Teachers' Literacy-related Knowledge and Self-perceptions in relation to Preparation and Experience

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After rating their own literacy-related knowledge in three areas (knowledge about reading/reading development, phonemic awareness/ phonics, and morpheme awareness/structural analysis), graduate teacher-education students completed five tasks intended to measure their actual disciplinary knowledge in these areas. Teachers with high levels of prior background (i.e., course preparation and experience) rated themselves as significantly more knowledgeable than did low-background teachers in all areas; high-background participants also significantly outperformed low-background participants on all tasks. However, even high-background teachers scored well below ceiling on the tasks. Regression analyses indicated that teachers' self-perceptions and knowledge were positively influenced by both level of preparation and teaching experience, although the influences on teachers' knowledge differed by task. Teachers had some accurate perceptions of their

own knowledge, especially in the area of phonics. Results suggest that differentiating levels of preparation may be useful in studying teacher knowledge, and also support the notion of a substantial gap between research on reading and teacher preparation in reading.

Scientific research about early reading acquisition and reading difficulties has increased greatly in the last few decades with crucial implications for the teaching of reading (e.g., Adams, 1990; Blachman, 1997; Gough, Ehri, & Treiman, 1992; Perfetti, 1985; Stanovich, 2000). This rapid growth in scientific understanding provides numerous potential benefits for children but also increases the challenges for teacher preparation, because the knowledge base required for teaching beginning reading skills effectively, especially to at-risk or disabled children, is extensive. Although many kinds of knowledge are required for capable reading instruction—including knowledge about how to foster children's comprehension abilities, fluency, and motivation to read—the focus of this investigation is teachers' disciplinary or content knowledge for teaching early literacy and word-level reading skills.

One important area of disciplinary knowledge involves teachers' understanding of English word structure. Written English is structurally complex, with mappings at both the phoneme level (e.g., in the word *ball* the letter *b* represents the sound /b/) and morpheme level (e.g., in the words *photographic, photography,* and *photographer,* the spelling of the base word *photograph* remains the same even though its pronunciation changes). Furthermore, unlike more orthographically transparent languages such as German or Spanish, the mappings in English are often multiple and complex (e.g., the vowel *a* can represent a number of different sounds depending on its position in a word and the letters that follow it as in *hat, cake, along, star, lawn,* and so on).

It has been argued that teachers' knowledge base about English word structure is important to effective instruction in word decoding and spelling, as well as vocabulary (Moats, 1994, 2004). Lacking this kind of knowledge, teachers may misinterpret assessments, choose inappropriate examples of words for instruction, provide unintentionally confusing instruction,

or give inappropriate feedback to children's errors (McCutchen & Berninger, 1999; Moats, 1994, 2004). Knowledge about word structure is important for all educators responsible for teaching basic reading and spelling skills, but it is particularly critical for those who work with struggling or disabled readers whose difficulties with word-level reading skills are well documented (e.g., Blachman, 1997; Rack, Snowling, & Olson, 1992; Stanovich & Siegel, 1994). Tasks used to assess teachers' word-structure knowledge have included counting phonemes in words (e.g., how many sounds are in the word *ship*?); counting morphemes (e.g., how many morphemes in *unwise*?); detecting phonetically irregular words (e.g., which word is irregular: *at, boy, what, will*?); and classification of words by syllable type (e.g., which of the following is a "silent e" syllable: *tree, feet, be, time*?).

Knowledge about reading-related abilities and reading development also is essential to effective reading instruction. For instance, one of the most important and well-investigated abilities in early reading is phonological awareness, which involves children's sensitivity to sounds in spoken words, and is foundational for learning to read in an alphabetic language such as English. Teachers' capacities to develop children's phonological awareness would appear to require at least a basic understanding of what phonological awareness is, such as understanding that it involves spoken rather than written language. Knowledge about some other reading-related abilities, though not typically addressed in studies of teachers' disciplinary knowledge, is important as well. For example, research has shown that whereas beginning and poor readers may rely on context to compensate for weak word decoding skills, the hallmark of skilled reading is accurate, automatic word reading, not the use of multiple cueing systems or context to aid decoding (Adams, 1998; Stanovich, 2000). Without accurate knowledge about the role of context in reading acquisition, teachers may provide inappropriate feedback to children's errors or encourage maladaptive strategies such as guessing at words based on context rather than paying close attention to all of the letters in a word.

Research on teachers' disciplinary knowledge is an emerging literature, but some consistent conclusions are apparent. This kind of knowledge is not an automatic consequence of adult literacy (Scarborough, Ehri, Olson, & Fowler, 1998), nor can it be taken for granted, even in experienced elementary or special education teachers (Bos, Mather, Dickson, Podhajski, & Chard, 2001; Cunningham, Perry, Stanovich, & Stanovich, 2004;

McCutchen, Harry, et al., 2002; Moats, 1994, 2004). Typical difficulties of experienced teachers on word-structure tasks include problems with specifying the correct number of phonemes or morphemes in words, lack of familiarity with syllable types, and failure to recognize the irregularity of common words such as *what*. Teachers' own knowledge of word spellings seems to create confounds in their understanding of word structure (Ehri & Wilce, 1980). For example, when asked to count phonemes in words, they may attend to letters rather than sounds (e.g., counting the *x* in *ox* as a single phoneme when it actually represents two phonemes, /k/ and /s/). Thus, they may perform somewhat better on orthographically transparent words where spelling mirrors the phonemic structure of the word than on less transparent words. Teachers appear to have the same kinds of difficulties counting morphemes in words as counting phonemes, suggesting a general lack of familiarity with language structure (Moats, 1994). In addition, teachers tend to confound phonological awareness with knowledge of letter sounds or with a method of reading instruction (phonics).

More positively, instruction focused on disciplinary knowledge has been successful in improving both preservice and inservice teachers' knowledge base (Bos, Mather, Narr, & Babur, 1999; McCutchen & Berninger, 1999; Spear-Swerling & Brucker, 2003, 2004, in press). Perhaps most important, studies have documented a relationship between teachers' disciplinary knowledge and the literacy achievement of their students (McCutchen, Abbott, & Green, 2002; McCutchen & Berninger, 1999; Moats & Foorman, 2003; O'Connor, 1999), providing support for the idea that such knowledge should be included in teacher preparation. For instance, Spear-Swerling and Brucker (2004) found that novice teachers' posttest knowledge on a graphophonemic segmentation task and a task requiring recognition of irregular words, developed as part of course instruction in a teacher preparation program, predicted the growth in word decoding of youngsters the teachers were tutoring as part of field experience.

Research on teachers' disciplinary knowledge has obvious implications for teacher education and professional development in the area of literacy, but delineating the relationships among specific types of teacher knowledge, levels of teacher preparation, and teaching experience is important to interpreting this research base. Evidence relating to the influence of the latter two variables on teacher knowledge is limited. The fact that focused professional development efforts have yielded

significant improvements in teachers' literacy-related knowledge suggests that it should be possible to find positive effects of preparation on teacher knowledge, assuming that teachers have received preparation relating to the kinds of knowledge being assessed. However, Cunningham et al. (2004) found no difference in performance between fully credentialed and not fully credentialed teachers on tasks measuring knowledge about phonological awareness and phonics, although there was a difference in knowledge about children's literature. Professional development studies involving inservice (typically credentialed and experienced) teachers have usually found teachers' knowledge about phonological awareness and word structure to be quite low at pretest.

These kinds of findings are consistent with others indicating that preparation in the area of language structure may receive short shrift in teacher education (e.g., Hoffman & Roller, 2001). In addition, they may reflect the fact that most studies have assessed different levels of preparation somewhat globally such as by comparing fully credentialed versus emergency credentialed and uncredentialed teachers, or preservice versus inservice teachers. Measures of preparation that take a range of variables into account, such as amount of coursework related to reading and special training related to literacy instruction, might yield more positive relationships with teacher knowledge.

In addition to their actual disciplinary knowledge, teachers' self-perceptions about their knowledge have implications for teacher education and professional development. If accurate, these perceptions provide insight about areas where greater emphasis may be needed. Bos et al. (2001), who asked teachers how they perceived their overall level of preparedness to teach reading, found that both preservice and inservice teachers felt only "somewhat prepared" to teach struggling readers effectively, suggesting the need for greater preparation in this area. Inaccurate teacher perceptions are important as well, because teachers who already perceive themselves as knowledgeable in an area may not be receptive to opportunities for learning in that area.

Cunningham et al. (2004) measured teachers' perceived knowledge in several areas in relation to certification status and teaching experience. Amazingly, they found an inverse relationship between self-perceptions and the latter two variables in all areas; that is, less-experienced, less-credentialed teachers viewed themselves as more knowledgeable than did more experienced, fully credentialed teachers. Moreover, teachers' percep-

tions of their knowledge in the areas of phonological awareness and phonics were highly inaccurate. Cunningham et al. suggest that the ability to calibrate one's knowledge in a domain, that is, to perceive one's knowledge accurately, is fundamental to future learning and professional development.

Even with focused training, acquisition of some literacy-related knowledge such as knowledge about word structure, can take a considerable amount of time (Moats, 2004). Teachers with more extensive reading-related preparation might be expected to outperform those with less extensive preparation, even if the latter are fully credentialed teachers. In this situation, more accurate teacher perceptions might also emerge.

THE PRESENT STUDY

We assessed teachers' literacy-related disciplinary knowledge and self-perceptions in relation to their preparation and experience, using a sample of participants that included teachers with advanced graduate work in reading, as well as a measure of preparation that took several variables into account. Teachers' perceptions and knowledge in a number of areas, including both word structure and knowledge about reading development, were examined. The main study questions were these:

1. Would more prepared or experienced teachers perceive themselves as more knowledgeable than teachers with less preparation or experience?
2. Would more prepared or experienced teachers outperform less prepared or experienced teachers in actual literacy-related knowledge?
3. Would teachers' perceptions and performance vary depending on the area of knowledge?
4. How accurate would teachers' self-perceptions be?

METHOD

PARTICIPANTS

All participants (N = 132, mean age = 32.58, SD = 8.78, 11 male, 121 female) were graduate students from the School of Education at a state university in the northeastern United States. Except for four nonmatriculated students, all participants came from graduate programs in either Special Education (n = 42), Reading (n = 73), or Elementary Education (n = 13). Most participants, 119 out of 132, were credentialed teachers,

with 68 holding elementary certification, 16 holding special ed-
ucation certification, 21 dually credentialed in both elementary
and special education, and 14 credentialed in areas other than
elementary or special education (e.g., secondary biology or
mathematics). Nearly all of the remaining, noncredentialed par-
ticipants (n = 13) were in the process of obtaining initial teacher
certification in either elementary or special education, with a
few of these (n = 4) already teaching in special education set-
tings based on emergency permits. None of the participants had
completed reading certifications, although some were at ad-
vanced stages of their graduate programs. Of the 119 creden-
tialed participants, many had received their initial teacher
training and certification at other institutions, 43% out of state,
and 25% in state.

    A background questionnaire obtained information about
participants' preparation and experience for teaching reading
(see Spear-Swerling & Brucker, 2003, for additional details).
Participants' responses regarding preparation were coded as
follows: they received 1 point for each certification relevant to
teaching basic reading skills such as elementary or special edu-
cation certification, 1 point for each course relevant to teaching
reading (including courses from different programs as well as
courses taken at other institutions), 1 point for each speech/
language or linguistics course, and 1 point for each special
training program in literacy (e.g., Reading Recovery, Orton-
Gillingham, or Wilson training). Participants also were asked
how many years of experience they had teaching basic reading
skills specifically (not just teaching experience in general).
Participants' mean preparation score was 4.00 (SD = 2.32), usu-
ally representing teacher certification plus two or three courses
relevant to teaching reading. Mean years of experience teaching
reading was 3.34 (SD = 3.64). However, the range for both
preparation scores (0 to 13) and years of experience (0 to 22)
was considerable.

MATERIALS AND PROCEDURE

    Ratings of Perceived Knowledge.   After completing the
background questionnaire, participants were asked to rate
themselves using a 5-point scale in the following three areas:
general knowledge about reading and reading development
(perceived GK); phonemic awareness and phonics knowledge
(perceived PK); and morpheme awareness and structural analy-
sis knowledge (perceived MK). The rating scale specified 1 as
"not at all knowledgeable," 3 as "somewhat knowledgeable,"

and 5 as "highly knowledgeable." Cronbach's Alpha for the self-ratings was .84.

   Five Knowledge Tasks.   Participants then completed five tasks intended to measure their actual knowledge base related to the previous areas: a general knowledge measure involving open-ended questions about reading and reading development related to perceived GK; a task requiring specification of the number of morphemes in words, modeled after similar tasks and items in Moats (2000), related to perceived MK; a grapho-phonemic segmentation measure modeled after the one used by Scarborough et al. (1998); a task requiring classification of pseu-dowords by syllable type; and a measure requiring identifica-tion of the phonetically irregular words in a set of common words. The last three tasks all were intended to relate to per-ceived phonemic awareness and phonics knowledge. Also, the last three tasks have been used in previous research (Spear-Swerling & Brucker, 2003, 2004, in press), whereas the first two are new to the literature.

   These particular measures were chosen because we believed they tapped a kind of knowledge—though certainly not the only knowledge—important to teachers of reading. For exam-ple, teachers need general knowledge about the abilities under-lying reading to understand why children may have problems in learning to read and which children require the most urgent attention. An understanding of the phonemic and morphemic structure of words is important for teaching word decoding, vo-cabulary, and spelling. Knowledge about syllable types is useful for predicting vowel sounds, which are highly variable in English. Recognition of irregularities in words is important be-cause without this knowledge, teachers may give inappropriate feedback to children's errors or may select inappropriate exam-ples of words for phonics activities.

   All tasks except the general knowledge measure had alter-nate forms. An early version of the general knowledge measure that involved a true-false format and alternate forms was dis-carded due to unacceptably low reliability. Alternate forms and open-ended questions were employed because they potentially could be useful in pre- and posttesting such as before and after teaching specific course content.

   Testing was group-administered in graduate classes in the School of Education in two separate sessions, one to two weeks apart. The first test session took approximately one hour and the second approximately one-half hour. In the first session, participants completed the background questionnaire, the self-

perception ratings, the general knowledge measure, and one form (*a* or *b*) of the other four tasks. In the second session, participants completed the second alternate form of the four tasks. Administration of alternate forms was counterbalanced across participants, with about half of the participants receiving first form *a*, then form *b*, and the other half receiving the forms in the reverse order. For subsequent analyses, participants' z-scores on alternate forms were averaged. Directions and items for the two previously unpublished teacher knowledge tasks are in the Appendix; directions and items for the other three tasks can be found in Spear-Swerling and Brucker (2003).

General Knowledge (GK) Task. This task consisted of five questions focused on phonemic awareness, reading fluency, the nature of the English writing system, risk indicators for reading difficulties in kindergartners, and the role of context cues in reading. Participants were asked specifically about phonemic awareness rather than the related but broader construct of phonological awareness because the investigators thought they would be more familiar with the former term than the latter one. Responses were scored by two separate scorers using written guidelines that provided point values for specific answers (see Appendix). Interscorer reliability for the total score on the general knowledge measure was .96, with reliabilities for individual questions ranging from .88 to .98. For subsequent analyses, participants' z-scores from each scorer were averaged.

Morpheme Counting (MC) Task. On this task, participants were given a list of real words, including both one-syllable and multisyllabic words, and were asked to indicate the number of morphemes for each word as well as to show which letters represented which morpheme. For instance, for the word *millisecond*, participants were expected to specify two morphemes and to underline *milli* and *second*. The maximum possible score for each form of the morpheme counting task was 12, with one point for each item with the number of morphemes correctly specified; the segmentations were used to elucidate errors rather than in assigning point values. The alternate-form reliability of this task was .56 and the mean Cronbach's Alpha reliability across forms was .64. (Alpha reliabilities for individual forms for all tasks were comparable.)

Graphophonemic Segmentation (GPS) Task. This measure was analogous to the morpheme counting task except that participants were asked to specify phonemes rather than morphemes in words. For example, for the word *sea*, participants were expected to specify two phonemes and to segment the

word by underlining *s* and either *e* or *ea*. There were 16 items for each form of the task, which was scored analogously to the MC task. The alternate-form reliability was .70 and the mean alpha reliability was .77.

Syllable-types (ST) Task.   Participants were asked to indicate the syllable type of pseudowords such as *knoof* (vowel team), *ack* (closed), and *bru* (open). All items were single syllables that could be unambiguously classified by syllable type with a total of 14 items per form. The participant's score was the number of items correctly classified. The alternate-form reliability was .72 and the mean alpha reliability was .88.

Irregular-words (IW) Task.   This task involved a set of 40 common words for each form (e.g., *saw, what, of, fix, lose, under*) that participants had to classify as phonetically regular or irregular. Irregular words came from lists of exception words (e.g., Fischer, 1993; Moats, 2000) used in teaching phonics and were described as words that violate typical letter-sound patterns in English. For instance, participants were expected to classify *what, of,* and *lose* as irregular because these words have irregular vowel sounds, and also, in the word *of,* the letter *f* takes the atypical sound /v/. The participant's score was the number of irregular words correctly circled minus the number of regular words incorrectly circled, with 20 the highest possible score on each form. The alternate-form reliability was .67 and the mean alpha reliability was .78.

RESULTS

TEACHER BACKGROUND GROUPS

Attempts to separate participants into groups based on differing levels of preparation and experience (e.g., high preparation/ low experience versus low preparation/high experience) yielded numerous problems such as very imbalanced cell sizes and some cells with very small n. Therefore, teacher background was based on a composite of both preparation and experience, using an average of participants' z-scores for both variables.

Participants with a background z-score $\geq$ .5 comprised the high-background group (n = 34, mean age = 34.47, SD = 8.55). Participants in this group had a mean preparation score of 6.62 (SD = 2.07) and an average of 7.48 (SD = 4.20) years of experience teaching reading. They were all credentialed elementary or special-education teachers, with about a third dually credentialed

in both areas. Most had considerable graduate-level coursework relevant to reading (generally three or four graduate courses, sometimes more), as well as one or two reading-related courses taken at the preservice level.

Participants in the medium-background group (n = 56, mean age = 30.54, SD = 7.15) had background z-scores between -.5 and .5, a mean preparation score of 4.09 (SD = 1.16), and an average of 3.02 (SD = 1.86) years of teaching experience. Most medium-background participants were fully credentialed elementary or special-education teachers at earlier levels of graduate training and with less teaching experience than the high-background group.

The low-background group (n = 42, mean age = 33.76, SD = 10.44) had z-scores ≤ -.5, a mean preparation score of 1.76 (SD = 1.03), and less than a year of experience teaching reading on average (mean = .41, SD = .59). About half of these participants were in the process of obtaining initial teacher certification or were credentialed in areas that do not involve teaching basic reading skills (e.g., secondary mathematics, biology, or home economics); the other half were credentialed elementary or special education teachers, most not yet employed or in their first year of teaching. This group had either minimal or no coursework and teaching experience involving reading. Table I summarizes the characteristics of all three background groups. A one-way ANOVA confirmed that the three groups did differ significantly both in preparation to teach reading, $F(2, 129)$ = 110.011, p < .001, and in years of experience, $F(2, 129)$ = 77.861, p < .001, with Tamhane post hoc tests showing p < .001 for all group comparisons.

PERCEIVED KNOWLEDGE BY BACKGROUND GROUP

Table II displays participants' mean self-ratings by background group for the three areas of general knowledge about reading and reading development (perceived GK), phonemic awareness and phonics knowledge (perceived PK), and morpheme awareness and structural analysis knowledge (perceived MK). The means consistently showed high-background participants > medium-background participants > low-background participants. All three groups rated themselves lowest for perceived MK.

A multivariate analysis of variance on these data, with background group entered as a fixed factor and the three self-ratings as dependent variables, yielded significant multivariate differences, Wilks' Lambda = .685, $F(2, 129)$ = 8.825, p < .001. Between-subjects effects were significant at the .001 level for all

Table I. Characteristics of Teacher Background Groups

Characteristic	Low-background Group (n = 42)		Medium-background Group (n = 56)		High-background Group (n = 34)	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Age	33.76	(10.44)	30.54	(7.15)	34.47	(8.55)
Preparation Score	1.76	(1.03)	4.09	(1.16)	6.62	(2. 07)
Years of Experience	.41	(.59)	3.02	(1.86)	7.48	(4.20)
	Number and Percentage of Group		Number and Percentage of Group		Number and Percentage of Group	
Certification Status						
Not credentialed	11 (26%)		2 (3%)		0 (0%)	
Other credentialed	11 (26%)		3 (5%)		0 (0%)	
Elementary education	11 (26%)		35 (63%)		22 (65%)	
Special Education	8 (19%)		7 (13%)		1 (3%)	
Dual	1 (3%)		9 (16%)		11 (32%)	

Note. "Other credentialed" means teachers credentialed in an area not covering the teaching of basic reading skills (e.g., secondary mathematics); "dual" means dual elementary and special education certification.

three rating areas. Tamhane and Bonferroni post hoc comparisons showed that for perceived general knowledge about reading and reading development, low-background participants rated themselves significantly lower than each of the other two groups ($p < .001$ in each case), but the differences between high- and medium-background groups did not quite attain significance ($p = .07$). For the other two areas, perceived phonemic awareness and phonics and perceived morphemic awareness and structural analysis, all group comparisons were statistically significant.

PERFORMANCE ON THE FIVE KNOWLEDGE TASKS BY BACKGROUND GROUP

Table III shows the scores of the background groups on the five knowledge tasks, with scores expressed as proportions correct of the maximum possible score for each task. Once again, the means were consistently highest for high-background participants and lowest for low-background participants. In all background groups, participants performed best on the

Table II. Teachers' Perceived Knowledge by Background Group

	Rating Area					
	General Knowledge about Reading & Reading Deveopment (Perceived GK)		Phonemic Awareness & Phonics (Perceived PK)		Morphemic Awareness & Structural Analysis (Perceived MK)	
Prior Background Group	Mean	(SD)	Mean	(SD)	Mean	(SD)
Low (n = 42)	2.976	(.781)	2.857	(.952)	2.048	(.882)
Medium (n = 56)	3.625	(.728)	3.321	(.788)	2.768	(.991)
High (n = 34)	3.912	(.452)	3.912	(.712)	3.235	(.606)

Note. Means are average ratings on a 5-point scale, where 1 = not at all knowledgeable, 3 = somewhat knowledgeable, and 5 = highly knowledgeable.

graphophonemic segmentation task and were more successful at specifying phonemes than morphemes in words; their lowest scores were on the general knowledge about reading and reading development task.

A multivariate analysis of variance, with background group again as the fixed factor but scores on the five knowledge tasks as the dependent variables, showed significant multivariate differences, Wilks' Lambda = .807, $F(2,129) = 2.835$, $p < .01$. Tests of between-subjects effects were significant for all five tasks, $p < .001$ for the syllable types and irregular words tasks, $p < .01$ for the general knowledge about reading and reading development and graphophonemic segmentation tasks, and $p < .05$ for the morpheme counting task. Bonferroni and Tamhane post-hoc tests indicated that the high-background group significantly outperformed the low-background group on all tasks; also, the medium-background group significantly outperformed the low-background group on the general knowledge about reading and reading development task, and the high-background group significantly outperformed the medium-background group on the syllable types and irregular words tasks.

RELATIONSHIPS AMONG PREPARATION, EXPERIENCE, SELF-PERCEPTIONS, AND KNOWLEDGE

Table IV displays the zero-order correlations among teachers' preparation, experience, perceptions of their own knowledge in

Table III. Teachers' Performance on Knowledge Tasks by Background Group

Prior Background Group	Task									
	General Knowledge (GK)		Grapho-phonemic Seg. (GPS)		Syllable Types (ST)		Irregular Words (IW)		Morpheme Counting (MC)	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Low (n = 42)	.279	(.163)	.645	(.198)	.435	(.290)	.402	(.197)	.407	(.148)
Medium (n = 56)	.365	(.173)	.684	(.162)	.561	(.221)	.456	(.177)	.449	(.156)
High (n = 34)	.423	(.166)	.773	(.161)	.681	(.216)	.579	(.206)	.499	(.152)

Note. Means are proportions correct of the maximum possible score for each task, averaged across scorers for the GK task and across alternate forms for the other tasks.

General Knowledge (GK) = general knowledge about reading and reading development

Table IV. Zero-order Correlations among Preparation, Experience, Perceived Knowledge, and Performance on the Five Knowledge Tasks

	2. Exp	3. Perceived GK	4. Perceived PK	5. Perceived MK	6. GK Score	7. MC Score	8. GPS Score	9. ST Score	10. IW Score
1. Preparation	.639***	.447***	.417***	.444***	.372***	.261**	.219*	.341***	.253**
2. Experience		.490***	.481***	.458***	.308***	.114	.176*	.315***	.318***
3. Perceived GK			.707***	.569***	.135	.116	.079	.203*	.081
4. Perceived PK				.630***	.219*	.174*	.210*	.299***	.236**
5. Perceived MK					.174*	.171	.104	.304***	.134
6. General Knowledge (GK) Score						.330***	.325***	.428***	.380***
7. Morpheme Counting (MC) Score							.204*	.382***	.263**
8. Grapho-phonemic Segmentation (GPS) Score								.365***	.488***

(continued)

Table IV. Zero-order Correlations among Preparation, Experience, Perceived Knowledge, and Performance on the Five Knowledge Tasks (continued)

	2. Exp	3. Perceived GK	4. Perceived PK	5. Perceived MK	6. GK Score	7. MC Score	8. GPS Score	9. ST Score	10. IW Score
9. Syllable Types (ST) Score									.546***
10. Irregular Words (IW) Score									

Note. Perceived GK = perceived general knowledge about reading and reading development; perceived PK = perceived knowledge about phonemic awareness and phonics; perceived MK = perceived knowledge about morphemic awareness and structural analysis.

* $p < .05$, ** $p < .01$, *** $p < .001$

the three rating areas, and scores on the five tasks intended to measure their actual knowledge in these areas. Not only did preparation and experience correlate substantially ($r = .639$, $p < .001$), but both variables related significantly to all of teachers' self-ratings as well as to their performance on almost all of the knowledge tasks. The one exception was the correlation between experience and performance on the morpheme counting task, which was not significant.

RELATIONSHIPS BETWEEN PERCEIVED AND ACTUAL KNOWLEDGE

Relationships between teachers' perceived and actual knowledge are shown by the following correlations: perceived general knowledge about reading and reading development (GK) with GK score ($r = .14$, ns); perceived phonemic awareness and phonics with scores on the graphophonemic segmentation task ($r = .21$, $p < .05$), the syllable types task ($r = .30$, $p < .001$), and the irregular words task ($r = .24$, $p < .01$); and perceived morphemic awareness and structural analysis with morpheme counting scores ($r = .17$, $p = .05$). Thus, the only significant relationships involved teachers' perceived knowledge of phonemic awareness and phonics, although the area of morphemic awareness approached significance.

An additional analysis separated participants into two groups based on their perceived phonemic awareness and phonics knowledge. The high-rating group ($n = 55$) gave themselves a rating of 4 or 5 in the area of phonemic awareness and phonics, whereas the low-rating group ($n = 20$) gave themselves a 1 or 2; participants who gave themselves a rating of 3 were eliminated from this analysis. The high-rating group significantly outperformed the low-rating group on the syllable types task (high-rating mean = .633, $SD = .240$, low-rating mean = .411, $SD = .257$, $t = -3.472$, $df = 73$, $p < .01$) and irregular words task (high-rating mean = .532, $SD = .195$, low-rating mean = .434, $SD = .169$, t = -2.017, $df = 73$, $p < .05$); differences on the graphophonemic segmentation task were not significant, although the means were in the expected direction. Analyses using self-ratings in the other two areas did not yield any significant differences.

INFLUENCES OF PREPARATION AND EXPERIENCE ON PERCEIVED KNOWLEDGE

Standard multiple regression analyses explored the relative influences of preparation and experience in participants' perceived knowledge (see top portion of table V). Three separate

Table V. Results of Regression Analyses Using Preparation and Experience to Predict Teachers' Self-ratings and Performance on Knowledge Tasks

Dependent Variables	Total ΔR^2	Preparation				Experience			
		Beta	SEB	β	t	Beta	SEB	β	t
Self-ratings									
Perceived GK	.220***	.077	.034	.230	2.248*	.061	.022	.286	2.799**
Perceived PK	.226***	.097	.040	.246	2.414*	.069	.025	.277	2.724**
Perceived MK	.193***	.143	.044	.338	3.247**	.037	.028	.138	1.325
Knowledge Task Performance									
GK Task	.190***	.154	.045	.356	3.420**	.030	.029	.110	1.052
GPS Task	.058*	.028	.045	.070	.621	.048	.028	.189	1.685
ST Task	.135***	.102	.043	.256	2.373*	.037	.027	.145	1.349
IW Task	.117***	.029	.043	.073	.673	.073	.027	.289	2.661**
MC Task	.067*	.115	.043	.300	2.686**	-.018	.027	-.074	-.665

Note. GK = general knowledge about reading and reading development; PK = phonemic awareness and phonics knowledge; MK = morpheme awareness and structural analysis knowledge; GPS = graphophonemic segmentation; ST = syllable types; IW = irregular words; MC = morpheme counting.

$*p < .05$ $**p < .01$ $***p < .001$

regressions were done with each rating area as the dependent variable, and preparation score and years of teaching experience entered together as the predictors. For perceived general knowledge about reading and reading development, adjusted R^2 = .208, ΔR^2 = .220, $F(2, 129)$ = 18.199, p < .001. The beta weights for both preparation and experience were significant; for preparation, β = .230, t = 2.248, p < .05, and for experience, β= .286, t = 2.799, p < .01. For perceived PK, adjusted R^2 = .214, ΔR^2 = .226, $F(2, 129)$ = 18.832, p < .001; again, the beta weights for both predictor variables were significant (preparation β = .246, t = 2.414, p < .05, and experience β = .277, t = 2.724, p < .01). For the third rating area, perceived morphemic awareness and structural analysis, adjusted R^2 = .181, ΔR^2 = .193, $F(2, 129)$ = 15.455, p < .001; here only the beta weight for preparation was significant, β = .338, t = 3.247, p < .01. Variance inflation factors and condition numbers were all substantially less than 10, indicating that collinearity was not appreciably present (Fox, 1997).

INFLUENCES OF PREPARATION AND EXPERIENCE ON ACTUAL KNOWLEDGE

Another set of standard multiple regression analyses was used to examine the relative influences of preparation and experience in participants' actual performance on each task (see table V, which summarizes both sets of analyses). Five separate regressions were done with each task as the dependent variable, and preparation score and years of teaching experience again entered together as the predictor variables. ΔR^2 values were significant for all tasks, with the lowest value for the graphophonemic segmentation task, adjusted R^2 = .043, ΔR^2 = .058, $F(2, 129)$ = 3.962, p < .05, and the highest for the general knowledge about reading and reading development (GK) task, adjusted R^2 = .177, ΔR^2 = .190, $F(2, 129)$ = 15.104, p < .001. An examination of the standardized beta weights for each regression indicated that for three tasks, only the beta for preparation was significant: for the GK task (β = .356, t = 3.420, p < .01), the syllable types task (β = .256, t = 2.373, p < .05), and the morpheme counting task (β = .300, t = 2.686, p < .01). None of the beta weights for experience approached significance for these three tasks. However, on the IW task, the opposite pattern occurred: only the beta for experience was significant (β = .289, t = 2.661, p < .01). Finally, for the graphophonemic segmentation task, neither beta weight reached significance, although the one for experience approached it (β = .189, t = 1.685, p = .09). Variance inflation factors and condition numbers again indi-

cated no appreciable collinearity. Furthermore, for both sets of regression analyses, stepwise and hierarchical methods of regression yielded patterns of significance similar to those shown in table V.

ERROR PATTERNS ON THE KNOWLEDGE TASKS

On the GK measure, the maximum score of three was obtained by some participants on every question, although no participant obtained the maximum of fifteen points for the entire task. Overall, participants' lowest scores were on the third question, about the nature of the English writing system (mean = .557, SD = .781), where few participants could explain or give accurate examples of both "phonemes" and "morphemes," and on the first question, about phonemic awareness (mean = .742, SD = .753), where the most common error was that participants confounded phonemic awareness with knowledge of letter sounds or understanding of the alphabetic principle. The most variability in scores occurred on question six, about the role of context cues in skilled reading (mean = .942, SD = 1.208), where participants often appeared confused about the role of context in decoding words versus comprehension or mentioned multiple cueing systems models of reading. Participants' highest scores were on question two, about reading fluency (mean = 1.462, SD = .708), and question five, about risk indicators in kindergartners (mean = 1.567, SD = .947). Many teachers, especially those in the high-background group, did understand the importance of fluency to comprehension and risk indicators such as oral language difficulties or poor knowledge of letters.

On the tasks involving alternate forms, error patterns were very consistent across forms. On the morpheme counting task, participants made the most errors on words involving an irregular past verb tense (e.g., *lost, felt*) or spelling changes (e.g., *curliest, funnier, disinclined*). They were more likely to specify too few morphemes than too many; for example, for a word like *disinclined*, a typical error involved specifying two morphemes, *dis* and *inclined*, instead of four morphemes (*dis, in, clin(e), ed*). Participants more often counted morphemes correctly in relatively transparent words such as *millisecond*.

On the graphophonemic segmentation task, analogous to their performance on the morpheme counting task, participants often counted phonemes correctly in transparent words such as *fold* or those with common vowel patterns such as *sea* and *hay*. They made the most errors on less transparent words such as *mix* and words containing a schwa vowel such as *vandal*; schwa

vowels were frequently omitted as phonemes. On the ST task, participants were most likely to classify correctly silent e words (e.g., *chupe, ake*) or consonant-le words (e.g., *gle*), but they often made errors on words with vowel patterns involving *w* (e.g., *grewn, blawn*) or *r* (e.g., *keer, moar*). On the irregular words task, participants were more likely to overlook an irregular word, especially one with a single irregular vowel (e.g., *pretty, shall, bush, people*), than to incorrectly classify a phonetically regular word as irregular; transparent regular words (*end, kidnap, until*) usually were correctly classified as regular. Error patterns on these last three tasks were comparable to those observed in previous studies where the same tasks were used (Spear-Swerling & Brucker, 2003, 2004, in press), as well as to those obtained by other investigators on like tasks (e.g., Cunningham et al., 2004; Scarborough et al., 1998).

Error patterns across groups were similar, but the patterns did suggest that high-background teachers had achieved a generally deeper understanding of English word structure as compared to low-background teachers. For example, some of the largest differences in performance between high- and low-background groups (all favoring the former) included, on the graphophonemic segmentation task, less transparent items such as *mix, eight*, and *dough*; on the syllable types task, words with vowel r patterns such as *nurp, keer*, and *blarn*; and on the irregular words task, correctly recognizing as regular words with common orthographic patterns such as *food, nation*, and *pavement*. This pattern was less evident on the morpheme counting task where both groups had very high error rates on less transparent items like *lost, felt*, and *funnier*.

DISCUSSION

This study examined teachers' self-perceptions and disciplinary knowledge for teaching reading in relation to teacher background. The results demonstrated that high-background teachers—those with relatively high levels of reading-related preparation and experience—perceived themselves as more knowledgeable in all three rating areas than did low-background participants. Participants' self-perceptions were positively influenced by their level of preparation in all three areas, and by their experience in two out of three areas: general knowledge about reading/reading development (perceived GK) and knowledge about phonemic awareness/phonics (perceived PK).

High-background teachers also outperformed those with low background on all five knowledge tasks, and again, preparation and experience both emerged as important variables in the regression analyses. However, the relative influences of preparation and experience differed by task; for the general knowledge, syllable types, and morpheme counting tasks, only preparation was significant, whereas for the irregular words task, and perhaps also the graphophonemic segmentation task, only experience was significant. The reasons behind these differing influences must be speculative, but perhaps for these participants, the knowledge tapped by the former three tasks was more often addressed in their coursework than was the knowledge tapped by the latter two tasks. With limited or no formal preparation in a specific area, experience might become the primary avenue for acquiring knowledge in that area, to the extent that the knowledge is acquired at all. Some specific types of experiences might have enhanced teacher knowledge; for example, teaching experience with programs that include lists of exception or irregular words might have influenced participants' performance on the irregular words task.

Teachers' perceptions and performance varied by area with some consistent patterns across groups. All background groups were lowest in perceived morphemic awareness and structural analysis, and all groups had more difficulty counting morphemes than phonemes in words, consistent with the idea of a general lack of knowledge about language structure (Moats, 1994), not only lack of knowledge about phonology. Error analyses of specific items revealed some additional patterns within tasks. Participants understood the concept of reading fluency and its importance in reading development better than the concept of phonemic awareness. They could name risk factors for early reading difficulties more often than they could explain the morphophonemic structure of written English. The transparency of words seemed to influence participants' performance on both the graphophonemic segmentation and morpheme counting tasks, with better performance on more transparent items. Likewise, on the irregular words task, participants usually classified transparent regular words correctly. These patterns support the idea that teachers' own reading and spelling abilities, such as their automatic word recognition and their knowledge of specific word spellings, create confusions for them in acquiring disciplinary knowledge about word structure (e.g., Ehri & Wilce, 1980; Moats, 1994; Scarborough et al., 1998). Comparisons of error patterns between high- and low-

background teachers suggested that the former had deepened their understanding of word structure, especially with regard to phonology and common orthographic patterns.

Results for the accuracy of teachers' self-perceptions were mixed. On the one hand, participants did display some accurate perceptions of their own knowledge. High-background teachers thought they knew more in all three rating areas than did low-background teachers; and in fact, they did outperform low-background participants on all of the knowledge tasks. Also, participants' perceived phonemic awareness and phonics knowledge correlated significantly with their performance on the graphophonemic segmentation, syllable types, and irregular words tasks, and participants who rated themselves toward the "highly knowledgeable" end of the rating scale outperformed those who rated themselves toward the "not at all knowledge-able" end on the latter two tasks.

On the other hand, participants' self-ratings in two areas—perceived general knowledge about reading and reading development, and perceived morphemic awareness and structural analysis—did not correlate significantly with their actual performance in these areas, though the latter area approached significance. Furthermore, although participants' self-ratings did correlate significantly with their performance in the area of phonemic awareness/phonics, error analysis of the general knowledge measure revealed that many of them did not really understand the concept of phonemic awareness. Thus, the accuracy of participants' perceptions in the last area appears to relate more specifically to phonics than to phonemic awareness.

These results differ from those of Cunningham et al. (2004) in presenting a slightly more optimistic view of the accuracy of teachers' self-perceptions and the relationship of preparation and experience to teachers' disciplinary knowledge. In part, these disparities may relate to sample differences; the present sample involved relatively young teachers in the process of obtaining graduate degrees, whereas that of Cunningham et al. consisted of generally older teachers participating in a series of professional development institutes. Participants who are still in graduate school may have somewhat more accurate perceptions of their own knowledge and of gaps in that knowledge. There may also have been differences in the socioeconomic (SES) levels of the districts in which participants taught, with more participants in the present study coming from middle or upper SES districts. Furthermore, in Cunningham et al., preparation was assessed based on whether or not participants held a

full teaching credential, whereas in the present study, additional variables were used in determining preparation. The present participants may have had somewhat higher levels of preparation than did those in Cunningham et al., particularly in the high-background group.

Despite outperforming low-background participants, overall, the high-background teachers scored well below ceiling on the five knowledge tasks. These educators were often specialists teaching the most seriously impaired readers in a school or helping other teachers teach reading effectively, and their performance on the knowledge tasks raises some questions about how prepared they were to fulfill these roles.

LIMITATIONS

A number of important limitations of the study must be acknowledged. The five knowledge tasks represent only a small fraction of the knowledge important to teaching reading effectively, and the reliability of the morpheme counting measure in particular was only marginally adequate. Different ways of measuring teacher knowledge—for example, testing recognition of a correct definition as opposed to requiring the production of a definition—could yield some different outcomes. Moreover, teachers can be knowledgeable but still fail to apply their knowledge successfully in working with children: for example, due to difficulties with organization, choosing appropriate and engaging instructional activities, or behavior management. However, especially for teachers of reading in the primary grades and those working with struggling and disabled readers, the knowledge tapped by the study measures seems necessary, though not sufficient, for capable reading instruction. For example, it is hard to imagine that teachers can teach phonemic awareness effectively if they do not understand what phonemic awareness is or they cannot segment phonemes in simple words such as *mix*.

The preparation score did not tap the nature or quality of preparation such as how much specific content participants had received related to word structure or to research-based instruction. Relatively few of the participants had received focused, extensive code-based preparation such as that typical of Orton-Gillingham or Wilson training. Participants with such training might well have performed at higher levels on many of the knowledge measures. Also, the low-background group had relatively large variability in teaching experience as shown by the larger standard deviation than mean in table I.

Finally, although these participants had obtained their certifications and initial teacher training at a variety of institutions, and although they came from three different programs, they were all attending the same graduate School of Education. Teachers from other graduate schools certainly might show different patterns of performance than did these participants. However, given the general similarities of these participants' performance on the knowledge measures to those found in many previous investigations, the present participants do not appear atypical relative to other teachers.

IMPLICATIONS

These findings are very consistent with others reviewed in the introduction demonstrating that educators responsible for reading instruction with beginning or struggling readers may lack literacy-related disciplinary knowledge, especially if they are teachers with limited course preparation and experience. In the present study, nearly half of the low-background teachers were fully credentialed to teach in areas that cover basic reading, and some of them were already responsible for doing so, in some cases, in very challenging settings such as in high-poverty urban districts or with severely impaired readers in special education. These teachers were not necessarily destined for additional reading-related preparation, at least in terms of their graduate programs, because many of them were specializing in areas other than reading. Thus, the results confirm the viewpoint that teachers need more intensive preservice preparation related to reading as well as ongoing professional development (International Reading Association, 2003; National Reading Panel, 2000; National Research Council, 1998). The study extends previous findings about teachers' literacy-related disciplinary knowledge to a new domain—knowledge about reading and reading development—and it supports the need for continued investigations of teacher knowledge and self-perceptions with attention to sample characteristics and differentiation of variables such as levels of preparation.

The results of the study indicate that teachers' preparation and experience can make a difference in their disciplinary knowledge about literacy. However, the fact that even high-background teachers performed well below ceiling on the knowledge measures also supports the argument (e.g., Moats & Foorman, 2003) of a substantial gap between research on reading and teacher preparation. Furthermore, some of the participants' responses suggested a disjunction between certain

information they had learned in teacher education and basic research findings. For example, on the general knowledge about reading and reading development measure, many teachers were confused about the role of context in skilled reading, specifically about the use of context in word decoding, and they often referred to multiple cueing systems models of reading in their answers. It was clear that these models were the ones teachers had been taught, either in formal teacher preparation courses or in professional development workshops, despite the fact that the models are not consistent with scientific evidence about the role of context in skilled reading.

Many teacher educators do convey research-based information to their students. However, reconciling the need to provide appropriate preparation in reading with the many other demands of teacher education—for instance, developing teachers' competencies for teaching other subject areas and for behavior management—is not an easy task. Our experience is that most teachers are eager to acquire the kind of literacy-related knowledge examined here, especially if they understand its relevance to successful reading instruction. As Cunningham et al. (2004) point out, faulty self-perceptions may impede teachers' acquisition of new knowledge; similarly, inaccurate perceptions of teachers' knowledge among teacher educators may contribute to serious gaps in teacher preparation. Thus, assessment of literacy-related disciplinary knowledge—as part of preservice teacher preparation, certification, and ongoing professional development—would seem to be a key step in providing educators with the knowledge base they need to be effective teachers of reading.

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References

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Adams, M. J. (1998). The three-cueing system. In F. Lehr & J. Osborn (Eds.), *Literacy for all: Issues in teaching and learning* (pp. 73–99). New York: Guilford Press.

Blachman, B. (1997) *Foundations of reading acquisition and dyslexia: Implications for early intervention*. Mahwah, NJ: Erlbaum.

Bos, C., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of preservice and inservice educators about early reading instruction. *Annals of Dyslexia, 51,* 97–120.

Bos, C., Mather, N., Narr, R., & Babur, N. (1999). Interactive, collaborative professional development in early literacy instruction: Supporting the balancing act. *Learning Disabilities Research & Practice, 14,* 227–238.

Cunningham, A. E., Perry, K. E., Stanovich, K. E., & Stanovich, P. J. (2004). Disciplinary knowledge of K-3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia, 54,* 139–167.

Ehri, L. C., & Wilce, L. S. (1980). The influence of orthography on readers' conceptualization of the phonemic structure of words. *Applied Psycholinguistics, 1,* 371–385.

Fischer, P. E. (1993). *The sounds and spelling patterns of English: Phonics for teachers and parents.* Morrill, ME: Oxton House.

Fox, J. (1997). *Applied regression analysis, linear models, and related methods.* Thousand Oaks, CA: Sage.

Gough, P. B., Ehri, L. C., & Treiman, R. (Eds.). (1992). *Reading acquisition.* Hillsdale, NJ: Erlbaum.

Hoffman, J. V., & Roller, C. M. (2001). The IRA excellence in reading teacher preparation commission's report: Current practices in reading teacher education at the undergraduate level in the United States. In C. M. Roller (Ed.), *Learning to teach reading: Setting the research agenda* (pp. 32–79). Newark, DE: International Reading Association.

International Reading Association. (2003). *Investment in teacher preparation in the United States.* Newark, DE: Author.

McCutchen, D., Abbott, R. D., & Green, L. B. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities, 35,* 69–86.

McCutchen, D., & Berninger, V. (1999). Those who know teach well: Helping teachers master literacy-related content knowledge. *Learning Disabilities Research & Practice, 14,* 215–226.

McCutchen, D., Harry, D. R., Cunningham, A. E., Cox, S., Sidman, S., & Covill, A. E. (2002). Reading teachers' knowledge of children's literature and English phonology. *Annals of Dyslexia, 52,* 207–228.

Moats, L. C. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of Dyslexia, 44,* 81–102.

Moats, L. C. (2000). *Speech to print: Language essentials for teachers.* Baltimore: Paul H. Brookes Publishing Co.

Moats, L. C. (2004). Science, language, and imagination in the professional development of reading teachers. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 269–287). Baltimore: Brookes Publishing Co.

Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia, 53,* 23–45.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC: National Institutes of Health.

National Research Council. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

O'Connor, R. (1999). Teachers' learning ladders to literacy. *Learning Disabilities Research & Practice, 14,* 203–214.

Perfetti, C. A. (1985). *Reading ability.* New York: Oxford University Press.

Rack, R. P., Snowling, M. J., & Olson, R. K. (1992). The nonword reading deficit in developmental dyslexia: A review. *Reading Research Quarterly, 27,* 29–53.

Scarborough, H. S., Ehri, L. C., Olson, R. K., & Fowler, A. E. (1998). The fate of phonemic awareness beyond the elementary school years. *Scientific Studies of Reading, 2,* 115–142.

Spear-Swerling, L., & Brucker, P. (2003). Teachers' acquisition of knowledge about English word structure. *Annals of Dyslexia, 53,* 72–103.

Spear-Swerling, L., & Brucker, P. (2004). Preparing novice teachers to develop basic reading and spelling skills in children. *Annals of Dyslexia, 54,* 332–364.

Spear-Swerling, L., & Brucker, P. (in press). Teacher-education students' reading abilities and their knowledge about word structure. *Teacher Education and Special Education.*

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers.* New York: Guilford Press.

Stanovich, K. E., & Siegel, L. S. (1994). Phenotypic performance profile of children with reading disabilities: A regression-based test of the phonological-core variable-difference model. *Journal of Educational Psychology, 86,* 24–53.

APPENDIX

GENERAL KNOWLEDGE ABOUT READING AND READING DEVELOPMENT (GK) TASK

Directions: Please read the following questions carefully and answer them as well as you can. (All questions can be answered well in two or three sentences.) If the information is unfamiliar, it is fine to answer "I don't know" to all or to part of a question.

1. What is phonemic awareness and why is it important?
2. What is reading fluency and why is it important?
3. Briefly explain why English is a "morphophonemic" writing system, including specific words as examples.
4. Suppose you are trying to determine which kindergartners are most at risk for future reading difficulties. Name three "risk factors" that would be especially predictive of future reading problems.
5. Do skilled readers rely heavily on contextual cues (e.g., pictures or sentence context) to help them to read (decode) words? Briefly explain your answer.

SCORING GUIDELINES FOR GENERAL KNOWLEDGE TASK

Each question is worth 3 points.

Q1: What is Phonemic Awareness (PA)?   1 point for indicating that PA involves spoken (not written) language; 1 point for indicating that PA involves awareness of/ sensitivity to/ the ability to manipulate sounds (phonemes) in spoken words (second point given only if the student received the first point about PA involving spoken language). **Why important?** 1 point for any of the following: Because it is an important predictor of beginning reading achievement; because it is an important skill for beginning to read; because it is a foundation for learning to decode words.

Q2: What is Reading Fluency (RF)?   1 point for any of the following: Being able to read effortlessly/easily/ quickly as well as accurately; being able to recognize words automatically/ quickly as well as accurately; being able to read accurately and fluidly/without hesitation; being able to read accurately and with good expression/ intonation, "as if talking;" being able to integrate comprehension and word-recognition processes easily and smoothly while reading text. **Why important?** 1 point for an answer that recognizes the importance of reading fluency to good comprehension (e.g., "because dysfluent reading tends to

impair comprehension"); 1 additional point for either of the following (but no more than 1 point): for motivation (e.g., "if children find reading effortful they won't want to read"); or to meet upper-level grade demands (e.g., "as the amount of reading required in school increases, children will have trouble keeping up if they can't read fluently").

Q3: Morphophonemic. 1 point for an answer explaining that letters in English roughly represent sounds in spoken words; 1 point for an answer explaining that words and word parts (such as base forms, prefixes, suffixes) also represent meaning. **Examples:** 1 point for providing at least one appropriate example of a word illustrating morphemic relationships (e.g., the *know* in *knowledgeable* is a morpheme, the *un* in *unhappy* is a morpheme) AND at least one example of a word illustrating phonemic relationships (e.g., the *sh* in *ship* represents a phoneme, the letter *b* in *boy* represents a phoneme). A single word also may be used to illustrate both types of relationships (e.g., in *books,* the final *s* represents both the phoneme /s/ and a morpheme showing plurality).

Q4: Risk factors. 1 point for any of the following, up to a maximum of 3 points: oral language delay or disorder; a history of oral language delay or disorder; a disability that affects oral language development (e.g., hearing impairment, intellectual impairment); poor phonological/phonemic awareness; poor knowledge of letters; poor oral vocabulary; lack of basic print concepts; lack of preschool literacy experiences; family history of reading difficulties; lack of knowledge of spoken English (e.g., because child is an English language learner).

Q5: Do skilled readers rely heavily on contextual cues? 1 point for "no." Explanation: 2 points for an answer explaining that skilled readers have accurate, automatic, fast word reading (or good phonics skills/good ability to sound out unfamiliar words), so they do not need to rely heavily on context to recognize most words. 1 point for an answer that is on the right track but lacks clarity or completeness.

MORPHEME-COUNTING (MC) TASK, FORM A

Directions: A morpheme is a unit of meaning involving a word or part of a word. Look at the following words carefully. Determine which letter or letters correspond to morphemes (units of meaning) in the words, and circle each of them. In the blank following the word, record the number of morphemes (meaning units) that you detect.

Here are some examples:

RABBIT __1__   RABBITS __2__   JOYFUL __2__

Acceptable Answers

Item	Number of Morphemes	Segmentations
1. unicorn	2	UNI CORN
2. hopelessness	3	HOPE LESS NESS
3. telemarketing	3	TELE MARKET ING
4. carpet	1	CARPET
5. curliest	3	CURL I EST
6. felt	2	FEL T
7. tattletale	2	TATTLE TALE
8. misinformed	4	MIS IN FORM ED
9. pitchers	3	PITCH ER S
10. beautifully	3	BEAUTI FUL LY
11. biodegradable	4	BIO DE GRAD ABLE
12. nonjudgmental	4	NON JUDG MENT AL

MORPHEME-COUNTING (MC) TASK, FORM B
(SAME DIRECTIONS AND SAMPLE ITEMS AS FORM A.)

Acceptable Answers

Item	Number of Morphemes	Segmentations
1. millisecond	2	MILLI SECOND
2. carelessly	3	CARE LESS LY
3. sofa	1	SOFA
4. funnier	3	FUN NI ER or FUNN I ER
5. lost	2	LOS T
6. transfusion	3	TRANS FUS ION
7. unremarkable	4	UN RE MARK ABLE
8. artists	3	ART IST S
9. disinclined	4	DIS IN CLIN ED
10. mistletoe	1	MISTLETOE
11. excitement	3	EX CITE MENT
12. predictiveness	4	PRE DICT IVE NESS