
WHAT IS THE READING COMPONENT SKILL PROFILE OF ADOLESCENT STRUGGLING READERS IN URBAN SCHOOLS?

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Abstract. The purpose of this descriptive study was to examine the component reading skills of adolescent struggling readers attending urban high schools. Specifically, 11 measures of reading skills were administered to 345 adolescent readers to gain a research-based perspective on the reading skill profile of this population. Participants were assessed in the domains of word level, fluency, vocabulary, and comprehension. Analysis of the results found that 61% of the struggling adolescent readers had significant deficits in all of the reading components listed above. Subgroups of struggling readers showed similar but more severe patterns. For example, students with learning disabilities scored significantly below the levels of the struggling reader group at large. In contrast, most proficient readers scored high on all measures of reading with above-average component reading skills in word level, vocabulary, and comprehension. The lowest skill area for the proficient reader group was fluency, where they scored at the average level. Implications for policy and instructional programming are discussed.

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If the ability to read and comprehend is foundational to individual and national success in today's global economy, as is widely reported (e.g., Berman & Biancarosa, 2005; Biancarosa & Snow, 2004; Kamil, 2003; Lemke et al., 2005), clearly, knowledge about the nature of students' reading skills is important for two major reasons – as a means of preventing poor reading

performance and as a means of intervening to improve the performance of adolescent struggling readers (ASR).

Despite the encouraging progress that has been made in recent years in addressing the reading problems experienced by young children (Lyon, Alexander, & Yaffee, 1997; McCardle & Chhabra, 2004), more than eight million adolescents have not mastered the reading skills

necessary for them to successfully respond to demanding secondary school requirements or compete for meaningful jobs in the workplace (Adelman, 2006; Hock & Deshler, 2003; Kamil, 2003). These same adolescents are even less prepared to face the demands of the global economy described by Friedman (2005) in his book *The World Is Flat*. For example, according to the National Assessment of Educational Progress (NCES, 2005), 26% percent of eighth-grade students cannot read material essential for daily living, such as road signs, newspapers, or bus schedules. Overall, 68% of students score below the proficient level in reading. Students who are unable to handle the demands they face in high school will struggle in postsecondary education, and if their reading problems are not addressed, they will persist into adulthood.

The magnitude of the problems facing adolescents, especially those who attend poor urban high schools, is striking. In some of the largest urban school districts in the United States, nearly 65% of adolescents read below the "satisfactory" level on state reading assessments (Council of Great City Schools, 2001). Of major concern is the fact that for many ASR, the goal has changed from one of improving reading proficiency so they can participate in the existing economy to the goal of being able to compete in a much more competitive global economy that demands mastery of high-level reading and thinking tasks (Levy & Murnane, 2004).

The Urban Context

While information is available to inform policy and instructional decisions regarding the needs of younger struggling readers, the picture is far from complete for adolescent struggling readers in urban high schools (Snow, 2002). Additionally, the sparse information that is available on adolescent struggling readers must be mediated within the context of the urban environment for this group of students. Thus, living in an urban environment has been shown to exacerbate the educational risks and level of school failure associated with at-risk students (e.g., Leventhal & Brooks-Gunn, 2000, 2003; McWayne, Fantuzzo, & McDermott, 2004; Rury, 2005).

Contextual factors that predict urban student performance and school engagement include early childhood academic experiences and education (McWayne, Fantuzzo, & McDermott, 2004); poverty (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; McWayne, Fantuzzo, & McDermott, 2004; Rury, 2006); social competence and class (Phelps, 2005; Wentzel, 1999); neighborhood cultural socialization and crime rates (Lee, Spencer, & Harplani, 2003; Leventhal & Brooks-Gunn, 2003; Nash & Bown, 1999; Sampson, Raudenbush, & Earls, 1997); lack of employment and

opportunities to grow outside the classroom (Gleason, & Cain, 1997; Jarrett, 1997; Leventhal, Graber, & Brooks-Dunn, 2001; Newman, 1999); and a fear of danger associated with their school environment (Garcia-Reid, Reid, & Peterson, 2005). Additionally, poverty can have a profound negative effect on student academic performance (Leventhal & Brooks-Gunn, 2003). These factors must be considered when looking at the urban adolescent reader skill profiles discussed below.

Much of the evidence of student reading proficiency comes from standardized reading assessments administered to comply with No Child Left Behind Act of 2000 (NCLB) mandates. The utility of such assessments is limited with regard to component reading skill profiles as these measures are designed to provide a global measure of reading achievement and do not provide diagnostic or descriptive information.

In response to the need for more research on reading comprehension and urban readers, a descriptive study was conducted to determine the component reading skill profiles of adolescent struggling readers in urban middle and high schools. Thus, this study was designed to gather empirical evidence that goes beyond the general information about reading skills found on most state reading measures of adequate yearly progress (AYP). The overarching goal was to describe the reading skill characteristics of both proficient and struggling adolescent readers.

Foundational Research Literature

Several descriptive studies have been conducted with younger adolescents (approximately grades four to five) to more clearly define the reading skills of this population. These studies have added to our understanding of the nature of younger adolescent readers and their reading skill component profile (e.g., Buly & Valencia, 2003; Catts, Hogan, & Adlof, 2005; Leach, Scarborough, & Rescorla, 2003). However, the data are sometimes contradictory and, therefore, would benefit from clarity.

Younger adolescents. Buly and Valencia (2003) examined the reading skills of 108 fifth-grade students who scored poorly on the Washington Assessment of Student Learning (WASL). Students who participated in the study scored at levels 1 and 2 (on a scale of 1 to 4) on the reading portion of the assessment. While the specific ethnic characteristics of the sample were not provided, the authors noted that at the district level 57% percent of the students were Caucasian and 43% were students of color. Students in the sample performed poorly on all reading measures, including word identification, phonemic awareness, comprehension, vocabulary, rate, and expression. However, three factors accounted for 78% of the variance on the WASL scale scores: word identification, meaning, and fluency.

The authors concluded that poor student performance on the state reading assessment was due primarily to issues related to reading fluency and comprehension. Word-level problems contributed minimally to poor reading performance, and only about 9% of the students in the sample were poor readers in terms of word recognition, fluency, and meaning. Thus, most struggling readers in the study needed instruction primarily in comprehension and fluency, with very few needing instruction in all three areas. This study is widely cited by policy groups as a rationale for a primary focus on reading comprehension intervention with adolescent struggling readers (e.g., Berman & Biancorosa, 2005).

Leach and colleagues (2003) studied late-identified reading disability (RD) in a sample of 161 fourth and fifth graders. The sample consisted primarily of Caucasian students; only 5% of the students were ethnic minorities. Ninety-five of these adolescents were considered typically achieving readers, and 66 were identified as having some type of RD based on a standard score of 86 or less on reading comprehension tests.

On the basis of reading skill component scores and deficits, the authors assigned students to one of four groups; (a) the RC group, which included students with good word-level skills but poor comprehension; (b) the WL group, which consisted of students with deficits in word-level skills but good comprehension; (c) the WL-RC, group, in which students had deficits in both word-level and comprehension skills; and (d) the NRD group, in which deficits were not detected in either word-level or comprehension skills.

In the groups with reading deficits, 35% of the students had word-level processing deficits with adequate comprehension (WL), 32% had deficits in comprehension with adequate word-level skills (RC), and 32% had deficits in both word-level and comprehension skills (WL-RC). Thus, according to the authors, about two thirds of the poor readers had comprehension deficits, and 64% also had word-level deficits. Additionally, 41% to 47% of the poor readers were late-identified RD. That is, the reading skills of the students who met the established criteria for RD had adequate reading skills before the fourth grade. This is an important finding in terms of determining interventions that respond to student developmental needs and significantly narrow the reading achievement gap.

Older adolescents. In a longitudinal study of older adolescents, Catts et al. (2005) examined the word recognition and listening comprehension skills of poor readers over time. They followed their sample across grades 2, 4, and 8. Within the first portion of the study, the authors used data from 527 subjects who participated in a longitudinal and epidemiological study

through eighth grade. A regression analysis showed that word recognition and listening comprehension accounted for 76.6% (second grade), 71.8% (fourth grade), and 72.8 % (eighth grade) of the composite variance in measures of reading comprehension across grade levels. Word recognition and listening comprehension varied in their unique contributions to reading comprehension across grade levels and across time. For example, word recognition played a large role in predicting reading comprehension in the early grades, whereas listening comprehension was significantly more predictive of overall reading comprehension as students grew older.

For the second portion of the study, the authors selected from the sample of 527 students who could be identified as poor readers ($N=154$). Eighth-grade readers in this analysis clustered into one of three skill categories: (a) dyslexic or students with deficits in word recognition but adequate listening comprehension (13.3%); (b) mixed RD or students with deficits in both word recognition and listening comprehension (36%); and (c) specific comprehension deficits or students with adequate word recognition but deficits in listening comprehension (30%). Thus, Catts et al. (2005) found that about 49% of the eighth-grade poor reader group had poor word recognition, and about 66% had poor comprehension.

These findings clarified the influence that developmental stages have on reading skill profiles. For example, in the second-grade analysis, listening comprehension accounted for only 9% of the unique variance in reading comprehension, whereas in the eighth-grade analysis, it accounted for 36% of the unique variance. Thus, these findings support the developmental nature of reading and highlight the shifting importance that word-level and language comprehension skills play in predicting reading comprehension. Also, according to Catts et al. (2005), by the eighth grade, word-level reading skills contribute minimally to reading comprehension, and the percentage of poor readers who struggle with comprehension nearly doubles by the fourth and eighth grades. Catts et al. (2005) also found evidence of a fourth-grade slump, whereby students considered to be satisfactory readers in second grade were identified as struggling readers by fourth grade.

Together, these studies represent significant and foundational efforts to examine the component reading skills of struggling readers and to identify subcategories of readers, thereby bringing clarity to the discussion about the reading skill profile of struggling readers in young adolescent populations. However, the extent to which the findings can be generalized to older adolescents in urban schools is unknown.

First, the majority of the participants in the studies reviewed were late-elementary students and not necessarily representative of the older adolescent population. Additionally, none of the studies focused on struggling readers in urban schools with the intent to capture the range of skills possessed by this population. Finally, the results of these studies are somewhat mixed. For example, Buly and Valencia (2003) noted that only 9% of the population had reading deficits in word identification. In contrast, Catts et al. (2005) and Leach et al. (2003) found that between 49% and 67%, respectively, of the struggling reader group demonstrated deficits in word identification and comprehension. Thus, the literature on the reading skill component profile of this population is limited.

Purpose of the Study

The overriding goal of the present study was to fill a significant void in the literature by determining the nature of component reading skills for older adolescent struggling readers (ASR) in urban high schools. Questions related to the overall goal were as follows:

1. What are the differences between proficient and struggling readers on various reading measures that comprise the four components of word level, fluency, vocabulary, and comprehension?
2. Are the struggling readers' mean reading scores in the four specific reading component areas significantly different from the mean reading scores of proficient readers (those who score above the 40th percentile)?
3. Are the mean reading scores in the four specific reading component areas of students with learning disabilities (LD) significantly different from the mean reading scores of adolescent struggling readers in general (those who score below the 40th percentile)?
4. What is the relationship profile of specific reading component skills (i.e., word level, fluency, and vocabulary) and reading comprehension?
5. Do struggling adolescent readers need instruction in all reading components or is a focus on one or two component skills a better instructional strategy?

Theoretical Underpinnings: The Comprehension Process

Most current theories of reading view comprehension not as a unitary process, but as a result of interacting processes. Kintsch's discourse processing theory is a prominent example of such a view (E. Kintsch, 2005; W. Kintsch, 1998). According to this theory, true comprehension must take place at both local and global levels. Local-level processes use language knowledge concerning word meanings and grammar to build sentence-

level understanding. Global-level processes, in turn, employ language knowledge as well as cohesion and text structure to tie together sentence-level relationships into a text-based understanding. While some inferences are drawn, the text-based representation remains close to the text from which it was drawn. This mental representation is often sufficient to enable the reader to recall the text and answer explicit questions about its content; that is, the type of questions that are often found at the end of reading selections. However, although a text-based representation plays a critical role in comprehension, Kintsch argues that true comprehension requires that it be integrated with the individual's knowledge of and experience with the topic. Such integration results in a situation model – a mental model of the situation described in the text.

This model often goes beyond the verbal domain and may include such components as visual imagery, emotions, or personal experiences. Constructing a situation model can proceed automatically, but often involves conscious, effortful mental activity, much like solving a problem through the use of strategies. The resultant model is a much deeper understanding of the text – one that allows for true learning to take place such that new knowledge is created and can be accessed easily and used in novel situations.

Kintsch's theory suggests several potential obstacles to adolescent reading comprehension. First, it predicts that deficits in language knowledge may disrupt the formation of a text-based representation. Such deficits may result from a lack of language experience (e.g., English as a second language) or a developmental language impairment (Catts, Fey, Tomblin, & Zhang, 2002). A second obstacle may be a lack of relevant background knowledge. Prior knowledge is critical for building a deep understanding of the text. Thus, adolescents without knowledge of the subject matter would be expected to gain far less from reading a text than those with such knowledge. Finally, an especially likely obstacle for comprehension is a lack of efficient strategies for relating the text to one's background knowledge and experiences. Adolescents with reading difficulties are frequently reported to lack good reading comprehension strategies (e.g., Block & Pressley, 2002; Kintsch, 1998).

In addition to these potential obstacles, there is considerable evidence that word-level skills support the comprehension process. For example, in the reading process, printed words are recognized by the complex interplay of phonology, orthography, and semantics (Harm & Seidenberg, 1999). In skilled readers, word recognition is highly automated and places limited demands on cognitive resources. However, acquisition of word reading skills takes place over an extended

period of time and includes predictable phases of development (Adams, 1990; Ehri, 1995). Critical to this development is the acquisition of the alphabetic principle. That is, recognition that the spellings of words correspond to the sounds of words. This knowledge concerning sound-letter correspondence allows the reader to recognize novel words and to form well-specified orthographic representations of words (Share & Stanovich, 1995). Such representations lead, in turn, to more accurate and fluent word recognition.

Struggling readers often display difficulties in acquiring word-reading skills (Torgesen & Hoskyn, 1999). Thus, for a majority of these children, the fundamental problem is an inability to use sound-letter correspondence to decode words (Stanovich, 1988). As a result, poor readers are dependent on other sources of information to read (e.g., context) and are slower to develop sight word reading skills (Ehri, 1997). Further, problems at the level of phonological representations underlie many poor readers' difficulties in learning to use the alphabetic principle to decode words (Torgesen, Wagner, & Rashotte, 1994). Indeed, Torgesen, Rashotte, and Alexander (2001) argued that the ability to recognize individual words quickly is the most important factor in reading fluency.

Given the theoretical support for reading comprehension as a complex process involving both word-level and language comprehension competencies, an assessment of the reading skills of struggling readers should include multiple measures of both word-level text and language comprehension skills.

Thus, the primary goal of this study was to compare the word-level and reading comprehension skills of adolescent proficient and struggling readers, including those with LD. This information is needed to build the knowledge base about the reading skill component profile of adolescent readers, an area that has been largely ignored, and subsequently to inform the development of interventions and programs that respond to the instructional needs of adolescent struggling readers.

METHODS

The sample included 345 late eighth- and early ninth-grade students selected from two suburban junior high schools, two urban middle schools, and three urban high schools in two midwestern cities. The urban community consisted of 145,004 residents; the suburban community consisted of 81,873 residents (U.S. Census Bureau, 2002). Participating students from the urban schools were recruited from their English classes during the end of their eighth or the beginning of their ninth-grade year. They were selected for inclusion in the study based upon their Kansas Reading Assessment (KRA) scores, a measure of adequate yearly

progress (AYP) (Kansas Department of Education, 2005).

The Kansas Reading Assessment (Kansas DOE, 2005) is a group-administered test given annually in the spring to students in the 5th, 6th, 7th, 8th, and 11th grades to measure AYP as defined in the NCLB Act of 2000. By the end of eighth grade, students are assessed on their proficiency in comprehending narrative, expository, and technical text. Measures are also taken on such skills as identification of main ideas, details, and the author's purpose, comparing, contrasting, problem solving, and using text organizers. Additionally, students are assessed on fluency, decoding, and prior knowledge.

The overall sampling plan was to recruit at least 60 students in each of the five categories of the KRA (i.e., unsatisfactory, basic, proficient, advanced, and exemplary) so that adequate subgroups of students could be assessed and their reading skill component profiles analyzed. The goal was to differentiate the skill profile of adolescent readers, both proficient and struggling, using a common and standardized measure like that offered by the KRA continuum of reading proficiency. Those who scored at or below the 40th percentile were defined as struggling readers, whereas those who scored above the 40th percentile were defined as proficient readers.

The sample consisted of 202 ASR and 143 proficient readers. Included in the sample were 34 students with LD, 29 in the ASR group and 5 in the proficient group. While not a traditional cut point, the 40th percentile was chosen because students scoring at this mark are almost one third of a standard deviation below the expected mean standard score, and thus below the expectation set by NCLB that all children read at grade level (U.S. Congress, 2001). Given the focus of NCLB, many school districts are keenly interested in the group of borderline readers and even more interested in appropriate ways to intervene. The 40th percentile cut point allowed us to use all the collected data and increase our knowledge about readers who are not at grade level but close.

Eighty-two percent of the participants were drawn from the urban schools and 18% were from the suburban schools. (Suburban students were recruited to increase the number of exemplary readers and balance the five KRA categories.) Students ranged in age from 13.45 years to 17.5 years with an average age of 14.9 years. All students were enrolled in either eighth- or ninth-grade language arts or English classes. Fifty-five percent were male and 45% were females. The race and ethnicity profile of the sample was made up of 52% African-American, 15% Hispanic, 29% white, and 4% reporting in other categories. Fifty-one percent received free/reduced-cost lunch, and 47% of the students paid

for lunch. Ten percent were enrolled in special education, and 5% reported that they were English Language Learners (ELL) during time of the assessment.

Measures and Instruments

Instruments were selected and grouped within a reading-component framework identified in the literature as essential to the reading success of younger and adolescent readers (Curtis, 2002; NICHD, 2000) and responsive to Kintsch's theoretical model discussed earlier (see Table 1). The measures consisted of a battery of language and literacy tasks. Multiple measures of each construct were included so that the relations among latent abilities could be examined independent of task-specific factors or measurement error (Kline, 2005).

Word level. Two measures of word-level skills were administered. Word decoding and word identification were measured using the Word Attack and Word Identification subtests of the Woodcock Language Proficiency Battery-Revised (WLPB-R; Woodcock, 1991). The Word Attack subtest requires individuals to apply phonics and structural analysis skills to pronounce nonsense words ordered in increasing difficulty. The split-half reliability is greater than .90. The Letter-Word Identification subtest uses real letters and words in isolation, graded in order of difficulty. Participants read the increasingly difficult letters and words until a ceiling score is attained. The split-half reliability of this subtest also exceeds .90. Each subtest takes about 5 minutes to administer. The tests are administered individually.

Fluency. Fluency was assessed using three norm-referenced subtests. First, the Test of Word Reading Efficiency (TOWRE) Sight Word Efficiency subtest (Torgesen, Wagner, & Rashotte, 1999) measures the number of real printed words accurately decoded within 45 seconds. This subtest has two forms (A and B) of equivalent difficulty. The test-retest is .84 for students age 10-18 years. Second, the TOWRE Phonemic Decoding Efficiency subtest measures the number of pronounceable nonwords that are accurately decoded within 45 seconds. Its test-retest reliability is .89 for students age 10-18 years. Overall testing time is 2-3 minutes for each of the subtests.

Finally, the Gray Oral Reading Test-4 (GORT-4) was administered to evaluate oral reading rate and accuracy (Wiederholt & Bryant, 2001). The GORT-4 is comprised of 12 passages. Participants are required to read aloud passages as quickly and as accurately as possible and then answer five comprehension questions. For each passage administered, and depending on basal and ceiling criteria, the examiner documents the time in seconds required to read the passage, the total number of reading errors, and responses to com-

prehension questions. The GORT-4 rate and accuracy subtest scores are summed to provide an overall reading fluency score. Split-half reliability is .92 for the fluency measures.

Vocabulary. Receptive oral vocabulary was assessed using the Peabody Picture Vocabulary Test-Third Edition (PPVT-III; Dunn & Dunn, 1997). The PPVT-III requires the student to point to the one of four pictures that represents a stimulus word pronounced by the examiner. The words become increasingly difficult. Test administration takes 10-12 minutes.

Reading vocabulary was assessed using the Woodcock Language Proficiency Battery-Revised (WLPB-R; Woodcock, 1991) Reading Vocabulary subtest. The Reading Vocabulary subtest is comprised of two parts that assess a person's knowledge of synonyms and antonyms, respectively. The synonym portion measures participants' ability to identify a word that has the same or nearly the same meaning as the test item presented by the examiner. The antonym portion measures participants' ability to identify a word whose meaning is the opposite or nearly the opposite in meaning of the test item presented by the examiner. Performance on the synonym and antonym portions of the Reading Vocabulary subtest forms a single index of expressive vocabulary. Split-half reliability exceeds .90.

Comprehension. Reading comprehension was assessed with two measures, the WLPB-R Passage Comprehension subtest (Woodcock, 1991) and the GORT-4 (Wiederholt & Bryant, 2001). The WLPB-R comprehension subtest requires the reader to silently read a sentence or a short passage and supply a word that fits the meaning and context of the passage. This modified cloze procedure measure is completed in about 6 minutes. The GORT-4 comprehension subtest requires the reader to read graded passages orally and to respond to comprehension questions read by the examiner and presented in a multiple-choice format. Passages range from about 20 to 160 words in length. The task takes about 10 minutes; two forms (A and B) are available.

Language comprehension was assessed using the WLPB-R Listening Comprehension subtest (Woodcock, 1991). The test focuses on a number of semantic operations beginning with simple verbal analogies and associations and moving to the ability to infer implications. This 38-item cloze procedure requires the participant to listen to a sentence and then supply a key word that completes the meaning of the sentence. The task requires about 10 minutes. Split-half reliability exceeds .90.

Procedures

Participants were individually tested during one 2- to 2.5-hour testing session. A total of 16 examiners par-

ticipated in administering the test battery. Twelve were certified classroom teachers with undergraduate degrees in education and two had master's degrees in education. The two remaining examiners were research assistants; one had a bachelor's degree in education and the other was an undergraduate student.

All examiners completed an extensive six-hour training conducted by the investigators regarding administration and scoring procedures for each test within the assessment. In addition, prior to the first assessment, the examiners worked with a member of the project staff on assessment administration. The first assessment was observed for consistency in following the script, and the student record booklet was reviewed for recording/scoring accuracy. This was done individually, followed by immediate feedback.

Testing was conducted after school or on a Saturday at participants' schools in a quiet classroom or the library. Teacher-examiners received monetary compensation for all completed assessments. To participate in

the study, students or their parents/guardians (depending on age) had to sign letters of consent. Student participants received a monetary compensation of \$30.00 each for completing the test battery.

The process for handling student data included steps for completion, accuracy, reliability, data entry, and verification, as outlined below. A completion check was conducted to identify any missing information. Booklets with missing information were flagged and returned to the examiner for completion and/or explanation for missing information.

Next, all student data were checked for precision in scoring, including accurate basal and ceiling calculations and accurate calculation of raw scores. Raw scores were converted to standard scores using the examiner's manuals for the corresponding instruments or the assessment scoring software.

Data entry and verification were completed independently for validity purposes. Data were handled in sets of five and entered into a SPSS file. Each set was

Table 1
Reading Measures and Instruments

Assessment Area	Measure
<i>Word Level</i>	Woodcock Language Proficiency Battery (WLPB-R)
• Decoding	WLPB-Revised – Word Attack subtest
• Word Identification	WLPB-Revised – Word Identification subtest
<i>Fluency</i>	Test of Word Reading Efficiency (TOWRE)
• Pace & Accuracy	Sight Word Efficiency subtest
• Pace & Accuracy	Phonemic Decoding Efficiency subtest
• Rate	Gray Oral Reading Tests (GORT-IV) Rate subtest
• Accuracy	GORT-IV – Accuracy subtest
<i>Vocabulary</i>	Peabody Picture Vocabulary Test – III
• Receptive	WLPB-R – Reading Vocabulary subtest
• Expressive	
<i>Comprehension</i>	
• Reading Comprehension	WLPB-R – Passage Comprehension subtest
	GORT-IV – Passage Comprehension subtest
• Listening Comprehension	WLPB-R – Listening Comprehension subtest
• Reading Achievement	The Kansas State Assessment – Reading subtest

assigned a number, and separate Excel™ spreadsheets were used to keep track of all the sets. Project staff exchanged data sets for verification.

Reliability checks were completed for each measure that involved scorer judgment. Two scorers independently scored 10% of the student responses on the GORT, the WLPB-R word attack subtest, and the TOWRE subtests for sight word reading and phonemic word reading. The inter-scorer reliability was 96.5% on the GORT-4, 92% on the WLPB-R, and 95.5% on the TOWRE.

RESULTS

In this section we describe the characteristics of the adolescent struggling readers primarily with respect to the four reading components and compare descriptively their scores to those of a group of proficient readers drawn from the same geographic region and attending the same schools. Also, demographic characteristics of the struggling and proficient readers in the sample are discussed. Lastly, the results for the ASR readers, includ-

ing those with LD, are compared to those of the proficient readers and the overall skill profiles of both groups of readers are examined.

Creation of Component Scores

A principal-components analysis (PCA) was conducted to determine if the 11 reading measures administered formed distinct reading components (see Table 2). In order to make all scores comparable, the usual GORT standard scores (mean = 10, *SD* = 3) were transformed so that all measures would be in the same metric with a mean of 100 and an *SD* of 15. The results of the PCA indicated that the 11 variables could be summarized by four components.

The Word-Level component comprised the Word Attack and Word Identification measures; the Fluency component comprised the TOWRE Sight Word and Phonemic Decoding Efficiency measures and the GORT Accuracy and Rate measures; the Vocabulary component comprised the WLPB-R Listening Comprehension and Reading Vocabulary measures and the PPVT Total

Table 2
Principal-Component Analysis Pattern Matrix*

	Component			
	Word Level	Fluency	Vocabulary	Comprehension
WLPB-R Word Attack	22.90			
WLPB-R Word Identification	8.02			
TOWRE Sight Word Efficiency		12.12		6.79
GORT Rate		17.10		
GORT Accuracy		15.55		
TOWRE Phonemic Decoding Efficiency		10.95		
WLPB-R Listening Comprehension			24.39	
PPVT Total			9.66	
WLPB-R Reading Vocabulary			8.83	
GORT Reading Comprehension				17.59
WLPB-R Passage Comprehension				7.26

*The pattern matrix is used to help determine which clusters of variables are defined by the factor. The numerical values in the matrix (the weights or loadings) for each variable are directly related to the unique contribution that the factor makes to the variance of the variable. These loadings are similar to the regression coefficients found when the variables are regressed on the factors.

Table 3**Mean Standard Scores of Struggling and Proficient Readers on Assessments**

Assessment Variable	Reading Level					
	Struggling			Proficient		
	Mean	SD	N	Mean	SD	N
WLPB-R Word Attack	87.57	20.71	202	113.54	18.34	143
WLPB-R Letter-Word Identification	90.92	14.10	202	113.36	15.95	143
TOWRE Sight Word Efficiency	87.38	10.74	200	100.35	10.87	143
TOWRE Phonemic Decoding	84.20	14.51	191	100.29	12.29	143
GORT Rate	83.61	12.69	202	104.64	15.49	140
GORT Accuracy	81.63	14.09	195	107.71	17.65	140
PPVT Total	86.11	11.67	200	110.01	12.36	135
WLPB-R Reading Vocabulary	87.63	11.41	202	111.64	13.17	143
WLPB-R Listening Comprehension	86.34	14.86	202	112.04	16.88	143
WLPB-R Passage Comprehension	87.56	10.20	202	112.83	14.69	143
GORT Comprehension	80.22	10.30	202	105.21	11.22	140

score; and the Comprehension component comprised the WLPB-R Passage Comprehension and the GORT Reading Comprehension measures. Only one variable, Sight Word Efficiency, loaded on two components, Fluency and Comprehension. However, the loading on Comprehension was much smaller than the loading on Fluency, so Sight Word Efficiency was included in the Fluency measure.

A composite score was formed for each of the four components by combining the standard scores for the individual measures comprising the component. Thus, for example, the Word-Level component score was the mean of the standard scores for the WLPB-R Word Attack and Letter-Word Identification measures. Similarly, component scores for Fluency (mean of Sight Word Efficiency, Phonemic Decoding, GORT-4 Rate and GORT-4 Accuracy), Vocabulary (mean of the PPVT and the WLPB-R Vocabulary and WLPB-R Listening Comprehension), and Comprehension (mean of GORT-4 Comprehension, WLPB-R Passage Comprehension) were formed. Thus, each component score is the mean of the standard scores in the set of measures that comprise the

component. These four component scores were the primary variables included in the descriptive analyses below.

Definition of Struggling Readers

Struggling readers, as defined in this article, were identified on the basis of their scores on a Comprehension composite score, the mean of the WLPB-R-R passage comprehension subtest, and the GORT-4 comprehension subtest score. Those who scored at or below the 40th percentile (standard score of 96) on the composite score were defined as struggling readers; those who scored above the 40th percentile were defined as proficient readers. Using this criterion, the sample in the final analysis consisted of 202 adolescent "struggling" readers (including 29 students with LD) and 143 "proficient" readers (including 5 students with LD).

Comparisons of Struggling Readers and Proficient Readers

Table 3 presents the standard scores of the ASR and proficient readers on each of the 11 assessments. Examination of the mean scores on these assessments

indicates that the poor readers' standard scores were substantially below those of the good readers. Except for the TOWRE measures (Sight Word Efficiency and Phonemic Decoding), the differences were at least 20 standard score units and were often greater than 25 units. Differences between the poor and good readers were tested using a Bonferroni adjustment ($\alpha = .0045$) to take into account the large number of tests being conducted. All differences were statistically significant across all reading scores; that is, scores for the word level, fluency, vocabulary, and comprehension measures for ASR were significantly below the scores for the proficient readers.

Table 4 presents the number of ASR and proficient readers by demographic characteristics, including gender, students with a learning disability, free/reduced-

cost lunch status, ELL classification, and age. Nearly all of the ASR were from the urban area (194 out 202). Of the proficient reader group, 90 were from the urban area, whereas 53 were from a suburban area.

A total of 34 students in the study had active individualized education programs (IEPs), indicating that the presence of a specific learning disability had been determined. Twenty-nine were struggling readers, and five were proficient readers. Local district and Kansas Department of Education identification procedures and criteria were used to identify students with disabilities.

In the state of Kansas, specific learning disability is defined as:

(a) disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may

Table 4
Sample Characteristics of Struggling and Proficient Readers

Characteristic	Reading Level		Total
	Struggling	Proficient	
Gender			
Female	88 (44%)	68 (48%)	156 (45%)
Male	114 (56%)	75 (52%)	189 (55%)
SES			
Free/reduced-cost lunch	134 (68%)	43 (31%)	177 (53%)
No free/reduced-cost lunch	64 (32%)	96 (69%)	160 (47%)
English Language Learner			
No	190 (94%)	136 (95%)	326 (94%)
Yes	12 (.06%)	7 (.05%)	19 (.05%)
Special Education Status			
No IEP	173 (86%)	138 (97%)	311 (90%)
IEP (designation of LD)	29 (14%)	5 (.03%)	34 (10%)
Age Group			
< 14 yrs.	15 (.07%)	10 (.07%)	25 (.07%)
14-15 yrs.	106 (52%)	65 (46%)	171 (50%)
15-16 yrs.	70 (35%)	64 (45%)	134 (39%)
> 16 yrs.	11 (.05%)	2 (.01%)	13 (.04%)

manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations; (b) Disorders included – Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia; (c) Disorders not included – Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage; (d) Response to Intervention- In determining whether a child has a specific learning disability, it is not required to take into consideration whether the child has a severe discrepancy between achievement and intellectual ability, and the diagnostic team may use a process that determines if the child responds to scientific, research-based intervention as part of the child's evaluation. (Kansas Special Education Process Handbook, 2008, p. 15)

Table 5 presents the standard scores on each of the four composites for the students in the two reading groups and in various subclasses. Overall, the pattern of results is very similar for the ASR and the proficient readers. The Fluency score is the lowest, while the highest score for both groups is for the Word-Level component. As illustrated, the range of means for the poor readers is somewhat narrower than the range for the proficient readers.

The relationships among the component scores were more formally examined using profile analysis with reading group as the between-subjects factor. Since the struggling readers were defined as students whose Comprehension component scores were below the 40th percentile, only the other three components were included in the formal comparisons and analyses.

A profile analysis simultaneously compares the profiles of the groups on several measures and tests whether they have the same pattern of means on those measures (see Figure 1). The three primary questions in a profile analysis concern (a) the equality of the means of the groups, (b) the parallelism of the profiles, and (c) the similarity of the response among the dependent variables. The test for the equality of the means indicated that the groups differed significantly, $F(1, 343) = 322.44, p = .000$. Follow-up tests showed that, for every component, the proficient readers scored significantly higher than the struggling readers. The result of the parallelism test (given by the interaction of group with component) was also significant, Wilks' Lambda $F(2, 342) = 15.92, p = .000$. These results indicate that the differences between the means (slopes) for some pairs of dependent variables are not the same in the two groups (see Figure 1).

Follow-up tests showed that for the struggling reader group, there were statistically significant differences between each of three pairs of means: Word Level compared to Fluency, $F(1, 201) = 60.29, p = .000$, effect size $d = .61$; Word Level compared to Vocabulary, $F(1, 201) = 6.15, p = .014$, effect size, $d = .18$; and Vocabulary compared to Fluency, $F(1, 201) = 11.37, p = .001$, effect size, $d = .24$. For the proficient reader group, statistically significant differences were found for two of three comparisons: Word Level compared to Fluency, $F(1, 142) = 147.4, p = .000$, effect size, $d = 1.04$, and Vocabulary compared to Fluency, $F(1, 142) = 61.7, p = .000$, effect size, $d = .66$. However, there was no statistically significant difference between Word Level and Vocabulary for the proficient readers. Effect sizes were calculated using Cohen's adjustment for correlated measures, which is accomplished by multiplying the standard deviation in the denominator by the square root of $2(1-r)$, where r is the correlation between the two measures. The statistic may be interpreted using Cohen's (1988) suggested guidelines: A small effect is approximately .2, a medium effect is approximately .5, and a large effect is .8. Since the parallelism hypothesis was rejected, there was no need to test for flatness, as clearly some means were greater than others.

We also examined the four component scores for various demographic groups. Scores for the free/reduced-cost lunch group were generally 9 to 13 standard score points lower than those for the non-reduced-cost or free lunch group, the largest difference being the Vocabulary scores (see Table 5). Vocabulary scores also showed the largest difference between the males and the females, with the males scoring slightly higher. The sample contained 13 students older than 16; this group scored lower on all components than did the other members of the sample. The sample included 19 ELL students; their scores were very similar to those of the non-ELL students on all components. Students with IEPs designating LD ($N = 34$) scored lower on all components than the non-IEP students, with the largest difference on Word Level (approximately 22 standard score units). Students with disabilities also performed below the mean standard scores of the proficient reader group on all components and were below the struggling reader group on all components except Vocabulary, where they scored at approximately the same level as the struggling reader group.

Additional descriptive analyses were conducted for students who scored at or below the standard score of 96 on at least one of the four components (see Table 6). Of the 345 students in the sample, 85 scored above 96 on all components, whereas 260 scored below the mean standard score (approximately the 40th percentile) on at least one of the components. The 260 students

Table 5
Mean Component Standard Scores

Characteristic	Word Level Mean (SD)	Fluency Mean (SD)	Vocabulary Mean (SD)	Comprehension Mean (SD)
Reader Status				
Struggling (<i>n</i> = 202)	89.25 (16.55)	83.99 (11.95)	86.79 (10.77)	83.89(8.43)
Proficient (<i>n</i> = 143)	113.45 (15.57)	103.17(12.73)	111.23 (12.28)	109.10 (10.82)
SES Status				
Free/reduced-cost lunch (<i>n</i> = 177)	94.14 (16.70)	87.47 (12.62)	90.79 (14.04)	88.84 (11.81)
No free/reduced-cost lunch (<i>n</i> = 160)	104.87 (21.94)	96.98 (16.90)	103.51(16.72)	100.33 (17.17)
Special Education				
No IEP (<i>n</i> = 311)	101.53 (18.85)	93.53 (14.95)	97.98 (16.54)	95.66 (15.11)
IEP w/LD (<i>n</i> = 34)	78.69 (19.35)	77.34 (12.60)	87.21 (13.92)	82.29 (15.47)
English Language Learner Status				
No (<i>n</i> = 326)	99.22 (19.77)	91.89 (15.26)	97.05 (16.36)	94.43 (15.64)
Yes (<i>n</i> = 19)	100.29 (25.27)	92.80 (19.48)	94.70 (20.61)	92.87 (15.91)
Age Group				
< 14 yrs. (<i>n</i> = 25)	105.86 (19.81)	96.18 (13.01)	96.31 (13.38)	94.48 (12.28)
14-15 yrs. (<i>n</i> = 171)	97.51 (18.42)	91.02 (14.25)	94.77 (15.76)	93.03 (14.37)
15-16 yrs. (<i>n</i> = 134)	101.32 (21.99)	93.33 (17.37)	100.51 (17.77)	96.92 (17.49)
> 16 yrs. (<i>n</i> = 13)	88.65 (16.48)	81.58 (11.22)	88.33 (14.92)	82.92 (11.48)
Gender				
Female (<i>n</i> = 156)	100.88 (19.23)	94.28 (15.34)	95.70 (16.70)	94.84 (14.96)
Male (<i>n</i> = 189)	97.96 (20.69)	90.00 (15.39)	97.93 (16.48)	93.93 (16.21)

included 9 students in the struggling reader group who scored low only on Comprehension and were high on everything else. The remaining 193 struggling readers and 58 proficient readers scored low on at least one component other than Comprehension. Table 6 shows the distribution of the students in the various deficiency categories for each reading-level group.

Further examination of the 202 struggling readers showed that 123 (61%) scored low on every component, including Comprehension. Another 26 scored low on every component except Word Level. Aside from Comprehension, the component on which the largest number of students scored below the mean standard score of 96 was Fluency (177 or 88%).

Among the proficient readers, only four scored below the mean standard score of 96 on every component except Comprehension. As for the struggling readers, the component with the largest numbers of low scores was Fluency, where 49 proficient readers were below the mean standard score of 96. A common combination for the proficient readers was high Vocabulary scores, low Fluency scores, and varying Word-Level scores. Thus, 42 proficient readers fell into these categories versus only 28 struggling readers. Table 6 gives a complete summary of all students in the high/low numbers on each component. As illustrated, all struggling readers, by definition, scored at or below 96, and all proficient readers scored above 96.

DISCUSSION

Adolescents who arrive in high school lacking a solid foundation in core reading skills have a greatly reduced

probability of graduating with a standard diploma. For example, in a study by the Consortium on Chicago School Research, Allensworth and Easton (2005) found that students who stay “on track” in their freshman year (i.e., earn at least five credits and have no more than one semester F grade) are three and one half times as likely to graduate from high school as students who do not stay on track. This fact is even more striking when considering that those in higher risk groups (e.g., students with disabilities) evidence nearly twice the dropout rate as their peers without disabilities (Thurlow, Sinclair, & Johnson, 2002).

The purpose of this descriptive study was to determine the reading component skill profile of struggling adolescent readers in urban high schools to fill a critical need for well-controlled investigations of this population. Specifically, the study described the reading

Figure 1. Estimated marginal means of component.

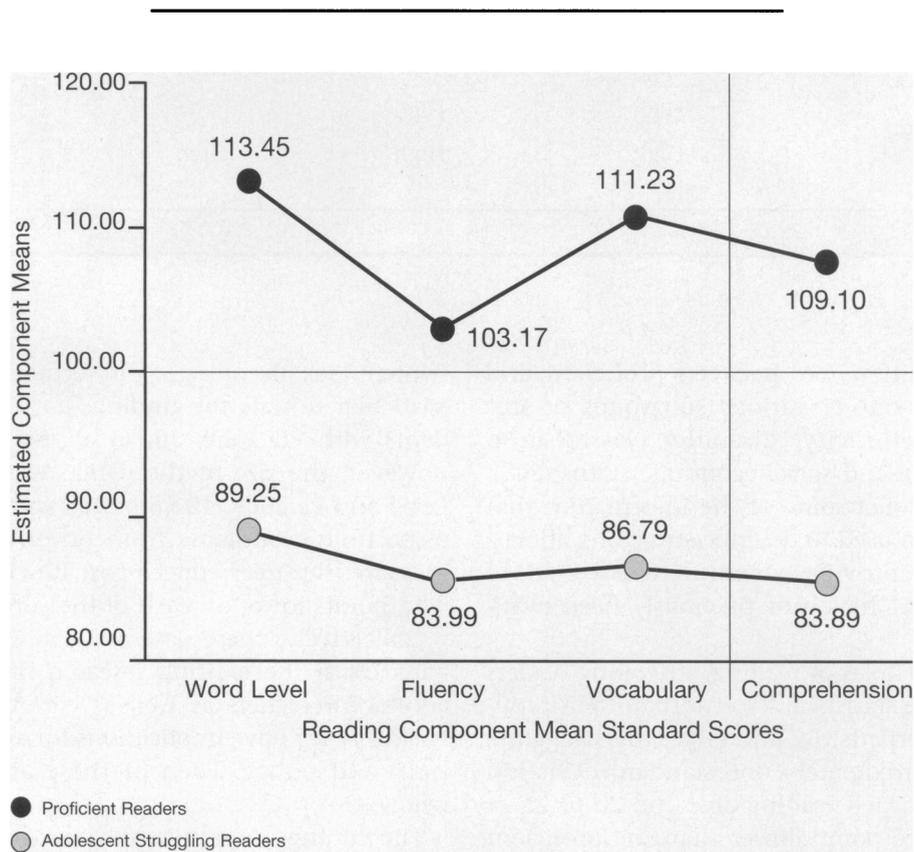


Table 6***Cross-Tabulation of High and Low Scores for Each Component by Reader Status***

Reader Status	Vocabulary	Fluency	Word Level	Total
Struggling	Low	Low	Low	123
	Low	Low	High	26
	Low	High	Low	2
	Low	High	High	14
	High	Low	Low	10
	High	Low	High	18
	High	High	Low	0
	High	High	High	9
Proficient	Low	Low	Low	4
	Low	Low	High	3
	Low	High	Low	0
	Low	High	High	8
	High	Low	Low	14
	High	Low	High	28
	High	High	Low	1
	High	High	High	85

component skill differences between proficient and struggling readers among various subgroups of students, including ethnicity, disability classification (learning disability), and social-economic status (SES). The findings contradict some of the information that has commonly been used to describe struggling adolescent learners and provide a comprehensive set of descriptive data that have not previously been available.

In all component areas of reading, struggling readers were found to score statistically lower than their proficient reader counterparts. By and large, the struggling readers scored approximately one standard deviation below the mean in each reading area and 20 to 25 or more standard score points lower than the proficient reader group. While the areas of greatest deficit were in Fluency and Comprehension, many poor readers also demonstrated significant deficits at the Word Level

(word attack, decoding, word recognition, and rate). Of particular note is the finding that the profiles of students with LD were similar across component areas; however, the size of the deficit was greater in Word Level and Fluency (10.56 points and 6.65 points lower respectively). Students from poverty backgrounds, as measured by free/reduced-cost lunch, scored between 9-13 points lower on each of the components.

Collectively, these data are noteworthy when compared with the existing research literature on young adolescent readers as well as current reading theory. Further, they have implications for assessment, instruction, and policy. Each of these areas are discussed below.

The findings from this study are at variance with what has been reported in the literature about the percentage of struggling readers who experience word-level and comprehension difficulty. Whereas the current study

found that 61% of the struggling reader group scored low on all component reading skills and an additional 12% scored low on all reading components measures except Word Level (word attack and word identification), Buly and Valencia (2003) found that only 9% of their sample had word-level difficulties and comprehension weaknesses. However, Buly and Valencia did not categorize fluency deficits (i.e., rate and accuracy) as word-level deficits, which may have skewed the interpretation of their findings.

Similarly, others (e.g., Berman & Biancarosa, 2005; Biancarosa & Snow, 2004; Kamil, 2003) have written that a relatively small percentage of adolescent struggling readers have word identification problems. Our data differ from those reports but are more consistent with the findings reported by Catts et al. (2005) and Leach et al. (2003), who, respectively, found 49% and 67% of younger struggling readers to have word-level problems either in isolation or in combination with comprehension deficits. Specifically, 61% of the students had word-level and comprehension difficulties. Thus, given that in many urban schools, large percentages of students fall at or below the basic level of proficiency, it would not be unusual to find as much as 65% of the total student body to demonstrate word-level difficulties.

However, the findings of the present study do confirm what has been reported about the difficulties experienced by poor readers in the areas of vocabulary, fluency, and comprehension. The breadth of the reading challenges presented by struggling adolescent readers in urban secondary settings is underscored by the fact that 260 of the 345 students scored below the 40th percentile on at least one component (this includes 67 of the 150 proficient readers and all but 2 of the struggling readers). These findings underscore the notion that to attain improved reading proficiency, the majority of adolescent struggling readers in urban schools need balanced reading instruction. In short, many students in urban schools should receive instruction in word-level skills as well as fluency, vocabulary, and comprehension.

One of the most significant challenges that secondary teachers face is having to design instructional programs for struggling adolescent readers in the absence of informative assessment data on students' reading profiles. Most frequently, the only data available come from state assessments. Generally, the results from such testing are not made available to teachers until several months after the test is administered (Boudett, City, & Murnane, 2005); more important, the nature of the information provided is not helpful from an instructional standpoint. That is, test reports consist of global designations of student performance (e.g., the student

is reading at the unsatisfactory level, or a percentile rating) that cannot be readily translated into instructional action plans.

This study underscored that assessing students with measures that provide detailed patterns of strength and weakness in the critical areas of reading can yield information that teachers can use for instruction. Regrettably, there is a shortage of such instruments. Therefore, there is a pressing need for development and validation of instruments that are efficient for screening, placement, and diagnostic purposes at the secondary level. In this investigation, four separate test instruments requiring two hours to administer were needed to generate the reading profile of poor readers. While this may be workable for a research study, for classroom use, educators need fewer instruments that require less time to administer and result in a single report providing student results in a form that is easy to interpret and use.

An additional point related to the need for tools for assessing adolescents is Leach et al.'s (2003) finding that between 41-46% of their sample began to evidence reading difficulties after the fourth grade. This finding, supported by the results of the present study and related to the persistence of reading difficulties into adolescence, underscores the need for assessment instruments that can be used for screening purposes as students move into middle and high school to detect emerging reading difficulties that were not present during the primary or early elementary grades.

Implications for Practice

The most significant implications from this study relate to instruction. Given the profile of reading problems of poor readers in urban settings, it is important that teachers be prepared to teach these students reading skills and strategies in each of the reading component areas studied in this investigation (in all likelihood these students will also need instruction on factors not directly assessed in this study, such as background knowledge and text structure). Given that many students will need instruction in all reading components (word identification, fluency, comprehension, vocabulary), but at different levels of intensity, secondary schools must develop ways to provide an array of instructional alternatives that address students' varying needs, especially for students with LD. Students with LD presented a reading component skill pattern similar to other ASR, but their scores were significantly lower than those of other ASR, with the exception of Vocabulary. Therefore, instruction for this group of students requires interventions that are comprehensive in nature and build skills and strategies in all of the component reading skills assessed here.

Both administrators and policymakers can take direction from the findings of this study. For federal policymakers, the data underscore the magnitude of the instructional problems facing those who work in urban schools with large percentages of poor students. For years, the majority of federal and state policy initiatives and resources have been directed at younger children. For example, in 2002, federal funding for Head Start was \$6.7 billion, and for Title I in grades K-6 it was \$10.49 billion. By comparison, federal funding for Title I programs in grades 7-12 was only \$1.85 billion (National Center for Educational Statistics [NCES], 2004). Two relatively new federal initiatives, Reading First (for children in grades K-3) and Striving Readers (for students in grades 6-12), reflect a similar pattern of marked inequities in federal expenditures by granting \$1.04 billion for Reading First versus \$24.8 million for Striving Readers.

Striving Readers, while a relatively small investment, represents a symbolically important acknowledgment of the unique challenges faced by struggling adolescent readers in secondary schools. Given the importance of putting students on a solid foundation as they enter high school, it would be logical and reasonable for policymakers to insist that Striving Readers projects focus the majority of their efforts on upper-elementary and middle schools so we can quickly add to our knowledge base of how to better serve struggling adolescent readers prior to the stringent requirements they will encounter in high school and beyond.

For state and local policymakers, the data suggest that professional development and certification and licensure programs need to require that teachers acquire the necessary competencies to teach the requisite reading skills to struggling adolescent readers. Additionally, these policymakers need to consider the implication of within-district and within-school resource allocation. That is, reallocation of existing resources to provide highly intensive, concentrated instruction on these foundational skills will be necessary at the earliest point in the students' secondary school experience if these poor readers are to have any chance of staying abreast in their subject-matter classes and meeting the expectations of state assessments and receiving standard diplomas.

It is essential that teachers, administrators, and policymakers have a clear understanding of the specific reading skill profile and instructional needs of this population and how those needs change over time and context. The reading skill profile that emerged in this study demonstrates the need for a curriculum and an instructional focus that include all reading components if the development of proficient readers in urban schools is to be accomplished.

The results of this investigation should be interpreted in light of the following limitations. First, the study was conducted in only two school districts in the mid-west. Thus, the prevalence rates described are not representative of a national sample. Second, the small size of some subgroups limited our ability to conduct detailed analyses on the various reading component skills (e.g., those from the learning disability and the ELL subgroups). Third, the type and number of measures used were limited. Additional measures in listening comprehension, additional student characteristics, and contextual factors might help further define the nature of adolescent struggling readers. Finally, given the limited descriptive research available on adolescent readers, studies of younger adolescents were used to provide some background information. With the exception of the Catts et al. study (2005), the comparisons were between fourth- and fifth-grade students, and differences in prevalence rates may be due to sampling procedures, development, and selection of measures.

REFERENCES

- Adams, M.J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: U.S. Department of Education.
- Allensworth, E. M., & Easton, J. Q. (2005). *The On-Track Indicator as a predictor of high school graduation*. Chicago: Consortium on Chicago School Research.
- Berman, I., & Biancarosa, G. (2005). *Reading to achieve: A governor's guide to adolescent literacy*. Washington, DC: NGA Center for Best Practices.
- Biancarosa, G., & Snow, C. E. (2004). *Reading next – A vision for action and research in middle and high school literacy: A report from Carnegie Corporation of New York*. Washington, DC: Alliance for Excellent Education.
- Block, C. C., & Pressley, M. (2002). *Comprehension instruction: Research-based practices*. New York: Guilford Press.
- Boudett, K. P., City, E. A., & Murnane, R. J. (2005). *Data wise: A step-by-step guide to using assessment results to improve teaching and learning*. Cambridge, MA: Harvard Education Press.
- Buly, M. R., & Valencia, S. (2003). *Meeting the needs of failing readers: Cautions and considerations for state policy*. Seattle: University of Washington, Center for the Study of Teaching and Policy.
- Campbell, F. A., Pungello, E. P., Miller-Johnson, S., Burchinal, M., & Ramey, C. T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood educational experiment. *Developmental Psychology*, 37, 231-242.
- Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research*, 45, 1142-1157.
- Catts, H. W., Hogan, T. P., & Adlof, S. M. (2005). Developmental changes in reading and reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *The connections between language and reading disabilities* (pp. 25-40). Mahwah, NJ: Lawrence Erlbaum Associates.

- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Council of Great City Schools. (2001). *A decade of outcomes in the nation's urban schools 1990-1999: A report on urban student achievement and course taking*. Washington, DC: Author.
- Curtis, M. B. (2002). *Adolescent literacy: A synthesis of research*. Boston: Lesley College, The Center for Special Education.
- Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test-Third Edition*. Circle Pines, MN: American Guidance Service.
- Ehri, L. C. (1997). Sight word learning in normal readers and dyslexics. In B. A. Blachman (Ed.), *Foundations of reading acquisition and dyslexia* (pp. 163-189). Mahwah, NJ: Erlbaum.
- Friedman, T. L. (2005). *The world is flat: A brief history of the twenty-first century*. New York: Farrar, Straus, and Giroux.
- Garcia-Reid, P., Reid, R. J., & Peterson, N. A. (2005). School engagement among Latino youth in an urban middle school context: Valuing the role of social support. *Education and Urban Society, 37*, 257-275.
- Gleason, P. M., & Cain, G. G. (1997). *Earnings of black and white youth and their relation to poverty* (discussion Paper No. 1136-97). Madison: University of Wisconsin, Institute for Research on Poverty.
- Harm, M. W., & Seidenberg, M. S. (1999). Phonology, reading acquisition, and dyslexia: Insights from connectionist models. *Psychological Review, 106*, 491-528.
- Hock, M. F., & Deshler, D. D. (2003). Adolescent literacy: Ensuring that no child is left behind. *Principal Leadership, 13*(4), 55-61.
- Jarrett, R. L. (1997). Bringing families back in: Neighborhoods' effects on child development. In J. Brooks-Gunn, G. J. Duncan, & J. L. Aber (Eds.), *Neighborhood poverty: Vol. 2. Policy implications in studying neighborhoods* (pp. 48-64). New York: Russell Sage Foundation
- Kamil, M. L. (2003). *Adolescents and literacy: Reading for the 21st century*. Washington, DC: Alliance for Excellent Education.
- Kansas State Department of Education. (2005). *Report card 2004-2005*. Retrieved February 12, 2007, from <http://onlineksde.org/rcard/>.
- Kansas State Department of Education. (2008). *Kansas special education process handbook*. Retrieved August 9, 2008, from <http://online.ksde.org/rcard/>.
- Kintsch, E. (2005). Comprehension theory as a guide for the design of thoughtful questions. *Topics in Language Disorders, 25*, 51-64.
- Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge, United Kingdom: Cambridge University Press.
- Kline, T. (2005). *Psychological testing: A practical approach to design and evaluation*. Thousand Oaks, CA: Sage Publications, Inc.
- Leach, J. M., Scarborough, H. S., & Rescorla, L. (2003). Late-emerging reading disabilities. *Journal of Educational Psychology, 95*(2), 211-224.
- Lee, C. L., Spencer, M. B., & Harpalani, V. (2003). Every shut eye ain't sleep: Studying how people live culturally. *Educational Researcher, 32*(5), 6-13.
- Lemke, M., Sen, A., Johnston, J. S., Pahlke, E., Williams, T., Kastberg, D., & Jocelyn, L. (2005). *Characteristics of U.S. 15-year-old low achievers in an international context: Findings from PISA 2000* (NCES 2006-010). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin, 126*(2), 309-337.
- Leventhal, T., & Brooks-Gunn, J. (2003). Children and youth in neighborhood contexts. *Current Directions in Psychological Science, 12*, 27-31.
- Leventhal, T., Graber, G. A., & Brooks-Gunn, J. (2001). Adolescent transitions to young adulthood: Antecedents, correlates, and consequences of adolescent employment. *Journal of Research on Adolescence, 11*(3), 297-323.
- Levy, F., & Murnane, R. J. (2004). *The new division of labor: How computers are creating the next job market*. Princeton, NJ: Princeton University Press.
- Lyon, G. R., Alexander, D., & Yaffee, S. (1997). Progress and promise in research in learning disabilities. *Learning Disabilities: A Multidisciplinary Journal, 8*, 1-6.
- McCardle, P., & Chhabra, V. (2004). *The voice of evidence in reading research*. New York: Brookes.
- McWayne, C. M., Fantuzzo, J. W., & McDermott, P. A. (2004). Preschool competency in context: An investigation of the unique contribution of child competencies to early academic success. *Developmental Psychology, 40*(4), 633-645.
- Nash, J. K., & Bowen, G. L. (1999). Perceived crime and informal social control in the neighborhood as a context for adolescent behavior: A risk and resilience perspective. *Social Work Research, 23*, 171-186.
- National Center for Educational Statistics (NCES). (2004). *The nation's report card: Reading 2002*. Washington, DC: U.S. Department of Education.
- National Center for Educational Statistics (NCES). (2005). *The nation's report card: Reading 2005*. Washington, DC: U.S. Department of Education. http://nces.ed.gov/nationsreportcard/nrc/reading_math_2005/s0002.asp?printver/
- National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: Government Printing Office.
- National Institute of Child Health and Human Development. No Child Left Behind Act of 2001, Pub. L. 107-110, 115 Stat. 1425 (2002).
- Newman, K. (1999). *No shame in my game: The working poor in the inner city*. New York: Knopf & the Russell Sage Foundation.
- Phelps, S. (2005). *Ten years of research on adolescent literacy, 1999-2004: A review*. Chicago: Learning Point Associates.
- Rury, J. L. (2005). *Urban education in the United States: A historical reader*. New York: Palgrave MacMillan.
- Sampson, R. J., Raudenbush, S. W. & Earls, F. (1997, August 15). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277*, 918-924.
- Share, D. L., & Stanovich, K. E. (1995). Cognitive processes in early reading development: A model of acquisition and individual differences. *Issues in Education: Contributions from Educational Psychology, 35*, 1-57.
- Snow, C. (2002). *Reading for understanding: Toward an R & D program in reading comprehension*. Santa Monica, CA: RAND.
- Stanovich, K. E. (1988). *Children reading and the development of phonological awareness*. Detroit, MI: Wayne State University Press.
- Thurlow, M. L., Sinclair, M. F., & Johnson, D. R. (2002). Students with disabilities who drop out of school: Implications for policy and practice. *Issue Brief, 2*(2), 1-7, Minneapolis: University of Minnesota, National Center on Secondary Education and Transition.
- Torgesen, J.K., & Hoskyn, M. (Eds.). (1999). *Assessment and instruction for phonemic awareness and word recognition skills*. Needham Heights, NJ: Allyn & Bacon.
- Torgesen, J. K., Rashotte, C. A., & Alexander, A. (2001). Principles of fluency instruction in reading: Relationships with established

-
- empirical outcomes. In M. Wolf (Ed.), *Dyslexia, fluency, and the brain* (pp. 334-355). Parkton, MD: York Press.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1999). *Test of Word Reading Efficiency*. Lake Oswego, OR: Northwest Evaluation Association.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1994). Longitudinal studies of phonological processing & reading. *Journal of Learning Disabilities, 27*, 276-286.
- United States Census Bureau. (2002). *2000 Census Bureau of population and housing, summary population and housing characteristics*. Washington, DC: Author.
- U.S. Congress. (2001). *No Child Left Behind Act of 2001. Public Law 107-110, 107th Congress*. Washington, DC: Government Printing Office.
- Wentzel, K. R. (1999). Socio-emotional processes and interpersonal relationships: Implications for understanding motivation at school. *Journal of Educational Psychology, 91*, 76-97.
- Wiederholt, J. L., & Bryant, B. R. (2001). *GORT4: Gray Oral Reading Test*. Austin, TX: PRO-ED.
- Woodcock, R. (1991). *Woodcock Language Proficiency Battery-Revised*. Allen, TX: DLM Teaching Resources.

AUTHOR NOTES

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