

## **Where there's a Will there are Ways to Close the Achievement Gap for Children with Special Education Needs**

*Children who get off to a poor start in reading (and math) rarely catch up. We wait—they fail. But it does not have to be this way. (Lyon et al. 2001 Rethinking Learning Disabilities)*

Children with special education needs include those with developmental learning disabilities, learning disabilities due to genetic, medical, and neurological disorders, children with sensory impairment, intellectual impairment, and so forth. Because well over 50% of children with special education needs have learning disabilities (LDs) regardless of how or why learning difficulties arise, this paper focuses on what is known about closing the achievement gap for these children.

There have been steady increases in the number of children identified with LDs since the official designation of LDs in education almost 40 years ago, (Fletcher et al., 2007). The designation arose from social and political forces in recognition that the education of significant numbers of children was not being adequately served by existing disability categories. At the inception of this new designation there was relatively little research on LDs to guide identification, prevention, and intervention (Lyon et al., 2001). However, in the past two decades, significant progress has been made in understanding: whether our means of assessing and identifying children with LDs are reliable and valid (Fletcher et al., 2007); the neurobiological underpinnings of learning difficulties involving the brain and genes (Plomin & Kovas, 2005; Shaywitz & Shaywitz, 2005); cognitive processes underlying both typical and atypical development of academic skills (Siegel, 2003); prevention strategies (Vaughn et al., in press); and evidence-based instructional and intervention practices (Swanson, Harris, & Graham, 2003). For word reading disability, or dyslexia, so much is known that there is a unifying theory explaining typical and atypical development of reading in relation to neurobiological and environmental factors as well as the effects of intervention on both brain and behaviour (Fletcher et al., 2007). These amazing advancements in knowledge have the potential to help children whose academic and vocational success are affected by what is arguably the most disabling learning disability. An overview of the research evidence on identification, prevention, and intervention – an understanding of which are critical for closing the achievement gaps in numeracy and literacy – is presented below.

### **Do our identification and assessment practices help or hinder the education of children with special education needs?**

The diagnosis of LDs with reference to the measurement of intelligence or IQ and to exclusionary criteria (what does *not* qualify as an LD) has long guided the assessment and identification of children with learning difficulties. In some jurisdictions, these means of identifying LDs are written into law (reviewed in Barnes & Fuchs, in press). The validity of the IQ-achievement discrepancy and the use of exclusionary criteria to identify children with LDs is discussed below.

Often, an LD is identified when there is an IQ-achievement discrepancy; that is, when intelligence is markedly higher than academic achievement. Historically, the use of IQ-achievement discrepancy to identify LDs comes from an incorrect inference that IQ is a measure of learning potential (Share, McGee & Silva, 1989). It isn't (Neisser et al., 1996). Today, there is little scientific evidence for the usefulness of the discrepancy in identifying or treating LDs. Children with learning problems who show large or small IQ-achievement discrepancies (historically, the latter group has been called “slow learners”) do *not* significantly differ from each other on a variety of dimensions such as: i) the cognitive processes that are deficient and that are the cognitive “causes” of the disability (phonological processing in both groups; Stanovich & Siegel, 1994); ii) the genetic and neural underpinnings of the learning difficulties (reviewed in Fletcher et al., 2007). For example, during

reading, brain activation patterns of children with dyslexia “normalize” after intensive remediation regardless of the IQ-achievement discrepancy (Simos et al., 2000); iii) the level of reading acquired by the end of schooling (Francis et al., 1996); and iv) how quickly or how well interventions work (Vellutino et al., 2000). Furthermore, there are some decidedly negative consequences of using the discrepancy approach to identification. Discrepancy scores are notoriously unreliable as are all classifications based on a cut-point along a normal distribution (Francis et al., 2005). More importantly, using a discrepancy score to diagnose an LD means the LD is identified late because the psychometric properties of the tests used to assess IQ and achievement do not produce large discrepancies until about grade 2-3 (Fletcher et al., 2007). Yet, we know that the greatest benefit to children with learning difficulties is to intervene early in schooling (see Prevention section below).

LDs are also often identified by a set of exclusionary factors such that the LD must *not* be due to mental retardation; sensory disorders; linguistic diversity; emotional or behavioural disorders; social or cultural factors; or lack of appropriate educational experiences (Ministry of Education, Ontario; U.S. Department of Education). Although the first three of these exclusionary factors are reasonable there are problems with the latter three. First, many children with behavioural disorders such as ADHD have co-occurring LDs. One does not cause the other though cognitive and learning difficulties tend to be more severe when both disorders are present (Fletcher, 2005; Willcutt et al., 2001). Improving reading and math early in schooling appears to reduce or prevent later emotional problems such as depression (Kellam et al., 1994). In all, there is little empirical support for the idea that children should be excluded from being identified with an LD if they have emotional, behavioural, or social difficulties. Second, we know that social-economic and cultural factors interfere with the development of cognitive and language skills, which in turn increases the risk of academic difficulties culminating in LDs. For example, children who are socially and economically disadvantaged have vocabularies half the size of non-disadvantaged children at school entry (Hart & Risley, 1999), enter kindergarten with much less knowledge of the alphabet than their more advantaged peers (Whitehurst & Masseti, 2004), and begin school with less informal number and quantitative knowledge than children from middle income families (Case et al., 1999). Although disadvantaged children develop in environments that sometimes provide less than optimal support for the growth of those cognitive skills that are important precursors for the development of literacy and numeracy, they respond in similar ways to high quality instruction and interventions as their non-disadvantaged peers with or without LDs (Case et al., 1999; National Reading Panel [NRP], 2000). Thus the validity of exclusion on social and economic bases seems unwarranted. Third, excluding children from a diagnosis of LD if they have not had appropriate educational experiences assumes that instruction has been adequate and appropriate for that child. However, the provision of intervention early in a child’s schooling and the child’s response to that intervention should be made *before* costly and complex special education procedures are put into place to assess and identify children with LD (see Prevention section below).

What is the answer to identification if the traditional means of identifying those with learning disabilities does not hold up to scientific and practical scrutiny? How can we deal with the diversity of children who have learning difficulties some of whom may be living in disadvantaged circumstances, some of whom may have a neurological disorder such as a head injury, a genetic disorder such as fragile X, or a behavioural or neurodevelopmental disorder such as ADHD or autism, and some of whom, for unknown reasons, just seem less able to learn how to read or do math than their peers? How do we ensure children’s learning needs are identified early so that prevention programs are in place to reduce the incidence of later learning difficulties? How do we help children who do not respond to prevention programs or whose learning difficulties are caught late? The remainder of the paper delineates what is known about identification, prevention and intervention for children with LDs.

**Prevention is often the cure.**

The news on prevention of learning disabilities is good! First, several studies have shown that the incidence of LDs can be significantly decreased; in fact, up to 70% of later diagnosed LDs can be prevented with a combination of early screening, progress monitoring, and teaching that is responsive to early emerging learning problems (National Reading Panel, 2000). Second, we know that prevention works better for fixing some skills than does the best remediation we have to offer that is introduced later in schooling. For example, while certain reading interventions instituted after grade 2 can produce remarkable growth in word reading accuracy, reading fluency is stubbornly resistant to these best teaching practices (Torgesen, 2004). Programs that work on prevention of reading problems in kindergarten and grade 1, on the other hand, seem to remedy both reading accuracy and fluency.

The two cornerstones to prevention are **mass screening** for all children at school entry and in the early grades, and **progress monitoring** of children, particularly those who are at risk for learning difficulties. Mass screening techniques exist that can predict academic and behavioural difficulties in children in the first few years of schooling (Donovan & Cross, 2002). These are quick assessments that identify those at risk at a much earlier age than that using a more traditional referral model and so prevention programs can be put into place as early as kindergarten. Progress monitoring is typically carried out by the classroom teacher and is done more frequently than mass screening – from once a week to about once every three weeks. What is progress monitoring? It is the frequent monitoring of children’s academic progress in relation to instruction. Progress monitoring tools are very sensitive to instructional change; they are widely available and easy and *very* fast to administer, taking only 1 to a few minutes at most; and, they are best at assessing phonological awareness, word reading accuracy, fluency, math and spelling and less adequate for assessing problems in reading comprehension and written composition. Examples are having a child complete math computations or read a short grade-appropriate passage for 1 to a few minutes depending on the tool used. For reading, the number of accurately read words is graphed over time and compared to the school’s benchmarks that reflect expected outcomes for grade. But, why do more testing? And, what about the teacher’s primary job – teaching children? Progress monitoring should be viewed as one of the most powerful tools available to teachers to produce change in their students. It puts assessment information directly in the hands of teachers, which is what is critical for providing immediate and frequent feedback on student progress. It is this juxtaposition of teacher-driven assessment in relation to previous and ongoing teaching that allows for more differentiation of instruction – a necessity for children at risk of learning difficulties (Stecker et al., 2005). Thus teachers in the early grades may increase the intensity or duration of instruction for children who are not responding to previous instruction. Although progress monitoring is a necessary component of prevention it is also extremely important for driving instruction for children who have special education needs regardless of what grade they are in.

Screening and progress monitoring firmly situate assessment in the service of intervention and privilege prevention and intervention over identification and traditional forms of LD assessment. It is important to realize that prevention programs, progress monitoring, and differentiated instruction all require considerable education, professional development, and institutional support, particularly for teachers in the primary grades who are the first line of defense in the attempts to close achievement gaps for children at risk and for those with early emerging special education needs.

What happens when all attempts at prevention fail? What about the roughly 30% or more of children in studies who do not respond to best prevention and early intervention programs? When schools have prevention models in place children that do not respond to the instructional opportunities provided within the general education classroom are identified early. These students can then be provided with increasingly intensive interventions and their progress monitored. This is referred to as multiple tiers of instruction within general education (Vaughn et al., in press). Children who continue to show lack of progress may require highly specialized and intensive interventions partly outside of

the general education classroom. But, when a prevention model is in place this situation represents the endpoint of the special education process, not the beginning.

In sum, educators need not wait for a diagnosis of LD to begin intervening with children who are at risk for learning difficulties or who are not progressing as expected. In fact, a combination of early screening, and instruction that is responsive to findings obtained from teacher-driven progress monitoring in kindergarten and grades 1 and 2 has the effect of reducing the later incidence of full-blown LDs. As is true for other societal problems, prevention is less expensive in terms of both financial and human resources, than is intervention and treatment. Waiting for a diagnosis of an LD is, as the quote at the beginning of this paper conveys, tantamount to “waiting for a child to fail”. But despite the best screening, high quality instruction in reading and math, and appropriate progress monitoring that drives differentiated instruction some children will fail to make much progress. The following instructional principles apply to these children, but you will see that they are also good instructional principles for children in general education (and see Principle 8). If high quality prevention and intervention programs are in place in the early primary grades, then the numbers of children needing special education later in schooling decreases. The flip side of this is that the resources, intensity and effectiveness of special education could be enhanced for those children who fail to respond to prevention and early intervention within general education.

### **Eight instructional principles for improving literacy and numeracy in children with special education needs (Fletcher et al., 2007)**

1. **The instructional approach needs to be explicit and well-organized with opportunities for cumulative review.** One of the best sets of evidence for this type of instructional approach comes from the National Reading Panel (NRP, 2000) that conducted a meta-analysis of over 75 studies on the effectiveness of phonics instruction for improving reading. This analysis showed that those studies in which phonics was taught systematically and explicitly were more effective for improving reading than were programs in which phonics was implicit or not taught at all and in which phonics instruction was not systematic. The effects were greatest when phonics instruction was introduced in kindergarten and grade 1. Studies of math interventions are much less common than for reading and instructional programs for reading outnumber those for math by a factor of 6 to 1 (Ginsburg et al., 1998). However, the findings on instructional approach are similar for reading and math. Explicit teaching of math concepts and procedures results in increases in math achievement (Baker et al., 2002). Instruction for children with learning difficulties also needs to provide for cumulative review of previously instructed and seemingly mastered content. It is a frequent complaint of teachers and parents that children with learning difficulties seem to have a concept or a skill one day only to have it disappear the next. Research shows that these anecdotes are well-supported by evidence. Children with learning difficulties have problems in consolidating, retaining and transferring newly learned information and skills from one day to the next and from one situation to another. That is why cumulative review is so important for these children.
2. **Self-regulation strategies provide benefits over and above those provided by systematic explicit instruction.** These strategies directly involve students in setting goals for their academic performance and require them to monitor and chart their progress. For example, in instructional studies designed to improve math fact retrieval and arithmetic procedures or algorithms, students who selected their own learning goals had stronger learning than students who were assigned learning goals (Fuchs et al., 1989). In intervention studies of math problem solving, students who set goals and graphed and monitored their progress made the greatest gains (Fuchs et al., 2003).

3. **Peer Mediation is an effective method for extending scaffolded instruction and results in more acceptance by peers.** Peer-assisted learning strategies, also called collaborative learning, involve small-group instruction and students working together on specific learning activities. These practices are useful at the classroom level because they aid in classroom management and provide a means to deliver differentiated instruction (Jenkins & O'Connor, 2003). Many studies of math and reading have shown that pairing students who have stronger academic skills with those with weaker skills from kindergarten on improves outcomes for *all* students and provides opportunities for practice that help acquisition of new knowledge and transfer of skills and content knowledge (Fuchs & Fuchs, 2005). Furthermore, students with special education needs are better known and better liked by their peers in classrooms that practice peer assisted learning strategies (PALS website, Vanderbilt University).
4. **Skills based instruction needs to be integrated with instruction in higher level skills and weak foundational skills should not stop teaching of higher-level skills.** The NRP report discussed above provided clear evidence that simply adding more phonics instruction to the general education classroom or to programs for children with reading disabilities without incorporating instruction in other areas of reading such as fluency, vocabulary, and reading comprehension does *not* improve reading outcomes. The most effective prevention and intervention programs for both reading and math are comprehensive and integrate instruction in basic skills with higher-order skills. For example, the most successful early prevention programs for reading are those that provide explicit instruction in the alphabetic principle, that teach for meaning, and that provide opportunities for practice. Research also shows that impressive gains in higher order skills such as comprehension, written expression, and math problem solving can be achieved even when word decoding, spelling, and arithmetic are weak, but this only occurs if teachers are simultaneously instructing students in these higher-order skills (Wilder & Williams, 2001).
5. **Gains in literacy and numeracy are specific to instruction in literacy and numeracy.** For example, medication for children with ADHD plus reading disability may help ease some of the behavioural and cognitive manifestations of the ADHD, but will not cure the reading disability (Rabiner et al., 2004). Teaching academic content in one domain such as literacy will not result in transfer or improvement in another academic domain such as numeracy. Finally, despite some claims in the educational and psychological literature and the popular media, programs that provide training in neural, motor, visual, auditory, or cognitive processes that do not explicitly teach academic content, simply do not improve literacy or numeracy and result in lost time and resources that are better spent on addressing the core academic learning problems.
6. **Children are complex and so are their learning difficulties.** Most children with LDs have special education needs in more than one domain. For example, 50% of children with reading disabilities also have math disabilities (Shalev et al., 2000). Children with certain neurological and genetic conditions are at high risk for LDs (Barnes & Fuchs, in press). Children with spina bifida, for example, are at high risk for math disabilities, but not word reading disability (Barnes et al., 2006). This is powerful information to have in terms of prevention, monitoring progress and intervening when and if necessary. Even when a child's academic difficulties are confined to only literacy or numeracy, these children may have accompanying difficulties in attention, memory, executive functions involving planning ahead and self-regulation, and so forth that complicate how the learning difficulties play out in the classroom and that may dilute the effectiveness of particular interventions (Fletcher et al., 1999; 2007). Fortunately, the cognitive sources of difficulties in reading and math and the interventions that help children to learn literacy and numeracy skills may be more similar than they are different across diverse groups of children (Barnes et al., 2006). This does not mean that other issues such as attention deficits do not need to be taken into account, but it does mean that high quality teaching

practices may help many children even when co-occurring conditions are present. Nonetheless, the research base on how attention disorders and other cognitive, behavioural, and emotional difficulties affect learning difficulties and their interventions is sparse and this is clearly an area in need of increased research focus (Willcutt et al., 2005).

7. **Practice makes perfect.** The aim of any special education instruction, whether for prevention or intervention, is to *accelerate* growth and this requires that more time be spent on instruction, engagement, and practice in those areas in which the student has most difficulty. But there is a delicate balance that needs to be respected. Priorities in the primary and junior grades are learning to read, write and do math so additional instruction time in these areas may be necessary and appropriate. However, in the senior grades and in secondary school, additional instructional time spent on these skills may not be advisable if it reduces engagement in other important educational domains. Increased practice and engagement for students with special education needs often also means time on task spent outside of school hours. For example, time spent on reading connected text outside of school helps with reading fluency, acquisition of new vocabulary, and consolidation of word reading and comprehension skills taught in school for children with special education needs just as it does for typically achieving children.
8. **Special education and general education need better integration.** There are many effective interventions for problems in word reading and comprehension, math computations and problem solving, and spelling and written composition and many instructional components of these programs are similar to those that are effective in general education (see Lyon et al., 2006). If prevention and intervention programs are to be most effective for closing the achievement gap for children with special education needs there needs to be a better integration of instructional design across general education and special education. Effective prevention programs properly take place within general education. In turn, the general education classroom needs to be responsive to multiple tiers of effective general education in order for prevention to work. It is worth keeping in mind, however, that the best prevention programs will not address the learning difficulties of all children. Special education research and practice will need to focus on children who respond more slowly to or less well to our interventions.

The explosion of intervention and prevention research in the past decade, mainly in reading, but increasingly in math and writing, provide evidence for what works and what does not work for students with special education needs, though much remains to be studied. Although research provides some of the means for closing the achievement gap, it is worth remembering that educational “research is only as good as its implementation” (Fletcher et al., 2007, p. 274).

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