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ARE THERE ALTERNATIVES IN READING TEXTBOOKS? AN EXAMINATION OF THREE BEGINNING READING PROGRAMS

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The first-grade components of three textbook programs—mainstream basal, combined phonics and literature, and phonics emphasis—were compared on cognitive load (e.g., number of different words) and linguistic content (e.g., number of monosyllabic, simple vowel words). Three levels of three components of a program—literature anthologies, decodable texts, and leveled texts—were compared.

Texts of the mainstream basal program grew in length but had similar cognitive load and linguistic content across levels and components. The phonics and literature program had numerous decodable texts initially but, at later levels, emphasized a literary anthology and leveled texts that were similar to the mainstream basal program. The phonics-only program had decodable texts with small numbers of unique words. Its literature, however, had no clear connections to the words of decodable texts.

The policies of the nation's two largest states over the past fifteen years are evidence that beginning reading textbooks are viewed as a primary means of reform in reading instruction. The California English/Language Arts Committee (1987) initiated massive changes in reading materials by mandating textbooks with authentic literature, a policy that the Texas Education Agency (1990) followed. In its next textbook adoption in 2000 the Texas Education Agency (1997) took a different tack by mandating

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that beginning texts be decodable. For its 2002 textbook adoption, the California English/Language Arts Committee (1999) followed the Texas mandate for decodable text.

In recent years, the involvement of policymakers in textbook selection has moved beyond mandates that state-adopted textbooks have particular features to the specification of particular textbook programs. In 1999, the Packard Humanities Foundation provided California's largest school district, Los Angeles Unified School District (LAUSD), with funds to buy programs that were not on the state-approved list at the time—Open Court, Reading Mastery, or Success for All (Libit, 2000). Advocacy by some state-level policymakers of Open Court has resulted in its presence as one of two textbook programs that qualified for statewide funding in the 2002 California textbook selection process (California State Board of Education, 2002). This advocacy by policymakers of particular programs, specifically the three programs funded in LAUSD, has extended to the national level according to the International Reading Association (Ogle & Farstrup, 2002).

After this decade of policy-governed decision-making regarding beginning reading textbook programs, we were interested in examining the similarities and differences of textbook programs that are presented to educators as offering different philosophical orientations. In particular, we were interested in the features of a mainsteam, basal program—one that claims to maintain a balance between extremes in the ongoing debates about reading methodology—relative to those of phonics-oriented programs that have been advocated by policymakers as the remedies for highly challanged school districts in raising children's literacy levels.

The Text Elements by Task (TExT) model provided the theoretical framework for describing text features. Specifically, the TExT model (Hiebert, 2002) addresses the word recognition proficiencies that are required by beginning and challenged readers in order to successfully read the words in texts. With its concentration on the word recognition demands of reading tasks, the model does not purport to attend to all text features that influence the comprehensibility and readability of texts for beginning and challenged readers. For beginning and challenged readers to independently comprehend a text, however, they need to be able to recognize at least a modicum of words in that text. An overview of the TExT model's constructs of linguistic content and cognitive load as factors in word recognition is presented next, followed by a description of what is known about differences across textbook programs and components and levels within programs.

THE TExT MODEL

Currently, a handful of models is evident in the pedagogical literature for describing the difficulty of texts for beginning readers: text leveling

(Fountas & Pinnell, 1999), lexiles (Smith, Stenner, Horabin, & Smith, 1989), decodability, engagingness, predictability (Hoffman et al., 1994), and potential for accuracy (Stein, Johnson, & Gutlohn, 1999). As a review of the theoretical and empirical bases for these models shows (Hiebert, 2002), none comprehensively attends to the relationship of text to the processes and content that characterize beginning reading acquisition. The TExT model proposes two constructs that determine the ease of the word recognition task that a particular text poses for beginning and challenged readers: the linguistic content (e.g., the percentage of monosyllabic words that have simple or complex vowel patterns), and the cognitive load (e.g., the number of different or unique words within a text). A brief overview of the components of the TExT model follows; more extended descriptions of the model can be found elsewhere (Hiebert, 2002; Hiebert & Fisher, 2002).

Linguistic Content

The following two sentences, although having the same number of words, differ in the kind of linguistic content with which beginning readers must be proficient:

Example 1: I can hop, run, and dig.
Example 2: I found my old, orange tiger.

Knowledge of words where a single grapheme represents a single phoneme, as in *cat*, is sufficient to recognize almost all of the words in the first sentence. Children must recognize consistent letter–sound relationships automatically if they are to be proficient readers (Adams, 1990; National Reading Panel, 2000). Further, the phonics content with which successful beginning readers must be adept goes beyond one-to-one letter-sound correspondences. Words such as *old* and *found* in the second example illustrate the nature of the task confronting beginning readers. These two words are among the 200 most frequent words (Zeno, Ivens, Millard, & Duvvuri, 1995), and other common words share the vowel pattern of each (e.g., *told, cold; round, ground*). However the word *orange* introduces a third sound associated with the grapheme *o* in a word configuration that is infrequent.

The word *I* in both of the examples is from a second category of linguistic content with which beginning readers require facility. Zeno et al. (1995) rank *I* as the 25th most frequent word in written English. Within this group of the most frequent 25 words, half have vowel patterns that are irregular; yet these words need to be recognized quickly if children are to be successful, since this group of 25 words accounts for one-third of the

total number of words in texts (Carroll, Davies, & Richman, 1971). Since there are many irregular vowels in highly frequent words, children must develop a set for diversity in letter–sound relationships during the early stages of learning to read (Gibson & Levin, 1975).

The word *tiger* in Example 2 illustrates a third type of linguistic content —high-meaning or high-imagery words that are frequently multisyllabic. Over the past fifteen years, high-meaning, multisyllabic words have increased in number in beginning reading programs (Hiebert, in press), with many appearing a single time in a text. Highly decodable words that have an easily associated meaning appear to be recognized more readily than highly decodable words that are less meaningful (Laing & Hulme, 1999; Metsala, 1999). However, in the early stages of beginning reading when children are grappling with both high-frequency and decodable words, their ability to integrate high-meaning words into their word recognition corpora, especially words that appear a single time in a text, is unknown.

If a sentence with the words *digs, hops*, and *runs* followed the first example above, a fourth type of linguistic content would be required—recognizing known words with additional morphemes. This aspect of linguistic content typically generates less attention among reading researchers in the debate about what to teach beginning readers, but it becomes increasingly more critical as students encounter the texts of the upper primary grades, where complex morphological derivatives are many (Hiebert, 2002).

Cognitive Load

Cognitive load has to do with the amount of new linguistic information beginning readers can handle while comprehending the text's message (LaBerge & Samuels, 1974). Various assumptions were made about the rate of introducing new words by behaviorists who designed the textbooks that dominated American beginning reading instruction from the 1930s through the mid-1980s (Elson & Gray, 1930). These assumptions were tested almost exclusively with high-frequency words such as *the, then, there,* and *they* (Gates & Russell, 1938–39). High-frequency words, particularly those with irregular letter–sound relations, give children little opportunity to apply the strategic stance toward word recognition that characterizes proficient beginning reading (Share, 1995). Numerous factors likely require consideration in determining the exposure to words beginning readers require, including the size of their existing word corpus, the features of the words, and the imagery value of words (Thompson, Cottrell, & Fletcher-Flinn, 1996). Even so, there is likely an upper limit to the number of new, unique words that even rapidly progressing readers can read in a single text. In examining children's reading of words in little, predictable books, Johnston (2000) found that the highest readers remembered thirty of the

160 unique words in three texts at the end of the three-week period, the middle readers fifteen, and the lowest readers six.

Reitsma (1983) has conducted one of the only empirical examinations in which exposures to unique words were sufficiently controlled to permit conclusions about the optimal number of repetitions needed to learn a word. Even these findings need to be viewed cautiously, since the typically developing readers in this study had basic word recognition vocabularies. When exposed to a target group of words in sentences two, four, or six times, typically developing readers remembered words after four repetitions. Many factors likely influence beginning readers' learning of words, including the number of known and unknown words in a text and their phonetic and semantic properties. In a study such as this one, the cognitive load requirements can be described but cannot be evaluated relative to empirically based data on optimal features.

COMPONENTS AND LEVELS WITHIN PROGRAMS

During the fifty-year period from the 1930s to 1980s, the marketplace was dominated by a set of mainstream, basal textbook programs (Chall & Squire, 1991). Even then, alternative beginning reading programs were plentiful, including phonics-oriented programs (Cassidy, Roettger, & Wixson, 1987) and meaning-oriented programs (Martin, 1966). None of the alternative programs was a major factor in the mainstream market until the past several years, when California's standing in the 1994 National Assessment of Educational Progress state-by-state assessment (Campbell, Donahue, Reese, & Phillips, 1996) raised questions about the mainstream, basal textbook programs.

Mainstream, basal programs continue to be published, although the number has declined to a handful due to the increasing costs of publishing (Chall & Squire, 1991). As described earlier, three phonics-oriented programs have been offered nationally as alternatives for mainstream, basal textbook programs: Open Court, Reading Mastery, and Success for All. While Success for All has a set of texts for beginning readers (Slavin, Madden, Karweit, Dolan, & Wasik, 1994), the English form of this program is not offered as a commercial product separate from participation in Success for All school-wide reform. In contrast, Open Court and Reading Mastery—both published by the SRA Division of McGraw-Hill Publishers—offer comprehensive textbook programs. While Open Court is presented as having an initial phonics emphasis, literary content is also emphasized in the program. Reading Mastery has had a phonics emphasis throughout.

In light of the various mandates and claims by policymakers regarding particular textbook programs, the nature of changes in mainstream, basal,

and phonics-oriented programs and fidelity to their claimed emphases deserve attention. It was of particular interest to this study to examine changes in linguistic information and cognitive load across two dimensions: the *components* and *levels* of different programs.

Components

When Anderson, Hiebert, Scott, and Wilkinson (1985) summarized research on textbooks almost twenty years ago, first-grade portions of mainstream, basal reading programs consisted of a set of five books or readers, supplemented by numerous sets of workbooks and worksheets. While the student readers continue to be important today, the student books for grade one have been augmented by various sets of texts. These sets of texts usually take one of two forms. One group emphasizes words with particular phonetic patterns in specific books, often called *decodable books*, while the other will be described in this study as *leveled texts*. Leveled texts have been written or selected according to text-leveling criteria, such as that of Reading Recovery (Peterson, 1991) and Guided Reading (Fountas & Pinnell, 1999). These criteria include:

1. picture–text match, with illustrations moving from word identification support to an artistic or aesthetic role.
2. text structure that moves from highly to less repetitive sentences and text episodes.
3. language and literary elements that progress from oral to written language registers.
4. content, theme, and ideas that move from the highly to less familiar.

In many cases, publishers have created commercially available sets of texts that comply with one of these leveling systems. However, the levels of existing literature have been established and are reported alongside specially written leveled texts (see, e.g., Fountas & Pinnell, 1999).

These additional components of textbook programs, especially the decodable texts, have increased in importance with the Texas Education Agency's (1997) ruling that their mandate for decodable text could be satisfied in ancillary components, and the California English/Language Arts Committee's (1999) requirement that decodable books be part of acceptable textbook programs. However, the connections of these sets of books to the literature in the students books of the same programs are unclear.

The present study considered features of student texts from three textbook programs that are offered to educators as philosophically different: a program that is described as predominantly aimed at developing phonics skills and then transitions to literature (Open Court), a program

that develops phonics throughout its first-grade program (Reading Mastery), and one of the mainstream, basal textbook programs that claim balance between extremes. From each of these programs, the texts of three components were considered: the literature or student readers, decodable or phonics-oriented texts, and leveled or additional literary texts. These are described in this paper as the components of each program.

Levels within Programs

Models of reading acquisition surmise substantial changes over the first stages of reading development (Chall, 1983; Ehri, 1991; Juel, 1991) that is associated with the first grade. Historically, first-grade components of textbook programs have been presented in a progression of levels, beginning with three preprimers, moving by mid-year to a primer, and ending with the first-grade reader. Each of these levels was defined by the controlled vocabulary presented within them. While the controlled vocabulary has disappeared in the literature-based programs that appeared after the California English/Language Arts Committee's (1987) mandate for literature, most first-grade programs have continued to consist of five books, now often called literature anthologies.

Documentation that is part of the current textbook programs provides few indications of how the task of beginning reading changes or stays the same across the five levels of student books of current textbook programs. In one of the few studies of how different texts affect reading development, Juel and Roper-Schneider (1985) observed that the differences between a phonics and mainstream program lay in the three preprimers. After that point, the student texts of both programs were similar.

Hypotheses can be made about how linguistic information and cognitive load might be expected to change over first-grade texts. Beginning readers who are moving from Chall's (1983) stage of prereading (Stage 0) to initial reading or decoding (Stage 1) would not be asked to remember 160 unique words over three weeks, as Johnston (2000) found to be the case. Nor would they be reading texts that permit comprehension by relying on illustrations. While general directions such as this one can be predicted, many questions remain about the trajectories that children follow in acquiring new linguistic information from texts.

As described earlier, three philosophically different textbook programs and three components within each program were selected for this study. For each program and each component, features of texts that represented the five levels of the first-grade program were examined. When analyses showed that differences across adjacent levels were often minimal, the examination of developmental patterns in cognitive load and linguistic content was directed at the first, third, and fifth levels of the programs.

With this focus, the nature of the reading task over a program can be ascertained. In establishing the vocabulary that is repeated in a program, however, all five levels of the program were examined. The inclusion of the vocabulary in all five levels ensures that conclusions regarding word learning can be viewed with confidence that all exposures to a word in a program have been represented.

METHOD

Selection of Materials

In the categories of comprehensive textbook programs with comparable philosophies, Reading Mastery (Engelmann & Bruner, 1995) and Open Court (Adams et al., 2000) have no competitors. Five programs, however, represented the mainstream, basal textbook category, at the time this analysis was initiated: Scholastic, McGraw-Hill, Scott Foresman, Harcourt, and Houghton Mifflin. With the exception of Houghton Mifflin, all of the programs had created new copyrights for the Texas textbook cycle that began in the fall of 2000. An analysis of the literature components of these five programs showed the linguistic content and cognitive load to be consistent, except for the initial level of Houghton Mifflin (Hiebert, in press). The Harcourt Collections program (Farr et al., 2001) was selected because of its prominence in the Texas marketplace (Association of American Publishers, 2001).

Teachers' guides, catalogs, and information material on websites were consulted to establish the components of each program. Visits were also made to publishers' exhibits at the 2001 meeting of the International Reading Association. While the three programs differed in the emphasis that particular components had in the teacher's guides, each had a component that fell into the following three categories:

1. literature, either combined within a book or as separate trade books.
2. decodable texts that emphasize words with particular letter–sound correspondences in a sequence, either as individual books or within a workbook.
3. leveled books, all as individual texts.

While the publishers call these components by different names, we have chosen to refer to them with similar labels. Table 1 describes the number of texts of each component for each of five levels in the three programs. To illustrate the nature of the texts, an example of each component appears in Table 2. These illustrations clarify the definition of the term "text" in this study (that is, a text is defined as a single passage).

TABLE 1 Number of Texts within Components and Total and Unique Words per Component and Program

	Levels							
Program/Component	1	2	3	4	5	Total texts	Total words	Unique words
Harcourt								
Literature	7	6	7	9	9	38	9091	1287
Decodable	13	11	9	16	7	56	3480	870
Leveled	8	11	12	16	16	63	5744	985
Total	28	28	28	41	32	156	18315	2059*
Open Court								
Literature	18	3	5	10	19	55	14712	2234
Decodable	20	26	24	2	3	75	9592	1684
Leveled	0	0	0	8	12	20	17464	2464
Total	38	29	29	20	34	150	41771	4206
Reading Mastery								
Literature	3	4	4	3	8	22	5266	990
Decodable	28	37	30	25	35	155	27505	1250
Leveled	4	4	4	4	4	20	7299	677
Total	35	45	38	32	47	197	40700	1855

*Total unique word counts across levels and components are smaller than cumulative total unique counts of individual components since a word that appears more than one component is counted only once.

Each text type (literature, decodable, leveled) is illustrated with a text from a different program—the program where that particular component appeared more than in any other program. The example for literature came from Open Court because, as is summarized in Table 1, that program had the most literature selections—55 texts, as compared to the 38 of Harcourt and the 22 of Reading Mastery. The example for a decodable text came from Reading Mastery since, with 155 texts, this program had more decodable texts than either Open Court with 75 decodable texts or Harcourt with 56 decodable texts. The example for a leveled text came from Harcourt with 63 texts of this type, relative to the twenty leveled texts in both Open Court and Reading Mastery. The examples presented here represent the last text of the first level of that component of a program.

Coding Scheme

Levels

All of the texts for each component were divided into five levels based on the teachers' guides and publishers' descriptions. The word corpus for every text within a level of a component was included in the database. When data summaries showed that differences were not evident between

TABLE 2 Examples of Texts in Each of Three Components at the End of Level 1

Literature (Open Court)*	Decodable (Reading Mastery)†	Leveled (Harcourt)
MRS. GOOSE'S BABY One day Mrs. Goose found an egg and made a nest to put it in. She sat on the egg to keep it safe and warm. Soon the egg started to crack open. The little bird inside was pecking at the shell. Mrs. Goose's baby was very small.	a fish mād$_e$ a wish. "I wish I had fēēt. I wish I had a tā$_i$l. I wish I had a hat. I wish I had a dish."	BUTTERFLIES Butterfly orange, Butterfly blue, Butterfly white, Butterfly two, Butterfly yellow, Butterfly brown, Fly butterfly, all around.

*Mrs. Goose's Baby represents 26% of entire text; other two examples represent a complete passage.

†This text simulates the Reading Mastery orthography. In its major characteristics such as symbols over vowels and the connection between the graphemes of a consonant digraph (e.g., sh) as well as lack of capitalization at the beginning of a sentence, the example mirrors the conventions of Reading Mastery orthography.

levels of adjacent levels, three levels—those representing the beginning, middle, and final levels of the program—became the focus of the study. In addition, shared vocabulary, which includes words from all program levels, was also analyzed.

Word Features

All of the words within each level of a program component were analyzed with a HyperCard computer program (Hiebert & Martin, 2002). The HyperCard program provides data on the cognitive load features of number of total words, unique words, and repetitions of unique words. The program also provides data on the linguistic content of unique words, specifically their high-frequency ranking (Carroll et al., 1971) and the decodability of the vowel patterns.

Two of the indices of cognitive load—total number of words and number of unique or different words—are straightforward: counts of all words in the case of the former, and inclusion of each different word once in the case of the latter. The index of word density (the number of unique words relative to total words in a text) was complicated by differences in the size of texts. Consequently, we have chosen to use Chall's (1967/1983) index of unique words as a function of 100 running words of text. Another aspect of cognitive load—repetitions of individual words—was characterized using two indices: the percentage of words that were "singletons" (i.e., words that occur a single time in an instructional unit) and the percentage of words that were repeated multiple times. The criterion chosen for multiple appearances was four. Words with four repetitions across all of the levels became the core vocabulary for a component. The word corpora for all five levels was entered into the analyses to establish the core vocabulary.

The HyperCard program assesses the presence of high-frequency words according to the 100 most frequent words in written texts (Carroll et al., 1971; Zeno et al., 1995). Because many of the most frequent 100 words have irregular patterns, coding these words according to decodability levels inflates the percentage of monosyllabic words with complex vowels. Consequently, in describing linguistic content, the 100 most frequent words are presented as a separate group. All words beyond this group are assigned one of eight decodability patterns.

Patterns 1–3 comprise words with one-to-one correspondences between phonemes and graphemes (1-long vowels at end of a one-syllable word, such as *go*; 2-short vowel with single initial and final consonants, such as *cat*; and 3-short vowel with cluster of initial or final consonants, such as *spin*). Patterns 4–5 represent words with long vowels (4-long vowels with silent e, such as *ride*; 5-vowel digraphs, such as *meat*). Patterns 6–7 represent words with complex vowels (6-r-controlled vowels,

such as *car*, as well as variant vowel patterns that appear in a heavily populated family of words, such as *light*, *old*, and *all*; 7-vowel diphthongs, such as *boil*, and also variant vowels, such as *bread*). Pattern 8, the highest level of difficulty in this classification, consists of multisyllabic words.

The HyperCard program established the percentage of words with these eight decodability patterns for each level, component, and program. In presenting the data summaries, however, we have chosen to collapse data for Patterns 1–3 and for Patterns 4–7. In the case of Patterns 1–3, all share a one-to-one match between phonemes and graphemes. We will refer to words with Patterns 1–3 as monosyllabic, simple-vowel words. The decision to collapse percentages for words with Patterns 4–7 was made because the number of monosyllabic words with Patterns 4–7 that have many consistent exemplars is smaller than the number of monosyllabic words with Patterns 1–3 (Fry, 1998).

In graphically presenting summaries of the data, two aspects of the linguistic content were highlighted. The monosyllabic, simple-vowel words were chosen to represent the degree of phonics instruction at particular levels of program components. This choice was made because numerous common English words fit this pattern (Fry, 1998) and because such words maintain a high level of consistency in phoneme–grapheme relationships (Treiman, Mullennix, Bijeljac-Babic, & Richmond-Welty, 1995). Multisyllabic words were chosen as an indication of the difficulty of the words in texts.

Individual multisyllabic words may be of interest to beginning readers because of the word's configuration (Ehri, 1991) or imagery (Hargis & Gickling, 1979). However, when many multisyllabic words consume significant portions of texts and these words are not repeated frequently either within or across texts, the difficulty of a text increases for beginning readers (Hiebert & Fisher, 2002).

RESULTS

The patterns in the data are described initially for each program, followed by a comparison of the patterns across programs. These descriptions address three dimensions of text features: cognitive load, linguistic content, and shared vocabulary. The data for the descriptions of the first two dimensions—cognitive load and linguistic content—appear in Table 3. To capture developmental patterns in Table 3, data for the first, third, and fifth levels are reported. Data related to the third dimension—shared vocabulary—are presented in Table 4. The data in Table 4 represent the words from all five levels of a component and a program.

The amount of data involved in comparing three levels of three components of three programs is considerable, as is evident in the data

TABLE 3 Cognitive Load and Linguistic Features of Components of Three Textbook Programs

	Cognitive Load Features			Linguistic Content of Unique Words (%)			
Component/Level	Total words per Text	Unique words per Text	Singletons (%)	HF 100	Simple	Long/ Complex	Multi syllabic
HARCOURT							
Literature							
1	71	25	48	31	25	25	18
3	231	24	45	21	25	24	33
5	323	22	47	15	19	25	41
Decodable							
1	23	28	35	25	32	27	17
3	93	41	54	27	29	25	18
5	95	42	59	15	19	28	38
Leveled							
1	28	34	58	32	39	17	12
3	66	26	51	21	36	24	20
5	160	25	49	25	22	26	26
OPEN COURT							
Literature							
1	94	31	55	16	22	27	36
3	274	38	63	14	15	21	50
5	365	17	48	8	18	25	48
Decodable							
1	38	21	40	20	68	3	10
3	153	23	48	9	20	33	37
5	189	32	51	25	14	25	37
Leveled							
5	1010	17	50	5	16	22	58
READING MASTERY							
Literature							
1	70	37	71	27	33	21	19
3	183	36	49	23	22	23	33
5	850	25	48	14	19	22	45
Decodable							
1	7	33	44	37	54	10	0
3	213	9	23	16	23	28	33
5	318	8	28	12	22	27	39
Leveled							
1	72	24	25	37	34	27	3
3	277	18	35	31	29	26	13
5	795	15	40	20	20	27	33

TABLE 4 Core Vocabulary (words with Four or More Repetitions) across all Levels of Components

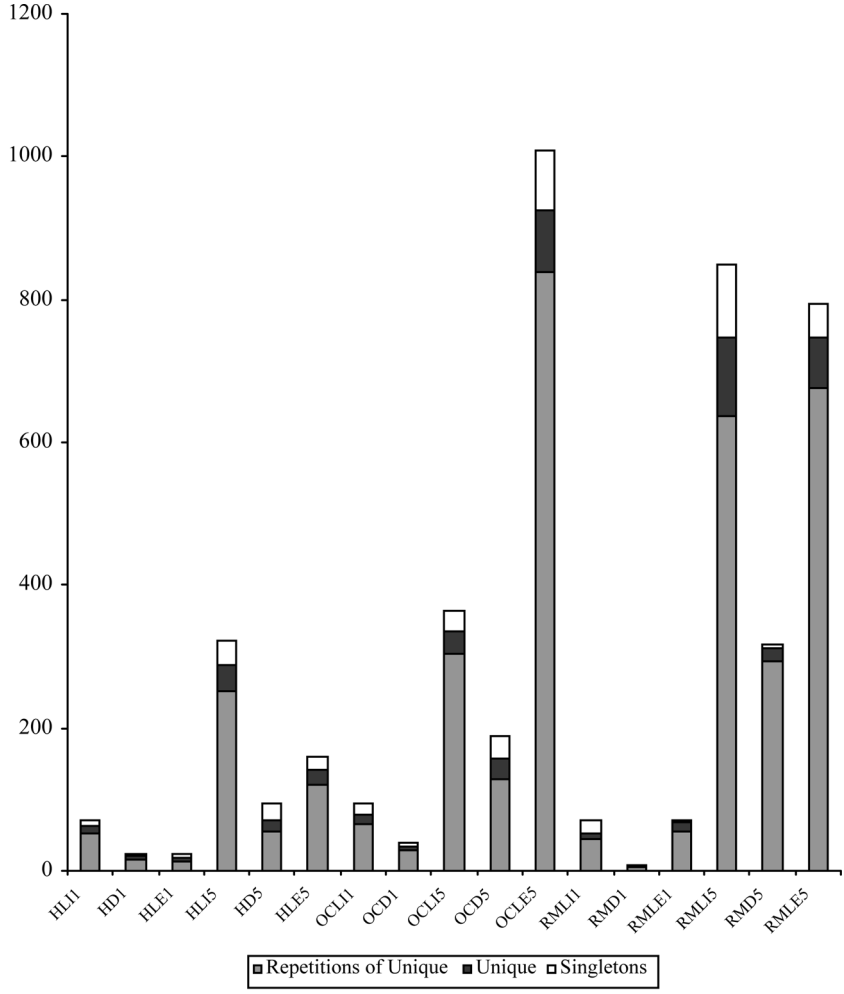
	Number of Unique Words (% of all unique words in component or program)	HF	Simple	Long/ Complex	Multisyllabic
HARCOURT					
Literature+ Decodable+Leveled	762 (37%)	13	27	27	33
Literature	442 (34%)	21	25	24	29
Decodable	213 (24%)	31	36	21	11
Leveled	324 (33%)	26	24	25	24
OPEN COURT					
Literature+Leveled+ Decodable	1472 (35%)	7	24	27	43
Literature	657 (29%)	15	21	28	36
Decodable	534 (32%)	16	33	25	26
Leveled	691 (28%)	13	18	26	43
READING MASTERY					
Literature+Leveled+ Decodable	946 (51%)	10	26	30	34
Literature	279 (28%)	29	25	20	26
Decodable	713 (57%)	13	25	31	31
Leveled	330 (49%)	25	26	30	19

summary in Table 3. To increase comprehensibility of the patterns across levels, components, and programs, portions of the data are also presented graphically in Figs. 1 (cognitive load) and 2 (linguistic content).

In Fig. 1, the height of each column represents the average number of total words per text. The percentage of the corpus that consists of unique words that are singletons is represented within the total words in white, while the percentage that represents unique words that are repeated four or more times is in black. Fig. 2 presents a scatter plot of easier linguistic content, as represented by monosyllabic, simple-vowel vowels, and harder linguistic content, as represented by multisyllabic words. Both figures provide data for Levels 1 and 5, permitting a comparison of the tasks confronting readers at the beginning and end of first grade.

Case Study of Harcourt

Even though the literature in the five student books receives the lion's share of attention in the teacher's guide of the Harcourt program, Table 1 shows that the program also provides a large number of decodable and



Note: H = Harcourt, OC=Open Court, RM=Reading Mastery
L=Literature Anthology, D=Decodable Text, L=Leveled Text
1=Level 1 of program component, 3=Level 3, 5-Level 5

FIGURE 1 Average Total Words per Text (differentiated by Unique Repeated and Unique Singleton Words) at Levels 1 and 5.

leveled texts. The decodable and leveled text components have more texts per level than does the literature component. However, the texts of the literature component are substantially longer and contain almost the same number of total words as the texts of the other two components.

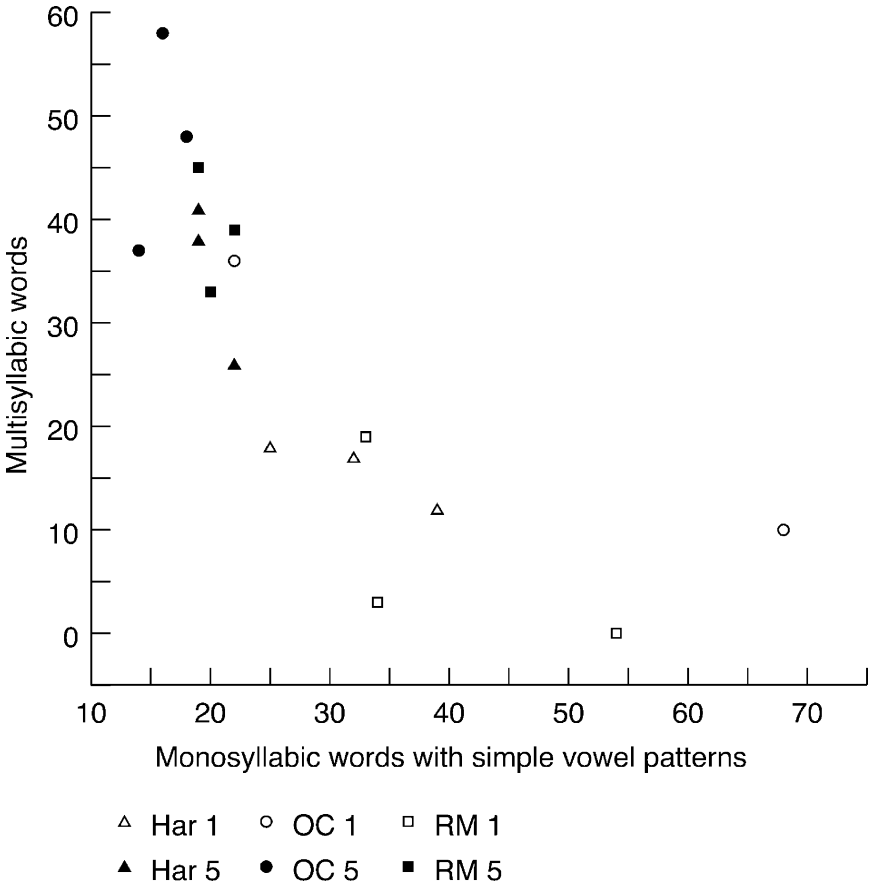


FIGURE 2 Scatter plot of Monosyllabic, Simple-Vowel Words and Multisyllabic Words for Texts of Three Components at Levels 1 and 5.

Some argue that a longer text presents more of a challenge to beginning readers than a shorter text (see, e.g., Fountas & Pinnell, 1999). However, the shorter texts of the decodable and leveled components of Harcourt present first graders with a higher ratio of unique to total words than the texts of the literature component. This is true for the first level of the leveled component and across the entire decodable component where, as can be seen in the columns in Fig. 1, the highest number on the unique word per 100 measure is reached at Level 5. The higher ratio of unique words in the shorter texts indicates few repetitions per word in the texts, raising the question of whether length alone contributes to the difficulty level of a text.

A pattern of consistency in the linguistic content of the three components of Harcourt within a particular level is evident in Fig. 2. The points in the scatter plot for the three Harcourt components at Level 1 are clustered more closely than the points representing the components of any of the other programs at one level. None of the points representing the Harcourt components at either Levels 1 or 5 in the scatter plot in Fig. 2 is at an extreme of the distribution. The components of the Harcourt program are moderate and consistent in their distributions of linguistic content relative to the components of other programs.

It is evident when studying Fig. 1, where the total height of a column represents the total words in a level of a component, that Harcourt has the fewest total words of the three programs. In light of this total, it should not be surprising that its core vocabulary—words that are repeated four times or more across the components of a program— is the smallest of any of the programs. Table 4 indicates that 762 words, or 37% of the unique words, are repeated four times or more in the Harcourt program.

In summary, the major distinction in the Harcourt first-grade program lies in the differences in the total number of words in text across levels. Level 5 texts have substantially more words than Level 1 texts, and texts of the literature component are consistently longer than those of the decodable and leveled components. But, with one exception (the increase in the number of unique words in decodable texts from Level 1 to Levels 3 and 5), patterns for the unique word per 100 measure are consistent. The linguistic content is quite similar across components within a level as well. Overall, the number of multisyllabic words increases as students move through the program, but the linguistic content is stable across components within a level. If students were to read all of the texts in all three of these components of the first-grade Harcourt reading program, they would see 37% of the words at least four or more times.

Case Study of Open Court

The literature and the decodable components receive attention for the first part of firstgrade in the teacher's guide of Open Court. The number of decodable texts changes as a function of level, as can be seen in Table 1. Each level from 1 through 3 has from 20–26 decodable texts. The number falls dramatically with Levels 4 and 5, with two texts for the former and three for the latter levels. The leveled texts, which consist of additional literature, enter into the program as the decodable texts decrease.

Differences in cognitive load demands can be seen in Fig. 1, with texts of the literature and decodable components showing a substantial increase in length from Levels 1 to 3. Cognitive load as measured by unique words per 100 and percentage of singletons differs for the literature and decodable components at Levels 1 and 3, with the figures substantially lower for the

texts of the decodable than the literature components at these levels. However, the unique word per 100 figures take a different turn in Level 5 for the literature and decodable components. As presented in Table 3 and depicted in Fig. 1, the decodable texts at Level 5 have a high unique word per 100 count (32), while the literature texts have a low unique word per 100 count (17). The leveled text component at Level 5 has characteristics similar to those of the literature texts at Level 5 in all respects except length. The leveled texts, which consist of literature or trade books such as *Ira Sleeps Over* (Waber, 1973), are considerably longer. In Open Court, the texts of the literature component frequently are specially written texts, such as *Mrs. Goose's Baby* (Voake, 1992), which appears in Table 2. The length of specially written texts can be constrained by writers and editors, while the length of already existing trade books cannot.

With respect to linguistic content, different components and levels of the Open Court program require and/or develop proficiency with different content. These differences in content can be seen in Fig. 2 where, at Level 1 of the decodable texts, the percentage of monosyllabic, simple-vowel words can be seen to the highest of any component in this study. At the same point in time, the texts in the Open Court literature component have a low percentage of monosyllabic, simple-vowel words and a high percentage of multisyllabic words. This profile in the literature component is maintained across subsequent levels, as the data in Table 3 show. The profile of the texts in the decodable component, however, changes considerably from Levels 1 to 3. At Level 3, the percentage of monosyllabic words with long/complex vowel patterns has increased substantially, while monosyllabic, simple-vowel words are fewer. The profile of linguistic content in the decodable component stays fairly consistent from Level 3 to Level 5.

Open Court has the most unique words (4,204) of any of the three programs, as well as the most total words (41,771). These figures are presented in Table 1 and can be seen visually in Fig. 1. However, as is evident in Table 4, the percentage of the unique word corpus that qualifies as core vocabulary is the lowest of any of the three programs—35%.

In summary, the Open Court program provides different experiences for students at different points in reading acquisition. At least in the first portion of the decodable component, texts are controlled in their linguistic content. By the middle of grade one, students are assumed to have gained a solid foundation in phonics. At this point, the decodable component decreases substantially in size and the amount of literature through leveled texts increases. The texts of the literature and leveled components differ from the decodable texts in linguistic content and, to a lesser degree, cognitive load.

Case Study of Reading Mastery

A set of 155 decodable texts forms the core of the Reading Mastery program. These texts are not presented as separate books but are clustered in workbooks for the first 43 texts, and in three paperback books for subsequent texts. Illustrations are infrequent in the workbooks and are presented on the page following the texts in the storybooks. A small set of leveled books—four for each level—are also part of this program. The decodable and leveled texts share the unique orthography that is evident in the example of the decodable text in Table 2. A set of literature selections is advertised as part of the program in the 2002 catalog. These literature selections come as 22 separate trade books, including classic titles such as *The Carrot Seed* (Kraus, 1945). The literature texts do not use the unique orthography that is evident in the Reading Mastery example in Table 2. All three components have separate teachers' guides.

Figure 1 shows that at Level 1, Reading Mastery texts belonging to different components are quite different in length as a function of component, with the texts of the literature and leveled components being much longer than the texts of the decodable component. However, by Level 3, the average length of the decodable texts has increased dramatically to 213 words and falls between the average lengths of literature ($M = 183$ words) and the leveled texts ($M = 277$ words). This trend changes again at Level 5, with the decodable texts being approximately half the length of the literature and leveled texts. However, the 318-word average for the Level 5 Reading Mastery decodable texts is considerably longer than those for the decodable texts belonging to the other two programs at the same level (95 words for Harcourt's decodable texts and 189 for Open Court's decodable texts).

Opportunities to see particular words repeated will vary for students across the three components. At Level 1, where the decodable texts are very short, the number of unique words per 100 is in the same range as for the texts in the literature and leveled components. After this level, however, the number of unique words per 100 falls for the decodable texts to nine in Level 3 and eight in Level 5. With respect to the linguistic content of the Reading Mastery components, the scatterplot in Fig. 2 shows that two of the Reading Mastery components at Level 1 have a high percentage of monosyllabic, simple-vowel words and a low percentage of multisyllabic words. From Table 3, it can be seen that these two components are the decodable and leveled texts. The literature in Reading Mastery at Level 1 has a moderate percentage of monosyllabic, simple-vowel words but a high percentage of multisyllabic words. As can be seen in Fig. 2, this difference in the profiles of the three components is no longer evident at Level 5. For Level 5, the points for the three components of the Reading Mastery program are clustered closely in Fig. 2.

The final feature of interest is the percentage of shared vocabulary across the components and levels of a program. When the entire corpus of the Reading Mastery program is considered (summarized in Table 4), 51% of the unique words appear four times or more. While not the largest shared vocabulary of any of the programs (Open Court has that distinction), more of the unique words across the Reading Mastery components and levels are repeated.

In conclusion, the Reading Mastery program recognizes the need for differences in linguistic content in the first level of its decodable component and in cognitive load in subsequent levels of this component. Students will have more experiences with monosyllabic, simple-vowel words in Level 1. Further, unique words are introduced at a slow pace in Levels 3 and 5 of the decodable component. The literature and leveled components are not sensitive to cognitive load to the degree of the decodable component. Indeed, the texts of the literature component at Level 1 have the highest percentage of singletons of any level of any component in the study—71%.

Comparison of the Three Programs

Each of the three programs is characterized by a distinct perspective on reading acquisition during the period represented by a first-grade reading program. The perspective of development underlying the Harcourt program is one of uniformity. While texts differ across levels in length, the features of cognitive load and linguistic content do not differ dramatically either from level to level or across components. The percentage of monosyllabic, simple-vowel words does decrease from Levels 1 to 5; however, the range is as low as 6% (across the literature component) and never higher than 17% (across the leveled component). By contrast, the range across levels of the decodable component of the Open Court and Reading Mastery programs is 54% and 32%, respectively.

The perspective of development underlying the Open Court program is one of some differentiation or scaffolding early on, but more demanding tasks by the middle of grade one. There are many decodable texts through the third level of the program. Further, this scaffolding of linguistic content at the beginning of grade one is not uniform across components. The difference in monosyllabic simple-vowel words is minimal across levels of the literature component—4%. Further, the percentage of multisyllabic words in Level 1 of the literature component is the highest of any component—36%.

Finally, the Reading Mastery program provides differentiated components across the levels of the entire program. The orthography of the texts of the decodable and leveled components is one form of differentiation. The differentiation extends to low numbers of unique words in the

texts of the decodable component at Levels 3 and 5. For the literature component and even the leveled texts that continue to use the unique orthography of the Reading Mastery program, unique word counts are not similarly low as those for the decodable texts. Indeed, the literature at Level 1 of the Reading Mastery program has the highest percentage of singletons of any program component reviewed in this study.

DISCUSSION

One answer to the question that introduced this paper, "Are there different options available to teachers?," is yes. All these programs provide literature, decodable text, and "little book" components, but the programs vary in the emphasis given to each component. The most striking difference between programs is in the emphasis given to decodable text. While the teacher's guides of Open Court and Harcourt programs emphasize the literature components, the decodable component is the centerpiece of the Reading Mastery program. The 155 texts in Reading Mastery's decodable component mean that a different text is available for almost every day of a 180-day school calendar. The corpus of Reading Mastery decodable texts has almost three times as many total words as the comparable Open Court texts and almost eight times more than the Harcourt texts. While the total volume of text provided by the full programs of Reading Mastery and Open Court is similar, decodable text accounts for two-thirds of the total text words in Reading Mastery, compared to less than a quarter in the Open Court program. In addition to differences in quantity and emphasis, the decodable component of the Reading Mastery program is unique in its cognitive load. Reading Mastery decodable texts have been constructed around a core set of words that are encountered repeatedly across texts. This core set of words is larger than in other programs.

While these comments about cognitive load and linguistic content suggest that the Reading Mastery program provides more opportunities to practice and acquire vocabulary, they need to be considered in relation to two features of the Reading Mastery program that have not been highlighted to this point. One is Reading Mastery's unique orthography, which appears in the example in Table 2. In relation to i.t.a., a previous phonetically-based orthography, the advantages were not found to outweigh the disadvantages (Bond & Dykstra, 1967). However, the Reading Mastery orthography differs from i.t.a. by retaining conventional English word spellings. More research is necessary to determine whether this orthography has any effect on beginning readers.

Another feature of the Reading Mastery program can be extracted from the example in Table 2—the potential for engagement, and cohesiveness

in the Reading Mastery decodable texts. A text in which a fish is wishing to have feet, a tail (which presumably the fish already has), a hat, and a dish may be hard for first graders to understand, especially since illustrations do not accompany the texts at this level of the program. These texts were explicitly designed to encourage children to focus on decoding by minimizing contextual aids (Engelmann & Bruner, 1995). When illustrations become part of the decodable texts, they are placed on the page following the texts in order to encourage children to make predictions based on the print, rather than using the illustrations to make predictions about the print. Many of the early stories also limit contextual cues by including nonsensical elements, such as an old man shaving a rock and a dog eating a car. Later stories are highly repetitive and may focus on adversarial relationships between people. Research is needed to determine whether these stories are engaging to children, and, more importantly, how the level of engagement of decodable texts affects student learning and motivation.

While the Reading Mastery program differs from the other two programs in its decodable component, the Open Court program differs in the emphasis given to different components over first grade. Despite the frequent association of Open Court's beginning reading program as a phonics program, the emphasis of the program is more fully on the reading of literature. The literature texts for the first 60% of the year are no longer optional in the 2000 copyright (Adams et al., 2000) as they were in previous copyrights. Decodable texts are emphasized during the beginning of the year. By mid-year, however, the main emphasis shifts almost exclusively to the reading of literature and leveled books with only a handful of decodable texts.

While the discussion thus far suggests that there are differences between programs, the real answer to the question "Are there alternatives in first-grade reading programs?," may be no when judged against other criteria. The cognitive load of almost all components in all programs is high. Only the texts of Levels 3 and 5 of the decodable texts of Reading Mastery have a low index for unique words per 100. On this feature, the Reading Mastery decodable texts are similar to the student texts of a previous era, when vocabulary was controlled. This comparability is not coincidental in that the decodable texts of Reading Mastery were originally created in the 1960s (Bereiter & Engelmann, 1966). On other features of cognitive load and linguistic content, the decodable texts of Reading Mastery are considerably more difficult than texts of comparable levels in programs of this earlier era. Specifically, singleton percentages of 23% and 28% at Levels 3 and 5 (see Table 3), respectively, in the decodable texts of Reading Mastery are higher than the 3% and 7% at comparable levels of Scott Foresman's (Robinson, Monroe, Artley, & Huck, 1962) program (Hiebert, in press; see

Table 2). Further, multisyllabic words are more frequent in Reading Mastery's decodable texts—33% and 39% at Levels 3 and 5 (Table 3), respectively, more than the 10% and 20% in the comparable levels of the 1962 Scott Foresman program (Hiebert, in press; Table 2).

Chall (1967/1983), in the landmark Learning to read: The great debate, argued that cognitive load was insufficiently challenging in mainstream, basal programs such as the Scott Foresman (1962) program. Changes in cognitive load in subsequent textbook programs reflect the response of publishers to Chall's critique. However, studies that validate Chall's claim and that document optimal rates of introducing and repeating unique words, particularly as a function of the linguistic content of words, are almost nonexistent. Johnston's (2000) analysis of word learning by first graders when faced by numerous unique words in texts (at similar levels to many of the program components reviewed in this study) indicates that even first graders who have a sizable word recognition corpus fail to remember many of these words. The texts in the classrooms that Johnston studied were much like the literature that appeared in the three programs. These three programs also do not differ substantially in the nature of literature and the connections of this literature to the word recognition curriculum. The questions of how many new unique words relative to known words beginning readers can acquire, how many repetitions of words they require, and how linguistic content influences the rate at which a word is learned are among the most pressing within reading education. If the approximately 40% of an American fourth-grade cohort who are reported to have below-basic proficiency (Campbell et al., 1996) are to leave the primary grades with sufficiently adequate reading levels, reading programs need to consider their cognitive capabilities in acquiring linguistic content.

These analyses bring to the fore questions about what constitutes an instructional program. Because of the interest in the present study in instructional programs, text characteristics have been summarized across groups of texts. For children, texts are encountered in single reading events. In single reading events, the unique word counts across the three programs examined here are high. Is it possible to design an instructionally sound program while maintaining engaging storylines or informational content? Could the principles of instructional design underlie a textbook program—a design that emphasizes generalizability of phonics knowledge and not simply of high-frequency words? We believe that it can. In another study, we have taken an existing set of leveled texts and clustered them according to a curriculum of phonics patterns and high-frequency words (Menon, 2002). At the end of fifteen weeks, significantly more students were reading at or above grade level in the classrooms using the reordered leveled texts than in those reading the

school-adopted literature texts. Furthermore, the reading of reordered, leveled texts aided both struggling and more advanced readers in their levels of word recognition.

Existing beginning reading programs leave many questions unanswered. Components appear to have been added and adjusted in response to the mandates of policymakers and perceptions of the wishes of consumers rather than on the basis of coherent theoretical perspectives on what children need to learn to become successful readers and how they acquire this information. If children are not to be left behind—especially the many children who depend on schools for their academic literacy experiences—beginning reading texts need to be revisited from the vantage point of the processes and content of successful beginning reading acquisition.

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