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Decodable Text: A Review of What We Know

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ABSTRACT

This article reviews the literature on decodable text, instructional material containing words with phonically regular relationships that the reader has been taught. In doing so the work establishes a definition for decodability by consolidating previous quantitative and qualitative analyses of words in text and by examining other word features. In addition, the theoretical purposes of decodable text are inspected, as are the very few studies that specifically examine the effects of text decodability on readers. The findings of this review are synthesized into a theoretical model that suggests a specific developmental juncture in which decodable text may be useful. In suggesting future research the work concludes that additional analyses of words in text are not necessary. Instead research should focus on the following: 1) experimental examinations of readers' interactions with decodable text; 2) inspection of readers' behavior as they read text with varying degrees of decodability; and 3) operation of text decodability with readers of varying abilities.

Over the past three years researchers and educators have expressed a renewed interest in the instructional materials used with beginning readers. Several articles exploring text issues in classrooms have been written (Brown, 1999; Cole, 1998; Mesmer, 1999a; Watson, 1997). The topic "readers and texts" has become an inquiry focus of the Center for the Improvement of Early Reading Achievement (CIERA) and a greater variety of instructional materials has flooded the textbook market. In particular, decodable text has become increasingly visible. In fact, the term "decodable text" has appeared in state documents (California Department of Education, 1996; Texas Education Agency, 1997). The return of decodable text has prompted educators and researchers to debate its merits (Allington, 1997; Allington & Woodside-Jiron, 1998; Beck, 1997; Fletcher, Francis, & Foorman, 1997; Kameenui & Simmons, 1997; Morris, 1999; Routman, 1997).

Some fear that overzealous policy documents mandating the use of decodable text will result in the production and marketing of materials resembling the linguistic readers of the 1970s (Allington, 1997; Routman, 1997). Opponents also decry the shaky research base supporting text containing "only words that [children] have been taught the phonics skills to sound out (Allington, 1997, p. 15)," as well as the lack of agreement on what defines decodability (Allington & Woodside-Jiron, 1998). Others argue that decodability varies along a continuum and take exception to extreme definitions (Beck, 1997; Kameenui & Simmons, 1997; Fletcher et al., 1997). They question intemperate approaches and point to studies in which decodability has been part of a larger instructional

program. Despite the disagreement, all researchers have acknowledged the need for more study.

Essentially, the discussion has revealed that although there is a literature base for decodable text, few studies document its effects on readers. Pinpointing the gap Pikuski (1998) asked, "How many studies have been published in which the nature of beginning reading texts is systematically varied and the effects measured?" (p.30). In more broad terms, Snow, Burns, and Griffin, (1998) stated, "What kinds of curriculum materials (including basal readers) are useful for what purposes, and how can published materials and the reading/writing curriculum be integrated?" (p. 344). Finally, the recent Report of the National Reading Panel (2000) states, "Surprisingly, very little research has attempted to determine the contribution of decodable books to the effectiveness of phonics programs" (p. 2).

The objective of this article is to review the current research literature base on decodable text. Although particular gaps in the research exist, at least three rationales justify a specific examination of this literature. First, and most obviously, future research on decodable text must be grounded in previous research and theory. Second, if experimental study is to proceed, decodability must be well defined as a manipulated variable. One of the strengths of the current literature is that it defines decodability and suggests how it might affect readers. Finally, a synthesis of the research literature and its integration with current developmental theory may suggest a model that addresses when decodable text may be most useful and for what purposes.

The article is divided into four sections. The first and most well documented portion of this manuscript examines definitions of decodable text as described by previous researchers. The following section clarifies the intended purposes of decodable text. The third section analyzes the few studies examining the effects of decodable text on readers and the final section presents a model grounded in phases of word identification. Throughout the piece the limitations of studies are identified so that future research queries may be better defined.

WHAT IS DECODABLE TEXT?

Researchers have defined decodability by the presence of two primary features, 1) a proportion of words with phonically regular relationships between letters and sounds, and 2) a degree of match between the letter/sound relationships represented in text and those that the reader has been taught (Allington & Woodside-Jiron, 1998; Anderson, Hiebert, Scott, & Wilkinson, 1985; Beck & Block, 1979; Beck & Juel, 1995; Groff, 1999; Grossen, 1997; Hiebert, 1998; Juel & Roper-Schneider, 1985; Moats & Hall, 1999; Stein, 1993; Stein, Johnson, Gutlohn, 1999; Willows, Borwick, & Hayvren, 1981). [Note: The term phonetically regular is often used to denote words with regular relationships between letters and sounds. According to Harris & Hodges (1995) the term "phonetic word," is actually a misnomer for a phonically regular word, the pronunciation of which may be accurately predicted from its spelling. In this work the term phonically regular will be used.] In addition, several other word and lesson features have been associated with decodability. Here, decodability features are discussed in two categories, those at the word level and those related to instruction.

Word Features

Regularity. Phonic regularity refers to the consistency with which phonemes are mapped onto graphemes in words. This key feature has been measured in the following five ways: 1) using rating scales; 2) counting words with one-to-one letter/sound matches; 3) counting the number of simple (CVC) and multisyllabic words 4) counting the number and repetition of rimes; and 5) measuring bigram versatility.

Rating systems have been used in a number of studies to establish regularity (Juel & Roper-Schneider, 1985; Hoffman, Roser, Salas, Patterson, & Pennington, 2000; Hoffman, McCarthey, Abbott, Christian, Corman, Curry, Dressman, Elliot, Maherne, & Stahle 1993; Menon & Hiebert, 1999). Juel and Roper-Schneider (1985) used a three-level rating system based on Venezky's (1970) analysis of the English language. Words rated as "1" were called *transfer words*, and contained patterns that could be transferred to the pronunciations of other words (e.g., bag, yell, seat). Words rated as "2" were called *association words*. These contained frequently occurring but more difficult patterns such as, l-, r-, and w- controlled vowels, diphthongs, and digraphs (e.g., law, that, car, boy). Words rated as "3" contained irregular and unpredictable patterns (e.g., come, pear). Lower ratings indicated greater regularity.

When contrasting decodable and high frequency text, Juel and Roper-Schneider (1985) found that regularity ratings differed only at the preprimer levels and not at the primer and first reader levels. Decodable text had an average rating of 1.2 and high frequency text an average rating of 1.8. At a macro-level the words in primers and first readers were equally regular. However, as Juel & Roper-Schneider (1985) indicated, decodable text seemed to cluster words with similar patterns together. For example, both texts may contain the words "tag, nap, and cat" but the decodable text might present these within the same story. In another study using the same scale, three sets of decodable books all differed significantly from little books in regularity (Mesmer, 1999b). The broadest range of regularity ratings was 1.0 for the decodable books to 1.6 for the little books. The term little books refers to 4-by-4 inch reading materials with a controlled number of running words, tight print/picture match, and some predictable elements (Hiebert, 1998).

Hoffman et al., (1993, 2000) used a 5-point rating scale to assess regularity. The earlier and later scales differed slightly. The later scale included more detail and the earlier scale defined high decodablity by the inclusion of common sight words and fewer consonant (e.g. ch, sh, wh) or vowel (e.g. ea, ee, ow) digraphs. Otherwise the scales were fairly similar. The later tool, the Scale for Text Accessibility and Support—Grade 1 (STAS-1), evaluated both the decodability and predictability of text (Hoffman et al., 2000). *Highly decodable texts*, those rated as "1," contained words with CVC patterns, single syllables, and short high frequency words. *Very decodable texts*, rated as "2," contained many high utility rimes but also regular digraphs (th, ch), vowel digraphs (oa, ee), and simple compound words. *Decodable text*, rated as "3," included regularly spelled one- and two-syllable words and less common rimes. *Somewhat decodable text*, rated as "4," included less attention to regularity, more inflectional endings, but still one- and two-syllable words. Finally, *minimally decodable text* contained more irregularly spelled words, a variety of patterns, and offered little word recognition support to the emerging reader.

Menon and Hiebert (1999) also used a rating system. This system differed from the Hoffman et al., (2000) system because it included 7 levels and more specifically delineated the word patterns included in each category. Words at level 1 were short, one- and two-letter words. Those at level 2 included short vowel, CVC, and VC patterns. Words at level 3 contained clusters (tr, st, scr) and digraphs (sh, ch) but not words ending in r, l, or gh. Level 4 words contained the silent "e" pattern (gate) and Level 5 words contained vowel digraphs (ea, ee, ue). Level 6 words contained r-controlled vowels and words ending in the double ll. Level 7 words included those with diphthongs (oy, oi) and level 8 words were multisyllabic.

One additional measure tapped the consistency of letter/sound relationships. The first took into account words with one-to-one relationships between letters and sounds. In one decodable basal, most of the words found in the first grade book were based on a one-to-one relationship (Beck & Block, 1979).

Because of its generalizability to many different words, the rime unit (e.g. –in, -an, -en, -ag, -at) has often been associated with decodability (Fry, 1998). In recent studies researchers have analyzed regularity by counting the number of unique rimes in a text and the number of times each was repeated (Hiebert, 1998; Menon & Hiebert, 1999). A sample of decodable text contained 5 unique rimes that occurred a total of 73 times. This contrasted with a sample from a literature-based anthology with 4 unique rimes repeated a total of 8 times. A later study compared three basal series, one called literature core, another referred to as literature/phonics, and the third labeled phonics core. Texts did not differ greatly in their presentation of the rime unit. All texts introduced between 40 and 60 unique rimes but repeated only 13-17 % of them in each passage (Menon & Hiebert, 1999).

Juel and Roper-Schneider (1985) considered a concept called *bigram versatility*. Like rimes, bigrams are also intraword patterns consisting of letter pairs that are frequently found together, e.g., tr-, ee, -at, -ay. Bigram versatility is defined as how often a bigram appears in specific position in different words of a set length (e.g. the bigram "at" is in the second and third position in the words, "cat, mat, fat, sat," and the bigram "ee" is also in the second and third position in the words, "meet, feel, see, beef"). A versatile bigram is repeated across words. Again, decodable text at the primer and first reader levels differed from control text in that it repeated more versatile bigrams. This review of the literature indicates a definite relationship between phonic regularity and decodability, although not one that is necessarily simple. Rimes are one of the major indicators of decodability (Hiebert, 1998; Hoffman et al., 2000, 1993), but the concept has been broken further down into bigrams. Decodable text may also be conceptualized as having short-vowel, one-syllable words with one-to-one matches between phonemes and graphemes (Beck & Block, 1979; Menon & Hiebert, 1999).

Essentially these regularity definitions refer to letter/sound patterns that can be applied to many different words (rimes, bigrams). However, the simple presence of these patterns does not necessarily characterize decodability. Hiebert (1998) found that texts did not differ greatly in the number of rimes represented but in their repetition. The findings of Juel and Roper-Schneider (1985) on bigrams intersected with the rime findings. Decodable text contained intraword units that were repeated more across words. Thus, in decodable text actual words may not be repeated more often but certain

universal word parts are. Major regularity differences between words in text are usually not apparent but decodable text consolidates and repeats phonically regular words within text passages. Of course many are opposed to the more exaggerated forms of this repetition. The alteration of text that maintains high levels of regularity can render stories boring and nonsensical (Beck & Juel, 1995; Watson, 1997; Weaver, 1997).

The major limitation of these regularity definitions is that researchers differ in the specific ways that they account for regularity. Some use rating scales, others count intraword patterns (rimes, bigrams) and others account for one-to-one correspondences. In fact researchers occasionally classify the same letter/sound patterns at different levels of regularity. For example one rating system placed vowel digraphs (oa, ai) at the second level of decodability (Hoffman et al., 2000) and still another placed them at level 5 (Menon & Hiebert, 1999).

Word Frequency. Several researchers have considered word frequency in discussions of decodablity. Word frequency refers to how often a word is used in the English language. Interestingly the linkage between frequency and decodability has evolved over the past thirty years. Some researchers have conceptualized frequency as a text feature that contrasts with decodability while others have associated it with decodablity (Beck, 1981; Beck & Block, 1979; Brown, 1999; Chall, 1967; Hiebert, 1998; Hoffman et al., 1993, 2000, 1993; Juel & Roper-Schneider, 1985; Menon & Hiebert, 1999; Stein et al., 1999).

In reaction to the exaggerated repetition of high frequency words in text, Chall (1967) questioned the dependence of basal texts on high frequency words. She inquired about basals, "Must the [vocabulary] control be based only on the commonest, most irregularly spelled words? Couldn't some of the control result from a consideration of the phonic elements previously taught?" (p. 261). Because high frequency vocabulary often contains some of the most irregular patterns in the English language, texts repeating large numbers of these words may divert attention from regular letter/sound relationships. More regular but less frequent words may require students to use decoding or structural analysis skills more (Adams, 1990). Traditionally text considered decodable has contained fewer high frequency words (Beck & Block, 1979; Juel & Roper-Schneider, 1985). In the Juel and Roper-Schneider (1985) study decodable preprimer text (Economy) contained fewer high frequency words. Recently Hiebert (1998) analyzed text samples of decodable and other texts. In this analysis decodable text contained two unique high frequency words as compared with a literature-based text with four, a multiple criteria text with one, a little book with three, and a Dr. Seuss book with six.

Lately, the notion of high frequency has been associated with decodability. It has been included in definitions of decodability (Brown, 1999; Hoffman, et al., 1993, 2000) and has been used to evaluate the match between instruction and text (Groff, 1997; Stein, et al., 1999). The initial dissociation between decodability and word frequency has gradually given way to a more moderate view. Now, proponents of decodable text seem to advocate a systematic inclusion of some high frequency words within text. Like decodability, this inclusion may render a text more accessible to the young reader.

Number of syllables and letters. Although not specifically included in definitions of decodability, the number of syllables and the number of letters in words may relate to decodability (Beck & Block, 1979; Hoffman, et al. 2000, 1993; Juel &Roper-Schneider, 1985). In one study, monosyllabic words outnumbered polysyllabic words in decodable text by 9.7% (Beck & Block, 1979). In other studies researchers found words in decodable text to contain fewer syllables (Juel & Roper-Schneider, 1985; Mesmer, 1999b) and to contain fewer letters (Juel & Roper-Schneider, 1985). Menon and Hiebert (1999) included in definitions of decodability the number of single syllable word as well as the number of multisyllabic words. More recently, Hoffman et al. (2000) found that the number syllables per sentence (r= .61) and the number of syllables per word (r= .37) correlated with decodability. Yet, in this same study the syllable counts, number per sentence (r= .64) and number per word r= (.27), also correlated with predictability ratings. Thus, low syllable counts seem to be associated with, but do not distinguish, decodable text.

Lesson-to-Text Match. Included in the definition of decodability is a degree of match between letter/sound relationships represented in text and those that the reader has been taught. This feature is called lesson-to-text match. It refers to the how well the words in an instructional text match the phonics instruction children have received prior to reading that text. Lesson-to-text match is usually expressed as a percentage of words matching phonics lessons. For example, if a child has been taught the /æ/ sound as in "cab," and then reads a number of /æ/ words in text (e.g. flag, rat, can), then the lesson-to-text match is high. To the contrary, if a child encounters few /æ/ words in text, then the lesson-to-text match is low.

None of the examinations thus far have examined actual phonics lessons delivered by real teachers in real classrooms. Instead examinations have focused on the teacher's editions, the sequence of phonics lessons in these manuals, and their coordination with the words in text. Analyses also have inspected the strategies that manuals direct teachers to use in assisting children with word decoding.

The match between phonics lessons in teacher's editions and words in text. A number of researchers have contrasted decodable text with high frequency text by counting the words in text matching phonics lessons in manuals (Barr & Dreeben, 1983; Beck, 1981; Beck & Block, 1979; Meyer et al., 1987). Across studies, they consistently found that decodable text differed from high frequency text in its match between phonics lessons expressed in teachers' editions and words in print (Barr & Dreeben, 1983; Beck, 1981; Beck & Block, 1979; Meyer et al., 1987).

Table 1 consolidates the findings of multiple text analyses in the area of lesson-to-text match. Note that the decodable text usually has a higher lesson-to-text match than comparison texts. The table gives the percentage of words that match lessons in teacher's editions both for decodable and comparison texts and, therefore, allows for comparison across studies. Although most researchers reported the lesson–to-text match in percentage form, not all did. Stein (1993) holistically evaluated six randomly selected samples of text from all basals. For each sample a yes/no determination was made as to whether or not the text was written "to provide multiple examples of the phonics instruction in the program (p. 12)." Some researchers broke down the lesson-to-text match by levels (e.g. preprimer, primer, 1st reader) and in these cases

the average across levels has also been calculated.

Table 1 illustrates three points about lesson-to-text match. First, over 20 years the same publishers have produced text with a tighter lesson-to-text match (Distar, Merrill, Open Court), while other publishers have seemingly not attended to this feature (Ginn, HBJ, Houghton Mifflin). Second, the degree of lesson-to-text match does not seem to follow any particular pattern within the series (See Beck & Block, 1979). One might expect lesson-to-text match to start out high and to gradually

Table 1 Lesson-to-text match in seven studies

Study	Words or Samples Matching Phonics Lessons			
	DecodableText(s)		Comparison Text(s)	
Beck & Block (1979)	Palo Alto		Ginn	
	Level 1	78%	Level 2	0%
	Level 2	62%	Level 3	15%
	Level 3	73%	Level 4	15%
	Level 4	54%	Level 5	43%
	Level 5	57%	Level 6	33%
	Level 6	78%	Level 7	57%
	Level 7	63%	Average	27%
	Level 8	53%		
	Level 9	48%		
	Level 10	87%		
	Level 11	64%		
	Level 12	78%		
	Average	66%		
Beck (1981)	Distar,	100%	Ginn,	3%
	Sullivan,	93%	Houghton, Mifflin,	13%
	Merrill,	79%	Bank Street,	0%
	Palo Alto	69%	Open Highways	0%
Barr & Breeben (1983)	Macmillan		Scott Foresman	
	primer words**	23%	Primer words**	10%
	1st reader words**	30%	1st reader words**	20%
Reutzel & Daines (1987)	Series 1*	50%	Series 2	10%
	Series 5	48%	Series 3	0%
	Series 4	78%	Series 6	17%
			Series 7	23%
Meyer et al. (1987)	Distar	>96%	Ginn,	<10%
			Harcourt Brace	
			Jovanovich (HBJ)	<10%
			Houghton Mifflin	<10%

(Table 1 cont.)

	Decodable Text(s)		Comparison Text(s)	
Stein (1993)	Addison Wesley***	6/6 samples	Macmillan,	0/6 samples
	Merrill Linguistic	6/6 samples	HBJ Reading Program,	2/6 samples
	Open Court	5/6 samples	DC Heath,	0/6 samples
	SRA Reading Mastery	6/6 samples	HRW Reading (HBJ),	0/6 samples
			Imagination (HBJ),	0/6 samples
			Impressions (HBJ),	0/6 samples
			Houghton Mifflin	0/6 samples
			Scott Foresman	0/6 samples
			Silver, Burdett, & Ginn	0/6 samples
Stein et al. (1999)	Open Court	52%	Harcourt Brace,	14%
			Houghton Mifflin,	5%
			Macmillan/McGraw Hill,	7%
			Scholastic,	10%
			Scott Foresman	8%
			Silver Burdette, Ginn	1%

Note. Reutzel & Daines (1987) and Stein (1993) did not classify texts as "decodable." However, these texts seem to share features of text previously denoted as "decodable" by other researchers.
*These researchers named the basals that they evaluated but used a coding system. The basals reviewed were Addison-Wesley, Ginn, Harcourt, Brace, & Jovanavich, Houghton-Mifflin, Macmillan, Open Court, & Scott Foresman
** These percentages were calculated by the author based on raw counts given in the study.
***Researcher evaluated six randomly selected samples of text from all basals. For each sample a yes/not determination was made as to whether or not the text was written "to provide multiple examples of the phonics instruction in the program (p. 12)."

decrease as readers know more letter/sound relationships. However, this was not the case. Finally, some approximation of the parameters for lesson-to-text match can be suggested by averaging the percentage of lesson-to-text match across studies. This average, 64%, suggests a rough quantitative definition of decodability on the lesson-to-text feature. (Excludes Meyer et al. 1987, and Stein, 1993, because specific percentages are not reported.)

Essentially, the findings have been fairly consistent—decodable text is distinguished from other text in its match between words in text and prescribed lessons. One limitation of studies is that the lesson-to-text match feature only takes into account prescribed lessons in teacher's editions, a shortcoming noted by Chall (1967). Actual phonics lessons differ from these (Ball & Cohen, 1996; Pressley, Rankin, & Yokoi, 1996). Because actual instruction is an integral part of determining lesson-to-text match, it cannot be ignored in defining decodability. Current analyses of lesson-to-text match fail to take into account the interactive relationship between text and actual instruction.

Phonics lessons in teacher's manuals and directives to teachers. After giving some attention to student materials, researchers turned their energies towards analyzing the content and sequence of phonics lessons in both decodable and non-decodable

teacher's editions. They found that non-decodable text placed more emphasis on lessons involving consonants and less emphasis on vowels (Barr & Dreeben, 1983; Meyer, et al., 1987). Meyer et al., (1987) noted that three meaning-emphasis basals (Houghton Mifflin, HBJ, and Ginn) contained fewer directives related to vowel sounds in contrast to a phonics program (Distar).

Researchers noted several other patterns in the phonics lessons of decodable text. In decodable text phonics lessons preceded story reading, suggesting that such lessons were essential to processing the text. Non-decodable text placed phonics lessons following reading (Chall 1967; Durkin; 1989). Non-decodable text presented phonics instruction more slowly and for a longer period of time than decodable text (Chall, 1967).

Chall (1967), Durkin (1989), and Meyer et al., (1987) examined directives to teachers in manuals. Chall and Durkin examined how teachers were advised to help children read new vocabulary. Essentially basal writers directed teachers to offer isolated phonics instruction but did not encourage them to instruct students to apply the phonics when reading words in text. Chall (1967) found that the predominant strategy for the two most popular basals (Ginn and Scott Foresman) was a sight word strategy. In her analyses between 47% and 80% of the directives instructed children to "just read," using a whole word strategy. Between 0% and 26% asked children to note the visual form of the configured letters and only 0% to 28% directed the child to use phonics or structural analysis.

In analyzing five basals two decades later, Durkin (1989) found the same inconsistency between the phonics taught and the strategies teachers were directed to use. For example, meaning hints (e.g. "It tells the size," for the word "big.") were encouraged when words were clearly decodable based on previously taught letter/sound information.

Meyer et al., (1987) counted the focus of directives in the following six categories: consonant sounds, vowel sounds, names, rules, rhyming, and blending. (First two categories are discussed earlier.) The meaning-emphasis basals contained more directives on naming letters and articulating phonics rules as opposed to the phonics-emphasis basal. The meaning-emphasis basals placed no emphasis on blending sounds, whereas the decodable basal did.

Limitations

Most of these studies have established decodability by contrasting materials on text features, namely regularity and lesson-to-text match. These analyses rate words for regularity and/or count words matching phonics lessons to derive ratios or percentages. Decodability is then established via a contrast between numbers. The major limitation of current decodability definitions is that exact percentages of phonically regular words matching lessons differs from document to document (Allington & Woodside-Jiron, 1998; Beck & Juel, 1995; Beck, 1997). Some suggest 70% (Beck & Juel, 1995). Others 100% (Groff, 1999) and still others say "a high percentage" (Moats & Hall, 1999). This literature review, which simply averages current percentages, suggests that at a minimum 64% of words must match lessons for a text to be considered decodable. Even taking into account this rough estimation of lesson-to-text match, the exact percentage remains unclear because no research stipulates the level needed by beginning readers of various skill levels (Beck & Juel, 1995; Hiebert, 1998;

Pikulski, 1997; Snow, et al., 1998). Note however, that no suggestions for the percentage of phonically regular words can be suggested by current literature. This limitation is the precise reason that many researchers argue with mandates for decodable text (Allington & Woodside-Jiron, 1998).

WHAT ARE THE INTENDED PURPOSES OF DECODABLE TEXT?

Clearly decodable text differs from other text types, but why? What intended purposes does it serve? The literature reveals three primary purposes. First, like any form of vocabulary control, decodable text supports readers in word identification. Second, decodable text theoretically allows for greater application of phonics lessons during reading, and third, it directs readers' attention to letters and sounds.

To become proficient, beginners must read great amounts of connected text (Beck & Juel, 1995; Stahl, Duffy-Hester, & Stahl, 1998; Snow et al., 1998), yet they are significantly challenged by the task of identifying words in print (Gough & Hillinger, 1980; Gough & Juel, 1991; Juel, 1994). These two facts create a double bind: while beginners must practice reading to improve, their ability to practice is impaired by their struggle to identify words. Like other forms of vocabulary control, decodable text supports beginning readers in word identification so that they may practice reading (Beck & Juel, 1995; Chall, 1967; Cole, 1998; Hiebert, 1998; Moats, & Hall, 1999). Vocabulary control is one means to the end of developing skilled readers who can eventually process materials without controls (Hiebert, 1998). However, the various types of vocabulary control represent distinct relationships between text and reader. Natural language text uses a presumed oral language facility to assist readers in identifying words (Brown, 1999; Hiebert, 1998; Mesmer, 1999a; Watson, 1997). Predictable text relies on repetition, rhyme, and the child's memory for verse to assist with word recognition (Weaver, 1997). Decodable text draws on the reader's fledgling knowledge of the alphabetic code.

Because of its emphasis on regularity and a relationship between text and phonics lessons, decodable text encourages children to apply phonics instruction during text reading. Why? The answer relates to what we know about the generalization of phonics instruction to reading and the limits of a reader's conscious attention. The purpose of phonics instruction is that it be applied during reading but children who learn abstract phonics rules or spend time completing worksheets, do not typically generalize what they learn to real reading (Adams, 1990; Dahl & Freppon, 1995; Gough, 1996; Haynes & Jenkins, 1986; Leinhardt, Zigmond, & Cooley, 1981). Thus, the purpose of phonics instruction will likely not be fulfilled if children are not given numerous opportunities to apply letter/sound knowledge during connected reading. Decodable text serves as a conduit for the application of phonics instruction (Adams, 1990; Barr, 1972; Biemiller, 1970; Bryne, 1991; Ehri, 1991, 1994, 1995; Gough & Hillinger, 1980; Gough & Juel; 1991; Juel, 1994; Juel & Roper-Schneider, 1985).

Of course not all researchers believe that children need decodable text to have opportunities to apply letter/sound knowledge. In addition, many feel that the over-emphasis in decodable text on letter/sound applications tips the balance of readers'

strategy use too far towards phonics. The supportive features in any text—repeated words, supportive pictures, rhyming words, or consistency between letters and sounds—affect beginning readers' attention. Adams (1997) explains that children can attend to only one thought dimension at a time and that which children learn depends entirely upon their attention. At specific developmental periods attention might be focused on any one of these supportive features for specific purposes. In order for readers to apply letters and sounds during connected reading they must be attending consciously to them. Decodable text encourages this attention. In contrast, text containing many unknown or irregular patterns may actually draw readers' attention away from the regularities of the English language (Barr & Dreeben, 1983; Beck, 1981; Beck & McCaslin, 1978; Juel & Roper-Schneider, 1985; Meyer, et al., 1987; Willows, et al., 1981).

HOW DOES DECODABILITY AFFECT READERS?

A number of researchers have included decodable text as one component of a treatment design. However, most do not manipulate, mention, or otherwise focus specifically on text decodability. In this paper, only research that specifically mentioned or controlled for text decodability was reviewed. Admittedly, studies do exist in which decodable text has been integrated into larger instructional programs (Beck, 1997) but these studies cannot be found in refereed journals.

Juel and Roper-Schneider (1985) are consistently cited as directly inspecting the effects of decodable text (Adams, 1990; Allington & Woodside-Jiron, 1998; Stahl, et al., 1998; Stein, et al., 1999). Although they did not conclusively determine a superior approach, they did address the following three questions: 1) How do the word attack abilities of readers processing decodable text compare to a comparison group? 2) Do decodable readers better transfer letter/sound knowledge to new words? and 3) What decodability features contribute to readers' abilities to recognize words?

This quasi-experimental study took place over an entire year. At three points, researchers measured the reading abilities of two first grade groups (N= 93), one group reading in a decodable basal and the other in a high frequency basal. Theoretically, both groups had the same phonics instruction, a scripted program mandated by the district. Over the year, the researchers measured the children's abilities to read individual words from their basal texts (three times), to read connected text (twice), to read pseudo words (three times), and to read unknown words from the other basal (end of the year).

The groups differed neither in reading words from their own basals, nor in contextual reading, but did differ in decoding ability and in reading the unknown words from the other basal. The decodable group, performed better on the decoding measure, both at the Nov./Dec testing, $F\ (1,71) = 12.0$, $p < .01$, and at the February testing $F\ (1,71) = 4.5$, $p < .05$. Thus, despite the same intensive phonics instruction received by both groups, the decodable group demonstrated a better ability to apply letter/sound knowledge in the first two-thirds of the year than the comparison group. At the end of the year, the decodable group also read unknown words from the other basal better than the comparison group, indicating their ability to transfer decoding knowledge, $F\ (1,41) = 8.0$, $p = .01$.

The groups did not differ in their abilities to read individual words from their own basal readers. Nonetheless, three word features predicted their abilities to do so. Despite context, regularity, repetition, and bigram versatility assisted all students in reading words. The power of these word features differed by group. The decodable group was most influenced by regularity and the high frequency group was most influenced by repetition.

As the major finding of the study, Juel and Roper-Schneider (1985) concluded that text type used during the first two-thirds of the first grade year contributed to the use of a letter/sound strategy. Text type also facilitated the transfer of letter/sound knowledge through the end of the first grade. Finally, text decodability affected strategy use and did so more than phonics instruction.

In another study, Felton (1993) randomly assigned two groups of at-risk students (N =48) to either a Code (Lippincott) or Context (Houghton Mifflin) treatment and followed these students longitudinally for 2 years. Participants were identified in Kindergarten as having weak phonological processing skills. Both treatments included decoding instruction but treatments varied by approach to phonics instruction (explicit or implicit) and by text decodability. At the end of the first grade year the Code group outperformed the Context group on decoding measures (reading pseudo words) and on spelling. By the end of the second grade year, the Code group scored higher on both the decoding measure as well as reading real, regular, polysyllabic words.

Finally, Hoffman et al. (2000) examined the text features in two leveling systems (Fountas/Pinnell system & STAS-1). Hoffman et al., (2000) explored how these features influenced the reading behaviors of first graders. The study evaluated the power of decodability, for predicting student accuracy, fluency, and rate within three different instructional treatments.

These researchers leveled three different book sets each containing seven little books using both the Fountas/Pinnell and the STAS-1 systems. Then they assessed first grade readers, placed them into high, middle, or low groups, and asked them to read each of the seven books. Researchers introduced the books to the participants through three instructional treatments. In the first, they asked participants to read the books with no support. In the second, participants previewed the books and were introduced to new vocabulary. In the third researchers first read the books to the participants and asked them to read each book aloud. Finally, running records were taken of the readings and evaluated for accuracy. Fluency was evaluated using a scale and rate measured by words per minute.

One finding indicated that decodability of various levels of books seemed to progress systematically. Decodability decreased as text difficulty increased. Books at the easiest two levels had decodability ratings of 1.9 out of 5 whereas more difficult books had decodability levels of 4.0. Note, however, that the definition of "decodable" in this study appeared to be broader and more inclusive than other definitions and that the little books, while rated in the area of decodability, are not considered to be decodable text per se. In addition decodability and predictability were highly correlated with each other (r = .77)

What makes this study particularly interesting is that it evaluated how children interacted with books of varying decodability levels. The study concluded that the

full-scale leveling systems were more accurate than individual text features for predicting student reading behaviors. However, the levels of decodability positively and significantly correlated with student accuracy (r = .21) indicating that decodability may have assisted students in analyzing words. However, decodability negatively and significantly correlated with fluency (r = -.21) indicating that the decodable features may have slowed readers down. Both predictability and decodability negatively correlated with rate, r = -.34 and -.40, respectively.

These three studies indicate that decodable text has some effect on the decoding abilities of beginning readers. By contrasting the results of the Felton (1993) and Juel and Roper-Schneider (1985) studies, one might conclude that decodable text operates differently on readers of varying abilities. Felton sampled "at-risk" students and Juel and Roper-Schneider sampled only students at the 40th percentile or above on the Metropolitan Test of Readiness. Although both studies found differences between groups on decoding abilities, the differences for the average and above average students only persevered through the first two-thirds of first grade. In contrast, for the students with phonological difficulties, the decoding abilities in the Code group remained superior through the second grade. Given Felton's findings, future research may indicate that lower performing students are more likely to benefit from programs including decodable text than average- to-above average students are.

Although much simpler, the Hoffman et al. (2000) study indicates that decodability may, in fact, help readers to be more accurate in their word identification. The finding does not address whether or not readers apply phonics instruction as they identify words. However, readers will likely be less fluent in their reading as they interact with more highly decodable text. In first grade decodable text will likely increase precision in word identification but may result in a fluency compromise.

WHEN IS DECODABLE TEXT MOST USEFUL?

Some researchers and theorists believe that decodability, like any other instructional tool, has a discrete developmental period of usefulness (Beck & Juel, 1995; Brown, 1999; Hoffman et al., 2000; Juel & Roper-Schneider, 1985; Mesmer, 1999b). This specific developmental point may be suggested by integrating findings from the research literature with the well-developed line of research on the phases of word identification.

Word Identification Phases

Readers in various stages of word identification are essentially differentiated by the extent to which they apply the alphabetic principle. In the first stage of word identification, called the *logographic* or *prealphabetic* phase, children do not use letter/sound relationships to identify words. Instead, they rely on selected, arbitrary visual cues, which they associate with word forms (Beimiller, 1970; Chall, 1983; Ehri, 1991, 1994, 1995; Ehri & McCormick, 1998; Ehri & Wilce, 1985, 1987; Frith, 1985; Gough, Juel, & Roper-Schneider, 1983; Gough & Hillinger, 1980; Gough & Juel, 1991; Juel, 1994). Prealphabetic readers may use letter features, word length, or word configuration, but not letter/sound correspondences (Barr, 1972; Bryne, 1991; Juel & Roper-Schneider, 1985). For example, in identifying the word "look,"

they might focus on the two o's, the extended letter l, the shape of the entire word, or the ending k (Gough & Juel, 1991). Prealphabetic readers also rely heavily on semantics, syntax, and contextual guessing (Ehri & McCormick, 1998). With some exposure to print, they can learn approximately 40 words using this strategy (Clay, 1993; Gough & Juel, 1991; Gough & Hillinger, 1980).

At the *partial alphabetic* phase, readers use some of the letter/sound relationships in a word to assist in word recognition (Ehri & McCormick, 1998). Usually children in this stage apply their knowledge of letters and sounds to the initial and final consonants of words but are unable to fully decode words. Prior to entering this phase, young readers must understand the following concepts: 1) words are composed of individual speech sounds (phonemic awareness); 2) words are composed of individual letters; 3) the spoken and written word are linked; and 4) there is a system for how words are constructed, i.e., cryptanalytic intent (Gough & Juel, 1991). They must be able to segment initial sounds, to match the initial letters with sounds, and to identify words that share the same initial sounds (Bryne & Fielding-Barnsley, 1989, 1991).

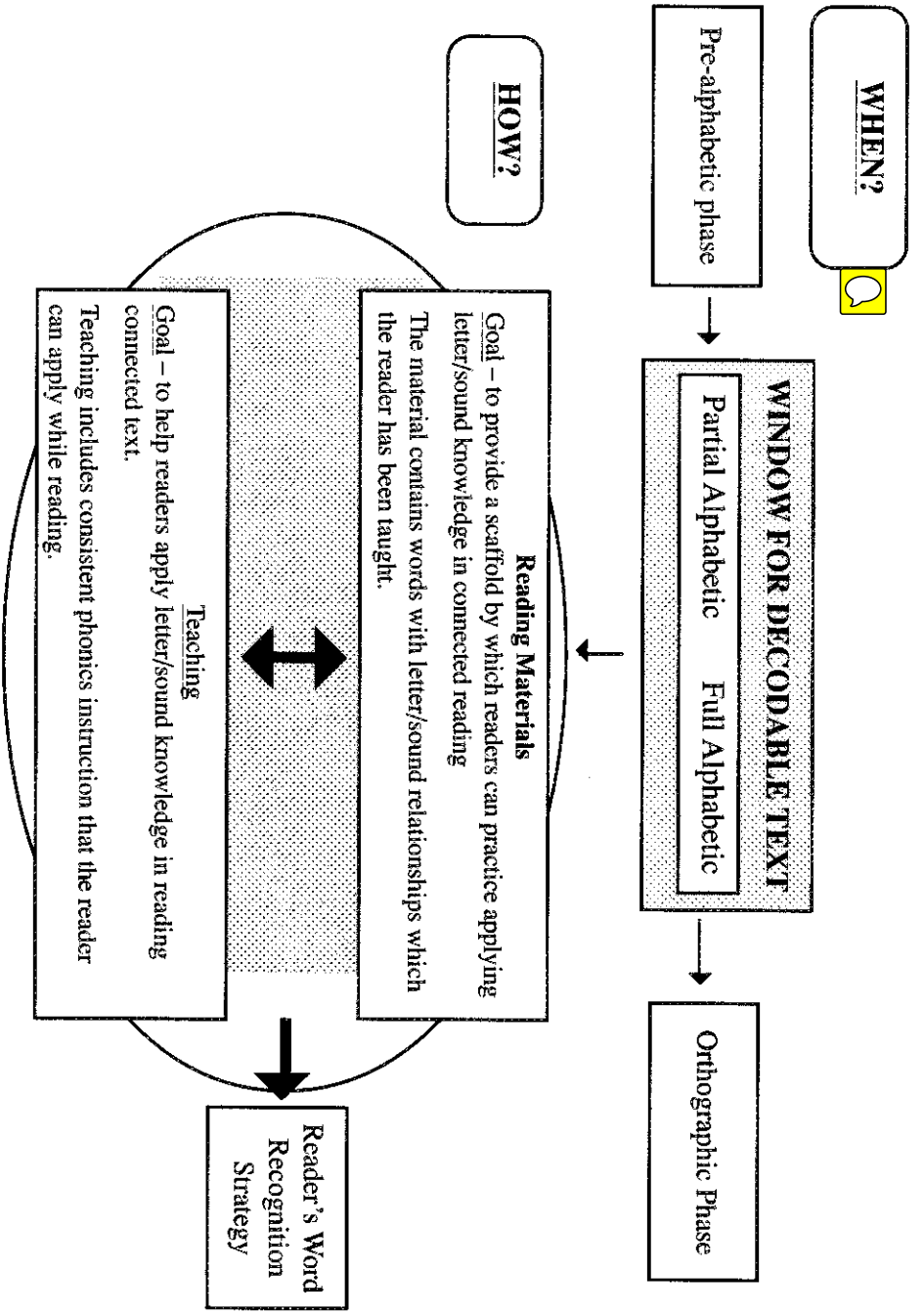
As readers move into the third stage of word identification, called *cipher reading* or full *alphabetic reading*, they use all letters in a word to form connections with all phonemes that they represent (Ehri, 1991, 1995; Ehri & McCormick, 1998; Gough & Hillinger, 1980; Gough & Juel 1991; Juel, 1994). Full alphabetic readers process vowels and fully blend together the sounds in words. Chall (1983) called this the "glued to the print" stage. In several studies full alphabetic readers tended to have more non-word reading errors than pre-alphabetic readers because they knew that they could not simply substitute words that graphically did not correspond to the print (Barr, 1972; Ehri & Wilce, 1987; Gough, Juel, & Roper-Schneider, 1983; Juel, & Roper-Schneider, 1985).

Eventually readers move beyond the full alphabetic stage to the *consolidated alphabetic* or *orthographic* phase, whereby they identify words using consolidated multi-letter units based on syllables, morphemes, or onsets and rimes (Adams, 1990; Ehri, 1995; Samuelsson, Gustafson, & Ronneberg, 1996). During this stage, the brain consolidates individual letters into stored visual patterns of letter strings. Through hours of connected reading, students gain the many exposures to the letters, strings of letters, and interletter associations that they need to automatically access words (Adams, 1990; Samuelsson, Gustafson, & Ronnberg, 1996). Most researchers agree that children who read large amounts of connected text move into this stage. In fact, studies substantiate that older readers, with larger sight vocabularies, are more sensitive to orthographic structures (Bowey & Hanson, 1994; Juel, 1983; Leslie & Thimke, 1986; Samuelsson, et al., 1996).

When to Use Decodable Text

As readers progress through these stages of word recognition, when might decodable text be most useful? Clearly, prealphabetic readers would not benefit from the regularity in decodable text because they have yet to fully acquire the alphabetic principle. Perhaps partial alphabetic readers could benefit from decodable text, but surely the progression into successful full alphabetic reading may be facilitated by the use of decodable text (see Figure 1). Beginners may benefit from decodable text

Figure 1 Theoretical model for the use of decodable text



when they have learned enough letter sound correspondences to begin to sound out words but not enough to handle the full range of English patterns presented in uncontrolled text. Decodable text may mediate readers' use of code information during connected reading as they transition from the partial alphabetic stage to the full alphabetic stage (Brown, 1999; Mesmer, 1999a).

The argument for using decodable text during the transition between the partial alphabetic and full alphabetic stages is clear—at the point when children must begin to use fully letter/sound correspondences, they must have texts that reinforce these patterns and allow them to practice. Prior to this point readers are only grasping the nature of print or nature of the alphabetic principle. During this transition period decodable text appears to meet readers' developmental needs for a variety of reasons. First, the connection between lessons and texts helps partial alphabetic readers to see that what they learn during phonics lessons does function within text. The connection empowers them to use their fledgling alphabetic knowledge. A second major hurdle for readers at this stage is decoding medial short vowels (Ehri, 1995). Decodable texts bridge this gap by presenting words with simple consistent, phoneme-to-grapheme relationships and words with rimes (Hiebert, 1998; Juel & Roper-Schneider, 1985). Third, according to at least one study the text/instruction interface affects strategy use more than phonics lessons (Juel & Roper-Schneider, 1985). Furthermore, the regularity may help readers to transition from relying on syntax and semantics cues they used in the pre and partial alphabetic stages to a more balanced word identification approach that includes alphabetic knowledge. Eventually readers will move through the full-alphabetic stage, and will have little need for decodable text.

As a teaching strategy, phonics lessons and decodable text must be paired. In fact, this interface defines and distinguishes decodability (Anderson, et. al, 1985; Barr & Dreeben, 1983; Beck & McCaslin, 1978; Beck & Juel, 1995; Meyer et al., 1987; Juel & Roper-Schneider, 1985; Willows, et al., 1981). Figure 1 illustrates the integrated nature of the strategy along with its stage specific usefulness.

CONCLUSIONS

What We Know about Decodable Text

This review of the research literature makes two facts abundantly clear. First, many researchers have analyzed words in basal readers (Barr & Dreeben, 1983; Beck, 1981; Beck & Block, 1979; Beck & McCaslin 1978; Chall 1967; Cole, 1998; Durkin, 1990; Menon & Hiebert, 1999; Meyer et al., 1987; Hiebert, 1998; Hoffman et al., 1993, 2000; Juel & Roper-Schneider, 1985; Mesmer, 1999b; Reutzel & Daines, 1987; Stein, 1993; Stein, et al., 1999; Willows, et al., 1981). Second, in 30 years a number of findings have been consistently replicated. A match between phonics lessons in teacher's editions and words in text distinguishes decodable text from non-decodable text, and so also does a repetition of intraword patterns (rimes, bigrams). The ways in which decodable text has differed from other text have remained fairly stable over all of these studies. The differences found in 1978 are very similar to those found in 1999.

In the opinion of this researcher, a need does not currently exist for more text analyses outside of those performed to operationalize an independent variable. Findings

have been sufficiently replicated and yet have left unanswered the most compelling question—What is the optimal level of decodability for different readers at different stages?

Patterns in word features in basal readers indicate a trend toward less extreme definitions of decodability. In 1967, for example, Chall discovered that many basal texts were based almost entirely on high frequency words. With this revelation some publishers in the 1970s began constructing text using very few high frequency words and many more decodable words. Today, decodability includes a modest mix of some high frequency words with decodable text (Brown, 1999; Groff, 1997; Hiebert, 1998; Hoffman et al., 1993, 2000; Stein, et al., 1999). This mix was most likely Chall's intention when she made her recommendations regarding textbooks, but the response of publishers at the time was extreme. In addition current notions of decodability couple it with other features, like predictability and repetition, that make text accessible to readers (Menon & Hiebert, 1999). Thus, strictly decodable text appears to be less popular than text that contains several accessibility features, one of which may be decodability.

The lesson-to-text match has attracted very little of researchers' attention or discussion and yet, this aspect is pivotal to successful use of decodable text. In order for decodable text to achieve its purposes, actual instruction must work with words in text. As an instructional strategy, the teaching and the text cannot be separated. The phonics lessons that children are taught must have some level of applicability to the words they read. The words that children read must contain letter/sound information that they know. Many arguments about decodable text attempt to separate text from instruction and then deny the power of one or the other.

What We Need to Know

Further research is needed to determine whether or not decodability is, in fact useful, and if so, how much, for whom, and when? At a very basic level more research is needed to address whether or not decodable text does affect readers in predicted ways. Much more examination of how readers specifically interact with text is needed. Where possible, research should take an experimental approach, randomly assigning students or groups of students to conditions that require them to apply the same phonics instruction in either a decodable or control context. Rarely, have researchers observed or controlled for actual phonics lessons that match decodable text. Due to the inseparable nature of instruction and text, prospective studies should examine actual phonics instruction and its integration with text. Close-in measures, like those used recently are needed as opposed to more removed measures like decoding tests, word lists, or standardized measures (Brown, 1999; Hoffman, et al., 2000; Mesmer, 1999a).

When is decodability useful? Exploring stage-related models, like the one suggested here, forms a second research focus. Decodable text most likely has a limited window of usefulness and research is needed that inspects how readers in various developmental stages interact with decodable text. If confirmed, these models have important implications for educators.

How much? A great deal of debate still exists regarding the degree of decodability a reader needs. What percentage of words must be both regular and match text to assist a developing reader? What percentage is too much? The field

currently needs more research like that of Hoffman et al., (2000), which exposes readers to texts with varying degrees of decodability and then inspects how readers interact with these (Pikulski, 1998). This type of work has the potential for establishing the point at which decodability yields diminished returns. It also specifies for teachers the likely reading behaviors that decodable text will encourage.

For whom? Finally, additional research is needed to address which readers would benefit the most from decodability. A particular focus for research should be on locating the readers who may not benefit from decodable text, as well as those who may. Some readers may need very little lesson-to-text match while others may need a great deal. Recent evidence suggests that struggling readers benefit from more explicit and systematic phonics instruction than average and above average readers (Juel & Minden/Cupp, 1999; National Reading Panel, 2000). The same may hold true with regard to decodability. Struggling readers may profit more from the consistency in decodable text than other readers may.

Without carefully considering the literature on decodable text, researchers and practitioners are doomed to fluctuate between the errors of the past— fervently embracing decodable text or hastily dismissing it. Both outright rejection as well as overzealous promotion ignore the potential developmental usefulness of this instructional material. This review suggests a more sophisticated position, one situated within a broader context of determining which materials are most useful for which readers at which developmental stages.

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