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Using the Content Literacy Continuum as a Framework for Implementing RTI in Secondary Schools

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This document is a preliminary draft of a manuscript being prepared for a special issue of *Theory into Practice* on RTI.

Adolescent Struggling Readers in Urban Schools: Results of a Latent Class Analysis of Critical Reading Component Skills (Draft)

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2009 STRATEPUBS

A Publication of the University of Kansas Center for Research on Learning

Using the Content Literacy Continuum® as a Framework for Implementing RTI in Secondary Schools

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The University of Kansas Center for Research in Learning has developed a Content Literacy Continuum® (CLC) (Lenz & Ehren, 1999; Lenz, Ehren, & Deshler, 2005) to provide a framework for organizing schoolwide literacy efforts at middle, junior, and high schools. The CLC involves five levels of literacy support that should be in place in every secondary school. The five different levels in this continuum offer a structure to conceptualize and implement a comprehensive initiative to make literacy a priority in secondary schools to meet the challenges of high literacy that ***all*** adolescents face in today's world. The CLC emphasizes the importance of infusing literacy instruction throughout the secondary school curriculum and of involving a host of secondary educators with different types of expertise to address the broad array of needs presented by adolescents.

CLC has been implemented in secondary schools since 1999. Its use predates the current movement in education toward a Response to Intervention (RTI) approach. However, in considering the intent and structure of the CLC, it is apparent that the framework dovetails nicely with the essential nature of the RTI framework. A few components of RTI may need amplification within a CLC context, but the structure works well as an RTI initiative. Therefore, the purpose of this paper is to discuss the CLC as a framework for conceptualizing and implementing RTI at the secondary level – why it is a good fit, how levels and tiers relate, and what should be considered in moving forward with adopting the CLC as an RTI initiative.

UNDERSTANDING THE CLC AND RTI FRAMEWORKS

The Content Literacy Continuum

The CLC is a framework designed as a schoolwide approach to address the content literacy needs of students in middle, junior, and high schools. Content literacy is defined as the listening, speaking, reading, and writing skills and strategies needed by students to learn in each of the academic disciplines. The CLC is a comprehensive approach to narrowing the achievement gaps experienced by many adolescents, often related to lack of literacy proficiency, while maintaining curriculum rigor for all students. It involves the packaging of research-validated literacy practices with tools of the Strategic Instruction Model® (Deshler, et al., 2001) as anchors. It is organized around five levels of instruction/intervention that increase in intensity to be responsive to diverse student needs. Planning and adoption are rooted in school improvement processes and revolve around high-quality professional development.

Level 1: Enhanced Content Instruction addresses the mastery of critical content in academic subjects for all students utilizing the listening, speaking, reading, and writing access skills necessary to manipulate subject matter. Tools such as Content Enhancement Routines (Bulgren, Deshler, & Lenz, 2007), graphic organizers, prompted outlines, structured reviews, guided discussions, and other instructional tactics are used at this level to organize and enhance the curriculum content in ways that promote its understanding and mastery by all students.

Level 2: Embedded Strategy Instruction focuses on student use of content literacy strategies to acquire, manipulate, and demonstrate knowledge in specific subjects as an integrated part of course learning for all students. At this level, teachers incorporate instruction on selected reading and writing strategies into their classes. On an ongoing basis, while teaching subject-matter material, teachers look for opportunities to teach students particular strategies that would help them manipulate the information being taught.

Level 3: Intensive Strategy Instruction is for those students who need more intensive strategy instruction to master independent use of content literacy strategies. Some students who struggle with literacy have great difficulty mastering literacy strategies within the class-

room as presented in Level 2. The instructional conditions may not be conducive to their learning (that is, the large numbers of students, little time for individual feedback, limited opportunity to ask questions for clarification, etc.). In Level 3, Learning Strategies (Schumaker & Deshler, 2006) are taught within an explicit eight-stage instructional model (Ellis, et al., 1991) designed for and validated with struggling learners. This intensive instruction is usually provided by someone other than a subject-matter teacher.

Level 4: Intensive Basic Skill Instruction targets foundational language and literacy skills that students (usually below the fourth-grade reading level) must acquire to be successful learners. Students receiving instruction in Level 4 learn fundamental content literacy skills through specialized, direct, and intensive instruction in listening, speaking, reading, and writing. Work in reading decoding and fluency as well as basic comprehension skills are examples of targeted instruction at this level.

Level 5: Therapeutic Intervention involves intensive therapy in language underpinnings for those students whose language impairment thwarts learning. In Level 5 interventions, students with underlying language disorders learn the linguistic, metalinguistic, and metacognitive underpinnings they need to acquire the necessary content skills and strategies. Generally, at this level, speech-language pathologists deliver small-group, curriculum-relevant language therapy (Ehren, 2002) in collaboration with other support personnel teaching literacy. They also assist content teachers in making appropriate accommodations in content instruction for students to promote their success.

Response to Intervention

RTI has received widespread attention across the country from all educational sectors. Yet there is still some confusion about what it is. Essentially, RTI is the practice of (1) providing high-quality instruction/intervention matched to student needs and (2) using learning rate over time and level of performance to (3) make important educational decisions (Kurns & Tilly, 2007). It is a multi-tiered approach to providing academic and behavioral supports to struggling learners at increasing levels of intensity. The goal of RTI is to ensure that all students have access to high-quality instruction and that struggling learners are supported in meeting curriculum standards. According to the National Center on Response to Intervention (2008),

> Response to Intervention integrates assessment and intervention within a multi-level prevention system to maximize student achievement and to reduce behavior problems. With RTI, schools identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities. (p. 1)

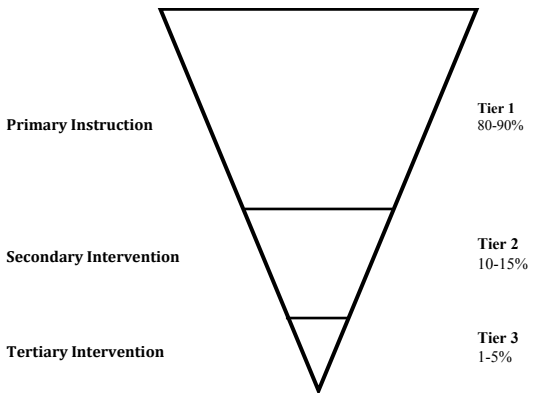
Many different iterations of RTI exist, including those that focus on literacy. The objective of all iterations is for students to receive what they need, when they need it. Although the majority of research and development have occurred at the elementary level, efforts are increasing at the secondary level (Burns, 2008; Canter, Klotz, & Cowan, 2008; Duffy, 2007; Ehren, 2008; Johnson & Smith, 2008).

There are several essential components to RTI (Kurns & Tilly, 2007; NJCLD, 2005):

- High-quality scientifically based core instruction.
- Universal screening to identify struggling learners who need additional support.
- Increasingly intensive instruction in a multi-tiered approach for struggling students.
- Frequent progress monitoring to examine student achievement and monitor the effectiveness of instruction and intervention.
- Data-based decision-making regarding students' instructional needs based on multiple data points over time.

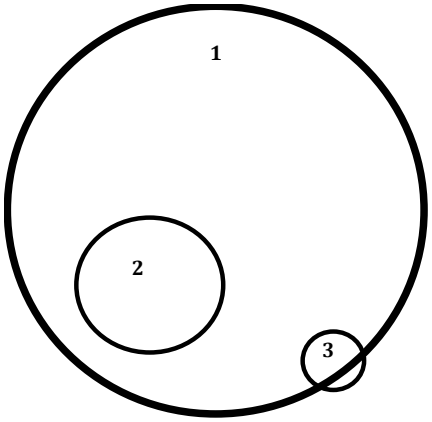
Some states and school districts do not use the term "RTI," although they have educational frameworks with the key features described above. Most RTI initiatives employ tiers, although they may not use that term. The term "tiers" refers to levels along a continuum of intensity for instruction and intervention. A typical configuration for RTI frameworks is a three-tiered structure even though processes and practices may differ from place to place. Johnson, Mellard, Fuchs, and McKnight (2006) refer to primary, secondary, and tertiary intervention within a three-tiered framework, while Ehren, Ehren, and Proly (2009) use the same schema but refer to Tier 1 as "Primary Instruction" to highlight the importance of core instruction before intervention is even considered. In this framework, Tier 1 involves primary instruction for students in the general education classroom; Tier 2 includes secondary interventions,

Figure 1. Inverted triangle to depict a three-tiered RTI framework



from Ehren, Ehren, & Proly (2009)

Figure 2. Alternative, non-linear depiction of a three-tiered RTI framework



from Ehren, Ehren, & Proly (2009)

typically delivered in small groups for at-risk students; and Tier 3 focuses on individualized systems for students with intensive needs, including"specially designed instruction" in special education (Graner, Faggella-Luby & Fritschmann, 2005; Mellard & Johnson, 2008).

A common graphic to illustrate a three-tiered approach is the triangle. Ehren, et al. (2009) use an inverted version to highlight the importance of Tier 1, which should be the first tier to receive attention (see Figure 1).

Although this graphic depicts a progression of intensity and the decreasing numbers of students who are addressed in the more intense tiers, Ehren et al. (2009) proffer another graphic (Figure 2) to show that RTI is not a linear process.

The logic behind this graphic is as follows: Students do not drop out of Tier 1 when they move to Tier 2; students may not be participating in Tier 2 if they are in Tier 3; Tiers 2 and 3 take place within the context of Tier 1; Tier 1 does not end when Tiers 2 or 3 are initiated; a very small percentage of students in special education may not receive core instruction in general education (assuming that special education is considered as part of Tier 3).

CLC AND RTI - A GOOD FIT

Rationale

Secondary schools interested in embracing RTI as a school improvement framework may find the CLC to be a useful approach for several reasons:

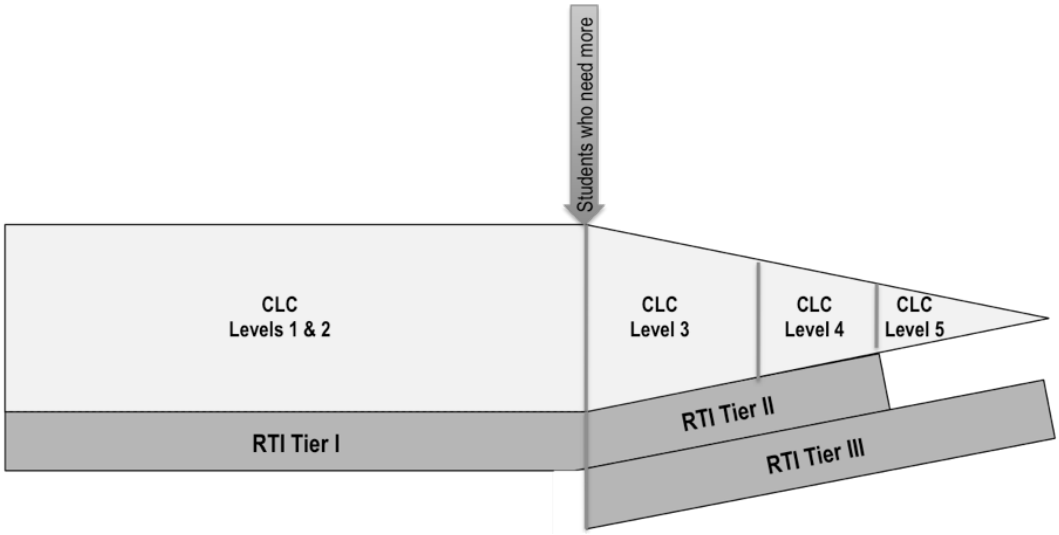
- *The history of CLC implementation provides an experiential base for approaching a school wide literacy initiative within an RTI frame of reference.* Most RTI efforts have been directed toward elementary schools. As increasing numbers of secondary schools explore ways to operationalize RTI at that level, schools utilizing the CLC will be navigating charted waters. The CLC has a history at the secondary level. The lessons learned about successful implementation over the years can be applied to adoption of a literacy focused RTI approach.
- *The literacy focus of the CLC helps schools respond to exigent needs in adolescent literacy.* RTI has many iterations, some literacy oriented, some more general problem solving in nature. The broad-based concern for the status of adolescent literacy in this country makes the CLC an attractive orientation for an RTI initiative. However, its use does not preclude the possibility of a more general problem-solving framework within which to operationalize the CLC.
- *Both the CLC and RTI share a focus on strong core instruction with opportunities for intervention when needed.* In any RTI framework, core academic instruction has to be differentiated and of high quality to meet the needs of a diverse student population. Further, opportunities must be present for increasingly intense interventions for students whose needs cannot solely be met within core instruction. The CLC is described in levels and RTI typically in tiers but the intent is the same. (See later section for the relationship of levels and tiers.).
- *RTI rests upon the use of scientifically based practices in instruction and intervention that is foundational to the CLC.* The CLC employs research-validated tools from the University of Kansas Center for Research on Learning for Content Enhancement Routines and Learning Strategies for Levels 1, 2, and 3, along with other scientifically based tools at these levels. In Level 4, research-based tools and practices from a variety of other sources are used. In Level 5 speech-language pathologists use evidence-based practices in language therapy with Content Enhancement Routines and Learning Strategies as a context.
- *RTI utilizes progress monitoring to target appropriate interventions*. Data-based decision-making is central to CLC implementation at a school. "What kind of intervention does a student need? In what specific literacy areas? For how long? How intense does it need to be?" are all questions germane to deciding how to structure classes and support services in levels 3, 4, and 5 of the CLC.
- *RTI interventions supplement universal instruction rather than supplant it*. Within the CLC framework, all students are involved in CLC Levels 1 and 2, which is where universal instruction takes place in RTI. For students who need more than the subject-area teachers can provide, additional intervention is provided, usually by support personnel (e.g., reading teachers, special education teachers, speech-language pathologists, academic tutors) in levels 3, 4, and 5.

How CLC Levels Relate to RTI Tiers

Although CLC and RTI frameworks both involve increasingly intense instruction for students who struggle, it would be inaccurate to equate a CLC level with its corresponding numerical RTI tier. For example Level 2 is not the same as Tier 2. In fact, Level 2 in CLC is more of an additional layer of core instruction focused on teaching students how to learn. It does not involve intervention the way Tier 2 does within RTI. Whether Levels 3 and 4 are considered Tier 2 or Tier 3 depends on several factors, in-

cluding the intensity, duration, and degree of individualization of the intervention. Figure 3 depicts the relationship of CLC levels and RTI tiers.

Figure 3 – Relationship of CLC Levels and RTI Tiers



Another way to discuss the relationship is to position CLC levels within RTI tiers as in Figure 4.

Both CLC Level 1 and Level 2 address content instruction in general education classes for all students. In Level 1, the concern is with mastery of content standards in academic areas such as science, social studies, math, and language arts/English. In Level 1, teachers use instructional tools to focus instruction on critical content in a way that promotes manipulation of language processes to enhance content learning. Visual devices serve as anchors to explicate the relationships among ideas. Therefore, in Level 1, content instruction is enhanced for all students. Level 2 is an added layer of content area instruction in which teachers embed the strategy instruction needed to help students master the content. At this level, integrally delivered with Level 1 instruction, teachers teach students how to take responsibility for their own learning by activating strategies to help themselves access the content and demonstrate what they know. Within these levels, instruction is differentiated insofar as is feasible for secondary teachers to do within their responsibilities to meet content standards. RTI Tier 1 is universal core instruction and therefore encompasses both Levels 1 and 2 of the CLC.

In the CLC, Levels 3, 4, and 5 are for students who need more than the general classroom teacher can provide alone. Level 3 is Intensive Strategy Instruction for those students who need more than the Embedded Strategy Instruction they receive in Level 2. In Level 3 the instructional methodology differs from that in Level 2, although the strategies may be the same. The more intense version involves a specific research-validated instructional sequence implemented with smaller groups of students. It most likely requires support personnel for delivery, because secondary content teachers would not have the time to provide this kind and intensity of instruction, given the demands of teaching their subject area. In RTI terms, CLC Level 3 could be either Tier 2 or Tier 3, depending on its intensity, duration, and the degree of individualization needed for student success. For example, if a student struggling with identifying multisyllabic words becomes part of a small group of students that receives six weeks of instruction in a Word Identification Strategy, we would consider that as an RTI Tier 2 intervention. Another student who is struggling in many areas of reading comprehension may need to take a semester (or

Figure 4. Alternate view of relationships among CLC levels and RTI tiers

Primary Instruction (Tier I)
- CLC Level 1 - Enhanced Content Instruction
- CLC Level 2 - Embedded Strategy Instruction

Secondary Interventions (Tier II)
- CLC Level 3 - Intensive Strategy Instruction
  - o (short term, less intense, may be standard treatment protocol)
- CLC Level 4 - Basic Skill Instruction
  - o (short term, less intense, may be standard treatment protocol)

Tertiary Intervention (Tier III)
- CLC Level 3 - Intensive Strategy Instruction
  - o (longer duration, more intense, more individualized)
- CLC Level 4 - Basic Skill Instruction
  - o (longer duration, more intense, more individualized
- CLC Level 5 - Therapeutic Intervention
  - o always"specialized instruction"

year) long course where he learns a variety of reading comprehension strategies where a good deal of individualization will take place. We would consider that an RTI Tier 3 intervention. Assuming that a student needs ongoing intensive intervention, this practice may constitute "specialized instruction" that occurs in special education.

In Level 4 of the CLC, struggling students, usually those below a fourth-grade reading level, receive the basic skill instruction they need in reading and writing as prerequisite to using strategies effectively in reading and writing. They may work on decoding, fluency, reading comprehension skills, spelling, vocabulary, writing composition, or other language skills, including those in listening and speaking. If they have skill gaps that can be filled in small group instruction of limited duration, then we would think of this work as RTI Tier 2 work. On the other hand, students who need long-term intervention in basic skills, for example an intensive reading course, we would think of as receiving Tier 3 intervention.

Students with language impairment who need therapeutic intervention on the language underpinnings of listening, speaking, reading, or writing would always be considered as receiving "specialized instruction" or related services in special education. This intervention would occur at Level 5 of the CLC. Some school districts would classify work in special education as part of RTI Tier 3 and some as Tier 4 (See further discussion about The Role of Special Education below.)

An important note is that interventions in the CLC and RTI should not be bound by time or defined by location or personnel. Specifically, intervention may occur outside of the school day or school year (e.g., after-school programs or summer programs employing Strategic Tutoring). Most importantly, intervention can be implemented in a variety of settings and by a host of personnel; for example: (1) Level 5 services can be provided by an SLP in a classroom; (2) special education teachers may provide Tier 2, Level 3 support to students who do not have disabilities.

The Role of Special Education

Where do special education services fit into the scheme of things in RTI and CLC? Some confusion exists in this regard. In trying to emphasize the role of general and compensatory education within RTI, special education is frequently discussed outside the parameters of RTI, as in this example: "We try RTI and if that doesn't work we look to special education." This is an inaccurate characterization. RTI, like the CLC, involves a continuum of instruction/intervention with increasing intensity. Within that continuum, special education services play a role when students need specialized instruction or related services of greater intensity, duration, and individualization than is provided in either general or compensatory education and students are eligible for those services under state and federal law. So, in an RTI framework, progress data gathered throughout a student's involvement in preliminary tiers provide information that becomes part of the comprehensive evaluation that must occur prior to a student's placement in special education. In essence, then, special education is part of the continuum. Therefore, it would be more accurate to say, "Special education is our most intense option within our tiered framework of RTI." Of course, specific procedures, consistent with federal and state regulations must accompany the use of this option.

Within the CLC, Levels 3 and 4 may be implemented with special education services for students with disabilities (SWD). For example, Learning Strategies may be taught intensely by a special education teacher within a special class for SWD (Level 3). However, Levels 3 and 4 may also involve support for struggling students outside of special education. For example, a reading specialist may teach Learning Strategies to small groups of students without disabilities within a special reading class or as part of a Language Arts class in middle school (also Level 3).

An important note is that this discussion regarding special education has focused on the services provided, not the place in which they occur. Special education services can be provided in many different locations, including general education classes. Further, within RTI approaches, it is common for special education teachers to provide intervention in tiers other than those involving special education.

MOVING FORWARD WITH CLC AS RTI

For schools and school districts to move forward in adopting the CLC as an RTI initiative, several considerations are essential, including the unique characteristics of secondary schools, fully leveraging schoolwide resources, building on the existing foundation, ensuring balanced strength within and across RTI tiers (or CLC levels), and amplifying specific CLC elements.

Unique Characteristics of Secondary Schools

Successfully implementing an RTI framework in middle or high school settings is, in part, influenced by the degree to which the unique characteristics of secondary schools are understood and taken into account by practitioners. Among other things, secondary schools are different from their elementary counterparts in terms of mission, how they are organized, and the professional preparation and mindset of their teachers and administrators.

- *Mission of secondary schools*– Secondary schools require students to master increasingly large amounts of content as they progress from 6th through 12th grades. The successful completion of a host of subject-matter courses and the accumulation of required credit hours significantly impacts how instruction is organized, how time is spent, and how priorities are set in secondary schools. Obviously,

the emphasis on subject-matter mastery becomes more dominant as students progress from their early middle school years into high school – but regardless of the grade level, there is an unmistakable shift to a subject-matter orientation. This shift assumes that once students enter middle or high school, they possess the necessary skills and strategies to enable them to navigate the rigorous curriculum demands in subject-matter courses.

• *Definition of core instruction at the secondary level*-As stated previously, literacy has been at the center of efforts at the elementary level to implement RTI. When Tier 1 and "core instruction" is discussed in elementary school, literacy is at the heart of the concern for academic achievement, not necessarily to the exclusion of other areas, but with a decided emphasis especially on reading. However, when secondary educators think of core instruction, they are likely to include math, science, social studies, and language arts or English as essential. Perhaps in middle school in the context of language arts, content literacy is highlighted as part of the core, but in high school, English as a core subject is more about literature than literacy. Literacy is not typically thought of as part of the core of instruction in every subject area. Therefore, for the CLC to be conceptualized as a fitting implementation framework for RTI, secondary educators will have to redefine core instruction to include literacy as part of every academic subject.

• *Organizational structure of secondary schools*–The organizational structure of the vast majority of secondary schools is markedly different from how elementary schools are structured and run. Most secondary schools are organized according to academic departments (e.g., history, science, mathematics, etc.) as opposed to grade-level teams. While this structure facilitates collaboration among professionals in terms of subject-matter issues, it is not conducive to conversations about student performance across content areas and teachers. This lack of opportunity for teachers to collaborate with colleagues from all subject-matter areas greatly hinders the ability of teachers to coordinate their instruction across disciplines. A consequence of this is often a fragmented, uncoordinated instructional plan and learning experience for students. This is especially detrimental to those students who have not acquired the foundational skills and strategies and who need individualized attention.

• *Professional preparation and role*–Most secondary teachers receive their professional preparation primarily in a subject-matter discipline. Relatively little or no attention is given to the acquisition of competencies in how to teach students who lack literacy competencies. As such, secondary teachers see their role as a being a subject-matter expert whose primary responsibility is to ensure that their students will acquire the necessary information in a subject-matter area so students are sufficiently prepared to succeed in subsequent courses in the content area and/or to prepare them with the necessary competencies to successfully pass end of course or state mandated examinations in the subject area. The professional preparation and their perceived role as educators can be potentially problematic when secondary subject-matter teachers are expected to assume some of the responsibilities inherent in RTI systems (e.g., progress monitoring).

• *Size of the achievement gap*–The size of the achievement gap for many struggling adolescent learners is well documented. One of the great challenges in closing this gap is the shortness of instructional time available to teachers. Because of this, it is imperative that the instruction that is provided to these at-risk learners be exceedingly well designed and delivered. One of the most significant things that can be done to ensure the greatest return on instructional investments is to carefully monitor the quality of instruction provided to struggling learners. All successful RTI systems have in place procedures to monitor the fidelity with which evidence-based practices are implemented. In the absence of doing periodic fidelity checks, instructional practices may drift away from preferred protocols and, in turn, have less chance of helping students make the kinds of gains that are needed to close the achievement gap.

These defining attributes of secondary schools can directly or indirectly impact how successfully CLC or any other RTI-like framework can be implemented in secondary schools. Certainly, none of these factors presents an insurmountable barrier to the successful implementation of tiered intervention systems. However, each must be carefully considered when administrators and teachers are evaluating whether or not to adopt and/or implement an RTI approach. Because of these unique characteristics of secondary schools, care will be required to put in place measures that will allow the full benefits of an RTI approach, like CLC, to be fully realized.

Fully Leveraging Schoolwide Resources

Most secondary schools have a broad array of people, programs, and practices designed to support students and to ensure their successful adjustment to and academic success in school. When RTI systems like the CLC are conceptualized for secondary schools, it is important to carefully inventory all of the people, programs, and practices that can be tapped as a part of an overall tiered system of supports. In short, RTI supports should be seen as consisting of *not only* direct instruction in classrooms with evidence-based practices *but also* other assets within the school or district. Some of the *people* with special expertise that can be tapped include instructional coaches, counselors, social workers, speech-language pathologists, school librarians, and community volunteers. Among the *practices* that can be used to advantage are double programming (i.e., two periods of English or math that are designed to assist stu-

dents who need extra instruction to overcome skill deficits), common assessments, rapid-response interventions for at-risk students (i.e., when at-risk students move into a secondary school, their academic and behavioral performance is carefully monitored – interventions are done at the first sign of difficulty to minimize failure and optimize chances of success), and carefully designed transition planning that enables students to move with an important array of supports in place when students move from elementary into middle/junior high school or from middle/junior high school into high school. Among the *programs* that can be leveraged to buoy student performance are before- and after-school and summer tutoring programs, positive behavioral support programs, peer tutoring programs, home-work support programs, online academic programs to supplement face-to-face classes (e.g., AVID), guided study halls, and support group programs (e.g., those that assist teens in dealing with peer and other pressures encountered in secondary schools).

In short, the CLC provides a potentially powerful framework for organizing and coordinating the array of resources, services, and personnel who can be tapped to enhance the successful performance of students. When RTI is conceptualized to include more than academic interventions, it has the potential of facilitating discussions and planning among professionals who, in the past, have lacked a mechanism (or reason) to bring them together. The benefits that can accrue to students (especially those at risk for academic failure) by viewing all resources, services, and expertise in a school within a single framework are obvious.

Building on the Existing Foundation

Schools wishing to embrace CLC as an RTI initiative may be overwhelmed by the prospect if they approach the process as a brand new "thing." It is more helpful, and in fact more accurate, to conceptualize CLC/RTI as a framework for integrating the good things they are already doing to meet students' needs and for guiding improvement efforts (Ehren et al., 2009). Looking at the effective educational practices employed at the school and the productive beliefs upon which the educational approach is based helps set the stage for moving forward with the CLC as an RTI approach. Ehren et al. (2009) identified eight practices and eight beliefs that provide a foundation on which to build an RTI framework.

Practices

1. *Teachers use sound instruction.*
2. *Fidelity of scientifically based methods is ensured.*
3. *Options are offered to meet learning needs.*
4. *A committee or team coordinates supports.*
5. *A data management system exists.*
6. *Data are used to inform instruction and service delivery.*
7. *Teachers, support personnel and administrators work together to meet the learning needs of all students.*
8. *Teachers and administrators participate in ongoing professional development*

Beliefs

1. *All students can learn.*
2. *One size does not fit all in learning.*
3. *Waiting for students to fail is not a good approach.*
4. *Research has value in guiding education.*
5. *Assessment is crucial to instruction.*
6. *Education is a partnership.*
7. *There is no quick fix.*
8. *The system will change only if I change.*

Ensuring Balanced Strength Within and Across RTI Tiers (or CLC Levels)

The common adage "A chain is only as strong as its weakest link" is a potentially useful metaphor when thinking about a tiered intervention system like CLC within a school. In short, if every tier of an RTI system is not solidly conceptualized and implemented with integrity, the system will not realize its full potential to help all students and it may, indeed, ultimately collapse. If a tiered intervention system is graphically represented by links of a chain with each link of the chain representing an instructional tier or level, we can see how the metaphor can be applied by considering three separate scenarios.

Scenario 1: In this scenario, instructional programming is characterized by general education teachers readily "referring students out" of their classes to support services (e.g., special education, Title 1, supplemental reading programs) as a primary means of dealing with academic or behavioral problems. Thus, in this scenario, when limited efforts are made to meet the needs of struggling students within the general education classroom, there tends to be an overreliance on support education services. This overreliance may cause the number of students served by support education (in this case, depicted by the third link in the chain) to grow and for those services to become "oversubscribed" (This scenario is depicted in Figure 5 with the larger sized or stronger link in Tier 3 and the smaller or weaker links in Tiers 1 and 2). However, over time, the quality or effectiveness of services provided in Tier 3 will likely become compromised (because of growing teacher/student ratios, burned out teachers, etc.) and the overall system will begin to fail. Thus, what was at one time a strength (i.e., high-quality services in Tier 3) becomes weakened; additionally, because teachers in the

Figure 5

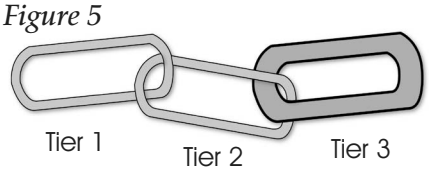


Figure 5a

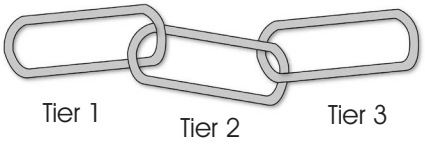


Figure 6

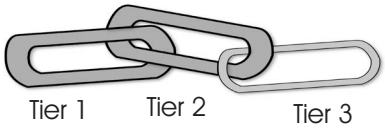
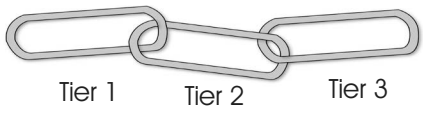


Figure 6a

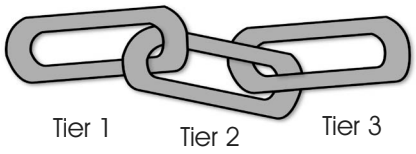


lower Tiers 1 and 2 never built their capacity to provide more intensive and/or individualized instruction to struggling students, all tiers under this scenario gravitate to a state of overall low quality services in which all links of the chain are relatively weak (Figure 5a).

Scenario 2: In this scenario, instructional programming is characterized by general education teachers assuming major responsibility for meeting the needs of struggling learners within their classes. In some instances, these schools/teachers philosophically believe that the primary source of instructional intervention should be designed and provided within the context of the general education classroom. Thus, because limited efforts are made to meet the needs of struggling students with professionals or services outside of the general education classroom, Tier 3 services may be marginalized or seen as not being central to the overall instructional program in the school. In short, there may be an overreliance on the skills and capacity of the general education teacher to meet nearly all of the instructional needs of students who are struggling. Just like in the first scenario, an overreliance may cause the number of students and complexity of the problems presented by those students to overtax or exceed the skills and wherewithal of the general education teacher to adequately meet all of their needs. This scenario is depicted in Figure 6 with the larger sized or stronger links shown in Tiers 1 and 2 and the smaller or weaker link in Tier 3. However, over time, the quality or effectiveness of instruction provided in Tiers 1 and 2 by the general education teacher may become compromised (because of growing teacher/student ratios, increased complexity of student needs that exceed teacher skills, burned out teachers, etc.) and the overall system will begin to lose effectiveness and may ultimately fail. Thus, what was at one time an area of strength (i.e., high-quality, differentiated instruction in Tiers 1 and 2) becomes weakened; additionally, because Tier 3 was somewhat marginalized or undersubscribed and its role was not defined and operationalized as being central to the goal of improving academic outcomes for all students, its capacity was not developed. Over time, there is a risk that all tiers will become weakened and ineffective in providing effective, differentiated instruction to students by teachers with varying skill sets (see Figure 6a).

Scenario 3: In this, the ideal scenario, there is recognition that each tier or level in an RTI system (like the CLC) represents a vitally important and unique component of instructional options for students. Each tier is differentiated from the other tiers by (1) what is taught; (2) how instruction is provided; and (3) the role that the teacher plays. Additionally, specific steps are taken to ensure close collaboration across the tiers (or levels). Unless steps are taken to ensure coordination across the tiers (or levels), it is likely that a system of silos will evolve in which the planning and instruction deal only with what is occurring within one level of instruction without attention being given to the larger picture and how all components of the system can be effectively leveraged to improve student achievement. Because of the diverse and complex needs of students, an effective RTI system like CLC requires distinctly unique instruction or intervention at each tier. The skill sets of the teachers are, by definition, also unique and important to the overall effectiveness of the system. If one component fails to do its part, it puts undue pressure and burden on the other tiers. This eventually leads to overtaxing and breakdown in the system. In short, CLC, like a successful RTI program, requires integrity within and across each of the tiers. Each needs to a strong link in the chain in order for the overall chain (or RTI system) to be strong (see Figure 7).

Figure 7



Like any improvement effort in education, it is unrealistic to think that a full-blown CLC framework can be put in place over night. Our experience tells us that successful implementation of CLC takes time. Plans should be made to phase in different instructional levels over several years. There is not necessarily a best place to begin when establishing a tiered intervention framework. Some schools choose to build on an area of strength as a point of departure, whereas others choose to focus on an area of greatest need. For example, if a school has a well-established supplemental reading program in place that might serve as an anchor for Level 3 services, a logical expansion strategy might be to focus on ways to bridge the specific reading strategies taught in Level 3 into instruction that is being done in the general education classroom. By doing so, the successful transfer and application of those strategies in subject-matter materials will be facilitated. On the other hand, if a school is especially concerned about the poor performance of some of its subgroups in meeting AYP and that opportunities for these students to receive explicit, intensive instruction are lacking (hence, a weakness), it may choose, as a point of departure, to focus its energies on building or bolstering intensive, clinical-type instructional options for students.

Amplifying Specific CLC Elements

As described earlier in this paper, there is a great deal of congruence between the structure and operation of most RTI systems and the CLC framework. There are, however, some areas in the existing CLC framework that require additional development or amplification to make it a fully functioning RTI system. Four areas are highlighted below:

- *Universal screening*–Although the CLC has consistently included processes to identify students with reading difficulties, screening for a wider range of literacy problems, including writing, has been more problematic. In a comprehensive approach to literacy as it relates to improved academic achievement, all important literacy areas will have to be addressed. Further, screening for more general behavioral problems that may affect literacy performance, among other areas, may be important to consider.
- *Progress monitoring*–One of the hallmarks of any RTI system is the presence of effective progress monitoring protocols. Given the breadth of subject-matter courses that must be considered and the great variance in academic performance among adolescents, an array of progress monitoring tools needs to be developed for practitioners. While some of these measures exist for the CLC, additional ones need to be developed and field-tested.
- *Decision-making teams*–Another hallmark of any effective RTI system is the operation of well-functioning decision-making teams. Among the functions performed by these teams are the following: (a) review of student data, (b) targeting areas of instructional focus, (c) directing staff development efforts to improve instructional effectiveness of teachers working at different levels of the continuum, (d) recommending instructional intervention targets, (e) reviewing effects of implementing new interventions, (f) reviewing data on individual students and recommending instructional solutions. The work of decision-making teams in RTI systems at the elementary level has been become quite sophisticated during the past decade. While there are similarities in how these teams can operate in secondary settings, some of the unique features of secondary schools (e.g., the departmental rather than grade-level focus, the scheduling complexities of large secondary schools to build team meetings into the schedule, etc.) will necessitate some modifications in the ways these teams are structured and function within the context of secondary schools.
- *Fluidity of movement between and among tiers*–Successful RTI systems provide fluid movement between instructional tiers. That is, students can readily move from Tier 1 instruction to Tier 2 and so on. This movement occurs when student progress and academic need calls for a different instructional focus. In many elementary applications of RTI systems, fluid movement from one tier to the next (forward or backward) has been clearly demonstrated. Achieving fluid movement in secondary schools is significantly more challenging because of the period structure (that is, students have a different teacher every period of the day unlike elementary school where students typically have one teacher) and students typically change teachers and classes at the end of semesters only. Achieving sufficient flexibility in grades 6 through 12 so students can move with ease from one tier (or level) of instruction to another in a seamless manner will require creative planning and strong leadership. This fluid movement only happens when teachers and administrators have a clear understanding of how important it is for students to move from one tier (or level) to another *and* there are structures in place to support fluid movement (e.g., an active literacy leadership team that frequently monitors student performance on key skill/strategy indicators and makes placement decisions accordingly). Other structures/mechanisms that facilitate fluid movement are protocols for observing, analyzing, and dialoguing about students and the instruction that they need. Finally, in a growing number of secondary schools, speech-language pathologists (SLPs) have been very effective in facilitating communication of professionals across levels in the CLC. SLPs have used their expertise in language to help teachers at all CLC levels to view instruction through a "language lens," thus creating a common denominator for making instructional decisions about students. Through this process, SLPs can orchestrate the transition of students across levels.

CONCLUSION

The intent of this paper was to discuss the CLC as a framework for conceptualizing and implementing RTI at the secondary level. Our experiences with secondary schools implementing CLC and with others seeking to put an RTI system in place have prompted the articulation of the link between the two constructs. After careful analysis, it is our belief that the CLC offers an excellent RTI implementation framework to secondary schools interested in addressing literacy in the context of improved academic achievement as a schoolwide effort. It is also important to note that other school improvement targets, for example behavioral issues, need not be abandoned in the adoption of the CLC and that CLC implementation can be accomplished within a general problem-solving approach to RTI. However, as discussed in this paper, a few components may need amplification for the CLC to become a comprehensive RTI system: Universal screening will have to address all the important aspects of literacy, including writing; schools will have

to develop a broader approach to progress monitoring; they will have to pay closer attention to the scope and function of decision-making teams; although fluid movement across levels has always been an important component of the CLC, for RTI to work, greater attention to this aspect is needed.

As with any schoolwide initiative, utilizing the CLC as an RTI framework requires sustained effort over time. It will not happen overnight. The adoption process for the CLC, already developed, provides a concrete structure with a track record for middle, junior and high schools wishing to engage in RTI.

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DRAFT

Adolescent Struggling Readers in Urban Schools: Results of a Latent Class Analysis of Critical Reading Component Skills

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February 2, 2009
The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education by grant R305G04011 to The University of Kansas Center for Research on Learning. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

ABSTRACT

What is know about the various subtypes of Adolescent Struggling Readers (ASRs), especially those in urban secondary schools, is largely lacking scientific foundation. Given the limited nature of the research on the reading skill profile and the non-existence of research that examines the heterogeneous nature of subgroup clusters of adolescent struggling readers in urban schools, our goal was to identify unique clusters of ASRs and examine the reading skill profiles each cluster presented. We used Latent Class Analysis to identify and describe the reading component skill profile of homogeneous sub-groups of ASRs. The two main questions we addressed were: (1) Using multiple measures of reading comprehension, do adolescents entering high school exhibit empirically different levels of comprehension achievement? and (2) Do such adolescents with below-average comprehension exhibit differentiated profiles of component reading skills (e.g., vocabulary, word reading)? In our analysis, five distinct profiles of component skills were found among below-average comprehenders. These results suggest that a great deal of heterogeneity in strengths and weaknesses of component reading skills exists within the ASR group. Such heterogeneity implies the need for diagnostic assessment and differentiated intervention for students not meeting state standards.

Recently, a great deal of attention has been focused on adolescent literacy, particularly as it relates to reading proficiency (Biancarosa & Snow, 2004; IRA, 2006; National Center for Educational Statistics, 2004). While this tread is welcome by those involved in the study of adolescent literacy, what is know about the nature of the reading challenges faced by Adolescent Struggling Readers (ASRs), especially those in urban schools, is largely lacking scientific foundation. That is, evidence that describes the reading skill profile of ASRs and that further identifies statistically unique sub-types of struggling readers is limited. This limitation presents a serious challenge for those designing interventions intended to have a significant impact on the achievement performance of ASRs. In this study, we use Latent Class Analysis to identify and describe the reading component skill profile of homogeneous sub-groups of ASRs.

The Challenge

The magnitude of challenges facing adolescents, especially those who attend poor, urban high schools, is striking. For example, in

some of the largest urban school districts, nearly 65% of all adolescents read below the "satisfactory" level on state reading assessments (Council of Great City Schools, 2001). Additionally, these students are unable to understand and respond to the complex literacy demands of secondary school subject-matter courses (Hock et al., 2009; Lee, Grigg, & Donahue, 2007). The reading achievement scores for adolescents who struggle with learning have remained virtually unchanged for the last 30 years. For example, reading achievement scores for 17-year-olds have reached a plateau with 70% of the students at the Basic or Below Basic level and unable to understand complex material written at grade level (Lee, Grigg, & Donahue, 2007). Collectively, these data are being characterized as one of the most pressing crises facing the educational system in the U.S. (Deshler, 2006).

A variety of factors have contributed to the literacy crisis confronting large portions of our high school populations. One of the most important is the ineffectiveness of instruction that is provided to many adolescents who struggle with reading (Kamil, 2003). While there are some adolescents who leave elementary grades as virtual non-readers or who are severely word-recognition deficient, the largest group of adolescent struggling readers (ASRs) are those who have acquired some, but not sufficient, reading skills to enable them to escape the "fourth-grade slump" (Chall, 1983). Specifically, nearly 65% of ASRs in poor urban settings fall between the 5th and the 30th percentile in reading performance (Council of Great City Schools, 2001; Curtis, 2002). That is, they generally have some decoding skills, but not at a level that enables them to deal fluently with subject-matter reading demands. In addition, they lack the required skills and strategies to meet comprehension expectations.

Contributing to the lack of achievement by adolescent struggling readers and their continued poor performance on measures of literacy may be a limited understanding of the component reading skill profile of this heterogeneous population. If literacy instruction is not aligned with knowledge of reading component skill needs and their unique profile, the academic literacy gap experienced by ASRs may continue. Thus, knowledge of the unique needs of subgroups within the general category of ASR may help inform instruction that addresses the specific needs of struggling readers.

Theoretical Underpinnings

The ultimate goal of our study was to identify specific clusters of ASRs and the unique reading component skill profiles they present. We framed our analysis of the data on an overarching view of reading comprehension as described by the National Reading Panel (NRP, 2000), as well as specific theory about essential reading components and processes.

The Simple View of Reading proposes that reading comprehension is a product of word recognition and linguistic comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). This view does not deny the complexities of reading, but rather divides them into two components. The word recognition component is responsible for translating print into language, and the comprehension component makes sense of this linguistic information. Both of these theoretical components are essential to developing fluent and effective reading comprehension but neither is sufficient on its own.

The Simple View of Reading requires both bottom-up and top-down processes. These processes are not always sequential but rather occur simultaneously and in relationship to each other. If one component is weak, then efficient and effective comprehension is difficult. For example, if word recognition accuracy is poor and effortful, comprehension of text will be limited, as most cognitive energy will be required to make sense of words in text (e.g., Adams, 1990; Ehri, 1998; LaBerge & Samuels, 1974; Perfetti, Marron, & Foltz, 1996; Torgesen, 1999; Torgesen, Wagner, & Rashotte, 1994). Similarly, if linguistic or language comprehension is limited, even though words can be read accurately and with acceptable pace, understanding of text may be limited due to vocabulary, semantics, lack of prior knowledge, or text structure knowledge deficits (e.g., Catts, Fey, Zhang, & Tomblin, 1999; Catts & Hogan, 2002; Kintsch, 1998; McCardle, Scarborough, & Catts, 2001). Numerous studies have been conducted to demonstrate the effects of each of the components described above (e.g., Foorman, Francis, Fletcher, Schatschneider, & Metha, 1998; Rashotte, MacPhee, & Torgesen, 2001; Torgesen, et al., 2001). The results of such studies show that each component is necessary for proficient reading comprehension and that neither is independently sufficient for comprehension.

Previous Descriptive Studies

Previous descriptive studies have been conducted with younger adolescents in order to describe the reading skill profile of struggling readers. These studies have added to our understanding of the reading skills of younger adolescent readers. However, the data are sometimes limited and contradictory and, therefore, would benefit from additional research.

Foundational Studies with Children. There have been numerous descriptive studies on the reading skill profiles of children. Here we review one example to help establish a foundation for studies with older populations. Konold, Juel, McKinnon, & Deffes (2003) conducted a multivariate analysis of early reading skill acquisition of students five to ten years of age. The researchers analyzed a large subset (n= 1,604) of the standardization sample for the Woodcock Diagnostic Reading battery (Woodcock, 1997). In the descriptive analysis, they identified six statistically significant and homogeneous core profiles. They found that there was

a developmental shift in skills and abilities that influence reading proficiency with strength in phonological processing outweighing other strengths at age five. They also found that strengths in comprehension knowledge and short-term memory were of greater importance in reading proficiency for ten year-olds. Thus, while overall reading skill profiles were stable and somewhat flat for all readers in all six groups, overall ability mediated reading success and distinguished reading subtypes. The authors suggested that there were multiple paths to reading proficiency.

Younger Adolescents. In order to more accurately describe the reading skills of students who struggled with a state reading assessment, 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. 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. Further, 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.

In another descriptive study, 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. One study followed a sample of struggling readers from 2nd grade through 8th grade. 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%); (c) mixed RD or students with deficits in both word recognition and listening comprehension (36%); and (c) specific comprehension deficit 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 student 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.

Adults. Sabatini (2002) extended the body of descriptive research by examining the impact of rate/speed on reading proficiency in adult struggling readers. While this study focuses on key reading and ability elements (rate or speed of processing) with a somewhat older population, the study does offer a profile of the reading component skills by examining how comprehension, word-level skills, and basic processing speed vary across word recognition skill levels in adult proficient and struggling readers, due in part to overall ability. Adult readers in the study presented significantly different profiles in terms of reading ability. Specifically, the high proficient group possessed efficient word-level skills; the average group demonstrated adequate word level skills, but they were not automatic in their use; and the low group struggled with accuracy in word-level reading and efficiency in reading rate. A key mediator of reading proficiency seemed to be related to processing speed and general ability, especially for the lower reading groups. Thus, adult struggling readers present heterogeneous reading profiles and may require differentiated instruction in multiple reading skills if they are to address problems of accuracy of reading performance.

When taken together, these studies represent 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) found only 9% of the population to have reading deficits in word identification. In contrast, Catts et al. (2005) and Leach et al. (2003) found between 49% and 67%, respectively, of the struggling reader group to demonstrate deficits in word identification and comprehension. Thus, the literature on the reading skill component profile of this population is limited.

Research Questions

While research studies during the past decade have added to our understanding of the reading profiles of struggling adolescent learners, collectively they have fallen short of providing us with sufficient information that enables researchers or practitioners from differentiating various subgroups of learners among this larger group of underachievers. In the absence of reliably defined subgroups, intervention work is adversely affected. That is, in light of the size of the achievement gap that many struggling adolescent learners face and the shortness of instructional time available to teachers, it is imperative that the instruction provided to these at-risk learners be exceedingly well designed and delivered. A prerequisite to designing effective interventions is a clear understanding of the defining characteristics of the learners who will be the target of the interventions. Hence, an overriding purpose of this study has been to differentiate various subgroups of struggling adolescent learners through an in-depth analysis of a carefully selected sample of ninth-grade students. With this information, it is possible to better tailor interventions to meet the unique instructional needs of different subgroups of students. In the absence of these data, the probability of producing large achievement gains for the majority of struggling adolescent learners is considerably reduced. Additionally, as a clearer understanding of the exact makeup of the population of struggling adolescent readers emerges, policy makers will have the kind of information that is necessary to drive appropriate local, state, and federal policies relative to teacher certification standards, school restructuring, and research investments.

Given the limited nature of the extant research on the reading skill profile and the non existence of research that examines the heterogeneous nature of subgroup clusters of adolescent struggling readers in urban schools, our goal was to identify unique clusters of ASRs and examine the reading skill profiles each cluster presented. The two main questions we addressed were: (1) Using multiple measures of reading comprehension, do adolescents entering high school exhibit empirically different levels of comprehension achievement? and (2) Do such adolescents with below-average comprehension exhibit differentiated profiles of component reading skills (e.g., vocabulary, word reading)?

METHOD

Overall Sampling Plan

The overall sampling plan was to recruit at least 60 students in each of the five categories of the Kansas Reading Assessment (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 (Kansas Department of Education,

2005). 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.

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.

We were able to obtain data on 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-grade year 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).

Those who scored at or below the 40th percentile using the mean percentile scores for total reading of the GORT-IV and the Woodcock Reading Proficiency Battery were defined as struggling readers, whereas those who scored above the 40th percentile were defined as proficient readers. The overall 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. Using 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 to it.

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 female. 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 the time of the assessment.

Sampling Plan for the Latent Class Analysis

The original stratified sampling plan included a number of participants in each of the five achievement levels on the Kansas Reading Assessment. Specifically, a minimum of 60 students were recruited to participate from each level. This approach has the advantage of maximizing statistical power for the full range of achievement and increasing the precision with which we can estimate population means and detect differences between profiles across the entire range of the achievement distribution. Without such a sampling plan, it is possible that we would have lacked sufficient power to detect profiles that are less common in the population of adolescent readers or to differentiate between somewhat similar skill profiles. The disadvantage of this approach is that it somewhat limits our ability to make generalizations about the prevalence of particular skill profiles in the population. We are limited to making inferences about prevalence within the levels of the variable used to stratify, thus we only discuss prevalence below in relation to models that included the KRA as a predictor or component of a composite used as a predictor.

Analytic Sample

We restricted the original sample of 345 students to the 319 students with complete data on all measures. As a result, each achievement level had a minimum of 55 students. Excluded students were not significantly different from included students on a range of demographic indicators. A demographic summary of the sample is in Table 1.

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 the Simple View of Reading 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 Identi-

Table 1.
Demographic summary of the participating students (n=319).

Demographic characteristic		Percent
Female		45.8%
Urban		81.5%
Free/Reduced-price Lunch		51.1%
Special Education (IEP)		9.1%
Race		
	Asian	2.5%
	Black	51.1%
	Hispanic	15.7%
	White	29.2%
	Other	1.5%
Language background		
	English-only at home	79.0%
	ELL	5.3%

fication 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 exceeded .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 documented the time in seconds required to read the passage, the total number of reading errors, and responses to comprehension questions. The GORT-4 rate and accuracy subtest scores are summed to provide an overall reading fluency score. Split-half reliability was .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 participated 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. Each completed student record book was assigned an ID number and identities were masked. A completion check was then 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 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.

Data Analysis

Latent Class Analysis (LCA) was used to describe empirically reading comprehension achievement levels within the sample, as well as the component skill profiles of below average comprehenders. A variation on cluster analysis, LCA is a multivariate method that groups individuals based on multiple measures, such that individuals within groups present homogeneous profiles (Lubke & Muthén, 2005). LCA uses maximum likelihood estimation to fit a hypothesized model in which membership in a specified number of unobserved (or latent) classes is related to performance on the included measures. The model-fitting process begins with a one-class model to which additional classes are added one at a time, and statistical tests are conducted at each step to determine if the additional class significantly improves the goodness of fit of the model. Unlike other cluster analysis methods, it allows for statistical inferences to be made about heterogeneity in the population of interest, and it yields fitted probabilities of class membership (that are analogous to the fitted probabilities estimated in multinomial logistic regression). LCA also has an advantage over non-parametric cluster analysis method in that it allows for statistical tests of whether substantive variables predict class membership, a technique which was used in the current study to investigate whether comprehension level predicted component skill profile. It is worth noting that although some LCA models invoke an assumption of conditional independence of indicators, such that the multiple measures are assumed to be uncorrelated within each latent class, this assumption can be relaxed (as in the models fitted below) when there are theoretical reasons to consider specific indicators to be correlated within class.

RESULTS

Levels of Reading Comprehension Achievement

In answer to our first research question, adolescents did indeed present at least four empirically different levels of reading comprehension. A sequence of LCA models fitted with increasing numbers of latent classes indicated several qualitatively different levels of reading comprehension achievement, based on students' performance on the three measures of reading comprehension. In each model, the three measures were allowed to correlate within class, thus relaxing the assumption of conditional independence; this decision has theoretical support in that the three measures would be expected to correlate even after partially out class membership (as well as empirical support based on the residual covariances from models that did not include these correlations). Table 2 provides the goodness-of-fit statistics for the two-class, three-class, four-class, and five-class models.

The four-class solution indicating four levels of reading comprehension was chosen, based on

Table 2.
Goodness of Fit Statistics, Results of Bootstrapped Log-likelihood Ratio Test, and Estimates of Within-Class Correlations for Latent Class Analysis Describing Levels of Reading Comprehension Achievement (n = 319)

	2-Class Solution	3-Class Solution	4-Class Solution	5-Class Solution
-2LL	6010.312	5961.574	5932.512	5914.52
AIC	6036.312	5995.574	5974.513	5964.520
BIC	6085.219	6059.529	6053.516	6058.572
Entropy	0.851	0.762	0.795	0.801
Δ-2LL (Δ df = 4)	49.154***	48.738***	29.061***	17.993***
Within-Class Correlations				
GORT with WLPB-R	.57	.49	.49	.41
KRAS with WLPB-R	.53	.41	.24	.30
KRAS with GORT	.50	.25	.19	.19

several goodness-of-fit statistics as well as substantive concerns about whether additional classes reveal interesting and theoretically interpretable sub-populations, as recommended by Lubke and Muthén (2005). In particular, we found that the addition of a third and fourth class each yielded a statistically significant improvement in the model fit (Δ-2LL = 48.738; Δdf = 4; $p < .0001$ and Δ-2LL = 29.061; Δdf = 4; $p < .0001$, respectively), as indicated by the bootstrap Likelihood Ratio Test.[1] The addition of a fifth class also led to a statistically significant improvement in the model fit (Δ-2LL = 17.993; Δdf = 4; $p < .0001$), however the fifth class was quite small (less than 2% of the sample) and difficult to interpret as a meaningfully distinct group of students.

The four classes displayed ordinal differences in reading comprehension achievement. Table 3 displays the predicted mean of each class on the observed measures, corresponding standard errors, and the proportion[2] and number of students in the sample classified into each class. In order from lowest to highest performance on all three measures, the groups were designated as Struggling Comprehenders, Low Average Comprehenders, Average Comprehenders, and Advanced Comprehenders. As shown in Table 3, each successive class demonstrates mean scores that are higher than the previous class on all three measures with typical differences between adjacent classes of roughly half a standard deviation (7.5 standard score points on the GORT and WLPB-R or approximately .7 achievement levels on the KRA).

Interestingly, there were some differences in the degree to which the three measures differentiated between comprehender classes, as evidenced by the differences in predicted mean scores in adjacent classes on each measure. For instance, the WLPB-R scores differentiated the higher two classes from one another very well (as evidenced by their 29 standard score point difference) and differentiated the lower two classes well (as evidenced by their nearly 11 standard score point difference), however this measure did not differentiate between the low average and average comprehenders. The 2.34 standard score point fitted difference between these latter two classes is not statistically significant. Similarly, the KRA differentiated the lower three comprehender classes well (as evidenced by differences of more than 1 achievement level) but did not differentiate between the average and advanced comprehenders. The .17 levels difference between these classes is not statistically significant. The GORT reading comprehension scores differentiated between adjacent classes more or less consistently across the four classes. The degree to which

1 The bootstrapped Likelihood Ratio Test has been shown in Monte Carlo simulations to be the most consistent indicator of the number of classes among currently-used indices (Nyland, Asparouhov, & Muthén, 2007)

2 As noted in the Method section above, the stratified sampling plan prevents us from making generalizations about the prevalence of these four classes in the broader population of adolescent readers. Thus, these proportions should not be interpreted as the proportion of adolescent readers in the population performing at each level of reading comprehension, but solely as the proportion of our sample classified into each latent class. Making broader generalizations about prevalence would require a simple random sample of adolescent readers or analytic techniques (e.g., weighting) that are beyond the scope of the current research questions and analyses.

Table 3.
Estimated Means on Reading Comprehension Measures for each Latent Class with Corresponding Standard Errors, based on Four-Class Model Describing Levels of Reading Comprehension Achievement (n = 319)

	Struggling Comprehenders	*Low Average Comprehenders*	*Average Comprehenders*	*Advanced Comprehenders*
GORT (Standard Scores)	80.61 (1.10)	87.91 (1.70)	98.27 (2.02)	109.55 (2.41)
WLPB-R (Standard Scores)	86.34 (1.02)	97.21 (1.36)	99.55 (2.35)	128.52 (2.75)
KRA (Achievement Levels)	1.53 (0.06)	2.95 (0.05)	4.43 (0.09)	4.60 (0.11)
Proportion of Sample Classified	.38	.23	.23	.16
n Classified	121	74	72	51

each of the three measures differentiated particular levels of readers differently does not reduce the trustworthiness of the classification of readers into these four levels. Rather, it indicates that none of the individual measures of reading comprehension could provide the same precision and reliability of classification across the range of achievement as a composite classification utilizing information from all three measures. The four latent classes described provide one such composite classification.

Profiles of Below Average Comprehenders

Next, we examined the component skill profiles of students within the low average and struggling comprehender classes to address our second question and identified five distinct skill profiles. In so doing, we fitted sets of LCA models with increasing numbers of latent classes based on students' performance on the nine measures of component reading skills (GORT rate and accuracy; TOWRE sight word efficiency and phonemic decoding efficiency; PPVT vocabulary; and WLPB-R listening comprehension, letter-word identification, word attack, and reading vocabulary). We fitted models to both the combined sub-sample of Struggling and Low Average Comprehenders, the combination of which we refer to as Below Average Comprehenders, and to each of these two sub-samples separately. We report here the results for the combined sample because the resulting skill profiles for the two separate sub-samples were also found to be represented in the combined sample.

Results indicated substantial heterogeneity within the population of below average comprehenders. Table 4 provides the goodness-of-fit statistics for the three-class, four-class, five-class, and six-class models, as well as the estimated within-class correlations fitted for selected measures. The five-class solution was chosen, based as above on several goodness-of-fit statistics as well as substantive concerns. In particular, we found that the addition of a fourth and fifth class each yielded a statistically significant improvement in the model fit (Δ-2LL =53.8; Δdf = 10; $p < .0001$ and Δ-2LL = 68.1; Δdf =10; $p < .0001$, respectively), as indicated by the bootstrap Likelihood Ratio Test. The addition of a sixth class also led to a statistically significant improvement in the model fit (Δ-2LL =59.2; Δdf =10; $p < .0001$), and although the sixth class essentially split the fifth class, it made both classes quite small (only 10 and 7 students respectively). In addition, the sixth class was difficult to interpret theoretically or practically. In each model, the assumption of conditional independence of indicators was relaxed for the eight pairs of measures listed in Table 4. Including each of these within-class correlations had both a theoretical justification and improved the goodness-of-fit of the model, as evidenced by a series of Likelihood Ratio Tests (all p's < .05).

Table 5 presents the fitted means and corresponding standard errors on the nine component reading skill measures for each of the five latent classes of below average comprehenders, and Figure 1 displays the fitted mean for each class on the measures. The five classes were found to be somewhat ordinal in the severity and multiplicity of their weaknesses, however their skill profiles were not strictly parallel; that is, while some classes differed only in their levels of performance across all the indicators, some showed unique strengths and weaknesses not observable in the other classes. The five classes are listed here and in Table 5 in order from most to least severe weaknesses.

The class that performed lowest on all measures was designated as Readers with Severe Global Weaknesses. This class demonstrated

Table 4.
Goodness of Fit Statistics and Results of Bootstrapped Log-likelihood Ratio Test for Latent Class Analysis Describing Skill Profiles of Below-Average Comprehenders (n = 195)

		3-Class Solution	4-Class Solution	5-Class Solution	6-Class Solution
Goodness-of-Fit Statistics					
	-2LL	12796.534	12742.778	12674.654	12615.500
	AIC	12890.534	12856.778	12808.655	12769.500
	BIC	13044.365	13043.339	13.027.946	13021.521
	Entropy	0.875	0.806	0.837	0.862
	Δ-2LL (Δ df = 10)	121.082***	53.756***	68.124***	59.154***
Within-Class Correlations					
	GORT Rate with GORT Accuracy	.40	.37	.37	.39
	GORT Rate with SWE	.41	.44	.55	.51
	PDE with WA	.51	.51	.51	.54
	SWE with LWID	.22	.22	.25	.29
	SWE with PDE	.46	.45	.43	.44
	SWE with WA	.21	.22	.22	.24
	PPVT with RV	.47	.38	.38	.30
	LWID with PDE	.39	.37	.39	.43
	WA with LWI	.51	.49	.50	.48

*** p < .0001

skills that were more than one standard deviation below national norms on all measures and were more than two standard deviations below national norms on GORT passage accuracy, phonemic decoding efficiency, and word attack. The next class was designated Readers with Moderate Global Weaknesses; like the class of Readers with Severe Global Weaknesses, this class demonstrated below average performance on all measures, though to a lesser degree, typically performing a standard deviation below national norms. Although the Readers with Severe Global Weaknesses had significantly lower performance than the Readers with Moderate Global Weaknesses on the word reading accuracy and fluency measures, the two classes had equally low performance on the vocabulary and listening comprehension measures (the apparent differences between the two classes' estimated means on these measures were not statistically significant). It is also worth noting that both classes demonstrated relative weaknesses on tasks involving decoding of pseudo-words (word attack and phonemic decoding efficiency) compared to their performance on tasks involving sight words (letter-word identification and sight word efficiency), suggesting that they may over-rely on knowledge of known words rather than automatized decoding skill while reading. Together these two classes present difficulties in multiple component skills.

Three latent classes presented more specific and distinguishable areas of strengths and weaknesses, as well as generally higher levels of performance. The third class, designated Dysfluent Readers, demonstrated language comprehension and word reading accuracy skills in the average range but fluency skills (at both the word and passage levels) that were below average. Alternately, the class designated Weak Language Comprehenders demonstrated word reading accuracy and fluency skills in the average range, but a relative weakness in listening comprehension. The final class, designated as Weak Reading Comprehenders, demonstrated component reading skills that were all in the average range, indicating that their specific weaknesses lie primarily in the reading comprehension tasks themselves. It is probable that students in this class demonstrate weaknesses in skills not assessed in this battery of component

Table 5.
Estimated Means and Standard Errors on Component Reading Skills, Based on Four-Class Latent Class Model Describing Below-Average Comprehenders, with Areas of Relative Weakness in Bold (n=195)

	Severe Global Weaknesses	*Moderate Global Weaknesses*	*Dysfluent Readers*	*Weak Language Comprehenders*	*Weak Reading Comprehenders*
GORT					
Rate	**71.61** (3.17)	**81.78** (1.15)	**84.98** (1.13)	99.64 (1.30)	112.43 (2.33)
Accuracy	**65.27 (3.39)**	**80.36** (2.02)	**84.96** (1.32)	105.38 (2.30)	106.68 (3.27)
TOWRE					
sight word efficiency	**77.87** (3.54)	**88.58** (1.31)	**89.21** (1.20)	100.24 (1.60)	98.02 (3.09)
phonemic decoding efficiency	**66.00 (2.77)**	**83.63** (3.20)	**86.58** (1.59)	99.29 (2.33)	100.79 (2.47)
PPVT	**78.74** (2.16)	**80.06** (2.45)	93.76 (1.73)	99.71 (1.64)	98.82 (3.44)
WLPB					
listening	**77.80** (2.44)	**78.15** (2.60)	97.30 (3.00)	**92.55 (3.60)**	104.47 (4.06)
letter-word identification	**76.97** (3.51)	**88.73** (1.67)	96.07 (1.57)	106.38 (1.78)	110.45 (3.02)
word attack	**67.10 (4.89)**	**85.66** (3.47)	94.00 (2.53)	114.29 (3.10)	112.90 (3.21)
reading vocabulary	**79.44** (1.83)	**84.48** (1.84)	95.59 (2.14)	100.27 (2.33)	100.11 (2.71)
Fitted Probability of Classification	.15	.35	.30	.11	.10
Proportion of Below-Average Sample Classified	.14	.36	.29	.11	.10
N of Sample Classified	28	71	57	21	18

skills, including potential difficulties with strategic processing of extended text, limited experience with particular genres of texts, or limitations in background knowledge necessary for comprehension of the passages on the reading comprehension measures. It is also worth noting that the Weak Reading Comprehenders demonstrated well above-average passage reading rates that were more than two-thirds higher than national norms and significantly higher than any other class of below-average comprehenders, including the Weak Language Comprehenders. The extremely high reading rate of Weak Reading Comprehenders suggests an additional hypothesis: they may be reading through text at a speed that is not conducive to strategic comprehension.

To explore the extent to which these five skill profiles are truly specific to Struggling Comprehenders or Low Average Comprehenders, we investigated whether students' classification into one of the five skill profiles differed as a function of their comprehender class (struggling vs. low), as determined by the first set of LCA models described above. An additional five-class LCA model was fitted that included students' comprehender class as a dichotomous predictor of skill profile class and compared this to a model in which comprehender class was unrelated to skill profile class. A log-likelihood ratio test confirmed that comprehender class did indeed significantly predict membership in skill profile class (Δ-2LL = 70.562; Δdf = 4; $p < .0001$), indicating that the differences in the distributions of Low Average and Struggling Comprehenders assigned to

the five skill profiles was statistically significant.

To provide insight into the relationship between comprehension level and component skill profile, Table 6 displays the number and percentage of Low Average and Struggling Comprehenders in the sample who fell into each of the skill profile classes. As the table demonstrates, the most prevalent profile among Struggling Comprehenders was the Readers with Moderate Global Weaknesses profile: about half (49.6%) fell into this profile. Despite nearly equal numbers of students from the two classes of comprehenders, the Dysfluent Readers profile was the most prevalent profile among Low Average Comprehenders (40.5%) but was only a distant second in prevalence among Struggling Comprehenders (22.3%).[3] Interestingly, a single class of comprehenders predominated in each of two of the skill profiles. Specifically, Readers with Severe Global Weaknesses were comprised almost exclusively of Struggling Comprehenders, whereas Weak Reading Comprehenders were comprised almost exclusively as Low Average Comprehenders.

As noted in the Method section, we cannot make generalizations about the overall prevalence of these classes in the population; however, we can generalize about the prevalence of the classes within each of the KRA achievement levels. As is clear from Table 7, students scoring Proficient or below on the KRA can appear in any of the Below Average Comprehender classes, with the only exception being that no students scoring Unsatisfactory on the KRA could be classified as Weak Reading Comprehenders. Despite the pervasiveness of all the classes within each achievement level, some classes were more common than specific levels. For example, students scoring at KRA level 1 (unsatisfactory) were much more likely to fit the Severe or Moderate Global Weaknesses classes than the others (34% and 53% respectively), while students scoring at KRA lev-

Table 6.
Percentage of Below-Average Comprehenders by Comprehender Class (Low Average vs. Struggling) and Component Skill Profile, with Number of Students in Parentheses and Areas of Relative Prevalence in Bold (n=195)

	Comprehender Class	
Component Skill Profile	Low Average	Struggling
Readers with Global Weaknesses	4.1% (3)	20.7% (25)
Sight Word Readers	14.9% (11)	49.6% (60)
Dysfluent Readers	40.5% (30)	22.3% (27)
Weak Language Comprehenders	18.9% (14)	5.8% (7)
Weak Reading Comprehenders	21.6% (16)	1.7% (2)

Table 7.
Proportions of Profiles of Below Average Comprehenders by Kansas Reading Achievement Levels (n=195).

	Below Average Comprehender Profile					
KRA level	*Severe Global Weaknesses*	*Moderate Global Weaknesses*	*Dysfluent Readers*	*Weak Language Comprehenders*	*Weak Reading Comprehenders*	*Total*
1	18	28	6	1	0	53
2	7	32	21	6	2	68
3	3	11	30	14	16	74
Total	28	71	57	21	18	

3 Despite our inability to make generalizations about prevalence in the overall population of readers, we are able to make generalizations about the prevalence of skill profiles within each comprehender class. Because the variable used to stratify the sample, the Kansas Reading Assessment scores, was included as an indicator of comprehender class, the estimates of prevalence of component skill profiles within comprehender class provided here take into account the stratification of the sample. One way of understanding this is to think of each of the comprehender classes as representative of a specific population to which we can generalize our findings concerning the prevalence of component skill profile.

el 2 (basic) were more likely to fit the Moderate Global Weaknesses or Dysfluent Readers classes (47% and 31% respectively). KRA level 3 students, deemed "proficient" by Kansas standards, most often fit the Dysfluent Readers class (41%), but just as many level 3 students were split between the Weak Language and Weak Reading Comprehender classes (19% and 22% respectively). However, it should be noted that more than 10% of the KRA level 2 students also fit these two profiles, demonstrating relative strength in most component skills. These results suggest that a great deal of heterogeneity in strengths and weaknesses of component reading skills exists at all three of these KRA achievement levels.

DISCUSSION

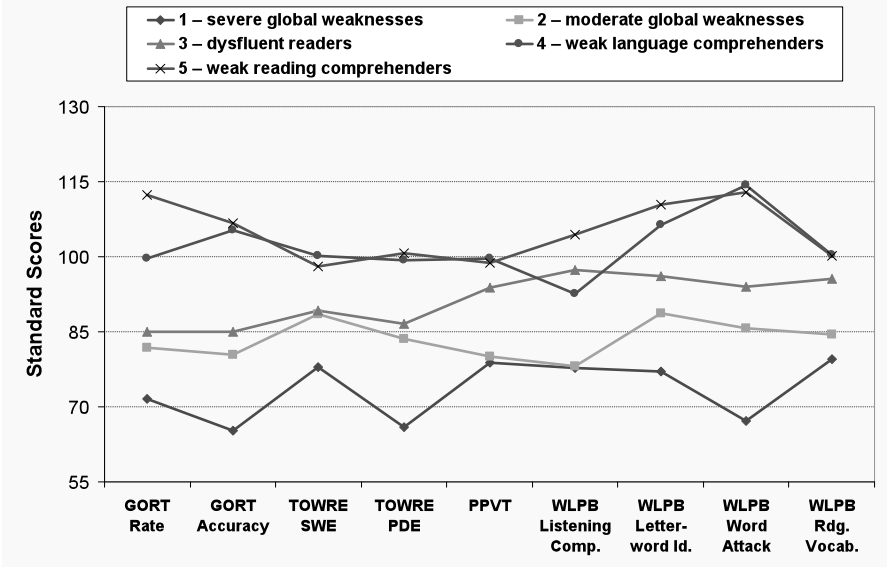
Our sample was originally drawn to represent each level of achievement on the KRA. As such, the proportions of different classes within the sample do not necessarily reflect the proportions within the larger population. Therefore, it is not accurate to say that 61% of students in the population are below average in their comprehension, based on the combination of the Low Average and Struggling groups. It is, however, accurate to say that the four distinct classes we found exist, but that they most likely encompass different proportions of the student population than found in the sample. Similarly, although the proportion of students demonstrating each component skill profile (e.g., Dysfluent Readers, Readers with Severe Global Weaknesses) would have been different given a different sampling plan or operationalization of below-average comprehension, it is accurate to say that these five distinct skill profiles exist, though at rates that may differ. At the same time and given the high number of ASRs in urban school populations, we could anticipate that there would be significant numbers of students who have profiles similar to those students in the most needy clusters (i.e., Dysfluent Readers, Readers with Severe or Moderate Global Weaknesses). In addition, the degree to which each of the three reading comprehension measures differentiated particular levels of readers indicates that none of the individual measures of reading comprehension provides the same precision and reliability of classification across the range of achievement as does a composite classification utilizing information from all three measures.

The five profiles of component skills found among below-average comprehenders were somewhat ordinal in the severity and multiplicity of their weaknesses; however, the classes were not strictly parallel indicating that adolescent readers are not simply better or worse on all skills. Rather, they are distinguished also by their specific strengths and weaknesses. Only two of the classes were particularly similar with respect to relative "peaks" and "valleys" though dissimilar with respect to severity of all difficulties: those with severe vs. moderate global weaknesses. Other classes were distinguished from these two classes and from each other by particular skills. Dysfluent Readers showed weaknesses only on speeded measures (TOWRE and GORT); as shown in Figure 1, they are probably the most disordinal of the classes in that their performance on the left four measures (the speeded measures) is essentially the same as the two lowest classes whereas their performance on the right five measures (the language & unspeeded word reading measures) is much more similar to the two higher-performing classes. Weak Language Comprehenders were distinguished by average to above average performance on all component skills except listening comprehension, which was a half of a standard deviation below norms. Weak Reading Comprehenders demonstrated pervasive strengths, performing at or above average on all components skills.

The two lowest below-average comprehenders classes (Readers with Severe Global Weaknesses and Readers with Moderate Global Weaknesses) demonstrated relative weaknesses on tasks involving decoding of pseudo-words (word attack and phonemic decoding efficiency) compared to their performance on tasks involving sight words (letter-word identification and sight word efficiency), suggesting that they may over-rely on knowledge of known words rather than automated decoding skill while reading

The two top classes of below-

Figure 1. Line plot with mean standard score on each component reading skill for the five profiles of below average comprehenders, based on the five-class solution (n = 318).



average comprehenders were relatively similar, but the Weak Reading Comprehenders read much faster than the Weak Language Comprehenders (or any of the other classes). The extremely high reading rate of Weak Reading Comprehenders (more than two-thirds higher than national norms) suggests that what appears to be a strength may in fact be their real weakness; that is, they may be reading through text at such a fast speed that it is not conducive to strategic comprehension.

One other take on the profiles is to look at how their vocabulary and decoding skills are associated or disassociated. Unlike prior studies (Buly & Valencia; Lesaux & Kieffer, under review), there was little evidence for "automatic word callers," i.e., readers with accurate and fluent word reading skills but low vocabulary and comprehension. However, that is not to say that vocabulary levels were always commensurate with word reading skills. If you look at the right-most two indicators in Figure 1, you will see that the relative levels of reading vocabulary and word attack are strikingly different for the different classes—the Readers with Several Global Weaknesses have vocabulary skills that are much better than their word attack skills (by about 2/3 SD), the Readers with Moderate Global Weaknesses and Dysfluent Readers have vocabulary and word attack skills that are more or less commensurate with each other, and the top two profiles have decoding skills that are much (almost 1 SD) higher than their vocabulary skills.

When we look at the five profiles of component skills found among below-average comprehenders, results suggest that a great deal of heterogeneity in strengths and weaknesses of component reading skills exists at each of the three lowest KRA achievement levels. Such heterogeneity implies the need for diagnostic assessment and differentiated intervention for students not meeting (and meeting) state standards.

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