Reading Science Considerations for Middle and High School Literacy Intervention

by Stephanie Petricone-Turchetta

Intervention frameworks such as Response to Intervention (RTI) and Multi-Tiered Systems of Support (MTSS) emphasize the use of evidence-based practices and the use of data for instructional decision-making in K-12 educational settings. These frameworks offer opportunities to improve teaching and learning, but complexities and challenges persist in implementing strong intervention processes, particularly at the middle and high school level (Miciak et al., 2014). Reading difficulties that either go undetected or are not present in elementary school can emerge in adolescent readers, yet secondary-trained educators are not always equipped with the knowledge and skills necessary to identify and remediate late-emerging reading difficulties (Oslund et al., 2018). This article aims to provide instructional leaders with background on the existing research on late-emerging reading difficulties as well as assessment and instructional considerations grounded in the science of reading that are necessary to strengthen intervention frameworks at the middle and high school levels.

Late-Emerging Reading Difficulties

Reading researchers Snowling and Hulme (2013) found that educators often fail to understand the features of reading disorders and the skills that require remediation. Middle and high school practitioners may not be aware of the complex processes that result in proficient reading, nor understand the factors that underlie reading profiles of adolescent readers in order to design effective interventions (Oslund et al., 2018). Since inadequate response to intervention can be the result of a mismatch between a teacher's practices and a student's needs, educators must have an understanding of the specific reading difficulties that can manifest in students beyond elementary school.

Some researchers have reported that academic deficits are well established by middle and high school (Fuchs, Fuchs, & Compton, 2010). However, it is important for those implementing intervention frameworks at the secondary level to note that reading difficulties not apparent during the early years of schooling can emerge in the middle and high school years, despite comprehensive primary-grade screening and interventions. Other researchers have found that among middle school students with reading disabilities, a considerable number were late-emerging cases whose weaknesses were not identifiable from performance on reading assessments during the primary grades. Late-emerging cases occurred in 42% of cases in the work of Shaywitz et al.'s Connecticut Longitudinal Survey (1992); 41% of cases in Leach et al.'s research (2003); and in 36% of cases in the research conducted by Lipka et al. (2006).

There is data to suggest that there are late-emerging profiles that do not appear to have been missed as a result of flaws in the identification process, such as having been overlooked due to high intelligence, good behavior, or compensatory strategies (Catts et al., 2012). Experts believe late-emerging reading difficulties can arise as a result of more complex texts encountered at the secondary level, which require advanced skills in phonological decoding, orthographic processing, and derivational morphology (Catts et al., 2012). Students who were off to a good start in word reading can show difficulties when they have deficiencies in these skills (Leach et al., 2003). In addition, some may have been relying on compensatory strategies such as memorization of words, appearing successful in beginning word reading, but struggling when memorization becomes inefficient in later grades as they encounter more complex words and texts.

Data-Based Decision Making

A pillar of successful RTI and MTSS frameworks is the use of data for instructional decision-making and monitoring student progress. An assessment system that accounts for a range of reading skills is crucial at the second-

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ary level where there is less focus on foundational reading skills and more focus on content and high-stakes assessment. Analyzing data to understand a student's strengths and weaknesses also requires that educators understand the subject matter, curriculum standards, and how students learn. Instructional leaders in secondary settings must recognize that many secondary educators have never been exposed to foundational reading pedagogy or the nuances of reading difficulties. In addition, the foundational skills critical for learning to read are not emphasized past third grade when there is a shift to comprehension and "reading to learn" (Chall et al., 1990). Since reading skills are integrative and occur along a continuum, multiple components of skilled reading must be considered when selecting assessments from phonological skills, to word reading, to fluency, to comprehension (Gough & Tunmer, 1986). An understanding of the underlying factors in adolescents' reading difficulties can foster more precise and targeted instruction (Oslund et al., 2018). A variety of targeted diagnostic reading assessments can and must be used to provide data-based individualization beyond the primary grades.

Targeted Diagnostic Assessments to Address Late-Emerging Difficulties

Secondary educators who are aware of factors that contribute to late-emerging reading difficulties are in a position to administer and analyze assessment data to determine the most appropriate and effective intervention (Gillis, 2017). Secondary-level screening processes generally rely on large-scale, standardized assessment data, such as state assessments, to evaluate student progress but do not offer the detail necessary to inform instruction. Therefore, schools should administer more targeted, diagnostic assessments.

One component of reading that should be considered in diagnostic assessment when a student is having difficulty with reading is decoding. As students are confronted with more complex texts, difficulties in reading can be rooted in decoding. Studies of middle school reading intervention have demonstrated that decoding is a statistically significant predictor of reading comprehension (Miciak et al., 2014; Oslund et al., 2018). Researchers have found that some students can have difficulties with word-level reading skills, yet their comprehension remains intact (Snowling & Hulme, 2013). Therefore, educators must be trained to administer and interpret diagnostic assessments that measure multiple facets of reading, such as decoding and phonological awareness. Comprehensive diagnostic assessments should also include measures of oral reading fluency, vocabulary, spelling, and comprehension (Gough & Tunmer, 1986; Scarborough, 2005).

Reading fluency assessment can provide information that will allow practitioners to target specific areas of weakness in reading. For example, students may read quickly and accurately but lack prosody, which may indicate that a student is using the bulk of their resources to decode. This would leave the student with little working memory left for prosody or comprehension (LaBerge & Samuels, 1974; Perfetti & Stafura, 2014). If a student demonstrates accurate, word-level reading at a rate that meets grade-level benchmarks, but the reading lacks in inflection, attention to punctuation, or an inability to group words into meaningful phrases, a practitioner should focus on comprehension. In addition, it is important to note that some students compensate with strong language skills which makes certain literacy challenges difficult for educators to recognize (Kilpatrick, 2015). Compensators can go undetected and often do not receive remedial instruction because their reading scores tend to be in the average range. However, their effortful word reading draws working memory resources away from their comprehension.

It is also important to assess and examine a student's spelling, as this can be an indicator of a phonological core deficit (Scarborough, 2005) and provide "a window into a student's phonological and orthographic skills" (Kilpatrick, 2015, p. 187). Listening comprehension, vocabulary, grammatical/syntactical skills, and working memory, as well as motivation and attention are additional important diagnostic considerations.

For evidence-based screening and progress monitoring assessments for middle and high school students, see the National Center on In-

tensive Intervention's (NCII) Academic Screening Tools Chart: https://intensiveintervention.org/resource/academic-screening-tools-chart. Examples of informal diagnostic assessments to target some of the needed skill areas discussed in this article can be found in resources such as the Consortium on Reaching Excellence in Education's (CORE) Literacy Library: *Assessing Reading: Multiple Measures*, Second Edition (2018), and Dr. Jan Hasbrouck's *Quick Phonics Screener*, Third Edition (Read Naturally, 2017).

Assessment and instruction should be aligned with the heterogeneous nature of adolescent skill deficits (Catts, 2012; Leach et al., 2003). Diagnostic assessments can assist in planning for effective intervention by allowing practitioners to identify reading problems that may be based on decoding or fluency deficits and those with a core comprehension deficit. Knowledge of these patterns can help teachers integrate and interpret information from multiple assessments to create targeted and effective interventions.

Grounding Intervention and Instruction in the Science of Reading

In addition to targeted and meaningful data use, there is a need to match the data to effective and appropriate interventions. In an effort to guide stakeholders' efforts to transform practices to those grounded in the science of reading, The Reading League formed a Defining Movement coalition that developed a clear and concise definition of the science of reading. The science of reading is defined as "a vast, interdisciplinary body of scientifically-based research about reading and issues related to reading and writing." More specifically, global research over the past five decades has "culminated in a preponderance of evidence to inform how proficient reading and writing develop; why some have difficulty; and how we can most effectively assess and teach and, therefore, improve student outcomes through prevention of and intervention for reading difficulties" (Defining Movement, 2021). The rigorous standard for reading science research pulls from a variety of fields including: cognitive psychology, communication science, developmental psychology, education, implementation science, linguistics, neuroscience, and school psychology.

Psychological and cognitive science has long provided researchers with evidence-based guidelines to inform the debate on how best to teach reading. Yet, this body of reading research has been slow to make its way into mainstream educational practice for a variety of reasons, including local district decision-making and inconsistencies and biases in teacher training. Utilizing and applying the knowledge gained from this body of research can help ensure alignment among practitioners in their selection and evaluation of instructional practices for students with late-emerging reading difficulties. The following section outlines instructional and intervention considerations, including progress monitoring, based on the principles of reading science.

Suggestions for Instruction and Intervention

Hollis Scarborough's "reading rope" demonstrates that skilled reading is influenced by individual component skills (2005). Secondary school settings aiming to improve learning and outcomes for students with reading difficulties should consider a structured and targeted approach to reading intervention. Structured literacy instruction should be explicit: the thoughtful and direct teaching of concepts with continuous student-teacher interaction. Evidence-based explicit instructional practices include teacher language that is clear and concise with time devoted to developing background knowledge. Additionally, clear teacher modeling is built into instruction alongside explicit and informative feedback for learners. All of these components should be situated within distributed and cumulative practice of previously taught concepts that are applied to increasingly more complex tasks with a gradual fading of instructional support and ultimate goal of student independence (Fletcher & Vaughn, 2020).

Phonological and phonemic awareness are terms often associated with beginning reading instruction. Since older, struggling readers can present difficulties in phonemic awareness, interventions should include explicit instruction in phonemic awareness with connections to English orthography, including the syllable types of the English language and syllable division rules to enhance word reading accuracy (Henry, 2017). With improved accuracy of words and their meanings, these techniques can promote fluent word reading and comprehension as readers have more information to make inferences and construct an accurate text model (Perfetti & Stafura, 2014).

Another area that should be a significant part of secondary literacy intervention is vocabulary development (Stahl, 1986). This can be accomplished through explicit instruction of morphology (Goodwin & Ahn, 2010), which is

the knowledge of the meaningful word parts. If a student can learn approximately 40-50 prefixes, suffixes, and Latin/Greek bases, they will have the tools necessary to unlock the decoding, encoding, and meaning of many words (Henry, 2017). Syntax, grammar, and semantics must also be incorporated into instruction for students at the secondary level. Students can be taught strategies that use context and morphological clues to infer word meanings.

In order to bolster reading fluency, educators should provide opportunities to read and interact with a range of reading material including digital, informational, and narrative texts. Text levels should also be varied, as students can read and comprehend at more complex levels when they have adequate background knowledge, are motivated by the topic, or have instructional support (Fletcher & Vaughn, 2020). Other specific evidence-supported strategies such as repeated readings, audio-assisted reading, teacher-modeling, and continuous teacher support used across a variety of contexts and content areas are effective in increasing the reading fluency of students who need targeted instruction.

In addition to targeted instruction, students with reading difficulties can benefit from accommodations and modifications. Accommodations can include additional time to complete tasks, assistance with notetaking and/or providing lesson notes, written directions, assistive technology such as text-to-speech programs, and the use of graphic organizers and daily reviews. Modifications can be made specifically to curriculum content, assignments, or assessments. Examples include prioritizing content/assignment length, providing an abridged or audio version of a book, providing a lower text level article, and allowing access to a word bank for vocabulary among others.

Progress Monitoring

Progress monitoring is an important component of data-based decision making and effective intervention systems. Once an evidence-aligned intervention based on diagnostic information is determined for a student, progress monitoring assessments must be administered in order to demonstrate a student's progress toward proficiency. The frequency of progress monitoring can vary, but researchers recommend weekly data collection for students receiving remedial instruction. As data are analyzed and graphed, trend lines and goal lines will show if proficiency gaps are decreasing and whether adjustments are needed to the intervention or the intensity of its delivery (Gillis, 2017).

The quality of the data, number of data points, and amount of time are important considerations in determining if a student has made progress. Unfortunately, there is little consensus among researchers as to the amount of time or data points to use to make inferences about a student's growth. Decision rules commonly used in schools, such as three data points above the trend line or 8 to 10 weeks before making a comparison, are "fairly arbitrary and have no research supporting them" (Silberglitt et al., 2016, p. 288). Using multiple, quality data points over time, effective professional judgment, and a multidisciplinary team-based decision model will increase efficient decision making while research continues to evolve.

Progress monitoring can include both informal and formal tests, curriculum-based measures (CBMs), and oral reading fluency and accuracy checks. Some diagnostic measures of academic achievement can also be used to inform a student's progress, or response to intervention. A number of diagnostic measures noted previously have multiple forms of the assessment that can be used to compare a student's progress over time, including DIBELS and CORE's *Assessing Reading: Multiple Measures*. For additional tools and evidence base, see the National Center on Intensive Intervention's *Academic Progress Monitoring Tools Chart*.

In a study examining the results of seven nationally-normed standardized reading assessments, Lipsey et al. (2012) found that annual student growth is greatest during students' early years and that it declines thereafter. In their analyses, effect size measures dropped from 0.97 between Grades 1 and 2, to 0.32 between Grades 5 and 6, and to 0.23 between Grades 6 and 7. It has been established in the research community that effect sizes of .20 are considered small, .50 are medium, and .80 are large. Therefore, practitioners should consider that, in general, the effects for interventions and growth among older students are likely to be smaller than the impact on growth with elementary students. Students with pervasive skill deficits may respond more slowly and require more individualized, intensive instruction (Gillis, 2017). Finally, instructional leaders and others with content expertise, such as school psychologists and reading specialists, should comprise the team making data-based decisions for students with reading difficulties.

Contextual Considerations

To be effective, the contextual characteristics (See Guskey, 2009) of secondary schools must

be considered. School leaders must analyze how time, schedules, and staff resources are arranged and provide adjustments to ensure interventions are built into the school day. Grade level, content-specific, and instructional specialists need to have common planning time that is consistent with a clear agenda and administrative support. Since processes for intervention have evolved in many places, schools should also carefully review and establish district-level implementation guidelines to provide consistency and ensure implementation fidelity.

Well-designed and implemented professional learning is an essential component of a comprehensive system of teaching and learning that supports students in developing the knowledge, skills, and competencies needed to thrive in the 21st century (Darling-Hammond et al., 2017). Because many secondary-trained educators have never been exposed to coursework or training on the nuances of reading difficulties, practitioners and administrators alike will require ongoing and meaningful professional learning and development opportunities grounded in reading science that include how to identify, understand, and utilize data related to varying reading difficulties that can emerge at this level, as well as effective practices for instruction, intervention, and progress monitoring.

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RTI's potential to increase equity in education by utilizing evidence-based practices and data to inform instructional decision-making can be accomplished through a school's purposeful uniting of general and special education teachers. RTI implementation research conducted by Gomez-Najarro (2019) indicated collaboration between special and regular education teachers typically only occurred during special education referral meetings. Outside of those meetings, RTI implementation was primarily a general education endeavor. Therefore, when planning intervention and evaluating student progress via progress monitoring data, secondary schools should establish and maintain processes that include ongoing and meaningful consultation and collaboration between professionals from various disciplines.

Conclusion

Since intervention frameworks serve as an equity tool as well as a pathway to the identification of possible learning differences, secondary-level educators must understand the features of late-emerging reading difficulties that can manifest in older students. Instructional leaders and their multidisciplinary problem-solving teams must become well-versed in data literacy and the complexity of reading difficulties in order to provide effective, targeted intervention grounded in the science of reading. Schools can begin with a needs assessment that includes the nature of late-emerging reading difficulties, diagnostic assessments and instructional interventions, data-use for progress monitoring, structured literacy practices, contextual considerations, etc. Ongoing and job-embedded professional learning experiences that target the nature of reading difficulties at this level should be provided to stakeholders to ensure that intervention frameworks effectively meet the unique educational needs of middle and high school students. ■

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