

# **SPECIFIC DEVELOPMENTAL DYSLEXIA**

*Canadian edition prepared by Louise Ward*

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The *Canadian Dyslexia Association* is working to promote public awareness in order to improve the quality of life of the estimated 4,200,000 Canadians with dyslexia.

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## SPECIFIC DEVELOPMENTAL DYSLEXIA (SDD)

In 1968 the World Federation of Neurology defined dyslexia as "a disorder of constitutional origin manifested by a difficulty in learning to read, write or spell, despite conventional instruction, adequate intelligence, and sociocultural opportunity".

It is estimated by the National Institute of Mental Health (U.S.) that approximately 15 percent of the population may have dyslexia.

Dyslexia knows no boundaries, affecting all races, socio-economic and ethnic groups.

Dyslexia tends to run in families.

The degree of difficulty ranges from mild to severe.

## CHARACTERISTICS OF DYSLEXIA

The symptoms of dyslexia vary widely from person to person. People with dyslexia may have trouble with one or more of the following:

- forming the shapes of letters
- writing the alphabet correctly in sequence
- naming letters
- orientation of letters or sequences of letters in words when read or written (such as b-d, was-saw, quiet-quite)
- reading
- spelling
- learning to write
- reading comprehension
- expressing ideas in writing
- finding the "right" word when talking
- expressing ideas clearly verbally
- knowing left from right, east from west
- telling time
- confusion with math symbols
- understanding word problem
- remembering multiplication tables
- inordinate time spent on homework
- inconsistent grades from day to day
- inordinate stress during performance times
- deteriorating organization and study habits

# NEUROLOGICAL ASPECTS OF DYSLEXIA

SDI) has been suspected to have a neurological cause since it was first described as congenital word blindness at the turn of the century, but only in the past decade has there been enough scientific evidence to support this suspicion. The older evidence came from clinical observations of dyslexics who often showed subtle neurological differences in the physical examination. Newer evidence comes both from anatomical observations in autopsy specimens and imaging studies in living subjects (CAT scans, PET scans, MRI scans), as well as from neurophysiological studies (specialized EEG brain waves and evoked potentials brain waves).

The anatomical evidence points to two types of differences in the brains of dyslexics:

The first type may be understood as an extreme form of normal variation. In this case, some areas of the brain that are concerned with language are symmetric in dyslexics much more often than in the population at large. This form of symmetry would indicate that the language areas of dyslexics are organized differently and probably process linguistic information differently as well. There are other findings of variation of asymmetry pattern in dyslexic brains as demonstrated by magnetic resonance imaging, but the bottom line is the same - there is something structurally different about at least the language areas of dyslexics' brains.

The second type of anatomical finding is more easily seen to reflect an abnormality, rather than normal variation, of brain development. This consists of areas in the cerebral cortex, the mantle of brain cells covering the surface of the brain, which show evidence of disorganization and miswiring. Substantial experimental research indicates that these small areas originate during pregnancy and are probably under genetic control. The most obvious functional implication of these areas of cortical disarray is that they make up neural networks that cannot support normal information processing, at least in the linguistic sphere.

In association with the areas of cellular disorganization, researchers have recently found abnormal development of brain cells that are engaged in various perceptual functions, both in vision and hearing. This has suggested that perceptual functions important for learning the phonological structure of the language are abnormal in dyslexic babies, which then leads to incomplete language development and difficulty learning to read and write. Although the anatomical findings to support this hypothesis have required the study of autopsy specimens, there are also psychophysical and neurophysiological tests that support it, which can be easily obtained in healthy, living children. Scientists are working on ways to relate these different types of brain changes in the dyslexic brain, but it is likely that the final explanation will indicate that dyslexics have a genetic predisposition to develop subtle alterations in the wiring of some brain cells, which in turn leads to alterations in the manifestation of brain asymmetry and in the ability by the young brain to process some types of perceptual information required for efficient language learning. Abnormal language acquisition would then be the explanation for pervasive difficulty with learning the written language.

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(Neuroscience) Harvard Medical School Chief, Division of  
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# RECOMMENDED DYSLEXIA SCREENING INFORMATION

## **HISTORY**

### **FAMILY:**

Is there a history of oral or written language problems in the student's immediate family?

### **SCHOOL:**

Has the student been to kindergarden? First grade? When did he/she begin to have trouble with reading? What help has he/she had?

## **HEARING TEST**

Can the student hear well enough to learn language and learn from verbal instruction?

## **VISION TEST**

Can the student see well enough to distinguish print and letters?

## **INTELLECTUAL**

Any student with reading difficulties should be referred for intellectual screening.

## **ATTENTION SPAN**

Can the student pay attention well enough to make normal progress in the classroom?

## **BEHAVIOUR ASSESSMENT**

Is the student's behavior affecting or being affected by his/her academic achievement?

## **MEDICAL**

When indicated, medical clearance from a physician should be obtained to rule out a medical condition contributing to the patient's difficulty in reading, writing and spelling.

## **WRITTEN LANGUAGE**

### **ALPHABET:**

Can the student recite the alphabet correctly? Can he/she write the alphabet in sequence, forming the letters correctly?

### **READING ACCURACY:**

Can the student read at grade 1 level and on a level commensurate with intelligence?

### **HANDWRITING:**

Is quality and rate of the student's handwriting at grade level?

## FOR THE PARENTS

Do not let the diagnosis of specific developmental dyslexia intimidate you. The problem is fifty percent resolved with your recognition and acceptance of the difficulty. Your child deserves to be fully informed at his/her level of understanding, either by you or the doctor. It is your prerogative to determine who is best suited to inform your child.

Next, make a list of your child's interests and abilities and develop a strong support program in the areas of his/her interests and aptitudes. As much effort should go into actions that reinforce the child's abilities as those that attempt to remediate his/her disabilities. This will keep both you and your child from thinking of him/her as disabled, and you will realize that he/she has strengths and weaknesses like anyone else. Do not attempt to do remedial language training as your efforts will not be successful. Your child needs you more as a parent and advocate than as a teacher of reading, writing, and spelling. .

Furthermore, do not punish or penalize your child for his/her difficulty in reading, writing, and spelling. It would be of no benefit to remove privileges because of poor grades when he/she is making an effort. Support your child in group activities where he/she has a reasonable chance of being successful and receiving positive acclaim. Please do not remove your child from successful sports and group competition because of poor grades that are a result of SDD.

If your child is not making adequate efforts or using SDI) to avoid school work, schedule a group meeting at the school with his/her teachers to discuss the appropriate action. Always bring your child to the group meetings, as he/she deserves to be present when his/her fate is being discussed. These sessions should result in agreements and decisions - not adversity, anger and indecision.

Do not allow your child to undermine your parental authority because of his/her diagnosis. He/she is still a member of your family and subject to its rules and regulations, and he/she should be treated and react accordingly. Finally, provide the best remedial language training available in your area to help your **child** overcome his/her language disorder and prevent complications.

## SUGGESTIONS FOR THE CLASSROOM TEACHER

It may be assumed that when the student with dyslexia can read, write and spell easily, he/she may function independently in the classroom. At the same time, he/she deserves help and consideration from everyone (family, peers, teachers). Pressure to excel in the classroom should be eliminated. The following suggestions have been found to help the student in the regular classroom:

- Use a highly specialized teaching method.
- Reduce reading load.
- Call on the student to read aloud only when he/she volunteers.
- Allow oral and untimed testing. (You are testing their knowledge of material, not the ability to read, write or spell.)
- Provide a "reader" and/or "secretary" for tests which cannot be given orally.
- Grant students the option to tape lessons.
- Make directions simple and brief.
- Give directives slowly and precisely.

## *TIPS FOR DYSLEXIC ADULTS*

1. Be sure of your diagnosis. Make sure you're working with a professional who really understands dyslexia. Remember that what you have is a neurological condition. It is genetically transmitted. It is caused by biology, by how your brain is wired. It is NOT a disease of the will, nor a moral failing. It is NOT caused by a weakness in character, nor by a failure to mature. Its cure is not to be found in the power of the will, nor in punishment, nor in sacrifice, nor in pain. ALWAYS REMEMBER THIS.
2. Educate yourself. Read books. Talk with professionals. Talk with other adults who are dyslexic.
3. Encouragement. Adults need lots of encouragement. This is in part due to their having many self-doubts that have accumulated over the years.
4. Realize what dyslexia is NOT, i.e., conflict with mother, etc.
5. Educate and involve others. Just as it is key for you to understand dyslexia, it is equally, if not more important for those around you to understand it family, friends, people at work or at school. Once they get the concept they will be able to understand you much better and to help you out as well. It is particularly helpful if your boss can be aware of the kinds of structures that help people with dyslexia.
6. Consider joining or starting a support group. Much of the most useful information about dyslexia has not yet found its way into books but remains stored in the minds of the people who have dyslexia. In groups, this information can come out. Plus, groups are really helpful in giving the kind of support that is so badly needed.
7. Try to get rid of the negativity that may have infested your system if you have lived for years without knowing that what you had was dyslexia. A good psychotherapist may help in this regard. Learn to break the tapes of negativity that can play relentlessly in the dyslexic mind.

8. Don't feel chained to conventional careers or conventional ways of coping. Give yourself permission to be yourself. Give up trying to be the person you always thought you should be - the model student or the organized executive, for example -and let yourself be who you are.

9. Try to help others with dyslexia. You'll learn a lot about the condition in the process, as well as feel good to boot.

10. Set up your environment to reward rather than deflate. To understand what a deflating environment is, all most dyslexics need do is think back to school. Now that you have the freedom of adulthood, try to set things up so that you will not constantly be reminded of your limitations.

11. Embrace challenges. Dyslexics thrive with many challenges. As long as you know they won't all pan out, as long as you don't get too perfectionist and fussy, you'll get a lot done and stay out of trouble.

12. Make deadlines. Think of deadlines as motivational devices rather than echoes of doom. If it helps, call them lifelines, instead of deadlines. In any case, make them and stick to them.

13. Break down large tasks into small ones. Attach deadlines to the small parts. Then, like magic, the large task will get done. This is one of the simplest and most powerful of all structuring devices. Often a large task will feel overwhelming. The mere thought of performing the task makes one turn away. On the other hand, if the large task is broken down into small parts, each component may feel quite manageable.

14. Notice how and where you work best. Let yourself work under conditions that are best for you.

15. Know that it is O.K. to do two things at once: carry on a conversation and knit, or take a shower and do your best thinking or jog and plan a business meeting.

16. Leave time between engagements to gather your thoughts. Mini-breaks can help ease the transition.

17. Keep a notepad in your car, by your bed, and in your pocketbook or jacket. You never know when a good idea will hit you, or you'll want to remember something else.

18. Have structured "blow-out" time. Set aside some time in every week for just letting go.

19. Recharge your batteries. Take a nap, watch TV, meditate.

20. Choose "good" helpful addictions such as exercise. Try to make them something possible.

21. Understand mood changes and ways to manage these. Don't waste your time ferreting out the reason why or looking for someone to blame. Focus rather on learning to tolerate a bad mood, knowing that it will pass, and learning strategies to make it pass sooner.

22. Expect depression after success. This is because the high stimulus of the chase or the challenge or the preparation is over.

23. Learn symbols, slogans, sayings as shorthand ways of labelling and quickly putting into perspective slipups, mistakes or mood swings. You still have to take responsibility for your actions. It is just good to know where your actions are coming from and where they're not.

24. Learn how to advocate for yourself. Learn to get off the defensive.

25. Use "time-outs" as with children. When you are upset or overstimulated, take a time out. Go away. Calm down.

26. Avoid premature closure of a project, a conflict, a deal, or a conversation. Don't "cut to the chase" too soon, even though you're itching to.

27. Try to let the successful moment last and be remembered, become sustaining over time. You'll have to consciously and deliberately train yourself to do this because you'll just as soon forget.

28. Remember that dyslexia usually includes a tendency to overfocus or hyperfocus at times. This hyperfocusing can be used constructively or destructively. Be aware of its destructive use: a tendency to obsess or ruminate over some imagined problem without being able to let it go.

29. Exercise vigorously and regularly. You should schedule this into your life and stick with it.

30. Make a good choice in a significant other. Obviously this is good advice for anyone.

31. Learn to joke with yourself and others about your various symptoms, from forgetfulness, to getting lost all the time, to being tactless or impulsive, whatever. If you can be relaxed about it all and have a sense of humor, others will forgive you much more.

32. Schedule activities with friends. Adhere to these schedules faithfully. It is crucial for you to keep connected to other people.

33. Find and join groups where you are liked, appreciated, understood and enjoyed.

34. Reverse of #33. Don't stay too long where you aren't understood or appreciated.

35. Set social deadlines. Without deadlines and dates your social life can atrophy. just as you will be helped by structuring your business week, so too you will benefit from keeping your social calendar organized. This will help you stay in touch with friends and get the kind of social support you need.

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## AWAKENING TO DYSLEXIC TALENTS IN THE "NEW ECONOMY"

Thomas G. West, author of *In the Mind's Eye*

An article in a recent issue of *Fortune* magazine addressed corporate Chief Executive Officers and other business leaders in this way: "We are, right now, in the very early stages of a new economy, one whose core is as fundamentally different from its predecessor's as, say, the automobile age was from the agricultural era. If you grasp this premise, it's much easier to understand a lot of what's going on around you, including why a seemingly unrelenting tsunami of change keeps washing over you and your business. As with any such tectonic shift, the ability to recognize the new economy for what it is... and ... to foresee its consequences could be crucial to prevailing - or surviving - in it ... Embrace [this new economy], for it will transform our lives and the way we work more profoundly than we can imagine - and nothing is going to stop it." As the *Fortune* writer explains, the heart of this "new economy" is the microprocessor - the tiny "transistor-packed silicon chip" -, which, combined with computer software and networks of laser fiber optics, makes possible what we have come to call the "Information Age".

Now, what does "the information age" have to do with children and adults who have lots of trouble with learning reading, writing and other traditional academic tasks -that is, those with dyslexia and other varied learning difficulties? Will not these future changes make things much worse for these students - those who already seem to have so much trouble with learning and processing traditional information? Surprisingly, in many cases, the answer may be "no". The future may very well bring the opposite of what we might expect.

In times past, the real heart of the work in many desirable occupations was very much intertwined with words - and skill with words was highly valued. But in times to come, if our expectations are correct, the real work will often consist of using visual talents and skills to understand complex patterns whether in business, technical fields, the sciences or the professions. In this anticipated future, the words would be used mainly to report or comment on

an activity that is fundamentally visual and spatial in nature - an activity that draws on the brain's special ability to recognize patterns in complex information. This new kind of work will be made possible with the help of new tools in the form of computer graphics and data visualization - the new tools themselves made possible by the increasingly cheap and plentiful microchips referred to in the *Fortune* article.

When people think about dyslexia and related disabilities, they are usually (almost by definition) concerned with a set of problems and they focus mainly on ways to fix these problems. However, now it is important to begin to focus on the other side. We need to focus not on the problems but on the gifts and talents and special abilities that often come along with the difficulties. In its broadest meaning, dyslexia means trouble with words - words read, words written, words spoken, words recalled on demand, words organized, words memorized with complex rules from foreign languages. (This is the definition used by some neurologists and is much broader than the definition usually used by legislators, educators and administrators.)

Surprisingly, along with these difficulties with words, often (but not always) there comes a varied set of special visual and spatial abilities. In recent years, neurological research has provided a possible explanation for this pattern. There is evidence that some forms of early brain growth and development tend to produce verbal and other learning difficulties at the same time that they produce a variety of exceptional visual and spatial talents. Furthermore, some psychologists have argued that visual-spatial abilities should be seen as a special form of intelligence, on a par with verbal or logical-mathematical or other forms of intelligence. Yet, for a long time our educational system has focused mainly - almost exclusively - on one form of intelligence.

For many decades, scientists, mathematicians and other professionals have tried to turn away from visual approaches as much as possible. There did not seem to be sufficient precision and logical rigor. Words, symbol manipulation and numbers had high status. Pictures were for children. Now these visual approaches are being returned to central positions in many fields once again. Many researchers are now focusing on data visualization - arguing that only graphically-oriented technologies and modes of analysis are capable of dealing with today's complex problems and massive volumes of data. But these new

approaches place new demands on the abilities of individual researchers and workers at all levels - requiring visual proficiencies that not all have in equal measure.

Indeed, for some 400 or 500 years our schools have been teaching fundamentally the skills of a medieval clerk - reading, writing, counting and memorizing texts. Today, it seems we are on the verge of a really new era when we will be required to develop, whether we want to or not, a very different set of visually-based talents and skills - like those of a Renaissance thinker such as Leonardo de Vinci rather than those of the clerk or scholar or schoolman of the Middle Ages.

In the not too distant future - as the *Fortune* article suggests - computers will be the best clerks. Accordingly, we all must learn to develop distinctly human talents, and these are likely to involve the insightful and broadly integrative capacities associated with visual and spatial modes of thought. Thus, we are presented with a most unexpected pattern - that some of those who have most difficulty learning old knowledge (especially when based on memorized words and texts) - may be exceptionally well suited to creating new knowledge (especially when derived from rich, dynamic mental models and many-dimensional visualizations of exceedingly complex systems). For many in this group, the "easy things" in the early school years are hard, but later the "hard things" in technical schools and professional schools become quite easy. This pattern is difficult for many to understand or to believe, yet the evidence mounts.

More and more of those working at the edge of these new technologies, in the sciences as well as business or the professions, are coming to recognize these surprising trends. For example, Dr. Larry Smarr, a physicist, astronomer and director of a supercomputer center, has commented: "I have often argued in my public talks that the graduate education process that produces physicists is totally skewed to selecting those with analytic skills and rejecting those with visual or holistic skills. I have claimed that with the rise of scientific visualization as a new mode of scientific discovery, a new class of minds will arise as scientists. In my own life, my 'guru' in computational science was a dyslexic and he certainly saw the world in a different and much more effective manner than his colleagues..."

Accordingly, we may soon come to discover we have wasted much - in lost time and lost self-esteem - by focusing on "basic skills" when we should have been focusing on the high-level thinking, mental modelling and visualization skills sometimes hidden beneath a variety of academic weaknesses. After all, young people must make their way in the world based on what they can do better than others - not on the "basics" which, by definition, can be done by many.

This new approach will, of course, probably be difficult since it will involve reeducating ourselves about the new demands of a changing world as much as educating others. But if we can learn to see the world in this new way, then we may find that we are surrounded by much more talent than we might otherwise have imagined. In the end, amid an economic landscape where long-held beliefs concerning education and career are daily being profoundly shaken, we may come to find that many of those who have been clearly ill suited for the last remnants of a 19th-century educational system and workplace may turn out to be superlatively well suited for the "new economy" of an emerging 21st-century educational system and workplace.

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Editor's Note: Some of the above material has been adapted from *In the Mind's Eye* and other articles, summaries and presentations by the author.

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