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# Averting and Remediating Academic Complications

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**Abstract**

We discuss the benefits and drawbacks of service delivery models based on student reaction to intervention (RTI) for preventing and remediating academic issues, as well as data sources for identifying students in need of special education services. RTI models' major purpose is to enhance academic and behavioral results for all kids. We examine the evidence for RTI processes like as screening and progress tracking assessments, evidence-based interventions, and school-wide coordination of multi-tiered instruction. We also address RTI's secondary purpose of providing data for the diagnosis of learning disorders (LDs).Incorporating instructional response into identification constitutes a contentious shift away from cognitive performance disparities, which have traditionally been the fundamental basis for LD identification. RTI processes have the ability to combine general and special education and provide new routes for research and public policy on LDs; nevertheless, scale challenges in schools are substantial, and further research on the use of RTI data for identification is required.

Children struggle to learn reading, math, and writing skills for a variety of reasons, including growing up in economically disadvantaged environments, a lack of English proficiency, emotional difficulties, and even inadequate academic instruction (Donovan & Cross, 2002). Some children are eventually diagnosed with learning disabilities (LDs), accounting for about 5% of the school-age population and 50% of students with disabilities in schools ( Department of Education, 2007).

A range of state, federal, and district school-based programmes try to address various barriers to academic skill learning. The federal government placed a stronger emphasis on early intervention, high-quality instruction, and accountability for academic performance with the enactment of the No Child Left Behind Act in 2002, which prioritizes the needs of economically disadvantaged children through Title I financing. Individuals with Disabilities in Education Act (IDEA Department of Education, 2004), which controls the provision of special education services in public schools in the United States, was likewise reauthorized in 2004.

The emphasis on early intervention programmes and specific provisions allowing districts to implement service delivery methods that focus on the child's response to intervention (RTI) were notable in the renewal. These models (a) screen all children for academic and behavioral problems; (b) track the progress of children who are at risk for difficulties in these areas; and (c) deliver increasingly aggressive interventions depending on the results of progress monitoring assessments (Vaughn & Fuchs, 2003). Children who do not respond appropriately may be referred for a full evaluation to determine their eligibility for special education services. Some children will be eligible for special education as a result of the comprehensive examination, while others may require alternative assistance because their learning difficulties are not related to an LD or other type of impairment associated with a requirement for special education. Universal screening, progress tracking, and tiered, or layered, interventions have been widely embraced in No Child Left Behind and Title I, and are a primary focus of IDEA 2004.

**RTI and multi-tiered intervention models**

**RTI Models: What Are They?**

RTI models are multitier service delivery systems in which schools give layered interventions that begin in general education and grow in intensity (e.g., more time for instruction to smaller groups of students) based on students' instructional responses. There are numerous techniques to implementing RTI models, which are better viewed as a collection of processes rather than a single model, with variations in how the processes are implemented. These techniques have at least two historical roots, both of which represent efforts to develop school-based preventative programmes.

The first cause is school-wide initiatives to reduce behavioral issues (Donovan & Cross, 2002; Walker et al., 1998). These models are associated with a problem-solving process in which a shared decision-making team identifies a behaviour or academic problem, proposes solutions, evaluates the outcome, and then reconvenes to consider whether the problem has been resolved, resulting in improvements in behaviour or learning (Reschly & Tilly, 1999).

These approaches often employ standardised protocols to give treatments that gradually increase in strength and differentiation in accordance to the child's instructional response. Both models have been strongly affected by public health disease prevention models that identify primary, secondary, and tertiary levels of intervention that increase in cost and intensity depending on the patient's response to therapy (Vaughn, Wanzek, & Fletcher, 2007).

All students are screened in a common implementation of a standard protocol model (Figure 1; Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2006), and those at risk for academic problems are assessed on short probes designed to assess progress over time (Stecker, Fuchs, & Fuchs, 2005). Classroom teachers receive professional development in effective instruction as well as tactics for increasing differentiation and intensity through flexible grouping strategies and progress evaluations (Tier 1, main intervention). Children who do not

meet defined levels of progress based on local or national benchmarks receive additional instruction for 20-40 minutes per day in small groups of three to five kids (Tier 2, secondary intervention). If the child does not make acceptable progress in secondary intervention, a more intensive and individualised intervention (Tier 3, tertiary intervention) is provided, which may include smaller groups, more intervention time (45-60 minutes daily), and a more specialised teacher. Progress is checked on a weekly or bimonthly basis. Because insufficient instructional response allows for the identification of adequate and inadequate responders and provides a framework for executing seamless interventions between general and special education, these models are linked with special education.

It takes a great amount of effort to implement both problem-solving and standardised protocol models. To begin, providing effective Tier 1 instruction to all kids necessitates continual professional development, screening, and progress monitoring. Maintaining these practises necessitates an intensive professional development regiment from well-trained and devoted professionals, which are in short supply (NASDSE, 2006). Second, Tier 2 intervention is ongoing. Despite the fact that effective Tier 1 treatments lower the number of students at risk, a considerable percentage of students (as much as 20%-25% in early reading; Vaughn et al., 2006) require extra interventions by trained individuals (e.g., classroom instructors, paraprofessionals). Finally, many school districts believe they lack the staff and resources to effectively execute all aspects of RTI models. Nonetheless, several school districts have implemented RTI models from kindergarten to high school over the last 20 years (Jimerson, Burns, & Van Der Heyden, 2007).

**Screening and Progress Observing**

The universal screening of all children for academic issues is a critical component of RTI programmes. The screening instrument can be norm-referenced or criterion-referenced, with the latter frequently serving as the initial evaluation of a progress tracking tool. In general, screens tend to over identify children as at risk since the result is that kids' progress is monitored and/or they receive supplementary intervention to improve their reading or math ability (Fletcher, Lyon, Fuchs, & Barnes, 2007).

Curriculum-based measurement (CBM), which provides brief (1-3 minutes per child) assessments that are easily administered and interpreted by classroom teachers and useful for adjusting instruction (Fuchs, Deno, & Mirkin, 1984), is the most common implementation of a progress monitoring measure. The number of correctly read (or computed or spelt) words (or math problems or spelling items) is graphed over time and compared to grade level criteria.

CBM provides trustworthy and valid information on how well pupils are progressing and is associated with improved results when employed by classroom teachers, according to a substantial research base (Stecker et al., 2005).

Controlled studies show that when CBM adoption is compared to non-CBM classrooms, teachers adapt goals and adjust instruction, resulting in better end-of-year academic outcomes (e.g., Fuchs, Fuchs, Hamlett, &

Stecker, 1991). Serial assessments based on CBM have also been utilised to give data for educational service eligibility determinations (Fuchs & Fuchs, 1998).

Despite the importance of CBM measures, there are issues concerning text equivalence (Francis et al., in press). Furthermore, it is uncertain how consistently benchmarks from these CBMtype measurements can be used to identify mobility through the tiers, and whether the optimal benchmarks are at the local or national level when applied. Finally, the use of CBM measures as part of the eligibility process is very contentious, and no commonly recognised criteria for identifying inadequate responders exist. As a result, instructional response should not be used as the only determination of eligibility for special education.

**Interventions Based on Evidence**

RTI methods rely on the adoption of evidence-based interventions aimed at preventing or correcting academic issues. Numerous syntheses and meta-analyses have been conducted to assess the efficacy of therapies for kids experiencing academic challenges. Although a detailed study is beyond the scope of this article, Swanson, Hoskyn, and Lee (1999) conducted the most comprehensive meta-analysis of therapies for children classified with LDs, reviewing and analysing 180 intervention studies over a 30-year span. Their findings indicated moderate to high impacts across trials (0.79) and larger effect sizes for treatments implemented in resource room settings (0.86 vs. 0.48 in general education classes).

Wanzek and Vaughn (2007) reviewed studies on complex reading interventions defined as at least 100 sessions (about 20 weeks of daily intervention). The effects ranged from moderate to big, but most studies reported impact sizes in the moderate to large range. Effect sizes were typically bigger when the study (a) included kindergarten and grade 1 pupils rather than grades 2-5, (b) used a comprehensive reading programme, and (c) administered the intervention one-on-one or in small groups.

Scammacca et al. (2007) analysed outcomes from intervention studies undertaken with older pupils with reading challenges in another recent meta-analysis. Scammacca et al. (2007) found that the overall effect size across all 31 investigations was 0.95, with a smaller overall effect size when solely standardized, norm-referenced measurements were utilized (0.42). The effect size for 23 intervention trials that examined reading comprehension, frequently using experimenter-designed measures, was 1.33; the effect size for standardized accomplishment reading measures was 0.35. The overall findings indicate that for older students with reading difficulties (a) adolescence is not too late to intervene, (b) students benefit from both word-level and text-level interventions, (c) instruction in reading comprehension strategies is associated with large effects, (d) students can learn the meanings of words they are taught, and (e) both researcher-implemented and teacher-implemented interventions are effective. However, older children with reading challenges may require more intensity and a longer amount of time to reach grade level, which is why prevention activities are being prioritized (Torgesen et al., 2001).

Meta-analyses on effective writing practice have been provided by Graham and Perrin (2007a, 2007b).They identified several instructional practices associated with improved student outcomes, including (a) writing strategies that explicitly teach students to plan, revise, brainstorm, and edit (0.82); (b) summarizing through writing (0.82); (c) collaborating with other students in small groups to provide feedback and write cooperatives (0.75); (c) assigning students reasonable goals for improving writing (0.70); and (d) other practices

Although recent research employing RTI-type frameworks is promising (Fuchs et al., 2005), there is less intervention research in the academic field of mathematics. Baker, Gersten, and Lee (2002) completed an empirical synthesis that revealed that effective mathematics instruction provides data or recommendations to teachers and students (0.57), uses peer-pairing to support learning (0.62), provides explicit instruction directed by the teacher, including teacher-facilitated approaches (0.58), and provides practices for communicating student successes to parents (0.42).

**Service Delivery Coordination Systems**

Despite the research base supporting the assessment and intervention components of RTI, the most difficult portions of implementation require schoolwide implementation, where scale challenges are crucial. Intervention services in schools are frequently sponsored by distinct entitlement programmes, particularly Title I and IDEA, which have strict eligibility requirements and have historically made it difficult to combine resources to enable schoolwide intervention models. These programmes are frequently separated from general education and the classroom, resulting in fragmented instruction. Schools should move carefully and with caution because it may take several years to change practise when introducing RTI models, especially given the entrenchment of outdated methods of thinking about instruction (NASDSE, 2006). Many districts may face resource constraints unless careful assessments of existing resources are done, which are often redeployed to support RTI forms of service delivery. One disadvantage of RTI being suggested under the newly reauthorized IDEA 2004 is that many educators regard RTI as merely a special education endeavor. In fact, RTI model implementation necessitates tight coordination and integration with general education, special education, Title I, and other entitlement programmes.

Scaling challenges are also hampered by the intervention evidence base's incompleteness. The subject of how to adopt RTI models in secondary schools is challenging, particularly given gaps in research on interventions and progress-monitoring tools for older pupils. RTI approaches appear harder to envision when the preventative component is not strongly applied. Although there is data on intense Tier 3 interventions, they have been used sparingly as part of a multitier intervention, reflecting in part the high expense of multi-tiered intervention research investigations. Because there have been few studies of children identified as insufficient responders in an RTI model, the efficacy of a layered Tier 3 intervention in this setting is unknown. Preliminary evidence suggests that many of these students are difficult to teach, with roughly half showing

insufficient progress to read at grade-appropriate levels despite a yearlong intervention followed by additional intensive interventions (16 weeks) in grades 1-3 (Denton, Fletcher, Anthony, & Francis, 2006). Studies of multitiered intervention methods, on the other hand, show that inadequate responders for early reading can be as low as 2%-5% (Berninger et al., 2003; Mathes et al., 2005; McMaster, Fuchs, Fuchs, & Compton, 2005; Torgesen, 2000). Schools may be able to devote the resources required for effective remediation of inadequate responders since the number of kids who require intensive interventions may be considerably decreased (Burns, Appleton, & Stehouwer, 2005; Van Der Heyden, Witt, & Gilbertson, 2007).

Despite these challenges, there have been successful district-wide RTI model implementations across the country (Jimerson et al., 2007; NASDSE, 2006). Many of these implementations show higher overall academic success scores and lower special education referrals (e.g., Van Der Heyden et al., 2007). More research on how schools successfully (and unsuccessfully) employ RTI models will be required. This research must examine outcomes in connection to historical data so that it is obvious that RTI models increase outcomes for all children, including those who are at risk and those who are not. Furthermore, nationalising these models will be an enormous task.

**Models of RTI and Special Education**

The precise requirements in IDEA 2004 for RTI models have been contentious in the field of special education. This debate is mostly focused on two topics, the first of which is the scalability issues discussed above. The second concern is the employment of RTI models to identify LDs. In contrast to the previous 30 years of implementation, IDEA 2004 allows school districts to employ RTI models and move away from identifying approaches that depended on IQ-achievement disparities. Instead, poor instructional response and other criteria are used for identification, minimizing the significance of IQ and other examinations aiming to identify variations in cognitive ability for identification. Given how deeply embedded the latter exams are in the day-to-day practise of evaluating pupils, this debate is unsurprising. However, the modifications in IDEA 2004 reflect concerns regarding (a) the efficacy of traditional special education programmes in schools and (b) the utilisation of IQ-achievement disparities for identification.

**Intervention**

There is a significant gap between what is known about the efficacy of education for kids with academic issues and how students are taught in schools, particularly for students who are most vulnerable to academic and behavioural difficulties. Studies of special education students' outcomes show flat growth and little evidence that traditional interventions close the achievement gap (Bentum & Aaron, 2003; Donovan & Cross, 2002; Glass, 1983; Hanushek, Kain, & Rivkin, 1998; Torgesen et al., 2001; Vaughn, Levy, Coleman, & Bos, 2002). The emphasis on educational outcomes, as well as the attempt to reduce the number of pupils who require the most intensive intervention, are driving interest in RTI. As previously discussed, the most consistent data about improving outcomes for kids with LDs focuses on avoiding or remediating specific academic skills, with a

particular emphasis on academic domains (Fletcher et al., 2007). These youngsters are subjected to a smorgasbord of therapies that engage the eyes, brain, and perceptual processes but do not involve reading, writing, or maths. Mann (1979; Vellutino, Fletcher, Scanlon, & Snowling (2004) found that previous interventions had limited generalisation to academic achievement for these students.

**Identification**

Although deficits in specific cognitive functions are strongly associated with various types of LD, focusing on inter individual differences and discrepancies has not proven to be a reliable practise for identification (Francis et al., 2005; Shepard, 1980; Stuebing et al., 2002; Siegel, 1992) and does not result in the implementation of appropriate interventions with strong outcomes (Mann, 1979; Vaughn & Linan-Thompson, 2003). These risks are especially relevant when using identification models based on IQ-achievement disparity.

Two meta-analyses (Hoskyn & Swanson, 2000; Stuebing et al., 2002) raise doubts regarding the validity of IQ-discrepancy models. Both studies indicated low to modest overall effect size differences between IQ-discrepant and non-discrepant poor readers, with negligible differences on most reading and phonological processing measures. Other studies that compare poor readers with and without major IQ-achievement gaps reveal no difference in prognosis (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Share, McGee, & Silva, 1989) or responsiveness to instruction (Vellutino, Scanlon, & Lyon, 2000). These validity concerns do not support the 30-year-old practise of detecting LDs in schools and clinics based on a disparity between IQ and accomplishment (Donovan & Cross, 2002).

**Identification and RTI Models**

RTI models intentionally de-emphasize cognitive gaps in the identification process, instead focusing on discrepancies in age-based expectations and training. As a result, the eligibility procedure in an RTI model differs from that in a traditional approach (see Figure 2).Children in an RTI model are assessed and monitored early in school, as opposed to traditional eligibility approaches, which rely on referral, usually in the later grades and after failure. Furthermore, instructional response data leads to evaluations that inquire how to best teach the child and deemphasize the search for cognitive disparities. However, using instructional response data is unlikely to solve all of the challenges associated with identifying kids with LDs. One of the recurrent issues with IQ-discrepancy models has been the use of hard "cut points" for LD diagnosis. The use of strict cut-points for benchmarks and classifying students as high or poor responders to instruction may result in the same types of problems with identification reliability and validity as seen in RTI models. When children with brain injury are excluded from the sample, the attributes (IQ, cognitive processes, and achievement) are usually continuous and normally distributed (Lewis, Hitch, & Walker, 1994; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992; but see Rutter & Yule, 1975, which did not exclude brain injury). Deciding where an impairment resides on this spectrum is inherently arbitrary and must rely on measures other than IQ and success scores (Francis et al., 2005). However, instructional response could exist on a spectrum with no

intrinsic qualitative splits. Criteria for insufficient response may be as arbitrary as a cutpoint on an achievement dimension, and merely developing equations without evaluating their validity is no better than IQ-distribution models. The use of confidence intervals and an assessment of the ramifications of various actions to intervene or not intervene will aid in dealing with this issue. Validating opinions against additional adaptive criteria that are not directly related to academic accomplishment might also aid in determining decision appropriateness. Research is also required to assess the dependability and validity of expert judgements rather than decisions based only on statistical criteria.

**Multiple Criteria are required for LD Identification**

It is impossible to diagnose children with LDs purely based on their response to instruction. Three factors were deemed crucial by the consensus group of researchers gathered for the Learning Disabilities Summit (Bradley, Danielson, & Hallahan, 2002): (2) Evaluation of low achievement, typically through norm-referenced achievement tests; (3) application of exclusionary criteria to ensure that low achievement is not caused by another disability (e.g., mental retardation, sensory disorder), or by environmental and contextual factors (e.g., limited English proficiency). Response to instruction is evaluated through progress monitoring and evaluations of the integrity of interventions.

With this hybrid model of classification, IDEA 2004 is consistent. It makes it clear that children can only be designated for special education if there is proof that their academic struggles are not the product of poor instruction. IDEA also specifies six areas of low academic attainment where LDs may manifest. It necessitates evaluation of the conventional exclusionary criteria, a process that is inherently hazy when the issues involve elements like emotional difficulties, which may coexist with or result from low achievement, or economic disadvantage, whose contribution to low achievement is difficult to distinguish from LD in the absence of adequate instruction.

**Conclusions**

By providing effective in-class education and progressively more demanding interventions, RTI models' main objective is to avoid and address behavioural and academic problems. The providing of pertinent information that aids in referral and decision-making about students with LDs is a secondary purpose of RTI models. Districts that effectively deploy RTI models may enhance academic and behavioural results for all students, particularly for those most at risk for academic difficulties, if the scalability issues can be resolved.

No matter what identification model schools use, IDEA 2004 mandates an evaluation of student learning. Definitions of LD have always centred on removing identified factors that contribute to poor performance, such as insufficient instruction. The primary idea historically behind LD has been that children who do not exhibit symptoms of an exclusionary disorder and who have a cognitive difference are "unexpected" underachievers (Hammill, 1993). If the inability to respond to high-quality instruction can be systematically measured, it serves as an inclusionary criterion that indicates intractability un the teaching process. If the

definition includes a formal assessment of an unsatisfactory instructional response, a distinct kind of child with LDs will manifest. This subgroup of inadequate responders with poor accomplishment and no additional disability or environmental factors to explain low achievement may exemplify what is meant by unanticipated underachievement. It is expected that research on the cognitive and neurobiological aspects of LD will begin to focus on children diagnosed under this approach, rather than samples that have previously been a mix of kids with adequate and inadequate educational backgrounds. As a result, new approaches to education and understandings of the neurobiological and environmental aspects behind academic challenges and LD may emerge.

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