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SPECIAL FEATURE ARTICLE

The editors and CEC are pleased to offer this first in a series of special feature articles addressing topics of wide-ranging interest for all in special education.

Smart RTI: A Next-Generation Approach to Multilevel Prevention

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ABSTRACT: *During the past decade, responsiveness to intervention (RTI) has become popular among many practitioners as a means of transforming schooling into a multilevel prevention system. Popularity aside, its successful implementation requires ambitious intent, a comprehensive structure, and coordinated service delivery. An effective RTI also depends on building-based personnel with specialized expertise at all levels of the prevention system. Most agree on both its potential for strengthening schooling and its heavy demand on practitioners. In this article, we describe* Smart RTI, *which we define as making efficient use of school resources while maximizing students' opportunities for success. In light of findings from recent research, we discuss three important features of Smart RTI: (a) multistage screening to identify risk, (b) multistage assessment to determine appropriate levels of instruction, and (c) a role for special education that supports prevention.*

The 2004 reauthorization of the Individuals With Disabilities Education Improvement Act (IDEA, 2004) described and expressed a subtle preference for what was then a new and untested method of identifying students with learning disabilities. Specifically, the reauthorization encouraged use of a child's response to evidence-based instruction as a formal part of the disability identification process. This new method was called "responsiveness to intervention," or RTI. Since 2004, there has been much debate about whether and how to combine RTI with a multidisciplinary evaluation of a learner's strengths and weaknesses to determine disability status and special education

eligibility (cf. The Consortium for Evidence-Based Early Intervention Practices, 2010; Learning Disabilities Association, 2010; National Joint Committee on Learning Disabilities, 2005).

RTI has also moved to the center of ongoing discussion about educational reform. For many, it represents a fundamental rethinking and reshaping of general education into a multilevel system oriented toward early intervention and prevention (e.g., National Association of State Directors of Special Education & Council of Administrators of Special Education, 2006). Partly because its procedures were underspecified in the 2004 reauthorization of IDEA, RTI is currently implemented in numerous ways (e.g., Berkeley, Bender, Peaster, & Saunders, 2009; Jenkins, Schiller, Blackorby, Thayer, & Tilly, 2011). It can include one tier or as many as six or seven tiers. Tiers designated by the same number may represent different services in different schools. In School A, for example, Tier 2 may involve peer tutoring in the mainstream classroom; in School B, it signifies adult-led, small-group tutoring in the auxiliary gym. Varying criteria define "responsiveness"; varying measures index student performance (cf. D. Fuchs, Fuchs, & Compton, 2004). Similar inconsistency extends to the role of special education. In Jenkins et al.'s survey of RTI-implementing teachers and administrators in 62 schools across 17 states, 12 separate approaches were described for serving students with individualized education programs (IEPs) in reading, reflecting disparate views about whether special education should exist within or outside RTI frameworks, and what services it should provide.

One constant among the many variants of RTI is that, as an early intervention and prevention system, it is costly in time and resources. It requires assessments and interventions that educators rarely conducted a decade ago. Moreover, because of its relative newness, there are serious inefficiencies in its application. This article offers research-backed guidance for designing more effective and efficient (next generation, if you will) multilevel prevention—an approach we call, Smart RTI. We use the term to evoke such recent and popular innovations as *smart houses*, *smart cars*, and *smart phones*. Smart houses use highly advanced and automated systems for lighting, temperature control, multimedia, and window and door operations. Smart cars are defined in part by information-oriented enhancements such as GPS navigation, reverse sensing systems, and night vision. Smart phones can include features found on a personal digital assistant or computer such as the ability to send and receive e-mail and edit documents. Each of these technologies reflects outside-the-box thinking that helps us become more effective and efficient. Put differently, although the inventors of these hi-tech homes, cars, and phones use "smart" to describe their products, the term also reflects their intent to make all of us—the users—smarter.

Our description of Smart RTI will not sizzle and dazzle as advertisements for smart phones do. We use plainer language to suggest a modest redesign of multilevel prevention systems to make users smarter and to help them make more efficient use of resources and promote school success among more of their students. We examine three critical components of Smart RTI practice: multistage screening to identify risk for academic difficulty, multistage assessment to determine a necessary level of instructional intensity, and special education services that complement general education instruction and contribute to prevention efforts. Our discussion focuses on K–12, not preschool; on academic performance, not school behavior. The academic focus should have relevance for students with high-incidence and low-incidence disabilities who are striving to meet academic goals. We address the *prevention–intervention* dimension of RTI, not its disability identification and eligibility dimension. Before discussing major components of Smart RTI, we clarify our terms.

LEVELS VERSUS TIERS; PRIMARY VERSUS SECONDARY PREVENTION

Some who write or speak about RTI intervention describe it in terms of "tiers." Others combine two or more tiers and refer to the aggregate as "levels." Most using this latter terminology describe a three-level prevention system (e.g., Denton et al., in press; O'Connor, Bocian, Beebe-Frankenberger, & Linklater, 2010; Simmons et al., 2011; Vaughn et al., 2010). We, too, think of

RTI this way with each of the levels distinguishable by the distinctiveness of the instruction delivered and by the skill set required of instructors (e.g., D. Fuchs, Compton, Fuchs, Bryant, & Davis, 2008; L. S. Fuchs et al., 2008). We use the descriptors *primary prevention*, *secondary prevention*, and *tertiary prevention* for our three levels. We first define primary and secondary prevention. Later in the article, we address tertiary prevention.

Primary prevention refers to the general instruction all students receive in mainstream classes. This includes (a) the core program, (b) classroom routines that are meant to provide opportunity for instructional differentiation, (c) accommodations that in principle permit virtually all students access to the primary prevention program, and (d) problem-solving strategies for addressing students' motivation and behavior. (Many view the core program as Tier 1 and instructional differentiation, accommodations, and problem solving as Tier 2.)

Screening in primary prevention identifies students at risk of not responding to the general instructional program. These students can then access more intensive secondary prevention in a timely manner. Screening in primary prevention is typically accomplished by administering a brief test to all students (i.e., a universal screen). A cut-point on the measure has been established through prior research, reflecting students' likelihood of successful or unsuccessful performance on important future outcomes such as teacher grades or high-stakes tests.

Secondary prevention differs from primary prevention in several ways. Probably the most important difference is that primary prevention programs are designed using instructional principles derived from research, but they typically are not validated empirically. This is partly because the commercial publishers of these programs usually lack the personnel or the desire to implement complex and costly experimental studies. (See Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998, for an example of a research team and publisher combining to explore the efficacy of a primary prevention program.) Secondary prevention, by contrast, often involves small-group instruction that relies on an empirically validated tutoring program. *Validation* denotes that experimental or quasi-experimental studies have demonstrated the efficacy of the instructional program. The tutoring program specifies instructional procedures, duration (typically 10 to 20 weeks of 20- to 45-min sessions), and frequency (three or four times per week). It is often led by an adult with special training. Schools can design their RTI prevention systems so students receive one or more tutoring programs in the same academic domain or in different domains.

Assessment during secondary prevention determines whether students have responded adequately to the tutoring. This assessment is usually based on progress monitoring during tutoring, on an assessment following tutoring, or on a combination of the two. Schools use these data to decide whether students should return to primary prevention without additional support or whether more intensive intervention is necessary. Findings from recent research have questioned aspects of conventional screening and assessment conducted during primary and secondary prevention.

PRIMARY PREVENTION: ONE-STAGE VERSUS TWO-STAGE SCREENING

Maybe the greatest RTI-inspired change in service delivery is schools' routine reliance on universal screening to identify students at risk for reading or math problems. Screening measures based on curriculum-based measurement (CBM; e.g., Deno, 1985; L. S. Fuchs & Deno, 1991) are widely used. They assess calculations and concepts/application skills representing the annual mathematics curriculum (kindergarten–Grade 6), letter sound fluency (kindergarten), word identification fluency (Grade 1), passage reading fluency (Grades 2–4), and maze fluency (Grades 5–7), as well as measures that focus more narrowly on single tasks and skills.

Limitations of One-Stage Screening

The critical objective of those conducting universal screens is the accurate identification of students who, if left in primary prevention, would develop serious and chronic academic problems. Most schools rely on one-time, brief screening measures like the ones just mentioned. Confi-

dence in one-stage screens is based largely on same-point-in-time correlational investigations. However, in recent years, the research has become more sophisticated. Researchers are collecting data from screening measures in the early grades and on academic outcomes in later grades, using the former to predict the latter and, thereby, to specify the screening measures' capacity to designate young students as at risk or not. Findings from this research frequently show unacceptably high rates of false positives (or students who appear at risk but are not) with one-stage screens, particularly in the early grades.

Large numbers of false positives can dramatically increase the cost of schools' preventive efforts. Educators can learn from medical practitioners in this regard. Doctors, for example, do not recommend treatment based on a single, elevated blood pressure measurement, a high PSA reading, or a suspicious mammogram—each of which produces large numbers of false positives. Instead, such screening procedures are followed by second-stage screens—more accurate and expensive monitoring (as in blood pressure) or diagnostic assessment (as in PSA and mammograms). We recommend a two-stage screening process as part of Smart RTI.

The first stage of a two-stage screen should exclude children clearly *not* at risk. These students pass a cut-point set sufficiently high to miss only a small number of students with actual risk. The second stage should target the subset of students who failed the first-stage screen and whose risk status is uncertain. These students receive an additional and more thorough assessment to discriminate false positives from those with actual risk. Recent studies show that a two-stage screening process can improve the accuracy with which students are identified for secondary prevention. We describe three such studies, two conducted in reading at first grade and another completed in mathematics at third grade.

Research on Two-Stage Screening

Predicting Reading Disabilities 2 Years Out. Compton et al. (2010) examined four ways to conduct a two-stage screening process in fall of first grade. The goal was to predict reading disability 2 years later in spring of second grade. In the first stage, and preceding each of Compton et al.'s four versions of a second-stage screen, children were assessed on the Word Identification and Word Attack subtests of the Woodcock Reading Mastery Tests (Woodcock, 1998) and the Sight Word Efficiency and Phonemic Decoding Efficiency subtests of the Test of Word Reading Efficiency (Torgesen, Wagner, & Rashotte, 1999). Compton et al.'s first version of a second-stage screen was Word Identification Fluency (WIF; L. S. Fuchs, Fuchs, & Compton, 2004), a version of short-term progress monitoring that was used to index response to 6 weeks of first-grade reading instruction. WIF indexed both the slope of improvement during, and level of performance after, the 6 weeks of instruction.

The second approach to a second-stage screen was dynamic assessment, which measured the amount of scaffolding necessary for a student to learn a novel task; specifically, decoding pseudowords. The third and fourth approaches involved reading text with either CBM-Passage Reading Fluency (L. S. Fuchs, Fuchs, & Maxwell, 1988) or running records, a popular procedure among reading educators.

To explore the utility of these four second-stage screening procedures, Compton et al. (2010) assessed 485 children in fall of first grade on the first- and second-stage screening measures. In spring of second grade, 355 of the 485 children still available were assessed to create a second-grade composite score. This score included timed and untimed performance on word identification and word attack and reading comprehension. Fifty-four of the 355 children were identified as reading poorly. The four methods of conducting a two-stage screen in fall of first grade were then contrasted against each other. Results showed that measuring response to classroom instruction with 6 weeks of WIF progress monitoring, or with dynamic assessment, significantly reduced false positives. Testing children's ability to read passages with running records or CBM Passage Reading Fluency did not reduce false positives.

Predicting Reading Disabilities 5 Years Out. D. Fuchs, Compton, Fuchs, Hamlett, and Lambert (in press) explored how to strengthen the prediction of fifth-grade reading disability status using a two-stage screen in first grade. Study participants

were 195 students who performed least well among their classmates on a first-stage screen consisting of WIF (L. S. Fuchs et al., 2004) and Rapid Letter Naming of the Comprehensive Test of Phonological Processing (Wagner, Torgesen, & Rashotte, 1999), administered in early fall to 783 consented students in 42 first-grade classrooms. D. Fuchs and colleagues wished to classify the 195 students in terms of those who would emerge with and without reading disability in spring of fifth grade. To produce a reasonable distinction between disability/no disability at Grade 5, the researchers administered the Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised (Woodcock, 1998) each spring in Grades 1 through 5 and used growth modeling to estimate a final intercept in spring of Grade 5. Students whose fifth-grade performance fell below a standard score of 86 and above a standard score of 91 were designated with and without a reading disability, respectively. A total of 36 students met the disability criterion (i.e., 4.6% of 783 students who had been screened in fall of first grade).

The researchers used two types of first-grade data for the second of their two-stage screening method. The first was a battery of tests given in early fall, assessing Rapid Automatized Naming, phonological processing, oral language comprehension, and nonverbal reasoning. For each of these cognitive dimensions, multiple measures had been administered. Weighted scores were derived to strengthen reliability. The second type of first-grade data indexed students' WIF performance. The research team calculated the mean of two alternate forms of WIF, which were administered weekly for 18 weeks. The researchers then modeled both December and May reading outcomes.

To determine the usefulness of the cognitive predictors and WIF reading performance for the second-stage screen, D. Fuchs et al. (in press) ran a series of classification models, each stipulating that first-grade screening would miss no more than three students with fifth-grade reading disability. The first model relied solely on reading skill in December of first grade. This simple, inexpensive second-stage screen failed to accurately classify fifth-grade reading disability. In a second model, the four fall-of-first-grade cognitive measures were added to the December reading performance. This more expensive alternative greatly improved classification accuracy. A third model based exclusively on the cognitive predictors produced comparable fit and was therefore considered superior to the model that combined the December reading score with the cognitive predictors. Exclusive reliance on May reading performance in a fourth model was less accurate than the model that combined the cognitive data with December reading skill. Adding May reading to the cognitive predictors in the fifth and last model was superior to the model that relied exclusively on the cognitive variables, but delaying prediction to the end of first grade means delaying intervention until second grade.

These logistic regression analyses suggested that one can be relatively accurate in predicting reading disability in spring of fifth grade using a cognitive battery administered in fall of first grade—a battery that, as in this study, is administered after a first-stage universal screen. In weighing the importance of a two-stage screen versus a one-stage screen, readers should understand that, had the researchers followed typical RTI practice and relied on a one-time screen, they would have tutored 195 students. Of this group, only 36 students would have met criteria for reading disability in spring of fifth grade. So, 159 false positives would have been tutored unnecessarily. By contrast, with a two-stage screening process, only 65 students would have been tutored (29 of whom would be false positives), a more efficient use of school resources even after accounting for the cost of administering the first-grade test battery (see D. Fuchs et al., in press).

Dynamic Assessment. A similar pattern was observed with dynamic assessment as a second-stage screen for third-grade mathematics (L. S. Fuchs, Compton, Fuchs, Hollenbeck, Hamlett, & Seethaler, 2011). Dynamic assessment may be used to predict responsiveness to classroom instruction by measuring the amount of assistance students require to learn novel content in a test situation. It involves (a) structuring the learning task, (b) providing instruction in increments to help the student learn it, and (c) thinking of responsiveness to the instruction as a measure of learning potential. The examiner in such assessment is interested in the student's level of perfor-

mance and rate of growth. Traditional testing, by contrast, is typically concerned only about level of performance. Some claim that dynamic assessment's dual focus on level and rate of learning makes it a better predictor of future performance. Consider, for example, the child who enters kindergarten with little background knowledge. He scores poorly on traditional tests but during dynamic assessment he shows maturity, attention, and motivation. More importantly, he learns a task, or series of tasks, with only a modest amount of guidance from the examiner. Because of this, he is seen as being in less danger of school failure that his classmates who are scoring poorly on both traditional tests and dynamic assessment. Therefore, use of dynamic assessment may help decrease the number of false positives.

To identify students likely to exhibit inadequate learning on word problems, L. S. Fuchs et al. (2011) first group-administered a screening measure to 122 third graders. The second-stage screen was a 45-min individually administered dynamic assessment to determine the amount of scaffolding students required to learn three algebra skills. Mastery of each skill is assessed before and after the instructional scaffolding occurs. The scaffolding gradually increases in its explicitness and concreteness. Scores range from 0 to 21 (0 indicates no mastery of any skills despite the provision of all levels of scaffolding; 21 indicates mastery of each of the three skills without scaffolding). Word-problem difficulty was designated at the end of third grade based on the Iowa Test of Basic Skills: Problem Solving and Data Interpretation (Hoover, Dunbar, & Frisbie, 2001).

Results suggested the superiority of a two-stage screen. Had the researchers relied solely on the group-administered test, they would have routed many false positives to secondary prevention. The two-stage screening model, combining the group-administered test and dynamic assessment, resulted in 21 fewer false-positive students referred for secondary prevention.

Summary of Findings

These three studies indicate that schools save money by conducting two stages of screening by reducing false positives, or students who unnecessarily enter expensive secondary prevention. More importantly, these false positives compromise the efforts of practitioners trying to provide services to true positives. *Schools should practice Smart RTI by conducting multistage screening in primary prevention to lessen the likelihood of providing expensive secondary prevention to students who do not need it and to strengthen such efforts for those who do.*

Secondary Prevention: Necessary for Students Requiring Most Intensive Instruction?

Although the 2004 reauthorization of IDEA, and more recent "memoranda of understandings" from the federal government, require practitioners to conduct multidisciplinary evaluations of students suspected by parents or others of having special needs, students in most RTI systems almost always participate in less intensive levels of prevention before gaining access to more intensive levels. In a three-level system, for example, students must appear at risk for inadequate response to primary prevention before becoming eligible for secondary prevention services. Then, they must show lack of responsiveness to secondary prevention before becoming eligible for tertiary prevention. This typical lockstep process raises a basic question: Can practitioners identify students likely to be unresponsive to secondary prevention while they are still in primary prevention? That is, can practitioners identify the children who won't benefit from secondary prevention without placing them there? If so, such students may avoid an extended period of failure before gaining access to a more appropriate level of instructional intensity, and schools may avoid the cost of providing ineffective secondary prevention. Research suggests this is possible.

Compton and colleagues (in press) recently demonstrated that diagnostic assessment in fall of first grade can both prevent the placement of children in secondary prevention who do not require it (i.e., false positives) and identify a second group of children for whom secondary prevention will not be intensive enough. In fall of first grade, Compton et al. administered WIF for 6 weeks to 427 initially low-performing children while they

participated in reading instruction in their classrooms. The research team was looking to identify students who entered first grade with low reading performance and showed poor response to the first 6 weeks of classroom instruction. Among the initial group of 427 pupils, 232 were identified. In November, they were individually assessed on measures of phonemic awareness, rapid naming, oral vocabulary, listening comprehension, untimed and timed word identification skill, and untimed and timed decoding skill. Teachers completed an attention rating scale on the students.

Of the 228 students still available after this November testing, 149 were randomly assigned to secondary prevention; 79 to a control group. Secondary prevention consisted of small-group tutoring in 45-min sessions three times a week for 14 weeks. Students completed weekly WIF assessments and, at the end of tutoring, tutors completed an attention/behavior rating scale. Among the 129 of 149 students who participated in the full 14-week regimen, 33 were unresponsive (according to local norms).

The research team then asked whether they needed the data on responsiveness to secondary prevention, or whether they could have predicted the 33 unresponsive children using already available data. Four sets or "blocks" of predictors were considered, representing increasingly difficult and costly data to obtain. The first three blocks of data were available in fall of first grade before secondary prevention began. Block 1 included measures often used for universal screening (i.e., WIF, rapid digit naming, oral vocabulary, sound matching). Block 2 measured responsiveness to primary prevention (i.e., short-term WIF progress-monitoring data and classroom teachers' ratings of attention and behavior). Block 3 involved relatively lengthy tests of word reading skill and listening comprehension. Block 4 indexed responsiveness to secondary prevention tutoring with WIF progress monitoring data and tutor ratings of students' attention and behavior.

Four statistical models were tested, each incorporating an additional block of the predictive data, to determine the information necessary to identify students who would be unresponsive to secondary prevention. Model 1 contained only Block 1 data; Model 2, a combination of Blocks 1 and 2 data; and so forth until all four blocks of data were entered. Results indicated that the data generated during secondary prevention (i.e., Block 4) did *not* enhance classification accuracy. Relying exclusively on data collected in fall of first grade, before small-group tutoring began, provided similar classification accuracy. Model 3, which included universal screening data, primary prevention data (6 weeks of WIF progress monitoring and teacher ratings of student attention and behavior), and a battery of norm-referenced tests, identified nonresponders to secondary prevention to an impressive extent: sensitivity (or, the proportion of students correctly predicted by the model to be unresponsive) was 90%; specificity (the proportion of children correctly predicted as *not* unresponsive), 80%.

This suggests that a multistage screening process in fall of first grade can be used to avoid both an RTI "wait-to-fail" model and the provision of secondary prevention to students who don't require it. In an RTI wait-to-fail model, children participate in 10 to 30 weeks of small-group tutoring, despite that their unresponsiveness to it can be determined before tutoring begins. A wait-to-fail approach delays the provision of more intensive intervention and increases RTI costs. *We recommend that schools practice Smart RTI by conducting multistage screening within primary prevention to avoid providing secondary prevention to students whose failure to respond to it can be predicted. These students should be fast tracked to tertiary prevention.*

TERTIARY PREVENTION, SPECIAL EDUCATION, AND THREE ASSUMPTIONS

As we write, there is disagreement about whether special education should have a role in RTI. Some wish it would become a most intensive instructional level in RTI frameworks. Others say it should exist outside RTI or become an RTI component only after it has been redefined and "blurred" with general education (cf. D. Fuchs, Fuchs, & Stecker, 2010). We are in the first of these two camps. Special educators should be charged with delivering specialized, expert, tertiary prevention to students who are not helped by prior levels of instruction. We base this belief

on several assumptions we make about Smart RTI.

Purpose of RTI

Our first assumption is that the purpose of Smart RTI is *not* to prevent special education placement—the implicit belief of many who argue against including special education in RTI frameworks. Rather, we believe educators should think about prevention as working with students to help them steer clear of school dropout, unemployment, incarceration, poor health, and other life-limiting sequelae of inadequate academic performance. Describing an analysis by the Center for Labor Market Studies at Northeastern University of 2008 unemployment data, Dillon (2009) reported that 54% of the nation's high school dropouts, 16 to 24 years old, were jobless. On any given day, one in 10 was either in jail or juvenile detention. For black males, the proportion was one in four. Dropout, incarceration, unemployment and the like are the "big-picture" issues that will drive Smart RTI practitioners' prevention efforts. With such issues in mind, they will build frameworks that marshal the talents and efforts of all building-based professionals, including special educators.

Comprehensive Framework

A second and related assumption is that if the purpose of Smart RTI is to prevent the numerous, undesirable consequences of school failure such as high school dropout and unemployment, it must reflect a comprehensive effort—as comprehensive (and complicated) as multilevel systems of effective health care, which Gawande (2011) has characterized as "full-spectrum" care. The overarching goal of full-spectrum health care, according to Gawande, is to provide high-quality services at minimum cost. Where this occurs, it is achieved by reducing the need for intensive levels of prevention by offering effective primary care (e.g., regular screenings that may trigger early secondary prevention). The key distinction here is reducing, not eliminating, the need of intensive prevention. Among health care providers, there is unanimity of opinion that a most intensive level of intervention, with its high-cost specialists and hospitals, is essential for preventing long-term negative consequences of serious medical conditions. The challenge is to move patients in and out of intensive prevention as quickly as possible, while realizing that long-term care will be required by some. Analogously, full-spectrum RTI frameworks must be capable of helping both the "garden-variety" low achiever, who requires the intermittent attention of a co-teacher with expertise in modifying curricula and learning tasks, as well as the child with more serious and chronic learning and behavior problems, the severity of which requires 1 to 2 hours per day of one-to-one remediation from an expert instructor.

Specialized Expertise

A third assumption: If practitioners adopt a comprehensive or full-spectrum framework of care, special and general educators (and others) must accept equally important, but uniquely different, responsibilities. This is because Smart RTI is a highly articulated system: Many and varied activities must be implemented—activities that are interdependent and that call for different skills. We believe it is naïve to expect—and very bad policy to demand—that generalists will be cross-trained to teach skillfully to an academically diverse class of 28 children (primary prevention); to implement with fidelity a validated standard protocol to three to six students, some with behavior problems, while collecting and reviewing data on their progress (secondary prevention); and to use "experimental teaching" with the most difficult-to-teach children (tertiary prevention). In short, Smart RTI will be conducted by many specialists (including the classroom teacher) who are simultaneously applying different skills with different children at different levels of the prevention framework.

In short, Smart RTI will be conducted by many specialists (including the classroom teacher) who are simultaneously applying different skills with different children at different levels of the prevention framework.

Among the multiple prevention levels, the one about which there is greatest uncertainty is tertiary prevention (e.g., Berkeley et al., 2009; Jenkins et al., 2011). Many teachers and researchers do not know how to conceptualize it, let alone conduct it. This appears to be the case in health care as well. Gawande (2011) writes

> The critical flaw in our health-care system . . . is that it was never designed for the kind of patients who incur the highest costs. Medicine's primary mechanism of service is the doctor visit and the E.R. visit. For a thirty-year-old with a fever, a twenty-minute visit to the doctor's office may be just the thing. For a pedestrian hit by a minivan, there's nowhere better than the emergency room. But [the doctor visit and E.R. visit] are vastly inadequate for people with complex problems [like] the sixty-year-old with heart failure, obesity, gout, a bad memory for his eleven medications. [Our response to such patients is] like arriving at a major construction project with nothing but a screwdriver and crane (p. 9).

Smart RTI must include a level of tertiary prevention that is capable of serving most difficult-to-teach children and youth. Effective educators at this level will be instructional experts. They will be knowledgeable about curricula and instructional approaches across domains and will collect data on each of their students to understand whether and when their instruction is working. They will embrace the premise that, for many of their charges, effective treatments are derived across time through trial and error but guided by their knowledge and experience. They will be patient, persistent, and tolerant of ambiguity. Again, the need for such highly skilled clinician-researchers does not diminish the importance of equally talented teachers in primary and secondary prevention without whom RTI frameworks will simply collapse. In a comprehensive, full-spectrum system—irrespective of whether it's health care or educational care—specialization is pivotal at all levels.

Of course, it doesn't necessarily follow that special educators should be responsible for tertiary prevention. Nevertheless, there are at least two reasons for expressing this preference. First, for more than a century, special educators have worked with the most difficult-to-teach students, many of whom were previously rejected by general education. Second, during 25 years of funding by the Office of Special Education Programs (OSEP) in the U.S. Department of Education, special education researchers, often in collaboration with special education teachers, developed and validated a "technology" of assessment and instruction for the most instructionally needy students. This research, in turn, became the basis of a pedagogical approach known as "data-based instruction" or "experimental teaching," which has proved effective for many students with serious learning problems (cf. Deno & Mirkin, 1977; L. S. Fuchs, Deno, & Mirkin, 1984; L. S. Fuchs & Fuchs, 1986).

That said, there are precious few preservice or inservice programs currently preparing experimental teachers for our nation's schools. Special education has moved away from its unique history and tradition and distinctive practices. It is time for special educators to rediscover their roots and consider more ambitious roles for themselves in RTI frameworks. It is time, too, for policymakers, administrators, advocates, and academics to have high expectations of special educators—at least as high as the expectations they seem to have of general educators, despite the repeated failures of many to meet the needs of millions of students with disabilities as evidenced by data from the National Longitudinal Transition Study (Wagner, Newman, Cameto, Levine, & Marder, 2003) and other databases.

THREE QUESTIONS

We have been arguing for comprehensive frameworks of RTI characterized by specialized expertise at each level of prevention and in which special educators deliver the most intensive instruction. We suspect many readers will find parts of this view self-evident (e.g., a need for comprehensive frameworks and specialized roles); other parts less obvious and debatable. However, readers may be surprised to learn that *all* parts of our position are contested by various stakeholders. A need for a comprehensive framework, for example, is rejected by those who doubt the existence of "high-incidence disabilities"; who believe that,

with the right general education (i.e., strong primary and secondary prevention), virtually all children, including those with learning disabilities, mild intellectual disabilities, and behavior disorders, will make satisfactory academic growth (e.g., McLaughlin, 2006; Ysseldyke, Algozzine, & Epps, 1983).

Similarly, some reject a need for specialized expertise (e.g., Blanton, Pugach, & Florian, 2011). They champion generalists over specialists because of the purported absence of instructionally relevant differences between students with high-incidence disabilities and children without disabilities; also, because specialization, they say, divides educators from each other by necessitating different preservice majors and credentialing programs, and because it supposedly distances students from each other by contributing to the development of various instructional programs, categories of exceptionality, and learning environments. In short, some see specialization as working against collegiality among teachers and the inclusion of students in mainstream classrooms.

In light of these concerns, our perspective on RTI raises these three questions:

1. Is a third level of very intensive prevention necessary—or is primary and secondary prevention sufficient to prevent school failure?
2. If tertiary prevention is seen as necessary, how are practitioners currently implementing it?
3. What role(s), if any, should special educators play?

Is Tertiary Prevention Necessary?

Among researchers who study RTI, there is growing recognition that a combination of strong primary and secondary prevention will fail to meet the needs of about 5% of the student population. These students require an additional tertiary level of intensive and expert instruction. To illustrate the point, we describe two studies in which investigators implemented high-quality primary and secondary prevention. The first was conducted in mathematics at third grade. The second study addressed reading instruction at middle school.

Third-Grade Mathematics. In a multilevel, large-scale randomized control trial, L. S. Fuchs et al. (2008) identified the respective contributions of classroom instruction and small-group tutoring to what students learned about math word problems. The investigators randomly assigned 40 classrooms to a control condition and 80 classrooms to validated word-problem instruction, balancing the assignments to represent schools and classrooms in an unbiased manner. From these 120 third-grade classrooms, the research team screened a representative sample of 1,200 students, and designated 288 as at-risk for poor word-problem outcomes. These students were then assigned randomly to one of four conditions: (a) no validated instruction in either classrooms or small-group tutoring, (b) validated instruction in classrooms but not in small-group tutoring, (c) validated instruction in small-group tutoring but not in classrooms, and (d) validated instruction in both classrooms and tutoring.

Results indicated that on a measure of math word problems students who participated in validated classroom instruction outperformed students who participated in conventional (nonvalidated) class instruction by 1.3 standard deviations. A similar effect size characterized the comparison between tutored and nontutored students. Findings also showed that validated small-group tutoring was statistically significantly and practically more effective when combined with validated classroom instruction than when it co-occurred with conventional (nonvalidated) classroom instruction. The research demonstrated the importance of providing at-risk students with both strong primary prevention and secondary prevention.

Another important finding from the same study was that tutoring was the essential instructional component for the at-risk learners. Without it, the gap between at-risk and not-at-risk students widened, even when the not-at-risk students participated in the conventional classroom instruction. Yet, and here's our main point, even the demonstrably effective tutoring did not benefit all students. Extrapolating from the nonresponders in their sample to the general population, the researchers estimated a nonresponse rate of 4.0%. This is notably smaller than the extrapolated 7% rate of unresponsiveness among students who did not receive tutoring. But

for the 4%, a greater level of instructional intensity was clearly warranted.

Middle School Reading. In a multilevel, large-scale randomized control trial conducted at sixth grade, Vaughn et al. (2010) provided 6 hr of professional development in reading to classroom teachers with monthly follow-up sessions and in-class coaching when requested by the teachers. The research team's goal was to integrate vocabulary and reading comprehension instruction throughout the school day. Vaughn et al. were not interested in assessing the quality of primary prevention. Rather, primary prevention was enhanced as an instructional backdrop for studying secondary prevention's effects.

Vaughn et al. (2010) identified at-risk students based on their performance on the previous year's state reading assessment and randomly assigned them to two conditions: (a) business-as-usual school services or (b) 32 to 36 weeks of researcher-designed tutoring that emphasized decoding, fluency, vocabulary, and comprehension. The researchers delivered this secondary prevention in groups of 10 to 15 students, to reflect the realities of providing services in middle schools.

Compared to the at-risk control group, the tutored students exhibited stronger decoding, reading fluency, and comprehension outcomes following secondary prevention. However, given that the tutoring was implemented daily across the school year, the investigators described the size of these between-group differences as disappointingly small (i.e., 0.16 standard deviations). In addition, the percentage of nonresponders was relatively high. The researchers attribute these findings, in part, to the fact that some of their control students received supplemental supports. Nevertheless, their results still compare favorably to a number of large-scale treatment studies with secondary students that have produced no effects or smaller effects (e.g., Corrin, Somers, Kemple, Nelson, & Sepanik, 2008; Kemple et al., 2008). Vaughn et al.'s (2010) research effort highlights the difficulty of designing secondary prevention to remediate serious academic difficulty at middle school.

Findings from the two randomized control trials just described (L. S. Fuchs et al., 2008; Vaughn et al., 2010) indicate that, although student learning improves with high-quality primary and secondary prevention, the level of intensity—by which we mean the frequency and duration of instruction, size and homogeneity of the instructional groups, and specialized expertise of the instructor—is not sufficient for a significant minority of students. And these results are corroborated by additional studies on the efficacy of secondary prevention (e.g., Denton et al., in press; O'Connor et al., 2010; Simmons et al., 2011). (See Vaughn et al., in press, for just how intensive tertiary instruction had to become before their sample of very poor readers began to improve.) Taken together, this work shows that to prevent school failure and associated poor-life outcomes, much more intensive intervention is required for about 5% of the school population. (This estimate does not include students with intellectual disabilities who typically are excluded from RTI studies.) *We conclude that Smart RTI requires a third level of instruction, which is distinguishable by its intensity from secondary prevention.*

How is Tertiary Prevention Typically Implemented?

Nobody has an authoritative answer to the question: How is tertiary prevention typically implemented? Our impression based on the work we do in schools and our understanding of others' research is when students do not benefit from secondary prevention, they often face one of two highly problematic scenarios. In the first, they remain indefinitely in secondary prevention, despite their long-running unresponsiveness. This averts tertiary prevention and special education, but does not address their instructional needs. (Relying on secondary prevention as a long-term solution for unresponsive students also violates IDEA for students with suspected disabilities and raises questions about due process and appropriate notification and participation of parents in decisions about the long-term provision of supplementary instruction.)

In a second scenario, the unresponsive students move from secondary prevention to special education, which in many school districts terminates their involvement in RTI frameworks. Rather than obtaining specialized expert instruction in special education, however, they frequently return to the general class with accommodations

and co-teaching. According to the National Longitudinal Transition Study-2 (Wagner, Marder et al., 2003; Wagner, Newman et al., 2003), 40% of students with learning disabilities nationwide have general education teachers who receive no information about their instructional needs; only 11% of students with learning disabilities receive substantial modifications to the general education curriculum.

We refer to this form of special education as *special education as accommodation* (or, perhaps *special education lite*). The apparent rationale for such an approach is that, despite the students' poor response to general education and to secondary prevention, access to the general education program (again) will meet their instructional needs. Sadly and ironically, this form of special education is often less intensive than secondary prevention. We have to wonder whether it signals that schools have given up on teaching their most instructionally needy students. Equally troubling is the possibility that these children and the specialized expert instruction they require—which may occur outside the classroom—are being sacrificed because of an inclusion policy that lacks necessary nuance.

In health care, the second scenario we just described is sometimes referred to as *failure to rescue*. As the *New York Times* (Chen, 2011) recently reported,

> Over the last few years, no other aspect of the health care system has lost its luster as much as aggressive care. Once considered a point of pride and a source of strength, aggressive care has now been transformed into the whipping boy for health care reformers of all stripes . . . . Politicians from both sides of the aisle, administration officials and even insurers have transformed the nuanced caveats of the research into a broad "more is worse" rallying cry. In this heated environment, restricting payments to hospitals whose total expenditures, total I.C.U. days and total hospital days exceed the norm has become a foregone conclusion . . . . The notion that aggressive care leads to worse outcomes has been easy to buy into because it seems to offer an easy remedy for spiraling costs.

This echoes the zeitgeist concerning costly special education, which is often characterized as ineffective. Such claims—in education and health care—are sometimes accurate. However, they are also often based on confounded analyses. In health care, the confounding involves comparing sicker patients who receive more aggressive care to less sick patients who receive less aggressive care. Regarding special education, outcomes for students with disabilities are compared to general education outcomes for typically developing students. The *New York Times* article provided clarifying data for health care, showing that patients with surgical complications were significantly more likely to survive when treated in more aggressive hospitals. Similar findings, we suspect, would be obtained by comparing "special education as accommodations" against a more intensive and distinctive special education—for students with similar academic difficulty. This, of course, assumes that the more intensive and distinctive special education is designed in ways that make it a valuable component of Smart RTI.

What Might Special Education Look Like as Tertiary Prevention?

There is widespread recognition that special education and general education require reform. RTI provides opportunity for reforming both in coordinated fashion. We believe three changes are critical for strengthening connections between the two and making special education more effective for students with high- and low-incidence disabilities with academic goals. These changes are integral for practicing Smart RTI.

Experimental Teaching. In a Smart RTI framework, special education (tertiary prevention) differs from secondary prevention because teachers set individual, year-end goals in instructional material that matches students' needs. The material may or may not be drawn from the students' grade-appropriate curriculum. Similarly, the instruction may address foundational, or precursor, skills necessary for eventual satisfactory performance in grade-appropriate material. In short, practitioners in a Smart RTI framework recognize that "off level," or out-of-level, curricula and instruction are sometimes required for creating meaningful access to the general education cur-

riculum and content standards (a point to which we will return).

Because students in tertiary prevention, by definition, demonstrated insufficient response to "standard" instruction in primary and secondary prevention, special education instruction must be individualized; that is, no "off-the-shelf" instructional program or materials are likely to be helpful. The special educator may begin with a more intensive version of the standard protocol used in secondary prevention (e.g., longer instructional sessions, or smaller and more homogeneous groups), but she does not assume the protocol—more intensive or not—will be effective. Rather, she uses ongoing progress monitoring to evaluate instructional effects. The data are summarized in terms of weekly rates of improvement (i.e., slope) and, when slope indicates that goal attainment is unlikely, the teacher experiments by modifying treatment components and continues to evaluate student performance. In this way, the teacher uses her clinical experience and judgment to inductively design instructional programs—child by child. Research on the efficacy of this "data-based program modification" (e.g., Deno & Mirkin, 1977), or experimental teaching, approach indicates that it accelerates academic performance among many special education students (for summaries, see L. S. Fuchs & Fuchs, 1998; Stecker, Fuchs, & Fuchs, 2005).

It seems that most school district's RTI systems omit experimental teaching, despite its demonstrated effectiveness with students with severe learning problems (D. Fuchs et al., 2010; L. S. Fuchs & Fuchs, 1998; Stecker et al., 2005). Teachers and administrators often confuse it with informal, non-data-based problem solving. So, it is important to emphasize that in tertiary prevention informal problem solving (as well as implementing a standard tutoring protocol) is less intensive and will be less effective than experimental teaching.

Meaningful Access. Experimental teaching requires a type of access to general education that differs from how "access" is typically understood. Conventional practice reflects the misunderstanding that access prohibits teaching below-grade-level content and requires students with disabilities to be in the classroom for all instruction. However, requiring students without prerequisite skills to participate in grade-level instruction violates notions of meaningful access in two ways: by subjecting children to inappropriate instruction and by depriving them of more appropriate instruction and the opportunity to learn. Access must be understood in terms of building foundational skills for eventual success in grade-appropriate material. In other words, concern about access should not prevent practitioners from providing out-of-level instruction to meet students' academic needs. A practice guide recently issued by the Institute of Education Sciences' What Works Clearinghouse, and written by a panel of academics and practitioners (Gersten et al., 2009), supports this view. The panel reviewed the relevant literature and concluded, "Alignment with the core curriculum is not as critical as ensuring that instruction builds students' foundational proficiencies. Tier 2 and Tier 3 instruction must focus on foundational and often prerequisite skills that are determined by the students' rate of progress. In the opinion of the panel, acquiring these skills will be necessary for future achievement." (p. 20).

[C]oncern about access should not prevent practitioners from providing out-of-level instruction to meet students' academic needs.

In Smart RTI, special educators must focus on instructional level material, even if this material does not represent grade-level content. Creating the opportunity for intensive intervention may also mean that children with severe learning problems miss portions of the general education program from which they are not likely to benefit. Special educators and their building-based colleagues need clarifying language from federal and state governments about what *alignment with the general education curriculum* means. Such information can help educators practice what they know about student learning. At the same time, care must be taken. No student should be excluded from components of the general education program from which he or she can and does benefit. A national dialogue is needed about meaningful access; a thoughtful conversation

driven by concern for students with serious learning problems and not shaped by an ideological commitment to inflexible interpretations of access, which diminish opportunity for students to obtain the education they require and deserve.

Movement Across Prevention Levels. Many students who are unresponsive to secondary prevention have uneven profiles of academic development. Consider a fifth grader who requires primary prevention instruction to learn about whole numbers, secondary prevention to learn about rational numbers, and tertiary prevention to boost reading skills. As the intensity of a student's instructional needs varies, so does the meaning of access. For the fifth grader, meaningful access for reading may require instruction from a second-grade text, whereas meaningful access for math means instruction in fifth-grade material. Similarly, a first grader with reading problems who is not helped by secondary prevention may enter tertiary prevention, respond well and, within 6 months, achieve a level of performance indicating a need for access to first-grade material.

Consideration of a student's instructional requirements across academic domains at a single point in time (e.g., the previously mentioned fifth grader), and within an academic domain at various points in time (e.g., the just-described first grader), illustrate the need for linkages between general and special education that facilitate flexible entering and exiting from tertiary prevention. Students with special needs require open IEPs (developed with parental participation) that permit strategic movement into and out of special education. Such movement parallels health care's prevention system, where individuals participate in primary, secondary, and tertiary prevention, depending on their health-care needs at a given time or across time, as their diagnoses (or disabilities) change.

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We therefore recommend that schools practice Smart RTI by implementing tertiary prevention as intensive special education, which features data-based individualized instruction, or experimental teaching; meaningful access to the general education curriculum; and flexible movement across levels of prevention. Without such special education, schools will not make smart use of special education dollars to prevent the life-long difficulties associated with school failure. Schools will fail to rescue their most vulnerable students—those unresponsive to secondary prevention—requiring them instead to remain in secondary prevention or to exit the RTI system only to be warehoused in primary prevention under the guise of special education as accommodation. By contrast, if special education becomes tertiary prevention and is reformed as suggested, then school-based practitioners will mitigate the negative effects of disability and save their students with special needs not from special education, but from a litany of well-known failures that trail closely behind persistently poor academic performance.

CODA

To some, this article may read as two articles. The first, exploring technical issues of screening and assessment related to the accuracy and timeliness (i.e., efficiency) with which children are identified as requiring more intensive instruction; the second, addressing more general issues of RTI implementation and a role for special education. We hope a majority of readers will see the article more holistically as an effort to push the boundaries of accepted practice and to find more successful solutions to strengthen the academic performance of children with severe learning problems.

Trying to find more successful solutions should not imply a lack of respect for the many teachers and administrators who have worked very hard to make RTI work. But, as we and our colleagues (Lemons et al., 2010) have written elsewhere, there has been a rush to orthodoxy across the country with respect to RTI. That is, there has been a too frequent, unexamined acceptance of untested practices, which may not represent the smartest way of implementing multilevel

prevention. Examples of this uncritical acceptance include the very quick and broad adoption of one-stage screening procedures; the lockstep dance among the instructional levels, requiring children with serious learning disabilities to participate in primary prevention before secondary prevention and both primary and secondary prevention before tertiary prevention; and the popular belief that special education should exist outside RTI frameworks or be admitted inside only after it has been changed into something indistinguishable from general education. There are alternate ways of thinking about each of these important issues.

We encourage practitioners and researchers to think dispassionately and critically (not negatively) about what they do; to rigorously and fearlessly test the effectiveness of their assessments and instruction; and to be innovative in exploring alternatives to how they are attempting to strengthen students' academic performance. We hope that this will be understood as the overarching, undergirding, integrating theme of the article.

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