	O'Brien, Debbie
Just Jump	Ross, Linda
King's Thanks, The	Shulman, Lisa
Let's Go to School	Singer, Irma
Let's Look for Birds	Lewis, Kathryn
Life on a Farm	Lewis, Kathryn

Title	Author
Little Riddle Book, The	Dellies, Margaret
Lost on a Farm!	Lewis, Kathryn
Mark Writes a Letter	Ross, Linda
Matt, a Cat, and Me	Daniels, Paul
Meet Miss Shine	Singer, Irma
Men from Smog	Burton, Marilee
Ms. Keith's New Hat	Floyd, Lucy
My Brother's Candy	Eisenstark, Reyna
Off We Go in a Jet	Giglio, Judy
One Bike and One Trik	Clendaniel, Morgan
Our Friend, the Little Brown Bat	Benjamin, Cynthia
Painting to Music	Ross, Linda
Pet Time at School	Singer, Irma
Phil the Gerbil	Goldish, Meish
Picnic at the Pond , The	Waters, Carrie
Pie Contest, The	Eisenstark, Reyna

Title	Author
Pie Thief, The	Eisenstark, Reyna
Pigs Can Sleep	Benjamin, Cynthia
Plan and Toss	Rose, Emma
Pop It, Toss It	Dobeck, Maryann
Princess Cindy on Her own	Melton, Holly
Ride in Pig's Boat, A	Rose, Emma
Robbie's Apple Pie	Floyd, Lucy
Roy's Best Toy	Benjamin, Cynthia
Sandy's Crispy Candy	Eisenstark, Reyna
Signs to Know	Goldish, Meish
Simon Paints a Fence	Ross, Linda
Skit, The	Donovan, Barbara
Soccer Player, The	Shulman, Lisa
Something Grand	Burton, Marilee
Something Odd	Donovan, Barbara
Sounds Around You	Donovan, Barbara

Title	Author
Spin, Spin	Donovan, Barbara
Sports	Shulman, Lisa
Sprint to the Frog Pond, A	Paulson, Stephen
Storm, The	Shulman, Lisa
Stu Duck at the Pond	Waters, Carrie
Such Good Bugs	Burton, Marilee
Sue's Blue Marble	Benjamin, Cynthia
Thanks to Moms and Dads	Donovan, Barbara
Thanks, Miss Long	Donovan, Barbara
They Help Me	Orford, Caroline
Three Billy Goats Gruff, The	Shulman, Lisa
Tiny Plants, Big Plants	Melton, Holly
To Val from Jen	Giglio, Judy
Top and an Ant, A	Donovan, Barbara
Tory's Wonderful Surprise	Benjamin, Cynthia
Tough Enough	Burton, Marilee

Title	Author
Toys' Picnic, The	O'Brien, Debbie
Trip to a Candy Shop, A	Eisenstark, Reyna
Troy's Toy	O'Brien, Debbie
Turtle and the Bird, The	Melton, Holly
Twins Swim, The	Shulman, Lisa
Two Animals to Study	Shulman, Lisa
Uncle Bill and the Snake	Faye, Ann
Under the Big Blue Sea	Ross, Linda
Waiting Game, The	Eisenstark, Reyna
Water, Water	Floyd, Lucy
What Can You See on a Farm?	Lewis, Kathryn
What Is a Skit?	Donovan, Barbara
What Is My Job?	O'Brien, Debbie
What Made That Sound?	Donovan, Barbara
White Box, The	Donovan, Barbara
Who Helps?	Menzies, Ellen

Title	Author
Who Is Fast?	Crockett, Laura E.
Why Cubs Have Shorter Tails	Floyd, Lucy
Workers Come to School	O'Brien, Debbie

APPENDIX E

WORDS ANALYZED IN STUDY

Words With Frequency Greater Than Ten

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
THE	4518	1016	5534	1	1
A	2532	615	3147	2	2
AND	2186	346	2532	3	6
I	2060	439	2499	4	4
TO	1971	469	2440	5	3
SAID	1355	418	1773	6	5
YOU	1235	321	1556	7	7
IS	1149	300	1449	8	8
IT	1082	238	1320	9	9.5
IN	988	238	1226	11	9.5
HE	1018	178	1196	10	11
OF	752	159	911	12	13
ON	750	142	892	13	15
WE	682	125	807	15	19
ARE	672	108	780	16	21
MY	691	84	775	14	35
THEY	597	133	730	19	17
WAS	607	121	728	18	20

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SHE	617	89	706	17	32.5
FOR	525	132	657	20	18
CAN	459	164	623	23	12
WHAT	481	95	576	21	28.5
BUT	474	83	557	22	36.5
THAT	443	106	549	25	22.5
HIS	440	97	537	26	27
ME	450	83	533	24	36.5
GO	431	88	519	27	34
DO	419	95	514	30	28.5
HAVE	417	93	510	31	30
THIS	347	155	502	39	14
NOT	395	106	501	33	22.5
UP	421	73	494	29	39
AT	349	140	489	38	16
ALL	424	36	460	28	83
WITH	385	70	455	34	41
LIKE	364	89	453	36	32.5
WILL	345	105	450	40	24
LITTLE	400	49	449	32	59
HER	374	58	432	35	48

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
OUT	357	41	398	37	72.5
ONE	342	55	397	41	50.5
BE	274	102	376	47	26
THEN	266	92	358	49	31
NO	311	42	353	42	70.5
THERE	287	62	349	43	44
SO	283	62	345	44.5	44
MOM	235	103	338	55	25
NOW	283	36	319	44.5	83
YOUR	262	51	313	50	56.5
TOO	268	43	311	48	68.5
BIG	253	57	310	51	49
WHEN	281	19	300	46	173.5
GET	218	78	296	61	38
SOME	232	55	287	56	50.5
LOOK	226	59	285	57	46.5
GOOD	236	47	283	54	62.5
HAD	218	62	280	61	44
COME	239	40	279	52.5	74.5
SEE	205	71	276	67	40
FROM	217	51	268	63	56.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SAYS	239	28	267	52.5	112
AS	224	40	264	58.5	74.5
DAY	218	34	252	61	91
OUR	224	25	249	58.5	127.5
HERE	213	36	249	65	83
BACK	199	50	249	70	58
TIME	199	48	247	70	60
DOG	201	44	245	68	66.5
HIM	207	36	243	66	83
DID	196	47	243	75	62.5
THEIR	197	44	241	73.5	66.5
DOWN	216	20	236	64	160.5
ASKED	193	42	235	76	70.5
JUST	176	53	229	81	54
HOW	199	25	224	70	127.5
WENT	185	39	224	78	76.5
VERY	198	16	214	72	203
THEM	167	47	214	82	62.5
PLAY	187	26	213	77	122.5
HELP	158	52	210	85	55
TWO	179	28	207	79	112

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
DAD	135	69	204	97	42
INTO	155	43	198	87.5	68.5
OH	197	0	197	73.5	4148.5
WANT	166	30	196	83	102
HAS	155	41	196	87.5	72.5
MAKE	160	35	195	84	88
AWAY	177	13	190	80	250.5
KNOW	157	20	177	86	160.5
MOTHER	152	21	173	89	150.5
GOT	134	38	172	98.5	78.5
HOME	138	33	171	94	94.5
COULD	110	59	169	119	46.5
CAT	131	37	168	101	80
AN	139	25	164	92.5	127.5
WHO	134	27	161	98.5	118.5
BY	139	21	160	92.5	150.5
OVER	141	18	159	90	184.5
EAT	140	19	159	91	173.5
OR	126	33	159	106	94.5
WERE	126	29	155	106	105.5
GOING	133	21	154	100	150.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
LOOKED	123	30	153	108	102
RIGHT	128	22	150	103	143
WHERE	128	22	150	103	143
IF	122	27	149	109	118.5
AROUND	126	21	147	106	150.5
PUT	116	31	147	113.5	99
WOULD	93	54	147	142.5	52.5
OFF	111	35	146	117.5	88
ABOUT	116	28	144	113.5	112
LONG	108	36	144	121	83
PEOPLE	88	54	142	151.5	52.5
BABY	136	5	141	95.5	608.5
AM	119	20	139	111	160.5
RAN	112	25	137	116	127.5
BEAR	136	0	136	95.5	4148.5
NIGHT	128	8	136	103	425.5
MORE	118	18	136	112	184.5
TAKE	111	23	134	117.5	137.5
THINK	104	29	133	127.5	105.5
WAY	113	19	132	115	173.5
FRIENDS	106	24	130	123.5	133

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
US	99	28	127	133	112
BALL	120	6	126	110	534
OTHER	98	28	126	134.5	112
SAW	105	20	125	125.5	160.5
WATER	92	33	125	146	94.5
FUN	92	31	123	146	99
SAY	108	14	122	121	231
RED	106	16	122	123.5	203
TREE	108	10	118	121	346.5
HOUSE	104	14	118	127.5	231
FLY	100	17	117	131	192.5
THREE	96	19	115	138.5	173.5
BED	105	9	114	125.5	383
TELL	92	22	114	146	143
AGAIN	100	13	113	131	250.5
CAME	92	19	111	146	173.5
FIND	92	19	111	146	173.5
OLD	97	12	109	136.5	278.5
MADE	88	20	108	151.5	160.5
THINGS	78	30	108	170	102
CALLED	100	6	106	131	534

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
NEXT	90	16	106	149	203
FOOD	86	20	106	154.5	160.5
MANY	79	26	105	167	122.5
FISH	83	20	103	160	160.5
NEED	78	25	103	170	127.5
NEW	89	13	102	150	250.5
WOOF	101	0	101	129	4148.5
FATHER	93	8	101	142.5	425.5
DOES	84	17	101	158	192.5
SNOW	96	4	100	138.5	732
THROUGH	94	6	100	141	534
SOMETHING	81	19	100	161.5	173.5
RUN	76	24	100	172	133
SMALL	95	4	99	140	732
ROOM	85	14	99	156	231
MONSTER	98	0	98	134.5	4148.5
HAPPY	84	14	98	158	231
MAMA	97	0	97	136.5	4148.5
YES	84	13	97	158	250.5
GOES	87	9	96	153	383
TOOK	74	22	96	176.5	143

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
DUCK	70	26	96	187.5	122.5
STOP	80	15	95	164	216
SCHOOL	66	28	94	201	112
FAST	59	35	94	214.5	88
ITS	72	21	93	182.5	150.5
BEST	67	26	93	197	122.5
STILL	71	21	92	185	150.5
BOY	79	12	91	167	278.5
ANIMALS	71	20	91	185	160.5
BIRDS	67	24	91	197	133
WHY	81	9	90	161.5	383
AFTER	74	16	90	176.5	203
SUN	86	3	89	154.5	898.5
FIVE	78	11	89	170	312
MAN	43	46	89	295.5	65
TODAY	75	13	88	174	250.5
SEA	68	20	88	193	160.5
SOON	56	31	87	226.5	99
THESE	52	35	87	242	88
NEVER	73	13	86	179.5	250.5
EVEN	69	16	85	190	203

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
REALLY	80	4	84	164	732
LIGHT	73	11	84	179.5	312
SLEEP	73	11	84	179.5	312
UNDER	72	12	84	182.5	278.5
TOP	56	28	84	226.5	112
FIRST	64	19	83	204	173.5
READY	79	3	82	167	898.5
PUP	80	0	80	164	4148.5
COMES	75	5	80	174	608.5
HEAR	70	10	80	187.5	346.5
LOVE	69	11	80	190	312
TOGETHER	67	12	79	197	278.5
EGGS	71	7	78	185	477.5
EACH	61	17	78	208.5	192.5
LET	59	19	78	214.5	173.5
FRIEND	63	14	77	205	231
ANOTHER	62	15	77	206.5	216
JUMP	60	17	77	211	192.5
GREEN	67	9	76	197	383
MAX	67	9	76	197	383
CRIED	75	0	75	174	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
CATCH	68	6	74	193	534
DARK	66	8	74	201	425.5
YELLED	56	18	74	226.5	184.5
MUST	51	23	74	248	137.5
MOON	73	0	73	179.5	4148.5
GROW	60	13	73	211	250.5
WELL	58	15	73	218.5	216
RIDE	40	33	73	324.5	94.5
MORNING	68	4	72	193	732
FOUND	66	6	72	201	534
PLEASE	61	11	72	208.5	312
WANTED	50	22	72	256.5	143
MISS	45	27	72	286	118.5
FEEL	65	6	71	203	534
LIVE1	56	15	71	226.5	216
ONLY	54	16	70	236	203
DOOR	69	0	69	190	4148.5
LOTS	57	11	68	221	312
GREAT	49	19	68	263.5	173.5
TRY	48	20	68	269	160.5
MAYBE	59	8	67	214.5	425.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
LEFT	56	11	67	226.5	312
SHEEP	62	4	66	206.5	732
BROTHER	55	11	66	232.5	312
LOOKS	51	15	66	248	216
FROG	37	29	66	351.5	105.5
ALWAYS	54	11	65	236	312
MUCH	48	17	65	269	192.5
LAST	47	18	65	275	184.5
FOX	41	24	65	314	133
PIE	18	47	65	691	62.5
EYES	60	4	64	211	732
SOMETIMES	59	5	64	214.5	608.5
MOUSE1	58	6	64	218.5	534
STAY	56	8	64	226.5	425.5
FEET	54	10	64	236	346.5
BUNNY	55	8	63	232.5	425.5
GAVE	50	13	63	256.5	250.5
WORK	50	13	63	256.5	250.5
THAN	50	12	62	256.5	278.5
THANK	46	16	62	280.5	203
BIKE	23	39	62	535.5	76.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
HEAD	58	3	61	218.5	898.5
INSIDE	53	8	61	239	425.5
HIGH	50	11	61	256.5	312
HOT	49	12	61	263.5	278.5
RABBIT	58	2	60	218.5	1154
CAR	56	4	60	226.5	732
TREES	54	6	60	236	534
ANY	51	9	60	248	383
MAKES	51	9	60	248	383
BOAT	48	12	60	269	278.5
SHOULD	39	21	60	333.5	150.5
PIG	24	35	59	516	88
GIVE	50	8	58	256.5	425.5
NICE	47	11	58	275	312
BETTER	46	12	58	280.5	278.5
KEEP	42	16	58	303	203
CANDY	20	38	58	610	78.5
COLD	52	5	57	242	608.5
LOST	51	6	57	248	534
WATCH	50	7	57	256.5	477.5
WHITE	47	10	57	275	346.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
NAME	40	17	57	324.5	192.5
SWIM	35	22	57	370	143
HAT	32	25	57	394	127.5
HELLO	56	0	56	226.5	4148.5
QUIET	56	0	56	226.5	4148.5
ROGERS	56	0	56	226.5	4148.5
FIRE	50	6	56	256.5	534
TOLD	48	8	56	269	425.5
COW	52	3	55	242	898.5
TURN	44	11	55	291	312
EVERY	43	12	55	295.5	278.5
HARD	43	12	55	295.5	278.5
PLACE	42	13	55	303	250.5
FLOP	54	0	54	236	4148.5
STAR	52	2	54	242	1154
SISTER	51	3	54	248	898.5
SHOW	45	9	54	286	383
SKY	45	9	54	286	383
BLUE	30	24	54	407	133
BROWN	41	12	53	314	278.5
KNEW	41	12	53	314	278.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
DOGS	35	18	53	370	184.5
COMING	52	0	52	242	4148.5
BAD	49	3	52	263.5	898.5
SIT	42	10	52	303	346.5
TAIL	40	12	52	324.5	278.5
MONSTERS	51	0	51	248	4148.5
HAIR	50	1	51	256.5	1739
BEEN	42	9	51	303	383
ICE	42	9	51	303	383
RAIN	38	13	51	341.5	250.5
WAIT	38	13	51	341.5	250.5
BRING	37	14	51	351.5	231
BIRD	24	27	51	516	118.5
SAM	50	0	50	256.5	4148.5
FALL	48	2	50	269	1154
TRIED	47	3	50	275	898.5
EVERYONE	45	5	50	286	608.5
BIRTHDAY	44	6	50	291	534
READ2	42	8	50	303	425.5
BEFORE	37	13	50	351.5	250.5
GRANDMA	49	0	49	263.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SHOO	48	1	49	269	1739
SING	39	10	49	333.5	346.5
LEAVES	48	0	48	269	4148.5
EVERYTHING	47	1	48	275	1739
ALONG	44	4	48	291	732
TURKEY	44	4	48	291	732
SHOUTED	41	7	48	314	477.5
YELLOW	37	11	48	351.5	312
KING	20	28	48	610	112
EGG	46	1	47	280.5	1739
PARTY	46	1	47	280.5	1739
AIR	42	5	47	303	608.5
TAKES	41	6	47	314	534
APPLE	36	11	47	361	312
BECAUSE	35	12	47	370	278.5
USE1	28	19	47	434	173.5
HONEY	46	0	46	280.5	4148.5
WALK	46	0	46	280.5	4148.5
SURE	45	1	46	286	1739
EVER	42	4	46	303	732
HEN	42	4	46	303	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
STOPPED	42	4	46	303	732
CHILDREN	41	5	46	314	608.5
OPEN	41	5	46	314	608.5
JUMPED	40	6	46	324.5	534
STARTED	37	9	46	351.5	383
BLACK	35	11	46	370	312
SAT	35	11	46	370	312
THOUGHT	34	12	46	378	278.5
WANTS	41	4	45	314	732
SIX	40	5	45	324.5	608.5
FOUR	38	7	45	341.5	477.5
HOLD	38	7	45	341.5	477.5
HANDS	37	8	45	351.5	425.5
ATE	35	10	45	370	346.5
TEN	34	11	45	378	312
GIRL	44	0	44	291	4148.5
HUNGRY	43	1	44	295.5	1739
TIGER	41	3	44	314	898.5
QUICK	39	5	44	333.5	608.5
UNTIL	37	7	44	351.5	477.5
MICE	34	10	44	378	346.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
KIDS	26	18	44	474.5	184.5
POND	26	18	44	474.5	184.5
TOY	11	33	44	1023.5	94.5
CIRCUS	42	1	43	303	1739
GROUND	41	2	43	314	1154
GARDEN	39	4	43	333.5	732
LOT	39	4	43	333.5	732
SPRING	35	8	43	370	425.5
GAME	33	10	43	385	346.5
BOOK	28	15	43	434	216
GRASS	28	15	43	434	216
MIGHT	28	15	43	434	216
MAY	26	17	43	474.5	192.5
CARE	40	2	42	324.5	1154
TEAM	37	5	42	351.5	608.5
START	28	14	42	434	231
MIKE	41	0	41	314	4148.5
LOVES	40	1	41	324.5	1739
HILL	37	4	41	351.5	732
WINGS	36	5	41	361	608.5
MOVE	33	8	41	385	425.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SAFE	28	13	41	434	250.5
TURTLE	21	20	41	579.5	160.5
PAINT	18	23	41	691	137.5
BEAUTIFUL	40	0	40	324.5	4148.5
FEATHERS	40	0	40	324.5	4148.5
PUSH	40	0	40	324.5	4148.5
NEST	36	4	40	361	732
QUACK	35	5	40	370	608.5
SOUND	28	12	40	434	278.5
ENOUGH	27	13	40	454.5	250.5
DADDY	39	0	39	333.5	4148.5
WARM	39	0	39	333.5	4148.5
ACROSS	39	0	39	333.5	4148.5
KITTENS	38	1	39	341.5	1739
OKAY	38	1	39	341.5	1739
HOP	35	4	39	370	732
APPLES	33	6	39	385	534
GETS	30	9	39	407	383
THING	29	10	39	416.5	346.5
DONE	27	12	39	454.5	278.5
ONCE	27	12	39	454.5	278.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
JO	17	22	39	728.5	143
MOMMY	38	0	38	341.5	4148.5
TOOTH	38	0	38	341.5	4148.5
FLEW	36	2	38	361	1154
GETTING	36	2	38	361	1154
YET	32	6	38	394	534
TENT	30	8	38	407	425.5
WORLD	29	9	38	416.5	383
COLOR	21	17	38	579.5	192.5
BOX	15	23	38	818.5	137.5
GRAN	5	33	38	1782	94.5
HOUND	37	0	37	351.5	4148.5
PAPA	37	0	37	351.5	4148.5
SOMEONE	37	0	37	351.5	4148.5
TRAIN	36	1	37	361	1739
FOLLOW	32	5	37	394	608.5
HAND	30	7	37	407	477.5
HIT	28	9	37	434	383
KIND	27	10	37	454.5	346.5
PRETTY	25	12	37	496	278.5
LARGE	18	19	37	691	173.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
IDEA	36	0	36	361	4148.5
OUTSIDE	28	8	36	434	425.5
SOUNDS	24	12	36	516	278.5
FINE	20	16	36	610	203
ALICE	35	0	35	370	4148.5
HEY	35	0	35	370	4148.5
WRONG	33	2	35	385	1154
BARN	30	5	35	407	608.5
PARK	26	9	35	474.5	383
LUCKY	22	13	35	554	250.5
EARTH	20	15	35	610	216
BOUNCE	34	0	34	378	4148.5
BUZZ	34	0	34	378	4148.5
CARS	33	1	34	385	1739
KITTEN	33	1	34	385	1739
STORE	28	6	34	434	534
LATER	27	7	34	454.5	477.5
COLORS	26	8	34	474.5	425.5
PET	26	8	34	474.5	425.5
SAD	25	9	34	496	383
ASKS	22	12	34	554	278.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
HELPS	22	12	34	554	278.5
WISH	21	13	34	579.5	250.5
SET	18	16	34	691	203
UNCLE	6	28	34	1579.5	112
FOOTBALL	33	0	33	385	4148.5
QUEEN	33	0	33	385	4148.5
WALKED	33	0	33	385	4148.5
TAP	32	1	33	394	1739
WAITING	28	5	33	434	608.5
OWN	25	8	33	496	425.5
FAR	24	9	33	516	383
MOST	24	9	33	516	383
FARM	20	13	33	610	250.5
GINGERBREAD	19	14	33	648.5	231
JOEY	32	0	32	394	4148.5
LISTEN	32	0	32	394	4148.5
NOSE	32	0	32	394	4148.5
NOTHING	32	0	32	394	4148.5
RAT	32	0	32	394	4148.5
TALL	31	1	32	400.5	1739
WHILE	30	2	32	407	1154

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
WINDOW	29	3	32	416.5	898.5
END	28	4	32	434	732
BEACH	26	6	32	474.5	534
YARD	26	6	32	474.5	534
PLAYED	25	7	32	496	477.5
TOMORROW	21	11	32	579.5	312
WET	21	11	32	579.5	312
ASK	20	12	32	610	278.5
LIKES	20	12	32	610	278.5
COUNTRY	14	18	32	864.5	184.5
DIFFERENT	31	0	31	400.5	4148.5
FAMILY	31	0	31	400.5	4148.5
PIGGY	31	0	31	400.5	4148.5
MILK	30	1	31	407	1739
RIVER	30	1	31	407	1739
PLAYING	29	2	31	416.5	1154
STORY	29	2	31	416.5	1154
CALL	28	3	31	434	898.5
NOISE	28	3	31	434	898.5
SURPRISE	28	3	31	434	898.5
HEARD	27	4	31	454.5	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
TINY	27	4	31	454.5	732
MYSELF	22	9	31	554	383
PLANTS	18	13	31	691	250.5
CITY	30	0	30	407	4148.5
POT	29	1	30	416.5	1739
BUG	27	3	30	454.5	898.5
SUDDENLY	27	3	30	454.5	898.5
FELL	26	4	30	474.5	732
LOOKING	26	4	30	474.5	732
REST	24	6	30	516	534
BOOKS	18	12	30	691	278.5
MEET	18	12	30	691	278.5
BISCUIT	29	0	29	416.5	4148.5
FINALLY	29	0	29	416.5	4148.5
GUESS	29	0	29	416.5	4148.5
PANTS	29	0	29	416.5	4148.5
HIDE	28	1	29	434	1739
TABLE	28	1	29	434	1739
DEEP	27	2	29	454.5	1154
KISS	27	2	29	454.5	1154
LATE	27	2	29	454.5	1154

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
MAP	25	4	29	496	732
RICK	25	4	29	496	732
GRAY	24	5	29	516	608.5
SEEN	24	5	29	516	608.5
LUNCH	22	7	29	554	477.5
CUT	21	8	29	579.5	425.5
NEAR	21	8	29	579.5	425.5
CAKE	20	9	29	610	383
COOL	20	9	29	610	383
PICK	19	10	29	648.5	346.5
CAMPING	17	12	29	728.5	278.5
GLAD	17	12	29	728.5	278.5
BROUGHT	15	14	29	818.5	231
PIGS	15	14	29	818.5	231
JOB	14	15	29	864.5	216
SUE	0	29	29	5863.5	105.5
BABIES	28	0	28	434	4148.5
CHRISTMAS	28	0	28	434	4148.5
OWL	28	0	28	434	4148.5
POLICEMAN	28	0	28	434	4148.5
SPECIAL	28	0	28	434	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
TIRED	28	0	28	434	4148.5
WEAR	28	0	28	434	4148.5
WOKE	28	0	28	434	4148.5
PUPPY	26	2	28	474.5	1154
REAL	26	2	28	474.5	1154
TEETH	26	2	28	474.5	1154
BEGAN	25	3	28	496	898.5
BIGGER	25	3	28	496	898.5
OPENED	25	3	28	496	898.5
ARTHUR	24	4	28	516	732
CLEAN	24	4	28	516	732
MAD	24	4	28	516	732
DINNER	23	5	28	535.5	608.5
FUNNY	23	5	28	535.5	608.5
ANYTHING	22	6	28	554	534
TURNED	22	6	28	554	534
ANIMAL	21	7	28	579.5	477.5
ALSO	20	8	28	610	425.5
BOB	20	8	28	610	425.5
LEARN	20	8	28	610	425.5
TELLS	18	10	28	691	346.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
HI	16	12	28	771.5	278.5
HURT	15	13	28	818.5	250.5
CLASS	14	14	28	864.5	231
PLAN	14	14	28	864.5	231
JACK	9	19	28	1190	173.5
FLIES	27	0	27	454.5	4148.5
FLOOR	27	0	27	454.5	4148.5
LUCY	27	0	27	454.5	4148.5
UGLY	27	0	27	454.5	4148.5
BASEBALL	26	1	27	474.5	1739
BUTTERFLY	26	1	27	474.5	1739
DREAM	26	1	27	474.5	1739
EARS	26	1	27	474.5	1739
WATCHED	26	1	27	474.5	1739
BEHIND	25	2	27	496	1154
PAPER	25	2	27	496	1154
NEEDS	23	4	27	535.5	732
WINTER	23	4	27	535.5	732
MUD	22	5	27	554	608.5
THOSE	21	6	27	579.5	534
EIGHT	20	7	27	610	477.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SOFT	19	8	27	648.5	425.5
FELT	16	11	27	771.5	312
MONKEYS	12	15	27	963	216
BEE	26	0	26	474.5	4148.5
CLOUD	26	0	26	474.5	4148.5
DUCKY	26	0	26	474.5	4148.5
GONE	26	0	26	474.5	4148.5
MITTENS	26	0	26	474.5	4148.5
SCARED	26	0	26	474.5	4148.5
DANCE	25	1	26	496	1739
SONG	24	2	26	516	1154
FOLLOWED	23	3	26	535.5	898.5
PRINCESS	22	4	26	554	732
POP	21	5	26	579.5	608.5
MEAN	20	6	26	610	534
BAG	19	7	26	648.5	477.5
CARRY	17	9	26	728.5	383
BILL	12	14	26	963	231
CAUGHT	25	0	25	496	4148.5
FLOWERS	25	0	25	496	4148.5
FRONT	25	0	25	496	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
KITCHEN	25	0	25	496	4148.5
LAUGHED	25	0	25	496	4148.5
OWLS	25	0	25	496	4148.5
TABBY	25	0	25	496	4148.5
ARMS	24	1	25	516	1739
DOLL	24	1	25	516	1739
SORRY	24	1	25	516	1739
SPLASH	23	2	25	535.5	1154
CORN	21	4	25	579.5	732
SKATE	19	6	25	648.5	534
SUMMER	19	6	25	648.5	534
TOYS	19	6	25	648.5	534
OTHERS	16	9	25	771.5	383
PART	15	10	25	818.5	346.5
RACE	15	10	25	818.5	346.5
TOWN	15	10	25	818.5	346.5
FUDGE	4	21	25	2068	150.5
BUSY	24	0	24	516	4148.5
BYE	24	0	24	516	4148.5
GOODNIGHT	24	0	24	516	4148.5
GOOSE	24	0	24	516	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
PULL	24	0	24	516	4148.5
YIP	24	0	24	516	4148.5
SHINES	23	1	24	535.5	1739
SIDE	23	1	24	535.5	1739
WIND1	23	1	24	535.5	1739
HOLE	21	3	24	579.5	898.5
SLEEPING	20	4	24	610	732
TIM	20	4	24	610	732
BRIGHT	19	5	24	648.5	608.5
MUSIC	19	5	24	648.5	608.5
SHORT	19	5	24	648.5	608.5
ROUND	18	6	24	691	534
SAME	18	6	24	691	534
SMELL	18	6	24	691	534
PETS	17	7	24	728.5	477.5
SAND	17	7	24	728.5	477.5
SEVEN	17	7	24	728.5	477.5
ONTO	16	8	24	771.5	425.5
WHICH	16	8	24	771.5	425.5
SICK	14	10	24	864.5	346.5
HELPED	13	11	24	911.5	312

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
TURKEYS	13	11	24	911.5	312
WIN	10	14	24	1096.5	231
PAUL	4	20	24	2068	160.5
DUCKLING	23	0	23	535.5	4148.5
FAVORITE	23	0	23	535.5	4148.5
GRANDPA	23	0	23	535.5	4148.5
HUNT	23	0	23	535.5	4148.5
LOVED	23	0	23	535.5	4148.5
POPPY	23	0	23	535.5	4148.5
STORIES	23	0	23	535.5	4148.5
STRAWBERRY	23	0	23	535.5	4148.5
SILLY	22	1	23	554	1739
STARS	22	1	23	554	1739
CLOSE2	21	2	23	579.5	1154
LEGS	21	2	23	579.5	1154
PETER	21	2	23	579.5	1154
VISIT	21	2	23	579.5	1154
STRONG	20	3	23	610	898.5
ALONE	19	4	23	648.5	732
CRY	19	4	23	648.5	732
FASTER	19	4	23	648.5	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
STOPS	19	4	23	648.5	732
DRAW	16	7	23	771.5	477.5
DRINK	16	7	23	771.5	477.5
WILD	14	9	23	864.5	383
ANT	13	10	23	911.5	346.5
QUICKLY	13	10	23	911.5	346.5
SPIN	10	13	23	1096.5	250.5
SUCH	9	14	23	1190	231
MAIL	4	19	23	2068	173.5
COWS	22	0	22	554	4148.5
HORSE	22	0	22	554	4148.5
MAKING	22	0	22	554	4148.5
MEOW	22	0	22	554	4148.5
POOR	22	0	22	554	4148.5
PRINCE	22	0	22	554	4148.5
SKIN	22	0	22	554	4148.5
SPAGHETTI	22	0	22	554	4148.5
CLOUDS	21	1	22	579.5	1739
FEELS	21	1	22	579.5	1739
GRABBED	21	1	22	579.5	1739
HURRY	21	1	22	579.5	1739

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
PICKED	21	1	22	579.5	1739
TIGHT	21	1	22	579.5	1739
DRIVE	20	2	22	610	1154
HIP	20	2	22	610	1154
DAYS	18	4	22	691	732
LOUD	18	4	22	691	732
RUNS	18	4	22	691	732
STREET	18	4	22	691	732
FOXES	17	5	22	728.5	608.5
YUM	17	5	22	728.5	608.5
YEAR	16	6	22	771.5	534
TEACH	15	7	22	818.5	477.5
WASH	15	7	22	818.5	477.5
CANNOT	14	8	22	864.5	425.5
GRANDMOTHER	14	8	22	864.5	425.5
BAT	12	10	22	963	346.5
PAT	12	10	22	963	346.5
PINK	12	10	22	963	346.5
JOY	8	14	22	1296.5	231
SELL	6	16	22	1579.5	203
CAROL	21	0	21	579.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
CHIP	21	0	21	579.5	4148.5
CLOTHES	21	0	21	579.5	4148.5
CREAM	21	0	21	579.5	4148.5
CROCODILE	21	0	21	579.5	4148.5
FIGHT	21	0	21	579.5	4148.5
GREW	21	0	21	579.5	4148.5
SITTING	21	0	21	579.5	4148.5
SNIFF	21	0	21	579.5	4148.5
WOLF	21	0	21	579.5	4148.5
BUMP	20	1	21	610	1739
SWIMMING	20	1	21	610	1739
BORN	19	2	21	648.5	1154
KINDS	19	2	21	648.5	1154
LEAVE	19	2	21	648.5	1154
NAMED	19	2	21	648.5	1154
SLOWLY	19	2	21	648.5	1154
STICK	19	2	21	648.5	1154
WAKE	19	2	21	648.5	1154
FACE	18	3	21	691	898.5
FARMER	18	3	21	691	898.5
TEA	18	3	21	691	898.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BOTTLE	17	4	21	728.5	732
HONK	17	4	21	728.5	732
MET	17	4	21	728.5	732
FIX	16	5	21	771.5	608.5
TOUGH	9	12	21	1190	278.5
TRIP	8	13	21	1296.5	250.5
SHOP	7	14	21	1424.5	231
ANGRY	20	0	20	610	4148.5
ASLEEP	20	0	20	610	4148.5
CLOSET	20	0	20	610	4148.5
DINOSAUR	20	0	20	610	4148.5
FLOWER	20	0	20	610	4148.5
HEAVY	20	0	20	610	4148.5
MOOSE	20	0	20	610	4148.5
THANKSGIVING	20	0	20	610	4148.5
BOYS	19	1	20	648.5	1739
BREAD	19	1	20	648.5	1739
COOKIES	19	1	20	648.5	1739
DEAR	19	1	20	648.5	1739
HAPPENED	19	1	20	648.5	1739
KNOWS	19	1	20	648.5	1739

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SEEDS	19	1	20	648.5	1739
TRUCK	19	1	20	648.5	1739
HIMSELF	18	2	20	691	1154
ROAD	18	2	20	691	1154
CAGE	17	3	20	728.5	898.5
MISSED	17	3	20	728.5	898.5
STAYED	17	3	20	728.5	898.5
BOTTOM	16	4	20	771.5	732
DOING	16	4	20	771.5	732
DRY	16	4	20	771.5	732
FENCE	15	5	20	818.5	608.5
STARTS	15	5	20	818.5	608.5
SWEET	15	5	20	818.5	608.5
COOK	14	6	20	864.5	534
LINE	14	6	20	864.5	534
ENJOY	13	7	20	911.5	477.5
CAVE	12	8	20	963	425.5
LIFE	9	11	20	1190	312
SNAKE	9	11	20	1190	312
KATE	8	12	20	1296.5	278.5
BALLOON	19	0	19	648.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BODY	19	0	19	648.5	4148.5
BONE	19	0	19	648.5	4148.5
BOOM	19	0	19	648.5	4148.5
CHEESE	19	0	19	648.5	4148.5
CHICKENS	19	0	19	648.5	4148.5
COURSE	19	0	19	648.5	4148.5
ELSE	19	0	19	648.5	4148.5
EVERYBODY	19	0	19	648.5	4148.5
EVERYWHERE	19	0	19	648.5	4148.5
GROWS	19	0	19	648.5	4148.5
HALF	19	0	19	648.5	4148.5
PINE	19	0	19	648.5	4148.5
RO	19	0	19	648.5	4148.5
SHAPE	19	0	19	648.5	4148.5
TEACHER	19	0	19	648.5	4148.5
TOES	19	0	19	648.5	4148.5
WHISPERED	19	0	19	648.5	4148.5
WHOLE	19	0	19	648.5	4148.5
TRICKS	18	1	19	691	1739
STAND	17	2	19	728.5	1154
MUNCH	16	3	19	771.5	898.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
NAP	16	3	19	771.5	898.5
WAITED	16	3	19	771.5	898.5
FUR	15	4	19	818.5	732
SHARK	15	4	19	818.5	732
SITS	15	4	19	818.5	732
EARLY	12	7	19	963	477.5
SNAP	12	7	19	963	477.5
CAMP	11	8	19	1023.5	425.5
GOAT	10	9	19	1096.5	383
WRITE	9	10	19	1190	346.5
BADGERS	18	0	18	691	4148.5
BEAK	18	0	18	691	4148.5
CLIMB	18	0	18	691	4148.5
ELEPHANTS	18	0	18	691	4148.5
ERF	18	0	18	691	4148.5
HORSES	18	0	18	691	4148.5
MOO	18	0	18	691	4148.5
MOUNTAIN	18	0	18	691	4148.5
POLICE	18	0	18	691	4148.5
PULLED	18	0	18	691	4148.5
SANTA	18	0	18	691	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SATURN	18	0	18	691	4148.5
SPIDER	18	0	18	691	4148.5
TURNS	18	0	18	691	4148.5
WHALE	18	0	18	691	4148.5
WILLY	18	0	18	691	4148.5
BEN	17	1	18	728.5	1739
KNOCK	17	1	18	728.5	1739
MOUTH1	17	1	18	728.5	1739
TALK	17	1	18	728.5	1739
BEING	16	2	18	771.5	1154
DIG	16	2	18	771.5	1154
KID	16	2	18	771.5	1154
RUNNING	16	2	18	771.5	1154
SANG	16	2	18	771.5	1154
SKATES	16	2	18	771.5	1154
SMART	16	2	18	771.5	1154
PAST	15	3	18	818.5	898.5
PUTS	15	3	18	818.5	898.5
LIKED	14	4	18	864.5	732
ROPE	14	4	18	864.5	732
DRESS	13	5	18	911.5	608.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
THANKS	13	5	18	911.5	608.5
WAVES	13	5	18	911.5	608.5
BOATS	12	6	18	963	534
PLACES	12	6	18	963	534
CHANGE	11	7	18	1023.5	477.5
LAND	11	7	18	1023.5	477.5
PLANT	11	7	18	1023.5	477.5
CAP	10	8	18	1096.5	425.5
MEN	8	10	18	1296.5	346.5
ANYMORE	17	0	17	728.5	4148.5
BARKED	17	0	17	728.5	4148.5
BREAKFAST	17	0	17	728.5	4148.5
CHAIR	17	0	17	728.5	4148.5
CRIES	17	0	17	728.5	4148.5
DAISY	17	0	17	728.5	4148.5
FATHERS	17	0	17	728.5	4148.5
GIVES	17	0	17	728.5	4148.5
GORILLA	17	0	17	728.5	4148.5
JO'S	17	0	17	728.5	4148.5
LAUGH	17	0	17	728.5	4148.5
ORANGE	17	0	17	728.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
PREY	17	0	17	728.5	4148.5
REMEMBER	17	0	17	728.5	4148.5
SON	17	0	17	728.5	4148.5
STUFF	17	0	17	728.5	4148.5
TOBY	17	0	17	728.5	4148.5
WINTRY	17	0	17	728.5	4148.5
BOOTS	16	1	17	771.5	1739
HOPE	16	1	17	771.5	1739
INSTEAD	16	1	17	771.5	1739
ROCK	16	1	17	771.5	1739
TRAINS	16	1	17	771.5	1739
ROLL	15	2	17	818.5	1154
THINKS	15	2	17	818.5	1154
USED	15	2	17	818.5	1154
BUS	14	3	17	864.5	898.5
CROSS	14	3	17	864.5	898.5
GAMES	14	3	17	864.5	898.5
NEEDED	14	3	17	864.5	898.5
CATS	13	4	17	911.5	732
FIELD	13	4	17	911.5	732
SWING	13	4	17	911.5	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
DAWN	12	5	17	963	608.5
GOODNESS	12	5	17	963	608.5
PICNIC	11	6	17	1023.5	534
BATS	6	11	17	1579.5	312
CONTEST1	2	15	17	3070	216
BLANKET	16	0	16	771.5	4148.5
BUILD	16	0	16	771.5	4148.5
CARROTS	16	0	16	771.5	4148.5
CASE	16	0	16	771.5	4148.5
CLUCK	16	0	16	771.5	4148.5
EELS	16	0	16	771.5	4148.5
FALLING	16	0	16	771.5	4148.5
FULL	16	0	16	771.5	4148.5
GOODBYE	16	0	16	771.5	4148.5
HUP	16	0	16	771.5	4148.5
JAR	16	0	16	771.5	4148.5
JUNE	16	0	16	771.5	4148.5
MISTER	16	0	16	771.5	4148.5
PENGUIN	16	0	16	771.5	4148.5
PLAYS	16	0	16	771.5	4148.5
PUSHED	16	0	16	771.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SHARE	16	0	16	771.5	4148.5
SOMEWHERE	16	0	16	771.5	4148.5
SQUIDS	16	0	16	771.5	4148.5
TORTOISE	16	0	16	771.5	4148.5
AFRAID	16	0	16	771.5	4148.5
BOTH	15	1	16	818.5	1739
CLAWS	15	1	16	818.5	1739
COUNT	15	1	16	818.5	1739
SHAPES	15	1	16	818.5	1739
TIMES	15	1	16	818.5	1739
WITHOUT	15	1	16	818.5	1739
GINGER	14	2	16	864.5	1154
PERSON	13	3	16	911.5	898.5
PHILIP	13	3	16	911.5	898.5
TRICK	13	3	16	911.5	898.5
GRAB	12	4	16	963	732
MISSING	12	4	16	963	732
SEES	12	4	16	963	732
FAIR	11	5	16	1023.5	608.5
RING	11	5	16	1023.5	608.5
SOCCER	11	5	16	1023.5	608.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SPOT	11	5	16	1023.5	608.5
STORM	11	5	16	1023.5	608.5
BET	10	6	16	1096.5	534
LAKE	10	6	16	1096.5	534
MIDDLE	8	8	16	1296.5	425.5
QUITE	8	8	16	1296.5	425.5
SAIL	8	8	16	1296.5	425.5
BUGS	5	11	16	1782	312
GRANDFATHER	5	11	16	1782	312
RACCOON	5	11	16	1782	312
TWINS	5	11	16	1782	312
MADGE	0	16	16	5863.5	203
SKIT	0	16	16	5863.5	203
ALMOST	15	0	15	818.5	4148.5
BUTTER	15	0	15	818.5	4148.5
CHICKEN	15	0	15	818.5	4148.5
COSMOS	15	0	15	818.5	4148.5
EASY	15	0	15	818.5	4148.5
FLUFFY	15	0	15	818.5	4148.5
HALLOWEEN	15	0	15	818.5	4148.5
MAGIC	15	0	15	818.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
MONEY	15	0	15	818.5	4148.5
MOVING	15	0	15	818.5	4148.5
MUCKY	15	0	15	818.5	4148.5
OFFICERS	15	0	15	818.5	4148.5
POLLY	15	0	15	818.5	4148.5
PRESENT	15	0	15	818.5	4148.5
PURPLE	15	0	15	818.5	4148.5
ROBINS	15	0	15	818.5	4148.5
SCRUFFY	15	0	15	818.5	4148.5
SHORTCAKE	15	0	15	818.5	4148.5
TONIGHT	15	0	15	818.5	4148.5
YOUNG	15	0	15	818.5	4148.5
BLOW	14	1	15	864.5	1739
FOOT	14	1	15	864.5	1739
HOPPED	14	1	15	864.5	1739
KEPT	14	1	15	864.5	1739
LIVED	14	1	15	864.5	1739
MINE	14	1	15	864.5	1739
SENT	14	1	15	864.5	1739
SHINY	14	1	15	864.5	1739
SMILED	14	1	15	864.5	1739

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
FLYING	13	2	15	911.5	1154
FORGET	13	2	15	911.5	1154
PIN	13	2	15	911.5	1154
SHARP	13	2	15	911.5	1154
DUCKS	12	3	15	963	898.5
JOIN	12	3	15	963	898.5
NINE	12	3	15	963	898.5
STOOD	12	3	15	963	898.5
FEW	11	4	15	1023.5	732
WEEK	11	4	15	1023.5	732
ANSWER	10	5	15	1096.5	608.5
CHECK	10	5	15	1096.5	608.5
FILLED	10	5	15	1096.5	608.5
HATS	9	6	15	1190	534
AMERICA	8	7	15	1296.5	477.5
DRIP	8	7	15	1296.5	477.5
SIMON	8	7	15	1296.5	477.5
ANSWERED	7	8	15	1424.5	425.5
STRANGE	7	8	15	1424.5	425.5
BOUGHT	6	9	15	1579.5	383
TRAINED	5	10	15	1782	346.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
OWNER	4	11	15	2068	312
STEP	4	11	15	2068	312
ROY	0	15	15	5863.5	216
BUTTERFLIES	14	0	14	864.5	4148.5
CALLS	14	0	14	864.5	4148.5
CRUNCH	14	0	14	864.5	4148.5
EATS	14	0	14	864.5	4148.5
FAIRY	14	0	14	864.5	4148.5
GIANT	14	0	14	864.5	4148.5
GRANDMA'S	14	0	14	864.5	4148.5
HA	14	0	14	864.5	4148.5
LIBRARY	14	0	14	864.5	4148.5
LIGHTNING	14	0	14	864.5	4148.5
NESTS	14	0	14	864.5	4148.5
PARENTS	14	0	14	864.5	4148.5
POLE	14	0	14	864.5	4148.5
RECTANGLES	14	0	14	864.5	4148.5
ROAR	14	0	14	864.5	4148.5
SLEEPY	14	0	14	864.5	4148.5
SLIDE	14	0	14	864.5	4148.5
STRAIGHT	14	0	14	864.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
TOUCH	14	0	14	864.5	4148.5
UNICORN	14	0	14	864.5	4148.5
BITE	13	1	14	911.5	1739
CHANGED	13	1	14	911.5	1739
HARRY	13	1	14	911.5	1739
MARKET	13	1	14	911.5	1739
THROW	13	1	14	911.5	1739
WOW	13	1	14	911.5	1739
BIGGEST	12	2	14	963	1154
COACH	12	2	14	963	1154
CORNER	12	2	14	963	1154
PASS	12	2	14	963	1154
USES	12	2	14	963	1154
PICKS	11	3	14	1023.5	898.5
READ1	11	3	14	1023.5	898.5
SNACK	11	3	14	1023.5	898.5
STARFISH	11	3	14	1023.5	898.5
SWAM	11	3	14	1023.5	898.5
PIECE	10	4	14	1096.5	732
PIECES	10	4	14	1096.5	732
WOOD	10	4	14	1096.5	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BIT	9	5	14	1190	608.5
MONKEY	9	5	14	1190	608.5
SMILE	8	6	14	1296.5	534
ROUGH	7	7	14	1424.5	477.5
BELL	6	8	14	1579.5	425.5
SHINE	4	10	14	2068	346.5
ARCHIE	13	0	13	911.5	4148.5
BABOON	13	0	13	911.5	4148.5
BRANCHES	13	0	13	911.5	4148.5
BRUNO	13	0	13	911.5	4148.5
CLOSED	13	0	13	911.5	4148.5
COSTUMES	13	0	13	911.5	4148.5
COVERS	13	0	13	911.5	4148.5
DELICIOUS	13	0	13	911.5	4148.5
DING	13	0	13	911.5	4148.5
DRUM	13	0	13	911.5	4148.5
FINISHED	13	0	13	911.5	4148.5
FLORA	13	0	13	911.5	4148.5
FOXY	13	0	13	911.5	4148.5
HOO	13	0	13	911.5	4148.5
LOLLY	13	0	13	911.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
MINUTE1	13	0	13	911.5	4148.5
MOLLY	13	0	13	911.5	4148.5
SECOND	13	0	13	911.5	4148.5
SHOES	13	0	13	911.5	4148.5
STRING	13	0	13	911.5	4148.5
TONY	13	0	13	911.5	4148.5
WALL	13	0	13	911.5	4148.5
WASHED	13	0	13	911.5	4148.5
WEARS	13	0	13	911.5	4148.5
BLEW	12	1	13	963	1739
BOWL	12	1	13	963	1739
OLDER	12	1	13	963	1739
WHEELS	12	1	13	963	1739
BATH	11	2	13	1023.5	1154
FIT	11	2	13	1023.5	1154
LIGHTS	11	2	13	1023.5	1154
SAVED	11	2	13	1023.5	1154
SHOOK	11	2	13	1023.5	1154
WAVE	11	2	13	1023.5	1154
CLOCK	10	3	13	1096.5	898.5
EATING	10	3	13	1096.5	898.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
RODE	10	3	13	1096.5	898.5
UPSET	10	3	13	1096.5	898.5
YELL	10	3	13	1096.5	898.5
BAGS	9	4	13	1190	732
GENTLY	9	4	13	1190	732
HERE'S	9	4	13	1190	732
JOSH	9	4	13	1190	732
LIVES1	9	4	13	1190	732
MESS	9	4	13	1190	732
WIDE	9	4	13	1190	732
HUGE	8	5	13	1296.5	608.5
QUIT	8	5	13	1296.5	608.5
STUCK	7	6	13	1424.5	534
EDGE	6	7	13	1579.5	477.5
LETTER	6	7	13	1579.5	477.5
CLAP	5	8	13	1782	425.5
SIGNS	5	8	13	1782	425.5
TROLL	4	9	13	2068	383
MARK	1	12	13	4541	278.5
BEARS	12	0	12	963	4148.5
BELIEVE	12	0	12	963	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BROOMSTICK	12	0	12	963	4148.5
CLIMBED	12	0	12	963	4148.5
CONES	12	0	12	963	4148.5
ELK	12	0	12	963	4148.5
ENGINE	12	0	12	963	4148.5
FIREFLIES	12	0	12	963	4148.5
FOODS	12	0	12	963	4148.5
FOREST	12	0	12	963	4148.5
GUY	12	0	12	963	4148.5
HATE	12	0	12	963	4148.5
HAVING	12	0	12	963	4148.5
HUSH	12	0	12	963	4148.5
MICHAEL	12	0	12	963	4148.5
OCEAN	12	0	12	963	4148.5
PICTURE	12	0	12	963	4148.5
PIRATES	12	0	12	963	4148.5
PORRIDGE	12	0	12	963	4148.5
POTTY	12	0	12	963	4148.5
ROOSTER	12	0	12	963	4148.5
STICKS	12	0	12	963	4148.5
SUPPER	12	0	12	963	4148.5

	Frequency			Rank	
Word	Literature	Phonics	Total	Literature	Phonics
THINKING	12	0	12	963	4148.5
WATCHING	12	0	12	963	4148.5
WON	12	0	12	963	4148.5
ZOOMS	12	0	12	963	4148.5
ANYONE	11	1	12	1023.5	1739
CLEVER2	11	1	12	1023.5	1739
CRASH	11	1	12	1023.5	1739
PEEKED	11	1	12	1023.5	1739
RIDES	11	1	12	1023.5	1739
RINGS	11	1	12	1023.5	1739
SOCKS	11	1	12	1023.5	1739
SPEAK	11	1	12	1023.5	1739
SPRINGS	11	1	12	1023.5	1739
TRUE1	11	1	12	1023.5	1739
WOODS	11	1	12	1023.5	1739
BEES	10	2	12	1096.5	1154
BRINGS	10	2	12	1096.5	1154
FETCH	10	2	12	1096.5	1154
FISHING	10	2	12	1096.5	1154
FLASH	10	2	12	1096.5	1154
HOUSES	10	2	12	1096.5	1154

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
KICK	10	2	12	1096.5	1154
SAVE	10	2	12	1096.5	1154
SIGHT	10	2	12	1096.5	1154
GIRLS	9	3	12	1190	898.5
LOW	9	3	12	1190	898.5
RABBITS	9	3	12	1190	898.5
ROCKS	9	3	12	1190	898.5
SLEPT	9	3	12	1190	898.5
SONGS	9	3	12	1190	898.5
STEPS	9	3	12	1190	898.5
LANDED	8	4	12	1296.5	732
WORKING	8	4	12	1296.5	732
KEEPS	7	5	12	1424.5	608.5
LEG	7	5	12	1424.5	608.5
SHIP	7	5	12	1424.5	608.5
DREW	6	6	12	1579.5	534
EYE	6	6	12	1579.5	534
BAKE	5	7	12	1782	477.5
AGO	4	8	12	2068	425.5
ODD	3	9	12	2438.5	383
BARS	2	10	12	3070	346.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BOXES	2	10	12	3070	346.5
DIP	2	10	12	3070	346.5
OX	1	11	12	4541	312
TERRY	0	12	12	5863.5	278.5
TORY	0	12	12	5863.5	278.5
AGGIE	11	0	11	1023.5	4148.5
ALEXANDER	11	0	11	1023.5	4148.5
ALIEN	11	0	11	1023.5	4148.5
BAND	11	0	11	1023.5	4148.5
BASKETBALL	11	0	11	1023.5	4148.5
BUILDING	11	0	11	1023.5	4148.5
BUSHES	11	0	11	1023.5	4148.5
CARD	11	0	11	1023.5	4148.5
CLOSER	11	0	11	1023.5	4148.5
CRICKETS	11	0	11	1023.5	4148.5
DIANA	11	0	11	1023.5	4148.5
DUMB	11	0	11	1023.5	4148.5
EATEN	11	0	11	1023.5	4148.5
FEMALE	11	0	11	1023.5	4148.5
FORGETS	11	0	11	1023.5	4148.5
GOLDBERG	11	0	11	1023.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
KEY	11	0	11	1023.5	4148.5
LEO'S	11	0	11	1023.5	4148.5
LLAMA	11	0	11	1023.5	4148.5
MOJO	11	0	11	1023.5	4148.5
O'CLOCK	11	0	11	1023.5	4148.5
ROLLED	11	0	11	1023.5	4148.5
RUBY	11	0	11	1023.5	4148.5
SCARY	11	0	11	1023.5	4148.5
SEBASTIAN	11	0	11	1023.5	4148.5
SISTERS	11	0	11	1023.5	4148.5
SUGAR	11	0	11	1023.5	4148.5
TOUCHDOWN	11	0	11	1023.5	4148.5
TRASH	11	0	11	1023.5	4148.5
UNCLES	11	0	11	1023.5	4148.5
WHOSE	11	0	11	1023.5	4148.5
BEGIN	10	1	11	1096.5	1739
BREAK	10	1	11	1096.5	1739
FACES	10	1	11	1096.5	1739
FORT	10	1	11	1096.5	1739
HANG	10	1	11	1096.5	1739
HOLES	10	1	11	1096.5	1739

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
JUMPING	10	1	11	1096.5	1739
MATTER	10	1	11	1096.5	1739
PLANE	10	1	11	1096.5	1739
SHAKE	10	1	11	1096.5	1739
STATION	10	1	11	1096.5	1739
THICK	10	1	11	1096.5	1739
BANG	9	2	11	1190	1154
COOKIE	9	2	11	1190	1154
FINISH	9	2	11	1190	1154
PARTS	9	2	11	1190	1154
PERFECT	9	2	11	1190	1154
SINGS	9	2	11	1190	1154
SURPRISED	9	2	11	1190	1154
THIN	9	2	11	1190	1154
TILL	9	2	11	1190	1154
CHIRP	8	3	11	1296.5	898.5
TIE	8	3	11	1296.5	898.5
TWEET	8	3	11	1296.5	898.5
ABLE	7	4	11	1424.5	732
BABY'S	7	4	11	1424.5	732
CHICKS	7	4	11	1424.5	732

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
DIRT	7	4	11	1424.5	732
FEED	7	4	11	1424.5	732
GOBBLE	7	4	11	1424.5	732
LETTERS	7	4	11	1424.5	732
PACKED	7	4	11	1424.5	732
SPOTS	7	4	11	1424.5	732
SUPER	7	4	11	1424.5	732
UPON	7	4	11	1424.5	732
WORD	7	4	11	1424.5	732
SLIP	6	5	11	1579.5	608.5
SNIP	6	5	11	1579.5	608.5
TIRES	6	5	11	1579.5	608.5
CAST	3	8	11	2438.5	425.5
SALE	2	9	11	3070	383
SPORTS	2	9	11	3070	383
GOLD	1	10	11	4541	346.5
MARBLE	1	10	11	4541	346.5
VAN	1	10	11	4541	346.5
BATCH	0	11	11	5863.5	312
AIREDALE	10	0	10	1096.5	4148.5
BARK	10	0	10	1096.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
BEGINS	10	0	10	1096.5	4148.5
BOA	10	0	10	1096.5	4148.5
CATERPILLAR	10	0	10	1096.5	4148.5
CHEW	10	0	10	1096.5	4148.5
CHOCOLATE	10	0	10	1096.5	4148.5
COMET	10	0	10	1096.5	4148.5
CUTE	10	0	10	1096.5	4148.5
DIRTY	10	0	10	1096.5	4148.5
ELEPHANT	10	0	10	1096.5	4148.5
FLOPPED	10	0	10	1096.5	4148.5
FRENCH	10	0	10	1096.5	4148.5
FROGS	10	0	10	1096.5	4148.5
GIANTS	10	0	10	1096.5	4148.5
HEADS	10	0	10	1096.5	4148.5
HEARS	10	0	10	1096.5	4148.5
HIDING	10	0	10	1096.5	4148.5
LAY	10	0	10	1096.5	4148.5
LOSE	10	0	10	1096.5	4148.5
MARKS	10	0	10	1096.5	4148.5
MARTHA	10	0	10	1096.5	4148.5
MEAT	10	0	10	1096.5	4148.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
MO	10	0	10	1096.5	4148.5
NANA	10	0	10	1096.5	4148.5
NANNY	10	0	10	1096.5	4148.5
NOISES	10	0	10	1096.5	4148.5
PEANUTS	10	0	10	1096.5	4148.5
POM	10	0	10	1096.5	4148.5
RIDING	10	0	10	1096.5	4148.5
ROARED	10	0	10	1096.5	4148.5
RUFF	10	0	10	1096.5	4148.5
SKATEBOARD	10	0	10	1096.5	4148.5
SKINNY	10	0	10	1096.5	4148.5
TERRIERS	10	0	10	1096.5	4148.5
TIPTOE	10	0	10	1096.5	4148.5
TOWARD	10	0	10	1096.5	4148.5
TRACK	10	0	10	1096.5	4148.5
TRUNK	10	0	10	1096.5	4148.5
TRYING	10	0	10	1096.5	4148.5
VICTOR	10	0	10	1096.5	4148.5
WHOOSH	10	0	10	1096.5	4148.5
BERRY	9	1	10	1190	1739
CHASED	9	1	10	1190	1739

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
CHEER	9	1	10	1190	1739
CHILD	9	1	10	1190	1739
EMPTY	9	1	10	1190	1739
FAT	9	1	10	1190	1739
FINDS	9	1	10	1190	1739
FLAP	9	1	10	1190	1739
FORGOT	9	1	10	1190	1739
GOAL	9	1	10	1190	1739
PAIR	9	1	10	1190	1739
SMELLS	9	1	10	1190	1739
SUNLIGHT	9	1	10	1190	1739
THUNDER	9	1	10	1190	1739
TUB	9	1	10	1190	1739
WONDERED	9	1	10	1190	1739
YEARS	9	1	10	1190	1739
ADULT	8	2	10	1296.5	1154
CRACK	8	2	10	1296.5	1154
DREAMS	8	2	10	1296.5	1154
HEALTHY	8	2	10	1296.5	1154
INSECTS	8	2	10	1296.5	1154
NECK	8	2	10	1296.5	1154

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
SHOUT	8	2	10	1296.5	1154
WHEEL	8	2	10	1296.5	1154
YUCK	8	2	10	1296.5	1154
AWAKE	7	3	10	1424.5	898.5
LOG	7	3	10	1424.5	898.5
NAPS	7	3	10	1424.5	898.5
OFTEN	7	3	10	1424.5	898.5
QUAIL	7	3	10	1424.5	898.5
RANG	7	3	10	1424.5	898.5
SAILED	7	3	10	1424.5	898.5
WEEKS	7	3	10	1424.5	898.5
WING	7	3	10	1424.5	898.5
FAN	6	4	10	1579.5	732
KICKED	6	4	10	1579.5	732
TAILS	6	4	10	1579.5	732
THIEF	6	4	10	1579.5	732
AFTERNOON	5	5	10	1782	608.5
DANGER	5	5	10	1782	608.5
FORM	5	5	10	1782	608.5
GIFT	5	5	10	1782	608.5
POINTED	5	5	10	1782	608.5

Word	Frequency			Rank	
	Literature	Phonics	Total	Literature	Phonics
FRESH	4	6	10	2068	534
WIFE	4	6	10	2068	534
ADDED	3	7	10	2438.5	477.5
BIKES	3	7	10	2438.5	477.5
JUDGE	3	7	10	2438.5	477.5
PATCH	3	7	10	2438.5	477.5
HELPFUL	2	8	10	3070	425.5
STOVE	2	8	10	3070	425.5
TRAIL	2	8	10	3070	425.5
JAY	1	9	10	4541	383
JULY	1	9	10	4541	383
KENNY	1	9	10	4541	383
BEAVER	0	10	10	5863.5	346.5
CUB	0	10	10	5863.5	346.5
MITCH	0	10	10	5863.5	346.5
TEX	0	10	10	5863.5	346.5

APPENDIX F

RELATIVE FREQUENCIES AND RANKS OF PHONEME-GRAPHEME CORRESPONDENCES ACROSS THREE TEXT TYPES

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
R	r	.0850553	.0639474	.0556832	190	189	188
T	t	.0701003	.0648836	.0734962	189	190	190
N	n	.0693926	.0586324	.0582429	188	188	189
I short /i/	i	.0497816	.0454451	.0490909	187	186	186
L	l	.0455726	.0300429	.0305766	186	182	181
S	s	.0428256	.0438714	.0511773	185	185	187
A short /a/	a	.0390357	.0350884	.0433578	184	184	184
D	d	.0336254	.0455617	.0458825	183	187	185
K	c	.0321448	.0156134	.0157617	182	171	169
E short /e/	e	.0308784	.0220614	.0241948	181	179	178
M	m	.0307480	.0321012	.0312779	180	183	182
P	p	.0306922	.0218756	.0269474	179	178	179
B	b	.0208774	.0214421	.0221611	178	177	177
Schwa R & Short U + R /ə/ & /u/	er	.0184283	.0136827	.0105020	177	167	165
O long /ō/	o	.0174692	.0105353	.0078546	176	163	161
U Short and schwa /u/ & /ə/	o	.0174320	.0039598	.0029805	175	140	133.5
E long /ē/	y	.0167708	.0021602	.0014201	174	123	112.5
E long /ē/	e	.0164356	.0142291	.0118169	173	168	166

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
F	f	.0147129	.0167646	.0178305	172	172	173
O short /o/	o	.0145080	.0173475	.0196188	171	173	176
U Short and schwa /u/ & /ə/	u	.0140517	.0134496	.0140786	170	166	168
V	v	.0138282	.0086482	.0062591	169	160	156
U Short and schwa /u/ & /ə/	a	.0133906	.0144951	.0132546	168	170	167
U Short and schwa /u/ & /ə/	i	.0125432	.0012641	.0009643	167	107	101
G	g	.0109695	.0144878	.0164455	166	169	170
S	c	.0099358	.0033624	.0021740	165	135	123
A long /ā/	a	.0093306	.0022914	.0011571	164	124	107.5
U long OO long /ū/ and /o͞o/	u	.0084459	.0008233	.0007013	163	92	91
SH	tion	.0076358	.0001967	.0003156	162	51	72
A long /ā/	a-e	.0073564	.0060217	.0068903	161	154	159
U Short and schwa /u/ & /ə/	e	.0071050	.0184294	.0187598	160	175	174
H	h	.0070957	.0208374	.0187948	159	176	175
J	g	.0060248	.0015592	.0020513	158	115	122
Z	s	.0059596	.0295147	.0270526	157	181	180
L	le	.0057734	.0039015	.0065396	156	139	157.5
K	k	.0055965	.0132601	.0176903	155	165	172
W	w	.0053823	.0177409	.0175325	154	174	171
I long /ī/	i-e	.0051681	.0066592	.0083805	153	157	163
I long /ī/	i	.0051588	.0111800	.0095377	152	164	164

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
L	ll	.0045535	.0098067	.0075740	151	162	160
AR /ä/	a(r)	.0044139	.0038760	.0034364	150	138	141.5
S	ss	.0041159	.0016830	.0025597	149	117	131
TH voiceless	th	.0038272	.0056246	.0051721	148	151	151
SH	sh	.0037062	.0066410	.0058208	147	156	154
O long /ō/	o-e	.0034454	.0028087	.0024896	146	129	129
U Short and schwa /u/ & /ə/	ou	.0034082	.0006339	.0008766	145	87	98.5
NG	ng	.0033709	.0089251	.0065396	144	161	157.5
I short /i/	i-e	.0031567	.0010382	.0006312	143	100	86.5
Schwa R & Short U + R /ə/ & /u/	or	.0029891	.0013952	.0011571	142	109	107.5
CH	ch	.0029146	.0030819	.0030331	141	131	135
O broad /ô/	o(r)	.0029053	.0036320	.0038221	140	137	144
K	ck	.0027005	.0046957	.0049442	138.5	146	149
U long OO long /ū/ and /o͞o/	u-e	.0027005	.0005901	.0007539	138.5	83	93
NG	n	.0023373	.0020874	.0032260	137	122	138
E long /ē/	ee	.0023187	.0062330	.0055578	136	155	153
E long /ē/	ea	.0022814	.0044079	.0041026	134.5	143	146
/ks/	x	.0022814	.0013989	.0023669	134.5	110.5	127
F	ph	.0022535	.0002769	.0003857	133	69.5	76.5
Schwa R & Short U + R /ə/ & /u/	ur	.0021790	.0016976	.0015253	132	119	117
Z	z	.0021324	.0006521	.0004383	131	88	79.5

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
OU diphthong /ou/	ou	.0021138	.0059161	.0037695	130	153	143
J	j	.0020300	.0023132	.0041903	129	125	147
T	tt	.0020114	.0032932	.0022792	128	134	124.5
I long /ī/	y	.0019648	.0047940	.0034364	127	148	141.5
A long /ā/	ai	.0019369	.0016939	.0031208	126	118	137
R	rr	.0019276	.0011767	.0007364	125	105	92
OO short /oo/	u	.0018624	.0013989	.0010169	124	110.5	103.5
/kw/	qu	.0017786	.0012459	.0008240	123	106	96.5
I short /i/	a-e	.0017413	.0001676	.0000000	122	49.5	24.5
F	ff	.0016482	.0011366	.0010169	121	104	103.5
CH	t	.0016296	.0001348	.0000000	120	45	24.5
U long OO long /ū/ and /o͞o/	oo	.0016110	.0045864	.0033662	119	145	140
Schwa R & Short U + R /ə/ & /u/	ar	.0015644	.0003570	.0000000	118	76	24.5
O broad /ô/	a	.0015365	.0052348	.0025071	117	150	130
P	pp	.0014247	.0017741	.0011571	116	121	107.5
TH voiced	th	.0013875	.0280284	.0323299	115	180	183
A short /a/	a-e	.0013689	.0017522	.0016481	114	120	118
O broad /ô/	au	.0013595	.0002550	.0005260	113	62	83
K	ch	.0013223	.0004554	.0005435	112	79	84
M	mm	.0013037	.0004444	.0003682	111	78	75
E short /e/	ea	.0012944	.0013843	.0005786	110	108	85

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
A long /ā/	ay	.0012199	.0051911	.0039623	109	149	145
N	en	.0011919	.0009399	.0001929	108	94	66
N	nn	.0011826	.0009034	.0007890	107	93	95
O long /ō/	oa	.0011733	.0010492	.0010519	106	102	105
O long /ō/	ow	.0011547	.0032312	.0024721	105	132	128
O broad /ô/	o	.0011454	.0028305	.0032610	104	130	139
OU diphthong /ou/	ow	.0011081	.0039671	.0020338	102.5	141	121
SH	ci	.0011081	.0002076	.0000000	102.5	53	24.5
OO short /oo/	oo	.0010616	.0041274	.0044708	101	142	148
Schwa R & Short U + R /ə/ & /u/	ir	.0009684	.0015045	.0019812	100	113	120
U Short and schwa /u/ & /ə/	e-e	.0009405	.0000255	.0000526	99	27	54
I short /i/	y	.0009312	.0085827	.0051195	98	159	150
OI diphthong /oi/	oi	.0008567	.0003971	.0004909	97	77	82
WH /hw/	wh	.0008288	.0045682	.0029805	96	144	133.5
I long /ī/	igh	.0008195	.0024298	.0015078	95	127	116
O short /o/	a	.0007450	.0056538	.0051896	94	152	152
E short /e/	e-e	.0007356	.0002841	.0000877	93	71	60.5
K	cc	.0007077	.0001020	.0002805	92	39.5	69.5
O broad /ô/	aw	.0006984	.0009544	.0008240	91	97	96.5
D	dd	.0006891	.0006120	.0011571	90	86	107.5
G	gg	.0006239	.0010164	.0004558	89	98	81

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
Y	i	.0006146	.0001421	.0000000	88	46	24.5
AR /â/	ar	.0005960	.0003279	.0000175	87	73	49.5
B	bb	.0005867	.0006084	.0006312	86	84.5	86.5
E long /ē/	e-e	.0005773	.0010309	.0014377	84.5	99	114
E long /ē/	ie	.0005773	.0007067	.0003857	84.5	89	76.5
CH	tch	.0005680	.0011111	.0012273	83	103	110.5
U long OO long /ū/ and /o͞o/	ew	.0005587	.0009435	.0009468	82	95	100
ZH	si	.0005122	.0000109	.0000000	81	19	24.5
Y	y	.0004935	.0069944	.0079948	80	158	162
J	dge	.0004749	.0003133	.0014201	78.5	72	112.5
SH	ssi	.0004749	.0000000	.0000000	78.5	5	24.5
AR /â/	are	.0004656	.0005246	.0000877	77	81	60.5
OI diphthong /oi/	oy	.0004470	.0006084	.0018935	75.5	84.5	119
R	wr	.0004470	.0002696	.0003331	75.5	66	73
U Short and schwa /u/ & /ə/	o-e	.0004377	.0035445	.0026825	73.5	136	132
W	u	.0004377	.0000947	.0000000	73.5	38	24.5
AR /â/	air	.0004283	.0007322	.0002805	71.5	90	69.5
U Short and schwa /u/ & /ə/	u-e	.0004283	.0000073	.0000000	71.5	17	24.5
AR /ä/	a	.0004097	.0015154	.0004383	69	114	79.5
E long /ē/	i-e	.0004097	.0002076	.0000000	69	53	24.5
Z	es	.0004097	.0014317	.0006487	69	112	89

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
/kz/	x	.0004004	.0000656	.0000000	67	34	24.5
N	kn	.0003818	.0009472	.0007714	65	96	94
N	on	.0003818	.0001311	.0000526	65	43.5	54
Schwa R & Short U + R /ə/ & /u/	er-e	.0003818	.0000146	.0000351	65	21.5	51.5
E long /ē/	ey	.0003725	.0002331	.0001753	63	58.5	64.5
E long /ē/	i	.0003539	.0002696	.0000000	61.5	66	24.5
SH	si	.0003539	.0000000	.0000000	61.5	5	24.5
SH	ch	.0003166	.0000328	.0000000	59.5	28	24.5
ZH	s	.0003166	.0000801	.0000000	59.5	36	24.5
J	d	.0002980	.0000364	.0000000	57.5	29.5	24.5
N	gn	.0002980	.0000437	.0002104	57.5	32	67
AR /ä/	ar-e	.0002887	.0025464	.0022792	55.5	128	124.5
AR /â/	ere	.0002887	.0016211	.0014903	55.5	116	115
E long /ē/	ea-e	.0002794	.0005719	.0002630	53.5	82	68
SH	ti	.0002794	.0000036	.0000000	53.5	12.5	24.5
O long /ō/	ou	.0002700	.0002186	.0001753	51	57	64.5
Schwa R & Short U + R /ə/ & /u/	ear	.0002700	.0003497	.0006487	51	75	89
U long OO long /ū/ and /o͞o/	ou	.0002700	.0047321	.0059961	51	147	155
T	ed	.0002607	.0032604	.0030507	48.5	133	136
U long OO long /ū/ and /o͞o/	eu	.0002607	.0000146	.0000000	48.5	21.5	24.5
M	mb	.0002514	.0002586	.0000000	46.5	63.5	24.5

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
U long OO long /ū/ and /o͞o/	ue	.0002514	.0002769	.0012273	46.5	69.5	110.5
I long /ī/	ie	.0002421	.0005027	.0009818	44.5	80	102
/ks/	cs	.0002421	.0000036	.0000000	44.5	12.5	24.5
E long /ē/	ie-e	.0002142	.0001093	.0000701	41.5	41	57.5
I long /ī/	y-e	.0002142	.0001676	.0000000	41.5	49.5	24.5
U Short and schwa /u/ & /ə/	y	.0002142	.0000000	.0000000	41.5	5	24.5
Z	zz	.0002142	.0002732	.0004032	41.5	68	78
U Short and schwa /u/ & /ə/	ie	.0002049	.0000036	.0000000	39	12.5	24.5
G	gue	.0001956	.0000364	.0000000	37.5	29.5	24.5
Schwa R & Short U + R /ə/ & /u/	our	.0001956	.0000073	.0000000	37.5	17	24.5
O short /o/	o-e	.0001862	.0000219	.0000000	35.5	25.5	24.5
SH	s	.0001862	.0002113	.0000175	35.5	55.5	49.5
G	gu	.0001769	.0002696	.0000000	32.5	66	24.5
K	que	.0001769	.0000000	.0000000	32.5	5	24.5
L	el	.0001769	.0001020	.0000701	32.5	39.5	57.5
S	ps	.0001769	.0000000	.0000000	32.5	5	24.5
A long /ā/	eigh	.0001676	.0002113	.0001227	29.5	55.5	62
AR /ä/	ea(r)	.0001676	.0000401	.0000000	29.5	31	24.5
M	lm	.0001583	.0000146	.0000000	27	21.5	24.5
O broad /ô/	o-e	.0001583	.0003315	.0002981	27	74	71
OO short /oo/	o	.0001583	.0010455	.0008766	27	101	98.5

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
A long /ā/	e	.0001490	.0000036	.0000000	23.5	12.5	24.5
E long /ē/	ei	.0001490	.0000510	.0000526	23.5	33	54
I short /i/	ui	.0001490	.0002514	.0000000	23.5	61	24.5
R	rh	.0001490	.0000146	.0000000	23.5	21.5	24.5
I short /i/	ai	.0001397	.0001603	.0000000	20	48	24.5
O broad /ô/	ough	.0001397	.0002076	.0006487	20	53	89
ZH	g	.0001397	.0000073	.0000000	20	17	24.5
A long /ā/	ea	.0001304	.0002331	.0003506	16.5	58.5	74
A long /ā/	ei	.0001304	.0000182	.0000701	16.5	24	57.5
A long /ā/	ey	.0001304	.0023679	.0023318	16.5	126	126
J	gi	.0001304	.0000036	.0000000	16.5	12.5	24.5
AR /â/	ear	.0001211	.0007432	.0000000	12.5	91	24.5
CH	ti	.0001211	.0000729	.0000000	12.5	35	24.5
O long /ō/	oe	.0001211	.0001457	.0000000	12.5	47	24.5
Z	ss	.0001211	.0000219	.0000000	12.5	25.5	24.5
O broad /ô/	augh	.0001117	.0001311	.0000000	8.5	43.5	24.5
U long OO long /ū/ and /o͞o/	o-e	.0001117	.0002586	.0001578	8.5	63.5	63
U long OO long /ū/ and /o͞o/	oo-e	.0001117	.0002441	.0000701	8.5	60	57.5
U Short and schwa /u/ & /ə/	oo-e	.0001117	.0000000	.0000351	8.5	5	51.5
I short /i/	ei	.0001024	.0000000	.0000000	5	5	24.5
OO short /oo/	u-e	.0001024	.0000000	.0000000	5	5	24.5

		Relative Frequencies			Ranks		
PH	GR	Fry	Literature	Phonics	Fry	Literature	Phonics
T	bt	.0001024	.0000036	.0000000	5	12.5	24.5
G	gh	.0000931	.0001166	.0000000	2	42	24.5
O long /ō/	ou-e	.0000931	.0000838	.0000000	2	37	24.5
U Short and schwa /u/ & /ə/	eo	.0000931	.0000000	.0000000	2	5	24.5

Note. PH = Phoneme; GR = Grapheme.

APPENDIX G

INSTRUCTIONAL SEQUENCES BASED ON THREE TEXT TYPES

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
R	r	T	t	T	t
T	t	R	r	N	n
N	n	N	n	R	r
I short /i/	i	D	d	S	s
L	l	I short /i/	i	I short /i/	i
S	s	S	s	D	d
A short /a/	a	A short /a/	a	A short /a/	a
D	d	M	m	TH voiced	th
K	c	L	l	M	m
E short /e/	e	Z	s	L	l
M	m	TH voiced	th	Z	s
P	p	E short /e/	e	P	p
B	b	P	p	E short /e/	e
Schwa R & Short U+R	er	B	b	B	b
O long /ō/	o	H	h	O short /o/	o
U Short and schwa	o	U Short and schwa	e	H	h
E long /ē/	y	W	w	U Short and schwa	e
E long /ē/	e	O short /o/	o	F	f
F	f	F	f	K	k

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
O short /o/	o	K	c	W	w
U Short and schwa	u	U Short and schwa	a	G	g
V	v	G	g	K	c
U Short and schwa	a	E long /ē/	e	U Short and schwa	u
U Short and schwa	i	Schwa R & Short U+R	er	U Short and schwa	a
G	g	U Short and schwa	u	E long /ē/	e
S	c	K	k	Schwa R & Short U+R	er
A long /ā/	a	I long /ī/	i	I long /ī/	i
U long OO long	u	O long /ō/	o	I long /ī/	i-e
SH	tion	L	ll	Y	y
A long /ā/	a-e	NG	ng	O long /ō/	o
U Short and schwa	e	V	v	L	ll
H	h	I short /i/	y	A long /ā/	a-e
J	g	Y	y	L	le
Z	s	I long /ī/	i-e	NG	ng
L	le	SH	sh	V	v
K	k	E long /ē/	ee	U long OO long	ou
W	w	A long /ā/	a-e	SH	sh
I long /ī/	i-e	OU diphthong /ou/	ou	E long /ē/	ee
I long /ī/	i	O short /o/	a	O short /o/	a
L	ll	TH voiceless	th	TH voiceless	th

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
AR /ä/	a(r)	O broad /ô/	a	I short /i/	y
S	ss	A long /ā/	ay	K	ck
TH voiceless	th	I long /ī/	y	OO short /oo/	oo
SH	sh	U long OO long	ou	J	j
O long /ō/	o-e	K	ck	E long /ē/	ea
U Short and schwa	ou	U long OO long	oo	A long /ā/	ay
NG	ng	WH /hw/	wh	O broad /ô/	o(r)
I short /i/	i-e	E long /ē/	ea	OU diphthong /ou/	ou
Schwa R & Short U+R	or	OO short /oo/	oo	AR /ä/	a(r)
CH	ch	OU diphthong /ou/	ow	I long /ī/	y
O broad /ô/	o(r)	U Short and schwa	o	U long OO long	oo
K	ck	L	le	O broad /ô/	o
U long OO long	u-e	AR /ä/	a(r)	NG	n
NG	n	O broad /ô/	o(r)	A long /ā/	ai
E long /ē/	ee	U Short and schwa	o-e	T	ed
E long /ē/	ea	S	c	CH	ch
/ks/	x	T	tt	U Short and schwa	o
F	ph	T	ed	WH /hw/	wh
Schwa R & Short U+R	ur	O long /ō/	ow	U Short and schwa	o-e
Z	z	CH	ch	S	ss
OU diphthong /ou/	ou	O broad /ô/	o	O broad /ô/	a

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
J	j	O long /ō/	o-e	O long /ō/	o-e
T	tt	AR /ä/	ar-e	O long /ō/	ow
I long /ī/	y	I long /ī/	igh	/ks/	x
A long /ā/	ai	A long /ā/	ey	A long /ā/	ey
R	rr	J	j	T	tt
OO short /oo/	u	A long /ā/	a	AR /ä/	ar-e
/kw/	qu	E long /ē/	y	S	c
I short /i/	a-e	NG	n	J	g
F	ff	P	pp	OU diphthong /ou/	ow
CH	t	A short /a/	a-e	Schwa R & Short U+R	ir
U long OO long	oo	Schwa R & Short U+R	ur	OI diphthong /oi/	oy
Schwa R & Short U+R	ar	A long /ā/	ai	A short /a/	a-e
O broad /ô/	a	S	ss	Schwa R & Short U+R	ur
P	pp	AR /â/	ere	I long /ī/	igh
TH voiced	th	J	g	AR /â/	ere
A short /a/	a-e	AR /ä/	a	E long /ē/	e-e
O broad /ô/	au	Schwa R & Short U+R	ir	E long /ē/	y
K	ch	Z	es	J	dge
M	mm	/ks/	x	CH	tch
E short /e/	ea	OO short /oo/	u	U long OO long	ue
A long /ā/	ay	Schwa R & Short U+R	or	A long /ā/	a

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
N	en	E short /e/	ea	Schwa R & Short U+R	or
N	nn	U Short and schwa	i	P	pp
O long /ō/	oa	/kw/	qu	D	dd
O long /ō/	ow	R	rr	O long /ō/	oa
O broad /ô/	o	F	ff	OO short /oo/	u
OU diphthong /ou/	ow	CH	tch	F	ff
SH	ci	O long /ō/	oa	I long /ī/	ie
OO short /oo/	oo	OO short /oo/	o	U Short and schwa	i
Schwa R & Short U+R	ir	I short /i/	i-e	U long OO long	ew
U Short and schwa	e-e	E long /ē/	e-e	U Short and schwa	ou
I short /i/	y	G	gg	OO short /oo/	o
OI diphthong /oi/	oi	O broad /ô/	aw	/kw/	qu
WH /hw/	wh	N	kn	O broad /ô/	aw
I long /ī/	igh	U long OO long	ew	N	nn
O short /o/	a	N	en	N	kn
E short /e/	e-e	N	nn	U long OO long	u-e
K	cc	U long OO long	u	R	rr
O broad /ô/	aw	AR /â/	ear	U long OO long	u
D	dd	AR /â/	air	Z	es
G	gg	E long /ē/	ie	Schwa R & Short U+R	ear
Y	i	Z	z	O broad /ô/	ough

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
AR /â/	ar	U Short and schwa	ou	I short /i/	i-e
B	bb	D	dd	B	bb
E long /ē/	e-e	B	bb	E short /e/	ea
E long /ē/	ie	OI diphthong /oi/	oy	K	ch
CH	tch	U long OO long	u-e	O broad /ô/	au
U long OO long	ew	E long /ē/	ea-e	OI diphthong /oi/	oi
ZH	si	AR /â/	are	G	gg
Y	y	I long /ī/	ie	Z	z
J	dge	K	ch	AR /ä/	a
SH	ssi	M	mm	Z	zz
AR /â/	are	OI diphthong /oi/	oi	F	ph
OI diphthong /oi/	oy	Schwa R & Short U+R	ar	E long /ē/	ie
R	wr	Schwa R & Short U+R	ear	M	mm
U Short and schwa	o-e	O broad /ô/	o-e	A long /ā/	ea
W	u	AR /â/	ar	R	wr
AR /â/	air	J	dge	SH	tion
U Short and schwa	u-e	E short /e/	e-e	O broad /ô/	o-e
AR /ä/	a	F	ph	K	cc
E long /ē/	i-e	U long OO long	ue	AR /â/	air
Z	es	Z	zz	E long /ē/	ea-e
/kz/	x	R	wr	N	gn

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
N	kn	E long /ē/	i	N	en
N	on	G	gu	E long /ē/	ey
Schwa R & Short U+R	er-e	M	mb	O long /ō/	ou
E long /ē/	ey	U long OO long	o-e	U long OO long	o-e
E long /ē/	i	O broad /ô/	au	A long /ā/	eigh
SH	si	I short /i/	ui	E short /e/	e-e
SH	ch	U long OO long	oo-e	AR /â/	are
ZH	s	E long /ē/	ey	E long /ē/	ie-e
J	d	A long /ā/	ea	L	el
N	gn	O long /ō/	ou	A long /ā/	ei
AR /ä/	ar-e	SH	s	U long OO long	oo-e
AR /â/	ere	A long /ā/	eigh	U Short and schwa	e-e
E long /ē/	ea-e	SH	ci	N	on
SH	ti	E long /ē/	i-e	E long /ē/	ei
O long /ō/	ou	O broad /ô/	ough	Schwa R & Short U+R	er-e
Schwa R & Short U+R	ear	SH	tion	U Short and schwa	oo-e
U long OO long	ou	I short /i/	a-e	AR /â/	ar
T	ed	I long /ī/	y-e	SH	s
U long OO long	eu	I short /i/	ai	-	-
M	mb	O long /ō/	oe	-	-
U long OO long	ue	Y	i	-	-

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
I long /ī/	ie	CH	t	-	-
/ks/	cs	N	on	-	-
E long /ē/	ie-e	O broad /ô/	augh	-	-
I long /ī/	y-e	G	gh	-	-
U Short and schwa	y	E long /ē/	ie-e	-	-
Z	zz	K	cc	-	-
U Short and schwa	ie	L	el	-	-
G	gue	W	u	-	-
Schwa R & Short U+R	our	O long /ō/	ou-e	-	-
O short /o/	o-e	ZH	s	-	-
SH	s	CH	ti	-	-
G	gu	/kz/	x	-	-
K	que	E long /ē/	ei	-	-
L	el	N	gn	-	-
S	ps	AR /ä/	ea(r)	-	-
A long /ā/	eigh	J	d	-	-
AR /ä/	ea(r)	G	gue	-	-
M	lm	SH	ch	-	-
O broad /ô/	o-e	U Short and schwa	e-e	-	-
OO short /oo/	o	O short /o/	o-e	-	-
A long /ā/	e	Z	ss	-	-

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
E long /ē/	ei	A long /ā/	ei	-	-
I short /i/	ui	Schwa R & Short U+R	er-e	-	-
R	rh	U long OO long	eu	-	-
I short /i/	ai	M	lm	-	-
O broad /ô/	ough	R	rh	-	-
ZH	g	ZH	si	-	-
A long /ā/	ea	U Short and schwa	u-e	-	-
A long /ā/	ei	Schwa R & Short U+R	our	-	-
A long /ā/	ey	ZH	g	-	-
J	gi	SH	ti	-	-
AR /â/	ear	/ks/	cs	-	-
CH	ti	U Short and schwa	ie	-	-
O long /ō/	oe	A long /ā/	e	-	-
Z	ss	J	gi	-	-
O broad /ô/	augh	T	bt	-	-
U long OO long	o-e	-	-	-	-
U long OO long	oo-e	-	-	-	-
U Short and schwa	oo-e	-	-	-	-
I short /i/	ei	-	-	-	-
OO short /oo/	u-e	-	-	-	-
T	bt	-	-	-	-

Fry's Sequence		Literature Sequence		Phonics Sequence	
PH	GR	PH	GR	PH	GR
G	gh	-	-	-	-
O long /ō/	ou-e	-	-	-	-
U Short and schwa	eo	-	-	-	-

Note. PH = Phoneme; GR = Grapheme. All phoneme-grapheme correspondences are listed in descending frequency.

APPENDIX H

PRONUNCIATION GUIDE ALIGNMENT

Walker	Fry	Hannah	M-W
Along	A long	(A) A1	/ā/
ARbroad	AR	A5	/ä/
ARcarat	AR	A2	-
Ashort	A short	A3 (A4, A6)	/a/
B	B	B	/b/
CH	CH	CH	/ch/
D	D	D	/d/
Elong	E long	(E) E1, E2	/ē/
Eshort	E short	E3	/e/
F	F	F	/f/
G	G	G	/g/
H	H	H	/h/
Ilong	I long	(I) I1	/ī/
Ishort	I short	I3	/i/
J	J	J	/j/
K	K	K	/k/
KSunvoiced	/ks/	KS	/ks/
KW	/kw/	KW	/kw/
KZvoiced	/kz/	-	/gz/
L	L	L, L1	/l/, /ᵊl/

Walker	Fry	Hannah	M-W
M	M	M, M1	/m/, /ᵊm/
N	N	N, N1	/n/, /ᵊn/
NG	NG	NG	/ŋ/
Obroad	O broad	O2 & O5	/ȯ/
OIdipthong	OI diphthong	OI	/ȯi/
Olong	O long	(O) O1	/ō/
OOshort	OO short	O7	/u̇/
Oshort	O short	O3	/ä/
OUdipthong	OU diphthong	OU	/au̇/
P	P	P	/p/
R	R	R	/r/
S	S	S	/s/
SchwaShortU-R	Schwa R & Short U + R	U2 & E5	/ə/ + /r/
SH	SH	SH	/sh/
T	T	T	/t/
THunvoiced	TH voiceless	T1	/th/
THvoiced	TH voiced	T2	/t̲h̲/
U-OOlong	U long and OO long	(U) U1 & O6	/ü/
UshortSchwa	U short and schwa	U3 & SCHWA	/ə/
V	V	V	/v/
W	W	W	/w/
WH/hw/	WH /hw/	HW	/w/ or /hw/

Walker	Fry	Hannah	M-W
Y	Y	Y	/y/
Z	Z	Z	/z/
ZH	ZH	ZH	/zh/

APPENDIX I

INSTITUTIONAL APPROVAL

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **29042706**
PROJECT TITLE: **A Graphophonic Investigation of Beginning Level Texts**
PROPOSED PROJECT DATES: **04/27/09 to 04/27/10**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Kevin Clark Walker**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Curriculum, Instruction, & Special Education**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Exempt Approval**
PERIOD OF APPROVAL: **05/04/09 to 05/03/10**

Lawrence A. Hosman

Lawrence A. Hosman, Ph.D.
HSPRC Chair

5-6-09
Date

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