Analysis of Phonological Awareness Content in Pre-Service Textbooks on the Teaching of Reading

Analyse du contenu relié à la conscience phonologique dans les manuels de formation sur l'enseignement de la lecture

KEY WORDS

PHONOLOGICAL AWARENESS

INSTRUCTION

CLASSROOM

SPEECH-LANGUAGE PATHOLOGIST

TEACHERS

KNOWLEDGE

TEXTBOOKS

Denyse V. Hayward
Linda M. Phillips
Jennifer E. Sych

Abstract

The current study examined the accuracy of phonological awareness content in pre-service textbooks on the teaching of reading. Chapters in 28 textbooks published between 2001 and 2011 were analyzed for accuracy and omissions of content on phonological awareness. We identified and analyzed content related to six categories: (a) definitions, (b) task hierarchy, (c) task descriptions, (d) phoneme descriptions, (e) skill components, and (f) phoneme-grapheme correspondences. A total of 313 errors in accuracy were identified all six categories: no chapter was error-free. Content errors in the phoneme-grapheme correspondences category were the most prevalent across chapters. Error exemplars and inappropriate activities are provided. A total of 39 omissions were identified in the two categories examined: definitions and phoneme level word analysis. This is the first known study of the magnitude and type of phonological awareness inaccuracies and omissions of content in pre-service textbooks. Knowledge of these inaccuracies and omissions will allow speech-language pathologists to collaborate with teachers to overcome such resource shortcomings and enhance classroom phonological awareness instruction, particularly for children with language impairment who are at risk for reading difficulties. We recommend that textbook authors and publishers seek out expert collaborators and reviewers prior to publication.

Abrégé

L'étude examine le contenu associé à la conscience phonologique dans les manuels d'enseignement de la lecture. Des chapitres dans 28 livres publiés entre 2001 et 2011 ont été analysés pour évaluer la précision et les omissions du contenu en conscience phonologique selon six catégories : a) définitions, b) hiérarchie des tâches, c) description des tâches, d) description des phonèmes, e) composantes des habiletés et f) relations graphème/phonème. Un total de 313 erreurs de précision ont été identifiés dans toutes les catégories : aucun chapitre n'était sans erreur. Les erreurs de contenu dans la catégorie relations graphème/phonème étaient les plus fréquentes dans les chapitres. Des exemples d'erreurs et d'activités inappropriées sont fournis. Un total de 39 omissions ont été identifiées dans les deux catégories examinées : définitions et analyse de mots par phonèmes. Il s'agit de la première étude connue portant sur l'ampleur et le type des imprécisions en conscience phonologique et sur les omissions de contenu dans les manuels de formation. Une connaissance de ces imprécisions et omissions permettra aux orthophonistes de travailler avec les enseignants pour surmonter ces lacunes et rehausser l'enseignement relatif à la conscience phonologique, spécialement auprès d'enfants ayant des troubles de langage qui sont à risque d'éprouver des difficultés de lecture. Nous recommandons aux auteurs et éditeurs de trouver des collaborateurs et réviseurs experts dans le domaine avant de publier ces livres.

Denyse V. Hayward
Department of Educational Psychology
Canadian Centre for Research on Literacy
University of Alberta
Edmonton, AB
T6G 2G5

Linda M. Phillips
Department of Elementary Education
Canadian Centre for Research on Literacy
University of Alberta
Edmonton, AB
T6G 2G5

Jennifer E. Sych
Child Study Centre
University of Alberta
Edmonton, AB
T6G 2G5

Adequate knowledge of phonological awareness is recognized as a critical element for reading (e.g., Ehri, 2000; Moats, 2009), and spelling (e.g., Apel & Masterson, 2001; Goswami & Bryant, 1990; Masterson & Apel, 2010). The combined influence of a large body of research evidence, changes to educational policy, responses to intervention initiatives, and child-learning accountability standards have been instrumental in the inclusion of phonological awareness instruction in Kindergarten and Grade 1 curricula in both Canada and the United States. However, several studies have shown that many teachers do not possess adequate phonological awareness skills (e.g., Cunningham, Perry, Stanovich, & Stanovich, 2004; Fielding-Barnsley, 2010; Moats, 2009) and thus, their ability to provide explicit and accurate instruction of phonological awareness is compromised, which in turn impacts children's learning to read (McCutchen, Green, Abbott, & Sanders, 2009; McCutchen et al., 2002).

Even though practicing and pre-service teachers access a variety of resources to acquire or increase their knowledge of reading instruction, a commonly used resource is textbooks on the teaching of reading encountered in teacher training programs. Through our experiences teaching pre-service teachers, we noted numerous misunderstandings in their knowledge of phonological awareness and checked the required textbooks used in their programs of studies. It is important to know how well these textbooks present the fundamentals of phonological awareness (PA). Thus, the aim of this study was to analyze the phonological awareness content in pre-service textbooks developed for teacher education on the teaching of reading. Such information is important for professionals, such as speech-language pathologists (S-LPs), who collaborate in the instruction of PA with teachers.

Background

Phonological awareness (PA) is defined as "the ability to detect, manipulate, or analyze the auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning" (National Early Literacy Panel, 2008, p. 3). The term phonological awareness is commonly used to describe both the construct and the level of analysis within a word and type of task. The phonological awareness construct "refers to an individual's awareness of the sound structure or phonological structure of a spoken word" (Gillon, 2004, p. 2). Phonemic awareness is a constituent element of phonological awareness and refers to aspects associated with the focus on and manipulation of individual speech sounds within words (Anthony & Francis, 2005). The level of analysis and type of task include manipulation of larger and simpler units of analysis, such as separating words into syllables, creating rhymes, and identifying words that begin with the same sound, as well as manipulation of smaller and more difficult to isolate units of analysis; individual sounds in words (e.g., blending sounds into words, segmenting words into sounds, and deleting, substituting, or adding sounds in words) (Anthony & Francis, 2005; Stahl & Murray, 1994; Vloedgraven & Verhoeven, 2009). Phoneme segmenting and blending are recognized as critical skill achievements that support reading success; however, larger units of analysis are important components of instruction to the extent that they facilitate subsequent development of phoneme blending and segmenting (Schuele & Boudreau, 2008).

Phonological awareness is considered essential to all of the processes involved in learning to read and write and contributes to these skills in a variety of ways (Ehri, 1994; Griffith, 1991). Ehri points out that blending skills are needed to decode words, to read a word by analogy (i.e., read an unfamiliar word 'click' by using a familiar word with the same rime unit 'kick') onset-rime segmentation and blending skills are required, and reading words from memory requires phoneme segmentation. In the case of spelling, phoneme segmentation supports the construction of word spellings and memory of the correct spelling of words (Griffith, 1991; National Institute of Health and Human Development (NIHHD) (2000).

A large body of evidence showing causal relationships among phonological awareness, and reading, and spelling development has substantiated the importance of phonological awareness instruction in the early grades. Phonological awareness is cited as a strong predictor of early reading achievement and children experiencing delayed phonological awareness are at risk for developing delays in reading acquisition compared to children who do not experience delays in phonological awareness (Chafouleas, VanAuken & Dunham, 2001; Rvachew, Chiang, & Evans, 2007; Torgesen, Wagner, & Rashotte, 1994). For example, Torgesen et al. (1994) reported long term impacts of PA deficits on reading outcomes, whereby grade 1 children, otherwise developing typically, with phonological awareness skills below the 20th percentile lagged behind same-aged peers in word reading abilities throughout their elementary schooling. In fact, by grade 5, their average reading attainment was at a grade 2 level compared to at-grade-level attainment for children who had scored above the 20th percentile in their grade 1 testing of phonological awareness.

Dickinson, Golinkoff and Hirsh-Pasek (2010) stated "language is unique among precursor abilities in its pervasiveness for both early and later reading competencies" (p. 308) and has been verified by a large body of research demonstrating that oral language difficulties effect reading development (Bishop & Snowling, 2004; Boudreau & Hedberg, 1999; Nation & Norbury, 2005). In fact, Catts, Fey, Tomblin, and Zhang (2002) reported that more than 60% of children diagnosed with language impairment (LI) can be expected to have reading difficulties. Bishop and Snowling (2004) and Catts et al. (2002) provide evidence that children with LI may have word reading (decoding) and/or reading comprehension difficulties, and that word decoding deficits typically indicate the existence of phonological awareness difficulties.

Relationships between phonological awareness instruction, reading, and spelling development have also been demonstrated in two meta-analyses conducted by Bus and van IJzendoorn (1999) and Ehri et al. (2001). Both research groups examined experimental and quasi-experimental intervention studies to estimate the effects of phonological awareness interventions on reading. The 34 studies examined by Bus and van IJzendoorn (1999) provided intervention on either one or more of the following skills: (a) phoneme segmentation, (b) phoneme blending, (c) sound deletion, and (d) letter-sound connections. Ehri et al. (2001) examined 52 studies where the instruction or intervention was comprised of one or more of the following: (a) phoneme identification, (b) phoneme categorization, (c) phoneme segmentation, (d) phoneme blending, (e) sound deletion, (f) onset-rime, and (g) letter-sound connections. The Bus and van IJzendoorn (1999) and Ehri et al. (2001) meta-analyses showed phonological awareness as a causal factor in learning to read with effect sizes of 0.73 and 0.86 respectively. The effectiveness of phonological awareness instruction on reading was also found to be greater in particular circumstances than others. First, the effect of phonological awareness instruction on reading was greater for children at-risk for reading difficulties (d = 0.86) than for children with average reading abilities (d = 0.47) and children with existing reading disabilities (d = 0.45) (Ehri et al., 2001). Second, the combination of phonological awareness instruction with the instruction of letter-sound correspondences had a greater impact on reading than phonological awareness instruction alone (d = 1.75 vs d = 1.19) and (d = 0.67 vs d = 0.38), Bus and van IJzendoorn (1999) and Ehri et al. (2001) respectively. Ehri et al. (2001) also showed that phonemic awareness instruction supported spelling abilities (d = 0.59).

Results of these meta-analyses prompted the National Reading Panel (NIHHD, 2000) to recommend the inclusion of phonological awareness instruction in the early grades. Additionally, researchers studying children's language and literacy development, irrespective of language ability, have also consistently recommended high quality, classroom instruction in phonological awareness to support reading and spelling development (e.g., Boudreau & Hedberg, 1999; Dickinson et al., 2010; Torgesen et al., 1994). However, studies over the past two decades have revealed that many teachers have not received adequate training with respect to English phonology or phonological awareness, knowledge of which is necessary to ensure accurate, systematic, and explicit instruction (e.g., Bos, Mather, Dickson, Podhajski, & Chard, 2001; Brady, et al., 2009; Cunningham et al., 2004). The following example of an actual teacher lesson presented by McCutchen et al. (2002) illustrates the crucially important contribution that knowledge of English phonology and phonological awareness has to accurate and explicit instruction. In the lesson, students were asked to identify the words in which the letter U[1] "says its name," pronounced /ju[1] /, from a list of words provided by the teacher (i.e., hunt, shush, crush, prune, stump, abuse, slump, cute, stuck, tube, truck, and crunch). Though the two phonemes /ju/, representing the letter name U, occur in the words, ABUSE → / əbjus/ and CUTE → /kjut/, the teacher directed children to similarly categorize the words PRUNE → /prun/ and TUBE → /tub/, which in the majority of American dialects comprise only the single phoneme /u/, as words in which the letter U says its name (McCutchen et al., 2002). The example shows that the consequence of limited knowledge in English phonology results in inaccurate instruction. Additionally, children who had correctly categorized words and children who struggled to make accurate grapheme-phoneme connections were likely confused.

The importance of knowledge of English phonology and phonological awareness for student learning has been confirmed in studies by McCutchen et al. (2002; 2009). In 2002, McCutchen and colleagues examined the relationships between 51 teachers' (24 kindergarten; 27 grades 1 and 2 combined) knowledge of phonology and classroom phonological awareness instructional practices with student literacy achievement. A significant correlation was found between a measure of kindergarten teachers' knowledge of phonology and their instruction of phonological awareness with students' end-of-year word reading (r = .49 and r = .47, respectively, p <.05). The correlation between teacher knowledge and student literacy was not significant for first and second-grade children; however, word reading was only indirectly evaluated via comprehension and vocabulary measures for these students. In a later study, McCutchen et al. (2009)

examined the effects of teacher knowledge of English phonology and phonological awareness on the literacy achievement of students in grades 3 to 5, and a sub-group of struggling readers in each grade. Thirty teachers (16 intervention condition; 14 control condition) participated. Intervention teachers attended a 10-day workshop focused on increasing their understanding of phonology, phonological awareness, and the important connections between phonological awareness and reading instruction. All teachers (intervention and control) were observed during literacy instruction in their classrooms three times over the school year. Student literacy skill measures were assessed in both Fall and Spring and comprised vocabulary, comprehension, spelling, and writing. The struggling reader subgroup was also administered tests of word reading and word decoding.

McCutchen et al. (2009) found that teachers within both the intervention and control groups varied considerably in their knowledge of English phonology and phonological awareness. Hierarchical linear analysis revealed that teacher knowledge was related to improved student performance regardless of condition (intervention or control). Moreover, teacher knowledge had specific and measurable positive effects on struggling readers. Struggling readers in intervention classrooms showed significantly higher levels of performance at year-end on all literacy measures, compared with the struggling readers in control classrooms. These findings are consistent with the interpretation that adequate knowledge of English phonology and phonological awareness enables teachers to provide more effective instruction, especially for struggling readers (McCutchen et al., 2009).

Written Versus Spoken Word Conceptualizations

Proficiency in phonological awareness requires the ability to analyze words at the syllabic, onset-rime, and phoneme levels. Convergent evidence from the United States, United Kingdom, and Australia shows that teachers' misunderstandings of these concepts are primarily due to a reliance on the written conceptualization of words rather than on the spoken conceptualization of words (see Cheesman, McGuire, Shankweiler & Coyne, 2009; Fielding-Barnsley, 2010; Stainthorp, 2004).

For example, on a written survey of phonemic awareness knowledge (PAK), Spencer, Schuele, Guillot, and Lee (2008) found that when teacher participants (kindergarten, grade one, special education, and reading resource) and S-LP participants were asked to identify the number of sounds in a word, mean accuracy was relatively high (83% correct Teachers; 95% correct S-LPs) for words where there was a close correspondence between the phonemes and graphemes. For example, when counting phonemes in the word CAT each phoneme is represented by a single grapheme /k/ → C, /æ/ → A, /t/ → T. However, for phonemes where there was not a close phoneme-grapheme correspondence the mean accuracy for both groups was lower but substantially lower for teachers (22% correct Teachers; 54% correct S-LPs). The word BOX has four phonemes /b/ → B, /ɒ/ → O, /k/ and /s/ → X. However, most teachers indicated that the word BOX has 3 phonemes, counting 'X,' a letter where the phoneme-grapheme correspondence is not transparent, as a single phoneme. Spencer et al. (2008) found a similar pattern in phoneme identification tasks for teacher participants. When asked to identify the third phoneme in the word WOULD, most teachers stated that /l/ was the third phoneme even though there is no /l/ in the spoken word form of WOULD → /wʊd/. When asked to analyze the sound structure of words, the teachers tended to focus on orthographic representations of the word instead of the phonemes that comprise the word. When there is a close phoneme-grapheme correspondence, then either orthographic or spoken conceptualizations can lead to accurate word analysis; but for words with less transparent correspondence, orthographic knowledge tends to interfere with accurate analysis for many teachers (Moats, 2009; Stainthorp, 2004). Even though many of the teacher misunderstandings related to sound structure analysis can be linked to an over-reliance on orthographic patterns, other studies have shown that some teachers have difficulty analyzing the sound structure of words in general. For example, Cunningham et al. (2004), in an examination of 722 kindergarten and grade 3 teachers' PAK, found that 37% of the teacher participants could not correctly identify the number of phonemes in the word SUN even though it has one-to-one phoneme-grapheme correspondences.

Words containing consonant clusters (e.g., **ST**OP, **GR**ASS, **SCR**ATCH) were also shown to be problematic for many teachers and other professionals. On a written survey that included PAK items, Moats (1994) found that over one-half of the 89 participants (reading teachers, regular classroom teachers, teaching assistants, and S-LPs) treated consonant clusters as a single phoneme rather than two or three distinct phonemes. Moreover, the letter combinations TCH and BT (e.g., STRE**TCH**, DOU**BT**) were treated as consonant clusters even though each of these letter combinations represents a single phoneme in these words. Cunningham et al. (2004) reported similar findings for one-third of their teacher participants.

McCutchen et al. (2002) and Moats (2009) pointed out that a key difficulty for literate adults is that their knowledge of phonemes and orthographic patterns are intertwined to such a high degree that separation is difficult. If teachers have not received specific training in phonological word analysis, their classroom instruction may be inaccurate or inconsistent, and lead to confusions for children. Spencer et al. (2008) emphasized that in order to provide effective instruction, teachers, at the very least, must be able to accurately segment the sounds of words that would be found in basal readers. Moats (2009) went further and insisted that it is essential for teachers to have 'extensive proficiency' in analyzing the sound structure of words in order to implement phonological awareness instructional activities.

A final challenge for accurate teaching of phonological awareness is that many teachers confuse the instruction of phonological awareness with the instruction of phonics (i.e., letter-sound relationships) (Bos et al., 2001; Cunningham, Zibulsky, & Callahan, 2009; Joshi, et al., 2009b). The Bus and van IJzendoorn (1999) and Ehri et al. (2001) meta-analyses revealed that combining phonological awareness instruction with the instruction of letter-sound relationships had a greater impact on reading than phonological awareness instruction alone. Thus, it is critical for teachers and any other professionals engaged in reading instruction in classrooms to have (a) a clear understanding of the constituent components of phonological awareness, (b) the ability to analyze the sound structure of words, and (c) an understanding of the differences between phonological awareness and phonics instruction, to support reading success for children in their classrooms.

Barriers to Acquisition of Knowledge and Skills

Although the need for teachers to acquire knowledge and skills to provide accurate and explicit instruction of phonological awareness has been clearly identified, the informational resources that many teachers use to acquire knowledge may present additional barriers to, rather than aid, knowledge acquisition. Three barriers identified thus far include: (a) classroom instructional materials, (b) university and college instructor knowledge, and (c) course content related to reading instruction in college.

Instructional materials. A study conducted by Smith et al. (2001) provides insight into how instructional materials may create barriers for teachers attempting to provide adequate instruction. These authors completed a content analysis of 221 phonological awareness activities across four commercial basal reading programs at the Kindergarten level published between 1991 and 1993. The reading programs were examined for instructional design and pedagogical features that reflected current research, at the time, on phonological awareness for children at risk for reading delays.

The authors found similarities across the four reading programs regarding the type of phonological awareness activities provided. Activities focused on identifying beginning sounds in words and rhyming rather than on aspects most highly correlated with early reading acquisition (i.e., blending and segmenting phonemes in words). The four reading programs emphasized alphabetic understanding (i.e., letter naming) rather than phonological awareness. Smith et al. (2001) concluded that the phonological awareness instructional procedures in the four Kindergarten reading programs failed to integrate critical findings from empirical research for children at risk for reading failure or to provide sufficient teacher supports to enable the provision of accurate instruction.

Even though Smith et al. (2001) found basal reading programs lacking in terms of quantity and level of word analysis related to phonological awareness instruction, they did not indicate specifically whether the programs contained errors in instructional guidance. Teacher participants in the Spencer et al. (2008) written survey on PAK, on the other hand, asserted that their misunderstandings related to phonological awareness were attributable to instructional errors in the basal reading programs. Teachers claimed, for example, that instructional guides stated that consonant clusters were two letters that make one sound. Spencer et al. (2008) conducted a cursory review of the specific basal reading programs and found the claim to be unsubstantiated. However, errors in identifying and counting phonemes were found. The word OX → /ɒks/ was identified as having two rather than three phonemes, and the words OFF, ON, OLIVE, and ONE were identified as all beginning with the phoneme for the letter O (p. 517). None of these words begin with /o/, and depending on regional dialect, one or two of the four words may begin with different phonemes (i.e., OFF → /ɒ/ or /aʊ/; ON and OLIVE → /ɒ/; ONE → /w/).

It is possible that basal reader programs have improved in the quantity and level of word analysis related to phonological awareness since publication of the review conducted by Smith et al. (2001); however, the more recent, albeit cursory, examination of basal readers by Spencer et al. (2008) revealed errors in the quality of information, and if followed by teachers and other professionals, would result in inaccurate instruction. An examination of currently available basal reader programs is warranted not

only to determine if the quantity of instructional activities has improved but also to determine if the information is accurate with respect to phonological awareness. Moreover, instructional errors or lack of specific and explicit information in instructional materials would not be as problematic if teachers and other professionals were able to identify and correct errors, and enhance activities. As revealed in several studies cited herein, many teachers and professionals providing literacy instruction in schools have limited knowledge and training, inaccuracies are therefore likely left unchecked, and children who are already struggling with the reading process are further confused and ineffectively taught.

Instructor knowledge. Joshi et al. (2009b) identified another barrier to teacher knowledge acquisition. They found that pre-service teachers may not be receiving instruction related to phonological awareness in university and college-level reading courses because many college and university instructors are not familiar with the linguistic features of the English language. In a survey, conducted with a group of 78 college and university instructors of reading courses, Joshi et al. (2009b) sought to determine the instructors' level of knowledge about the linguistic features of English. All instructors taught from two to four reading courses to pre-service elementary education students across 30 universities, and all instructors claimed that they were well prepared to teach reading. The instructors completed a 68 item written multiple-choice survey of linguistic knowledge in which some items related to language structure, including definitions of key concepts (e.g., identifying the definition of phonological awareness) and word analysis (e.g., identifying the number of phonemes in words). Interestingly, similar to teachers, college and university instructors had difficulty identifying the number of phonemes in words where the phoneme-grapheme correspondence was not transparent. Only 42% of college and university instructors correctly identified the number of phonemes in the word BOX. Furthermore, only about one-half of the instructors were able to correctly identify the definition of phonological awareness. A second group of 62 college and university instructors, all teaching reading courses to pre-service teachers, completed a second 12-item written survey and participated in follow-up interviews. The survey and interview examined the instructors' beliefs about best practices in reading instruction and their knowledge of the sub-skills of reading. Similar to the first survey respondents, Joshi et al. (2009b) found that the majority (80%) of the second group also had difficulty correctly identifying the definition of phonological awareness. This is a worrisome finding for three reasons. First, the survey used by Joshi et al. (2009b) with both groups of instructors did not require recall of information; the instructors merely selected the correct definition from a series of choices, a much easier task. Second, given the importance of phonological awareness to early reading success, college and university students reasonably expect that instructors of reading courses are well versed in research evidence and best practices in reading instruction. Third, and most importantly, instructors cannot teach what they do not know, a phenomenon known as the 'Peter Effect' (Applegate & Applegate, 2004). Applegate and Applegate (2004) introduced the term Peter Effect, ascribed to a bible story about the Apostle Peter, to describe teachers expected to convey an enthusiasm for reading to their pupils but were not able to do so because they did not read or enjoy reading themselves. Binks-Cantrell, Washburn, Joshi, and Hougen (2012) adopted the term to describe instructors who, because of their lack of knowledge of English language structure, were not able to provide pre-service teachers in their classes with an understanding of language concepts known to be essential for reading success.

Course content. Course content related to reading instruction in college and university pre-service reading courses was identified as another barrier to teacher acquisition of knowledge necessary to support adequate instruction of phonological awareness. Two factors in particular were identified: instructional focus and textbooks.

Walsh, Glaser, and Wilcox (2006) studied factors related to the instructional focus of reading courses in an effort to determine what pre-service teachers were taught about reading instruction by examining the course syllabi from 222 undergraduate reading courses taught in the United States. Following the National Reading Panel's (NIHHD, 2000) recommendation that teachers need to be knowledgeable about the five core components of good reading instruction (i.e., phonological awareness, phonics, fluency, vocabulary, and comprehension), the syllabi (lecture schedule, quizzes, exams, assignments) were scored on whether these five reading components were present. Walsh et al. (2006) considered scoring of course syllabi a 'low bar' indicator of instructional focus since neither the quality nor proportion of instruction of the five core reading components was considered in the scoring. Nonetheless, they found that only 15% of the syllabi included all five core reading components and fully one third of the syllabi failed to include any of the core reading components. Even more disconcerting to Walsh et al. (2006) was that in institutions where students were required to take four courses in reading instruction, often not a single course included an instructional focus on any of the five core reading components. Walsh et al.

(2006) described their findings as 'alarming' and concluded that course instructors were failing to provide prospective teachers with the knowledge and skills needed to offer systematic and explicit instruction of the five components of good reading instruction.

In addition to the course syllabi, Walsh et al. (2006) examined the 226 textbooks listed in 222 course syllabi. The textbooks were examined and rated for inclusion of the five core reading components (i.e., phonological awareness, phonics, fluency, vocabulary, and comprehension). A textbook was rated an 'acceptable core textbook' if it was accurate and thoroughly covered all five core reading components, or 'acceptable supplemental' if it was accurate and covered some but not all of the five components. A textbook received a rating of 'not acceptable' if it was a comprehensive source of reading instruction but was either inaccurate or incomplete. Of the 226 textbooks reviewed by Walsh et al. (2006), only four were rated as acceptable core textbooks, and these four textbooks were used in only eleven of the 222 courses. An additional 50 textbooks were rated as 'acceptable supplementary' because there was information on at least one of the five core components of reading instruction. Examination of the six most frequently used textbooks across the 222 courses revealed that only one of the six was considered acceptable as a core textbook, and it was used in only six courses. Another of the six textbooks used in only 16 courses received an acceptable supplemental textbook rating. The remaining four most frequently used textbooks were used in 59 courses and all were rated as unacceptable. Walsh et al. (2006) concluded,

> "the vast majority of what prospective teachers are required to read does not provide an accurate, complete, or sufficiently deep overview of good reading instruction. Despite the scientific advancements, it would appear that teachers leave preparation programs no more knowledgeable than previous generations of teacher's." (p. 33)

Joshi et al. (2009a) undertook an examination of 17 of the most widely adopted textbooks used in university reading education courses at the elementary level in the USA. They extended the Walsh et al. (2006) study and examined whether all five components of good reading instruction were present in the textbooks, definitions of the five core reading components matched the National Reading Panel's definitions, and coverage of the five components. Results were no more favorable than those reported by Walsh et al. (2006) three years earlier. Four pre-service textbooks on the teaching of reading adopted by 91 universities did not cover phonological awareness. Ten textbooks included all five components and defined them correctly. However, when the coverage of the five core reading instruction components was examined in these textbooks, Joshi et al. (2009a) consistently found that overall coverage was very poor but substantially poorer for phonological awareness, phonics, and fluency when compared to coverage of vocabulary and comprehension. For example, the percentage of information provided on reading comprehension in textbooks ranged from 1% to 20%, and information on phonological awareness ranged from 1% to 5%. The researchers observed that in addition to providing scanty information about core reading instruction components, sometimes the information was unclear or incorrect. Joshi et al. (2009a) concluded that the textbooks did not provide adequate coverage of scientifically-based reading research.

Our study builds on the research of Joshi et al. (2009a) and Walsh et al. (2006) in three distinct ways. First, both research studies (Joshi et al., 2009a; Walsh et al., 2006) indicated the presence of inaccuracies in phonological awareness in textbooks; however, neither study reported the type nor extent of the phonological awareness inaccuracies, thus, the magnitude of the specific errors is unknown. Second, Joshi et al. (2009a) focused on the proportion of text within textbooks devoted to phonological awareness rather than the accuracy of the content. Equally important is the accuracy of content on phonological awareness, which is the focus of our study. Third, both prior research groups reported that the vast majority of chapters examined in their studies either did not include any information on phonological awareness or it was covered very minimally. We examined only textbooks on the teaching of reading that specifically included information on phonological awareness to determine the accuracy of the content when it was provided.

The preceding review paints a sobering picture of many prospective and practicing teachers being ill-prepared to provide accurate, systematic, and explicit instruction of phonological and phonological awareness for beginning, at-risk, and struggling readers. The studies reviewed show a consistent lack of information and instruction to help prospective and practicing teachers acquire the knowledge and skills necessary for effective reading instruction. For S-LPs to collaborate effectively with teachers to support classroom PA instruction, especially for children with LI, many of whom are at significant risk for or are evidencing reading difficulties, it is important for S-LPs to understand the nature and quality of pre-service textbooks on the teaching of reading in order to be watchful of the likely

pitfalls of teachers' PA content knowledge and ready to offer professional support.

Method

The aim of our study was to examine the accuracy and completeness of PA content in pre-service textbooks on the teaching of reading. We have adapted a content analysis methodology guided by a leading reference text on the topic, Neuendorf (2002). Content analysis is a quantitative summary of content through the analysis of texts based on, in our case, a substantive body of established research and theory on phonological awareness. This body of work served as a logical base for the descriptive and source content analysis conducted herein.

Data Sources

University and college pre-service course outlines on the teaching of reading in the early grades were procured through listserv requests and examined for the required pedagogical texts. The publishers of those texts in Canada and the United States were located through a series of internet searches. Next, each company was contacted to confirm the current and most frequently ordered pre-service textbooks on the teaching of reading. A list of all textbooks identified in the course outlines, as well as those named by the publisher, was compiled, cross-checked, and a copy of each pedagogical text was purchased.

Specific chapters in each textbook were selected based on two criteria: (a) inclusion of instructional content on phonological awareness; and (b) originally published between 2001 and 2011 inclusive. These criteria ensured that our review focused on the most recent textbooks published after the National Reading Panel's recommendations were made available. Application of the selection parameters resulted in the identification of 28 chapters in the textbooks studied (see Appendix – Pedagogical Textbook Chapter Key for a complete list).

Procedures and Materials

Content error coding. We first developed an error taxonomy to identify and categorize the different types of errors identified in the textbook chapters. A sub-sample of the 28 chapters was examined to identify and label all observed content errors in each strategy or activity presented in the chapters for teachers to use in the instruction of PA. Error identification was informed by the types of inaccuracies previously identified in instructional materials (e.g., Smith et al., 2001) and by the English language structure difficulties identified for pre-service teachers, teachers and instructors (e.g., Fielding-Barnsley, 2010; Moats, 2009; Spencer et al., 2008; Stainthorp, 2004) presented in the Background section. However, we did not limit our examination to only these previously identified problems but included as errors any information that would lead to inaccurate instruction. Once a list of content errors was compiled error categories were created to group similar types of content errors, after which the remaining chapters were examined and coded. Content error types and error categories were added if errors encountered during the coding process did not fit within the taxonomy. We paid keen attention to documentation provided in the chapters, transcribed errors as they were identified, and noted specific pages where errors were found.

Content omission coding. We made an a priori decision to examine each chapter for the inclusion of two specific PA content areas. The first was the definition of phonological awareness. Our decision was based on the extant research (e.g., Binks-Cantrell et al., 2012; Cunningham et al., 2004; Fielding-Barnsley, 2010; Joshi et al., 2009a; 2009b) that prospective teachers, teachers, and college and university course instructors were not able to define phonological awareness or confused phonological awareness and phonics. Additionally, it is important for teachers to understand phonemic awareness, a constituent component of phonological awareness, because phoneme level tasks are those than have been identified as critical for reading success.

The second was the inclusion of skill component strategies targeting phoneme blending and phoneme segmenting. We considered it important that textbooks include such information because the National Reading Panel (NIHHD, 2000) and National Early Literacy Panel (2008) specifically identify these as key areas of instructional need to support reading success.

If chapters did not include a definition of phonological awareness, phonemic awareness, or strategies targeting phoneme blending or phoneme segmenting we counted these as omissions. For any textbook that provided definitions or activities targeting phoneme blending or segmenting we examined each for accuracy. If inaccuracies were observed these were included as part of our Content Error Coding. Beyond intercoder reliability, the first and third authors established content validity through consistent verification of each content domain category (see Table 1).

Coding Reliability. To ensure that all content errors and omissions were captured and agreed upon, each chapter was examined thoroughly by the first and third authors. The first author has extensive background and training in

language structure analysis, assessment, and intervention of phonological awareness, and the third author has an education background with a language and literacy focus. Once coding was completed, coding results were compared using a match-mismatch interrater-reliability procedure and agreement was 92%. Discrepancies were discussed and resolved with the second author who has extensive background and training in cognition, reading, assessment, and intervention for reading difficulties.

Next, we present the results of our study followed by a discussion of those results in relationship to previous research and their possible impact on instructional practices. Finally, we provide some implications and recommendations for speech-language pathologists, other professionals engaged in literacy instruction, and textbook authors followed by a conclusion.

Results

Content Errors

Our analyses of phonological awareness content in pre-service textbooks developed for teacher education on the teaching of reading revealed that no chapter was error free and a total of 313 content errors were identified across the 28 chapters. Errors were identified in six content categories: (a) definitions, (b) task hierarchy, (c) task descriptions, (d) phoneme descriptions, (e) skill components, and (f) phoneme-grapheme correspondences. The six content categories and total errors identified by category in the 28 chapters are displayed in Table 1. In the next section we describe each of the content categories and provide examples of the types of errors that appeared in the chapters. Examples were chosen as exemplars of particular types of errors that occurred across chapters.

Definitions. The first content category referred to inclusion of definitions related to the construct of phonological awareness for completeness and accuracy against the definitions provided by the National Reading Panel (2000). Even though phonological awareness encompasses phonemic awareness, phonemic awareness abilities are considered critical for reading success, thus, we considered it important for textbook authors to define both phonological awareness, the ability to manipulate spoken language (words, syllables, or phonemes) independent

Table 1. Content Category and Total Number of Content Errors Across Textbook Chapters

Content Category	Error Total	Textbook Chapter Number and Content Errors
Definitions	14	6, 9, 10^{2}, 12, 15, 16, 17^{2}, 18, 21, 23, 26^{2}
Task Hierarchy	13	8^{6},10^{6}, 16
Task Descriptions	33	4, 8, 9, 11^{4}, 13^{2}, 15, 16^{4}, 17^{2}, 18^{2}, 19^{2}, 21^{6}, 22^{4}, 27, 28^{2}
Phoneme Descriptions	92	1^{10}, 3, 4^{9}, 7, 10^{2}, 11^{5}, 12^{4}, 13^{6}, 15^{8}, 16^{11}, 18^{6}, 19^{8}, 20^{11}, 28^{10}
Skill Component *Blending*	12	11^{2}, 22^{10}
Segmenting	23	1^{8}, 8^{2}, 9^{6}, 16^{7}
Phoneme-grapheme Correspondences	126	2, 3^{4}, 6^{2}, 8, 10, 12^{9}, 13^{4}, 14^{11}, 15^{6}, 16^{3}, 18^{15}, 19^{11}, 21^{33}, 22^{20}, 27^{5}

Note. Number in Textbook Chapter Number and Content Errors column signify the assigned number for Textbook Chapters in Appendix. Superscript numbers 2 to 33 positioned over the assigned Textbook Chapter number is the number of specific content errors for that particular content category in a chapter if higher than 1. For example, 3^{2} means Textbook Chapter number 3 and 2 instances of the specific error in the particular content category.

of meaning, and the constituent component, phonemic awareness, the ability to manipulate phonemes in spoken words (NIHHD, 2000).

We tallied 14 instances, 4% of the total error count, where incomplete or inaccurate definitions occurred across the 28 chapters. An incomplete definition is illustrated by the following example definition of phonemic awareness: *"The awareness that words are made up of individual sounds is logically called phonemic awareness."* [[2]10, p. 291] which omits the key element related to the ability to manipulate individual phonemes in spoken words.

Task Hierarchy. Task hierarchy refers to the level of analysis within a word and type of task, progressing from manipulation of larger and simpler units of analysis and manipulation of smaller and more difficult to isolate units of analysis. We identified 13 errors in task hierarchy accounting for 4% of identified content errors across the 28 chapters.

Some inaccuracies in content related to the order of task difficulty. For example, one chapter [8, p. 92] provided a chart delineating the difficulty of phonological awareness tasks and cited Yopp (1988). The order of task difficulty delineated in the content of the aforementioned chapter went from easiest to most difficult as follows: phoneme segmentation, counting, sound isolation, word-to-word matching, phoneme blending, auditory discrimination, rhyme, deletion, and substitution. Note that rhyming, an easier task, is listed toward the end of the hierarchy, and phoneme segmentation, a difficult task, is listed at the very beginning of the hierarchy. This order of task difficulty is inconsistent with the work of Yopp (1988) in which the order of task difficulty progressed from rhyme, auditory discrimination, phoneme blending, word-to-word matching, sound isolation, phoneme counting, phoneme segmentation to deletion. More importantly, Yopp (1988) did not present this progression as an order of task difficulty in the instruction of phonological awareness, but rather as the relative difficulty of tests being used to assess phonological awareness at the time.

Another content inaccuracy related to the type of tasks associated with phonemic awareness (e.g., *"phonemic awareness includes the ability to decide whether spoken words rhyme, to know what spoken word you would have if you removed a sound, and to manipulate phonemes to form different spoken words"* [6, p. 92]). Deleting sounds and manipulating phonemes represent complex tasks associated with phonemic awareness; however, rhyming is a simpler task and is considered an important component of phonological awareness (NIHHD, 2000; Schuele & Boudreau, 2008). Some chapters provided correct definitions of the construct of phonemic awareness but then provided strategies and activities that did not correspond to the level of word analysis. For example, another chapter [11, p. 180], provided a clear definition of phonemic awareness that closely matched the National Reading Panel's (2000) definition yet went on to provide a phonemic awareness assessment task where children are required to recognize rhyming words, which is a component of phonological awareness[3][11, p. 181].

Task Descriptions. The 33 instances of content inaccuracies related to task descriptions accounted for 10% of the total number of errors tallied across chapters. Chapters containing inaccuracies described the importance of phonological awareness, but the activities or sample lessons provided did not address these skills. For example, one lesson plan identified the following learning outcome *"demonstrate awareness of individual sounds and sound patterns of language"* [27, pp. 107-108], yet the lesson involved children guessing a storybook title and story content, discussing story vocabulary, demonstrating animal and human actions from the story, and sorting written sentences, words, and letters from the story. None of these activities targeted the development of an awareness of sounds and sound patterns. Chapters also provided inaccurate information regarding tasks that support the acquisition of phonemic awareness skills (e.g., *"The two best ways to develop phonemic awareness are invented spelling and reading literature aloud"* [26, p. 190]). Although it is possible that phonemic awareness may be acquired incidentally from these activities, there is consensus that for the majority of children, proficiency in phonemic awareness skills results from a planned and explicit instructional focus on phonemic awareness tasks (Schuele & Boudreau, 2008), rather than on incidental or implicit learning.

Phoneme Descriptions. Content errors in phoneme descriptions accounted for 29% of the errors found across all chapters. Some inaccuracies related to pronunciation of phonemes, for example, adding phonemes to words that result in a change of pronunciation (e.g., *"Say the word, 'quick.' Then say each sound slowly /kwoo/ + /i/ + /ck/"* [20, p. 40]), which results in the addition of a vowel in the pronunciation, /kwuɪk/ rather than the correct pronunciation, /kwɪk/ and the consonant cluster /kw/ and vowel /u/ treated as a single phoneme /kwu/ rather than as three distinct phonemes. Another frequent error was misclassification of phonemes related to either manner of articulation or number of phonemes in words: (a) labeling the continuant sound /h/ as a stop [20, p. 37]; and (b) labeling 'QU' as an unvoiced continuant [20, p. 38]. The

phonemes 'QU' were misclassified in three ways: first, as a single phoneme rather than as a consonant cluster /kw/; second, as a consonant type QU, consists of both a stop /k/ and a continuant /w/; and third, voicing, /k/ is voiceless but /w/ is a voiced phoneme. Misclassifications were also common in consonant cluster activities. In one chapter, a mini-lesson on final consonant clusters provided the following teacher demonstration words: BEST, RANG, HAND, PINK, and BUMP. However, RANG → /ræŋ/ does not have a final consonant cluster but rather the letters NG represent a single phoneme /ŋ/. Next, words listed for children to say and practice isolating final clusters similarly included words that ended in single phonemes rather than clusters: WING → /wɪŋ/ and HANG → /hæŋ/. Finally, guided practice of final consonant clusters also included selections that were single phonemes rather than final consonant clusters -ANG → /æŋ/ and -ING → /ɪŋ/ [19, p. 112].

Skill Components. Inaccuracies in chapter content related to blending and segmenting are reported next. Some chapters did include other PA skills components (e.g., rhyming, sound identification) but no errors were identified in skills other than blending and segmenting.

Blending. Incomplete or inaccurate descriptions of strategies or activities related to blending accounted for 4% of the total error tally across the 28 chapters. Inaccuracies were identified only for phoneme blending. Only four chapters provided strategies or activities for other types of blending but were error free. Phoneme blending errors related to confusions between phonemes and orthographic representations of words. An oral phoneme blending activity required children to listen to words spoken by the teacher one phoneme at a time and then blend the sounds to form a word. However, two of the ten words that the teacher was directed to say one phoneme at a time contained inaccuracies making the blending task both incorrect and confusing for children. For example, the word MICE was to be said by the teacher as m-i-c-e adding an E to the end of the word that is not present /mais/, while the word TURKEY was to be said t-ur-key where the last two phonemes in the word /k/ and /i/ would be spoken as a syllable /ki/ rather than as individual sounds [11, p. 187].

Segmenting. Incomplete or inaccurate descriptions of strategies and activities related to segmenting accounted for 7% of the total number of content errors across the 28 chapters. We found errors in tasks involving both syllable and phoneme segmenting. Other types of segmenting was included in only four chapters but was accurate. Similar to errors identified in blending tasks, the inaccuracies we did identify included confusions between phonemes and orthographic representations of words at both the syllable and phoneme level. Several chapters included oral syllable segmentation tasks but applied written syllabification rules rather than spoken syllabification rules for words orthographically written with doubled letters (e.g., PEPPER, BUBBLE, LETTUCE). In all cases, the teacher was instructed to segment the word between the doubled consonants using written rather than oral syllabification rules. For example, *"Clap the word pepper (pep ● per). Tell students to clap the word car ● rot and pep ● per several times. Repeat the same procedure using a picture of let ● tuce"* (1, 7.21). However, the doubled written consonant in each of these words represents a single phoneme /pɛpɝ/, /kærət/, and /lɛtəs/. The pronunciation that would result from segmenting the syllables as described in the above activity adds a phoneme not present in the oral pronunciation of these words, /pɛppɝ/, /kærrət/, and /lɛttəs/.

At the phoneme segmentation level, chapters either gave incorrect examples of tasks, or of sounds that were segmented incorrectly. An activity designed to help children identify sounds in words stated the following: *"Sing the song "Bingo." In the song each letter is chanted. There is a pretty little girl that I know and Jenny is her name-o J-e-n-n-y, J-e-n-n-y, J-e-n-n-y and Jenny is her name-o."* [16, p. 160]. In this case, the activity identified letter names not the sounds, /dʒ/ /ɛ/ /n/ /i/. Another chapter provided examples of sound clusters that could be segmented into individual phonemes: *"children can segment all sounds of a word including sound clusters such as sk, ch, and sh into individual sounds"* [8, p. 95]. Even though this is a correct statement for SK, it is not for CH and SH as these are digraphs that represent single phonemes not a sound cluster. In another chapter where the stated goal was to teach children whether words sound the same or different at the beginning of the word, the teacher is directed to say, *"in order to tell whether a word is the same or different at the beginning, we must say the word slowly and separate the beginning sound from the rest of the word"* [9, p. 173]. However, one of the examples given is '*snnnn—ail*' [9, p. 172] which segments the onset and rime units rather than the beginning sound in SNAIL, /s/.

Phoneme-grapheme Correspondences. The 126 inaccuracies tallied in the phoneme-grapheme correspondences content category accounted for 40% of the total number of content errors identified across the 28 chapters. Many chapters provided rules to support teaching letter-sound correspondences, yet these rules frequently included confusing or incorrect descriptions of the letter-sound correspondence for X and QU. A common description for the pronunciation of the letter X was as follows, *"When x is at the beginning of a word, it*

is often pronounced /z/, as in xylophone, but sometimes the letter name is used, as in X-ray. At the end of a word, x is pronounced /ks/ as in box." [12, p. 173]. The description for X in X-ray, although correct, is also confusing because it leads the reader to think of X as a single phoneme when in fact the letter name X comprises three phonemes /ɛks/ and may lead to the same type of inaccurate instruction we described in the Background section reported by McCutchen et al. (2002) for the letter name 'U'. The letter combination QU was either categorized with letters represented by a single sound [e.g., 15, p. 173] or described as a *"two letter-one sound pair"* [27, p. 192] when in fact the graphemes QU represent two phonemes /kw/.

Digraph descriptions and exemplars represented another common content error. For example, *"Consonant digraphs are letter combinations representing single sounds that aren't represented by either letter. The five most common are ch as in chair, sh as in shell, th as in father, wh as in whale, and ph as in photo"* [22, p. 108]. By this definition, the WH example is not an exemplar since the /w/ sound is pronounced in the word WHALE and represented by the letter W. Additionally, the definition does not indicate that the TH diagraph can represent two different sounds; the voiced interdental fricative /ð/ as in FATHER → /fɑðɚ/, or the unvoiced interdental fricative /θ/ as in PATH → /pæθ/. Other chapters using the same definition included CK and GHT as digraph exemplars [14, p. 152]. The sound /k/ can be represented by either of the letters C or K so does not create a sound not represented by the letters, and GHT is not a digraph. The examples given in the chapter included LIGHT, MIGHT, FIGHT where the three letter combination IGH represents the diphthong /ai/.

Phoneme-grapheme correspondence descriptions for consonant clusters, termed 'consonant blends' in many chapters, were also inaccurate. Chapter 16, page 140, for example, stated *"Consonant blends are two or three letters that when placed together blend into one sound that represents the two or three letters"*, and provided BL, CR, DR, FL, GL, PR, ST as exemplars of letters that blended into one sound. However, pronunciation of consonant clusters does not result in a single phoneme, each phoneme in a consonant cluster is pronounced (e.g., FLAG → /flæg/, SCRATCH → /skrætʃ/).

Several chapters provided tables with phonics rules, yet the examples given did not match aspects of the described rule. For example, a CVC rule included the following words: BAT, CUP and LAND [22, p. 112]. Even though the first two words match the CVC rule, LAND is an example of a CVCC pattern. Similarly, CVVC pattern exemplars included CLEAN and SNAIL [22, p. 113], both of which have two consonants, CC, at the beginning rather than a single consonant. This phonics rule description presents additional confusion because not only are the consonant clusters SN and CL represented as single consonants (CVVC), the single vowel EA →/i/ and diphthong AI → /eɪ/ are both represented by two vowel symbols (CVVC). These content inaccuracies and inconsistencies in pattern exemplars make it difficult to determine whether the phonics pattern represented the phonemes or graphemes that comprise words since they reflected neither accurately.

Content Omissions

Our analyses of the pre-service textbooks revealed content omissions in the two content areas examined: (a) definitions of phonological awareness and the constituent component, phonemic awareness, and (b) skill component strategies (phoneme blending and segmenting). A total of 39 content omissions were counted and are displayed by content category in Table 2.

Definitions

Eighteen chapters did not provide a definition of one of the two key terms (i.e., phonological awareness or phonemic awareness) and four of these chapters did not provide a definition of either term. These definitional omissions accounted for 56% of the total content omission count.

Phoneme Blending and Segmenting

One third of the 28 chapters did not provide any strategy descriptions for blending phonemes in words (21% of omission total). Similarly, we found that 24% of the 28 chapters failed to include at least one strategy on segmenting phonemes in words.

Discussion

Our examination of the accuracy and completeness of content related to phonological awareness in pre-service textbooks on the teaching of reading revealed not only numerous inaccuracies and omissions but two distinct error patterns across the content categories. Errors were related to (a) the nature of phonological awareness, and (b) an overreliance on English orthography.

Errors Related to the Nature of Phonological Awareness

Knowledge of what constitutes PA allows a teacher and other professionals engaged in literacy instruction to have a clear understanding of what differentiates these skills from other skills, in particular phonics. Furthermore, designing appropriate and accurate instruction is not possible without

Table 2. Content Category and Total Number of Content Errors Across Textbook Chapters

Content Category	Error Total	Textbook Chapter Number and Content Errors
Definitions	22	3^2, 4^2, 5, 6, 7, 9, 12, 13, 14^2, 15, 18, 19, 21, 22, 24, 25, 27, 28^2
Skill Component Strategy *Phoneme Blending*	8	4, 6, 7, 9, 13, 16, 26, 28
Phoneme Segmenting	9	4, 5, 6, 7, 9, 13, 14, 26, 28

Note. Number in Textbook Chapter Number and Content Omission column signify the assigned number for Textbook Chapters in Appendix. Superscript number 2 positioned over the assigned Textbook Chapter number is the number of specific content errors for that particular content category in a chapter if higher than 1. For example, 3^2 means Textbook Chapter number 3 and 2 instances of the specific omission in the particular content category.

complete and accurate knowledge of the constituent elements of PA; knowledge that previous studies (e.g., Bos et al., 2001; Cheesman et al., 2009; Fielding-Barnsley, 2010; Joshi et al., 2009a; 2009b) have repeatedly revealed prospective teachers, teachers, and university course instructors lack. For this reason we specifically examined the inclusion of, and accurate, definitions of phonological awareness. Of the 28 textbooks we examined, over 50% did not provide a definition of one of the terms (phonological or phonemic awareness), and of those that did, 35% of the chapters provided incomplete or inaccurate definitions. Thus, many textbooks continue to do little to increase teacher knowledge.

Similarly, errors in Task Hierarchy and Task Description content categories were primarily related to a lack of understanding by textbook authors regarding the nature of phonological awareness, as evidenced by the task exemplars that specifically targeted phonics, spelling, print concepts, and vocabulary rather than phonological awareness. Thus, our findings may explain in part why previous researchers (e.g., Bos et al., 2001; Cunningham et al. 2004; Cunningham et al., 2009; Joshi et al., 2009b) found that teachers demonstrated limited knowledge of phonological awareness and consequently on how to teach it. Such content inaccuracies may lead many teachers to think they are providing PA instruction when in fact they are not.

A lack of understanding of the nature of PA also resulted in the failure of many textbook authors to integrate critical findings from research on PA components considered essential to reading success, namely the contribution of phoneme level blending and segmenting. Smith et al. (2001) showed that basal reader programs did not address aspects of phonological awareness related to blending and segmenting phonemes in words. We found the same to be true of pre-service teacher textbooks. Even though textbook authors frequently described the importance of phoneme blending and segmenting, one third did not include a single instructional activity or strategy targeting blending or segmenting of phonemes in words.

When teachers lack knowledge about what constitutes phonological awareness, they are not in an informed position to judge whether tasks provided in resources such as textbooks address these skills. Consequently, the lack of such knowledge may result in teachers not providing instruction in those PA skills considered essential to reading or thinking that they are providing phonological awareness instruction when in fact they are not.

Errors Related to an Overreliance on English Orthography

Of all of the content inaccuracies found in the 28 chapters, errors classified in the phoneme-grapheme correspondence category was the most prominent and signaled an over-reliance on written word forms. Over 50% of the chapters contained inaccuracies in this error category, and the majority of chapters contained multiple inaccuracies, for example, Chapters 21 and 22 contained 33 and 20 inaccuracies respectively. The types of inaccuracies found in textbook chapters were similar in nature to those described in previous studies that examined teacher and university instructor knowledge, that is, confusion between phonemes and graphemes. Spencer et al. (2008) and Joshi

et al. (2009b), for example, observed that teachers and university instructors had difficulty identifying or naming phonemes where grapheme-phoneme correspondences were not transparent; similar inaccuracies were also evident in the chapters we examined. We found several chapters that had inaccuracies for words even when there was a transparent relationship between phonemes and graphemes. Consistent with the findings from earlier studies (e.g., Cunningham et al., 2004; Cunningham et al. 2009; Moats, 1994) with teachers, many textbook authors also lacked the knowledge and understanding of language structure critical for word analysis in spoken and written forms and tended to over-rely on the written form of the word rather than on the spoken form, with the latter being the correct form.

Additionally, many errors identified in the Phoneme Description and Segmenting content categories also revealed confusions between spoken and written word forms. Phoneme descriptions were incorrect with respect to phoneme pronunciations, phoneme classifications, and number of phonemes in words. A common segmenting error involved transposing written syllabification rules for words with double letters to oral syllabification of these same words. As shown in the exemplars in the results section, such inaccuracies result in additions of phonemes, LET • TUCE → /lɛttəs/ instead of the correct pronunciation /lɛtəs/. However, there are words for which double letters represent two distinct phonemes (e.g., SUC • CESS → /səksɛs/). A distinction that is only obvious when attending to the oral word form.

Interestingly, our research revealed a possible explanation for claims made by teachers in the Spencer et al. (2008) study. You will recall that Spencer et al. did not find evidence to support teacher claims that the instructions in the basal reader programs stated consonant clusters as two letters that made a single phoneme; however, we found that pre-service textbooks vindicated the teachers because this error was replicated across several chapters. Teacher participants in the Cunningham et al. (2004) and Moats (1994) studies also considered consonant clusters as single phonemes. Not only did we find this same error in descriptions and examples of consonant clusters across several chapters, we also found frequent inaccuracies in descriptions and examples of digraphs and phonics rules. Consequently, the content of many textbooks offered little to advance phonological awareness knowledge.

Additional Findings

We found that some textbooks had the same authors, and so, as to be expected, the same authorship resulted in duplication of the same inaccuracies and omissions of content across multiple textbooks. Finally, despite the large number of errors found and the fact that no textbook was error-free, some chapters often provided excellent content related to phonological awareness (e.g., 23, 24, 25). Correction of the inaccuracies and omissions identified herein would result in resources supportive of the acquisition of knowledge and skills in phonological awareness for professionals involved in reading instruction in elementary schools or in post-secondary contexts.

Implications and Recommendations

Based on the results of our study, we recommend that every effort be made to ensure that the phonological awareness content provided to teachers be complete, consistent, and accurate to enable high quality instruction to their students. Given that instruction in phonological awareness training is known to prevent reading and writing difficulties and that teachers are the primary instructors in reading and writing, their lack of understanding of phonological awareness can have a negative impact on their students' reading and writing development. This is of particular importance to S-LPs who frequently recommend a teacher provide PA instruction to children with LI. It is likely that many teachers would not know what such a recommendation entails (Cheesman et al., 2009). Thus, S-LPs may need to reconsider their recommendations for children with LI. If teacher skills or classroom resources are inadequate to support these children's acquisition of PA skills continued intervention from a S-LP may be warranted.

Moats (2009) suggested that teachers need extensive training in the English sound system if they are to have the needed proficiency to teach phonological awareness and Binks-Cantrell et al. (2012) suggested the same for university and college instructors. Binks-Cantrell and colleagues refer to negative impact instructors lacking knowledge in oral language constructs and phonological awareness as having the Peter Effect. Binks-Cantrell et al. describe the fact that "teachers cannot pass on understanding of the basic language constructs considered essential for early reading success when they do not possess that understanding" (p. 526). We concur, and would argue that all professionals engaged in supporting classroom reading instruction need similar training. The same holds true for textbook authors and publishers. Textbook authors and publishers should seek out professionals with the requisite knowledge of the sound structure of English to write or review content related to phonological awareness so that individuals using pre-service textbooks on the teaching of reading as a

resource have access to correct, consistent, and complete information.

Most S-LPs have extensive training in phonetics, articulation, phonology, and phonological awareness (Scheule & Boudreau, 2008; Spencer et al., 2008), and possess a great deal of knowledge to support classroom instruction of phonological awareness. Therefore, rather than wait for improved resources, S-LPs should consider collaborating with teachers and offer seminars and workshops at schools, within school districts, and at conferences attended by literacy educators. Such an initiative by S-LPs would help support an immediate and positive change in knowledge and skills of professionals involved in literacy instruction and, hence, improve instructional practices in phonological awareness.

Spencer et al. (2008) stress that curricula and instructional materials should support and enhance teacher efforts to teach phonological awareness. They note the importance of a thorough examination of curricular materials to ensure that teachers provide accurate instruction that supports children's phonological awareness development. We agree, and our results confirm and extend previous findings that there is not only a general lack of information on phonological awareness but when there is, the quality of that content is wanting. S-LPs could also direct their expertise to examining curricular materials with teacher colleagues to identify and correct inaccuracies in available resources used in classrooms. It is important to emphasize that accuracy in resources is necessary and expected, if teachers have adequate knowledge of English sound structure and PA they could correct and compensate for the resource deficiencies with the support of their S-LP colleagues. Thus, the possible impact of such S-LP collaboration on the effective teaching of children is substantial.

The results of our research on phonological awareness information confirm those of previous research, signal that little has changed, and extend the specificity of the phonological awareness inaccuracies and omissions in the content of current pre-service textbooks on the teaching of reading. For typical learners, inaccurate instruction in phonological awareness is not likely to have an adverse impact on their ability to acquire skills crucial for reading (McCutchen et al., 2009; Moats & Lyons, 1996). However, phonological awareness is an area in which many young, at-risk or struggling readers, and children with LI are particularly weak (McCutchen et al., 2002; McCutchen et al., 2009), and these students need reliable, accurate, explicit, and systematic instruction of these skills. Inaccurate or contradictory instruction may create substantial barriers to learning and significantly impede student progress (McCutchen et al., 2009; Spencer et al., 2008). Awareness of possible resource barriers will allow S-LPs to collaborate more effectively with teachers, and, thus, enhance language and literacy instruction in classrooms, particularly for children with LI who are at risk for or already have reading difficulties. Knowledge of these barriers will also allow S-LPs to determine if recommendations they make for children with LI with respect to classroom support for PA acquisition are in fact achievable.

Conclusion

Prospective and practicing teachers assume that their textbooks are accurate. However, our analysis of the quality and accuracy of the content in textbooks commonly used in college and university reading courses indicated another barrier, not only for teachers, but for other professionals using textbooks as a resource to support instruction of phonological awareness. We identified specific errors in six content categories. Nonetheless, it was clear that errors were largely related to two general aspects, namely (a) the nature of phonological awareness, and (b) an overreliance on English orthography. In addition, we identified textbook omissions such that neither definitions of key phonological terminology nor skill component strategies were provided. There was a general failure by text book authors and publishers to integrate critical findings from research even in the most recently published pre-service textbooks on the teaching of reading. We hope S-LPs will view our results as pointing to an exciting opportunity to collaborate with teachers to overcome textbook resource deficiencies and enhance classroom phonological awareness instruction for children with LI as well as other children for whom accurate and explicit instruction is a key to reading success.

Acknowledgements

This research was funded by a research grant (410-2008-0571) to the first two authors from the Social Sciences and Humanities Research Council.

References

Anthony, J.L., & Francis, D.J. (2005). Development of phonological awareness. *Current Directions in Psychological Science, 14*(5), 255-259.

Apel, K., & Masterson, J. J. (2001). Theory-guided spelling assessment and intervention: A case study. *Language, Speech, and Hearing Services in Schools, 32*(3), 182-195. doi: 10.1044/0161-1461(2001/017)

Applegate, A. J., & Applegate, M. D. (2004). The Peter Effect: Reading habits and attitudes of teacher candidates. *The Reading Teacher, 57*, 554–563.

Binks-Cantrell, E., Washburn, E. K., Joshi, R. M., & Hougen, M. (2012). Peter Effect in the preparation of reading teachers. *Scientific Studies in Reading, 16*(6), 526-536, doi: 10.1080/10888438.2011.601434

Bishop D. V. M., & Snowling, M. J. (2004). Developmental dyslexia and specific language impairment: Same or different? *Psychological Bulletin, 130*(6), 858-886.

Bos, C., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of preservice and inservice educators about early reading instruction. *Annals of Dyslexia, 51*(1), 97-120. doi: 10.1007/s11881-001-0007-0

Boudreau, D. M., & Hedberg, N. L. (1999). A comparison of early literacy skills in children with specific language impairment and their typically developing peers. *American Journal of Speech-Language Pathology, 8*(3), 249-260.

Brady, S., Gillis, M., Smith, T., Lavalette, M., Liss-Bronstein, L., Lowe, E., ...Wilder, T. D. (2009). First grade teachers' knowledge of phonological awareness and code concepts: Examining gains from an intensive form of professional development and corresponding teacher attitudes. *Reading and Writing, 22*(4), 425-455. doi: 10.1007/s11145-009-9166-x

Bus, A. G., & van IJzendoorn, M. H. (1999). Phonological awareness and early reading. A meta-analysis of experimental training studies. *Journal of Educational Psychology, 91*(3), 403-414. doi: 10.1037/0022-0663.91.3.403

Catts, H. W., Fey, M.E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language and Hearing Research, 45*, 1142-1157. doi:10.1044/1092-4388(2002/093)

Chafouleas, S. M., VanAuken, T. L., & Dunham, K. (2001). Not all phonemes are created equal: The effects of linguistic manipulations on phonological awareness tasks. *Journal of Psychoeducational Assessment, 19*(3), 216-226. doi: 10.1177/073428290101900302

Cheesman, E. A., McGuire, J. M., Shankweiler, D., & Coyne, M. (2009). First-year teacher knowledge of phonemic awareness and its instruction. *Teacher Education and Special Education, 32*(3), 270-289. doi: 10.1177/0888406409339685

Cunningham, A., Perry, K., Stanovich, K., & Stanovich, P. (2004). Disciplinary knowledge of K–3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia, 54*(1), 139–167. doi: 10.1007/s11881-004-0007-y

Cunningham, A., Zibulsky, J., & Callahan, M.D. (2009). Starting small: Building preschool teacher knowledge that supports early literacy development. *Reading and Writing, 22*, 487-510, doi 10.1007/s11145-009-9164-z

Dickinson, D. K., Golinkoff, R. M., & Hirsh-Pasek, K. (2010). Speaking out for language: Why language is central to reading development. *Educational Researcher, 39*, 305-310. doi: 10.3102/0013189X10370204

Ehri, L. C. (1994). Development of the ability to read words: Update. In R. B. Ruddell, M. R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 323-358). Newark, DE: International Reading Association.

Ehri, L. C. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders, 2*0(3), 19-36.

Ehri, L. C., Nunes, S. R., Willows, D. M., Schuster, B. V., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly, 36*(3), 250-287. doi: 10.1598/RRQ.36.3.2

Fielding-Barnsley, R. (2010). Australian pre-service teachers' knowledge of phonemic awareness and phonics in the process of learning to read. *Australian Journal of Learning Difficulties, 15*(1), 99-110. doi: 10.1080/19404150903524606

Gillon, G. (2004). *Phonological awareness: From research to practice.* NY: Guildford Press.

Goswami, U., & Bryant, P. E. (1990). *Phonological skills and learning to read.* Hove, East Sussex, UK: Erlbaum.

Griffith, P. (1991). Phonemic awareness helps first graders invent spellings and third graders remember correct spellings. *Journal of Reading Behavior, 23*(2), 215-233. doi: 10.1080/10862969109547737

Joshi, R. M., Binks, E., Graham, L., Ocker-Dean, E., Smith, D. L., & Boulware-Gooden, R. (2009a). Do textbooks used in university reading education courses conform to the instructional recommendations of the National Reading Panel? *Journal of Learning Disabilities, 42*(5), 458-463. doi: 10.1177/0022219409338739

Joshi, R.M., Binks, E., Hougen, M., Dahlgren, M. E., Ocker-Dean, E., & Smith, D. L. (2009b). Why elementary teachers might be inadequately prepared to teach reading. *Journal of Learning Disabilities, 42*(5), 392-402. doi: 10.1177/0022219409338736

Masterson, J. J., & Apel, K. (2010). Linking characteristics discovered in spelling assessment to intervention goals and methods. *Learning Disability Quarterly*, *33*(3), 185-198.

McCutchen, D., Green, L., Abbott, R.D., & Sanders, E.A. (2009). Further evidence for teacher knowledge: Supporting struggling readers in grades three through five. *Reading and Writing, 22*(4), 401–423. Doi: 10.1007/s11145-009-9163-0

McCutchen, D., Harry, D., Cunningham, A. E., Cox, S., Sidman, S., & Covill, A. (2002). Reading teachers' knowledge of children's literature and English phonology. *Annals of Dyslexia, 52*(1), 207-228. doi: 10.1007/s11881-002-0013-x

Moats, L. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of Dyslexia, 44*(1), 81-102. doi: 10.1007/BF02648156

Moats, L.C. (2009). Still wanted: Teachers with knowledge of language. *Journal of Learning Disabilities, 42*(5), 387-391. doi: 10.1177/0022219409338735

Moats, L., & Lyons, G.R. (1996). Wanted: Teachers with knowledge of language. *Topics in Language Disorders, 16*(2), 73-86.

Nation, K., & Norbury, C.F. (2005). Why reading comprehension fails: Insights from developmental disorders. *Topics in Language Disorders, 25*(1) 21-32.

National Institute of Health and Human Development (2000). Report of the National Reading Panel. *Teaching children to read. An evidenced-based assessment of the scientific research literature on reading and its implications for reading instruction.* Report of the sub-group. (NIH Publication No. 00-4754) Washington, DC. US Government Printing Office.

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel.* Washington, DC: National Institute for Literacy. Available at http://www.nifl.gov/earlychildhood/NELP/

Neuendorf, K. A. (2002). *The content analysis guidebook.* Thousand Oaks, CA: Sage.

Rvachew, S., Chiang, P., & Evans, N. (2007). Characteristics of speech errors produced by children with and without delayed phonological awareness skills. *Language, Speech, and Hearing Services in Schools, 38*, 60-71. doi: 10.1044/0161-1461(2007/006)

Scheule, C. M., & Boudreau, D. (2008). Phonological awareness intervention: Beyond the basics. *Language. Speech, and Hearing Services in Schools, 39*(1), 3-20. doi: 10.1044/0161-1461(2008/002)

Smith, S. B., Simmons, D. C., Gleason, M. M., Kame'enui, E. J., Baker, S. K., Sprick, M.,... Peinado, R. (2001). An analysis of phonological awareness instruction in four kindergarten basal reading programs. *Reading and Writing Quarterly, 17*(1), 25-51. doi: 10.1080/105735601455729

Spencer, E. J., Schuele, C. M., Guillot, K. M., & Lee, M. W. (2008). Phonemic awareness skill of speech-language pathologists and other educators. *Language Speech and Hearing Services in Schools, 39*(4), 512-520. doi: 10.1044/0161-1461(2008/07-0080)

Stahl, S., & Murray, B. (1994). Defining phonological awareness and its relationship to early reading. *Journal of Educational Psychology, 86*(2), 221–234. doi: 10.1037/0022-0663.86.2.221

Stainthorp, R. (2004). W(h)ither Phonological Awareness? Literate trainee teachers' lack of stable knowledge about the sound structure of words. *Educational Psychology, 24*(6), 753-765. doi: 10.1080/0144341042000271728

Torgesen, J. K., Wagner, R. K., & Rashotte, C.A. (1994). Longitudinal studies of phonological processing and reading. *Journal of learning Disabilities, 27*, 276-286. doi: 10.1177/002221949402700503

Vloedgraven, J., & Verhoeven, L. (2009). The nature of phonological awareness throughout the elementary grades: An item response theory perspective. *Learning and Individual Differences, 19*(2), 161–169. doi: 10.1016/j.lindif.2008.09.005

Walsh, K., Glaser, D., & Wilcox, D. D. (2006). *What education schools aren't teaching about reading and what elementary teachers aren't learning.* Washington, DC: National Council on Teacher Quality.

Yopp, H. (1988). The validity and reliability of phonemic awareness tests. *Reading Research Quarterly, 23*(2), 159-177. doi: 10.2307/747800

End Notes

[1] We use IPA symbols between slashes to represent phonemes. Graphemes are represented using capital letters unless taken from direct quotes from original sources.

[2] Quotes from reviewed chapters are presented using their assigned chapter number (see Appendix), followed by the page number of the quote.

[3] Rhyming can be considered a phonemic awareness task in CV word contexts.

Authors' Note

Correspondence concerning this article should be addressed to Denyse V. Hayward, Department of Educational Psychology 6-123H Education North University of Alberta Edmonton AB T6G 2G5 Canada. Email: **dhayward@ualberta.ca**.

Received date: May 13, 2013

Accepted date: October 24, 2013

Appendix

Pedagogical Textbook Chapter Key

Assigned Number	Textbook Chapter Reference
1.	Honig, B., Diamond, L., Gutlohn, L., & Mahler, J. (2008). Phonemic awareness. *In Teaching reading sourcebook: For kindergarten through eighth grade* (2nd ed.) (pp. 7.2-7.53). Emeryville, CA: CORE.
2.	Walpole, S., & McKenna, M. C. (2007). Differentiating phonemic awareness instruction. I*n Differentiated reading instruction: Strategies for the primary grades* (pp. 31-47). New York: The Guilford Press.
3.	Reutzel, D. R., & Cooter, Jr., R. B. (2007). Phonics and word attack skills. *In Strategies for reading assessment and instruction* (3rd ed.) (pp. 205-236). Newark, DE: International Reading Association.
4.	Gunning, T. G. (2005). Teaching phonics, high-frequency words, and syllabic analysis: Basic principles of phonics instruction. In *Creating literacy: Instruction for all students* (5th ed.) (pp. 161-186). Boston, MA: Pearson Education, Inc.
5.	Smith, J. A., & Read, S. (2005). Foundations of literacy: Helping students develop phonemic awareness. In J.A. Smith & S. Read (Eds.), *Early literacy instruction: A comprehensive framework for teaching reading and writing, K-3* (pp. 48-55). Upper Saddle River, NJ: Pearson Education, Inc.
6.	Cunningham, P. M., & Cunningham, J. W. (2002). What we know about how to teach phonics. In A. E. Farstrup, & S. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed.) (pp. 87-109). Newark, DE: International Reading Association.
7.	Graves, M. F., Juel, C., & Graves, B. B. (2007). Emergent literacy. In M. Graves, C. Juel, & B. Graves (Eds.), *Teaching reading in the 21st century* (4th ed.) (pp. 88-121). Boston, MA: Allyn & Bacon.
8.	Cramer, E. D. (2006). In the beginning: Phonological awareness. In J. S. Schumm (Ed.), *Reading assessment and instruction for all learners* (pp. 89-117). New York: The Guilford Press.
9.	Duffy, G. G. (2003). Example 16: Phonemic awareness. In *Explaining reading: A resource for teaching concepts, skills, and strategies* (pp. 170-175). New York: The Guilford Press.
10.	Farris, P. J., Fuhler, C. J., & Walther, M. P. (2004). Teaching reading: A balanced approach to phonics and word study. In P. Farris, C. Fuhler, & M. Walther (Eds.), *Teaching reading: A balanced approach for today's classrooms* (pp. 281-319). New York: McGraw-Hill.
11.	Reutzel, D. R., & Cooter, Jr., R. B. (2007). Phonemic awareness and alphabetic principle. In *Strategies for reading assessment and instruction* (3rd ed.) (pp. 179-204). Newark, DE: International Reading Association.
12.	Tompkins, G. E. (2005). Emerging into literacy: Phonemic awareness. In G. Tompkins (Ed.), *Language arts: Patterns of practice* (pp. 167-178). Upper Saddle River, NJ: Pearson Education, Inc.
13.	Collins Block, C. (2001). When sound meets print: Teaching phonics and vocabulary. In C. Collins Block (Ed.), *Teaching the language arts: Expanding thinking through student-centered instruction* (3rd ed.) (pp. 191-238). Needham Heights, MA: Allyn & Bacon.
14.	Graves, M. F., Juel, C., & Graves, B. B. (2007). Word recognition. In M. Graves, C. Juel, & B. Graves (Eds.), *Teaching reading in the 21st century* (4th ed.) (122-163). Boston, MA: Allyn & Bacon.

15. Tompkins, G. E. (2001). Breaking the alphabetic code: Phonemic awareness and phonics. In *Literacy for the 21st century: A balanced approach* (2nd ed.) (pp. 165-181).Upper Saddle River, NJ: Prentice-Hall, Inc.

16. Morrow, L.M. (2009). Strategies to figure out words: Phonological awareness, phonemic awareness, and phonics. In L. Morrow (Ed.), *Literacy development in the early years. Helping children read and write* (6th ed.) (pp. 135-185, 37-38). Boston, MA: Pearson.

17. Smith, J. A., & Read, S. (2009). Building early literacy skills: Phonemic awareness: Recognizing and using speech sounds. In J. Smith & S. read (Eds.), *Early literacy instruction: Teaching reading and writing in today's primary grades* (2nd ed.) (pp. 57-64). Boston: Allyn & Bacon.

18. Tompkins, G. E. Bright, R. M., Pollard, M. J., & Winsor, P. J. (2008). Emergent literacy. In G. Tompkins, R. Bright, M. Pollard, & P. Winsor (Eds.), *Language arts: Content teaching strategies* (4th ed.) (pp. 92-102). Upper Saddle River, NJ: Pearson Education, Inc.

19. Tompkins, G. E. (2007). Cracking the alphabetic code. In G. Tompkins (Ed.), *Literacy for the 21st century. Teaching reading and writing in pre-kindergarten through grade 4* (2nd ed.) (pp. 90-115). Upper Saddle River, NJ: Pearson.

20. Bursuck, W. D., & Damer, M. (2011). Phonemic awareness. In W. Bursuck, & M. Damer (Eds.), *Teaching reading to students who are at risk or have disabilities* (2nd ed.) (pp. 34-77). Upper Saddle River, NJ: Pearson Education, Inc.

21. Combs, M. (2010). Learning about words: Making the transition to print. In M. Coombs (Ed.), *Readers and writers in primary grades: A balanced and integrated approach* (4th ed.) (pp. 24-73). Boston, MA: Pearson Education, Inc.

22. Tompkins, G. E. (2011). Cracking the alphabetic code. In G. Tompkins (Ed.), *Literacy in the early grades: Instructor's copy* (3rd ed.) (pp. 92-119). Boston, MA: Pearson Education, Inc.

23. Ellery, V. (2009). Phonemic awareness. In V. Ellery (Ed.), *Creating strategic readers: Techniques for developing competency in phonemic awareness, phonics, fluency, vocabulary and comprehension* (2nd ed.) (pp. 23-46). Newark, DE: International Reading Association.

24. Strickland, D. S., & Snow, C. (2002). Sounds, letters and words: How print works. In D. Strickland, C. Snow, P. Griffin, M. Burns, & P. McNamar (Eds.), *Preparing our teachers: Opportunities for better reading instruction* (pp. 81-118). Washington, DC: Joseph Henry Press.

25. Cunningham, P. M., & Allington, R. L. (2007). *Classrooms that work. They can all read and write* (4th ed.) (30-44). Boston, MA: Pearson.

26. Cramer, R. L. (2004). Emergent literacy: Phonemic and phonological awareness. In R. Cramer (Ed.), *The language arts: A balanced approach to teaching reading, writing, listening, talking and thinking* (pp.189-191, 195). Boston, MA: Allyn & Bacon.

27. Bainbridge, J., Heydon, R., & Malicky, G. (2009). *Constructing meaning. Balancing elementary language arts* (4th ed.). Scarborough, ON: Nelson Education.

28. Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2004). Phonemic awareness and alphabetic understanding. In D. Carnine, J. Silbert, E. Kame'enui, & S. Tarver (Eds.), *Direct instruction reading* (4th ed.) (pp. 50-59). Upper Saddle River, NJ: Pearson Education, Inc.

Note. Textbook chapters do not appear in alphabetical order, chapters were assigned numbers in order of procurement and examination.