



## Achieving In Despite of...A Booklet On Learning Disabilities

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**IMAGINEHOWCONFUSINGITWOULDBEIFEVERYTHINGYOUREADLOOKEDLIKETHIS!  
ORI FTHEWOR DSBEGINA NDEN DI NPLAC ESTH ATDON'TM AKES ENSET OY OU?  
TAHW FI EHT SRETTEL EREW DESREVER, or OTU FO ODRER?**

Now imagine being called on to read aloud and the words seem to dance all over the page:

w r e o n a l o p a  
T o s e t a e l v e g e .  
e d s m c e r h  
h d t

What if on top of that people called you lazy, dumb, or retarded, and you know you're not?

These are just a few of the difficulties children with learning disabilities experience every day at school. These problems make learning difficult, but NOT impossible! It is important to remember that children with learning disabilities are more LIKE their peers than unlike them. What is different is HOW they learn. Too often children with learning disabilities are accused of not trying hard enough or not paying attention when in reality they are doing the very best they can and working many times longer and harder than their classmates.

Most people are surprised to learn that children with learning disabilities have average or above average intelligence, and many are gifted as well. That is difficult to understand. Too often we equate reading and writing ability with intelligence. A child with learning disabilities may have deficits in one or more areas, but may excel in others. No assumptions can be made about a child with learning disabilities. They are fascinating to work with because they will always surprise you! It is important to focus on their strengths and not their disability. They will amaze you with their ability to compensate for their weaknesses.

The first step in helping the child with LD is to understand what a learning disability is and how it relates to the learning process.

Four steps are required for learning to take place:

- 1. INPUT** (information is entered into the brain via the senses—visual input, auditory input, tactile)
- 2. INTEGRATION** (the information that is received is processed and interpreted)
- 3. MEMORY** (the information must be used or stored and later retrieved)
- 4. OUTPUT** (the information must be sent out through language or motor activities)

A learning disability is a 'short-circuit' or dysfunction in one or several of the channels to the brain. A dysfunction in any step may interfere with subsequent steps in the learning process and may result in a discrepancy between the child's potential ability and his or her academic performance. Any learning task involves more than one process and any learning disability can involve more than one area of dysfunction. For example, a child's visual-perceptual disabilities may likely result in fine/motor and writing difficulties, as well as difficulties with social perceptions.

### **DISABILITIES AT THE INPUT STAGE**

During the **INPUT** stage, a learning disability results when information from the environment is "misperceived." These misperceptions do not pertain to visual or auditory acuity. Thus, a child with perfect vision or hearing may still have a "visual or auditory perceptual disability." *It's not "what" you see or hear, but "how" you perceive it.*

Perceptual disabilities often leave the child feeling confused, anxious and/or frustrated. Self-doubts set in when one cannot trust what he/ she is seeing or hearing. The child whose perceptions are inaccurate, inconsistent, and misleading lives in an unstable and unpredictable world. A tremendous amount of conscious effort is required to override distorted visual and auditory information. And it takes a great deal of persistence and intelligence to overcome them.

### **VISUAL PERCEPTUAL DISABILITIES**

A child with a **Visual Perceptual Disability** has difficulty organizing the position and shape of what is seen.

#### **The child may:**

- 1. Reverse or rotate** letters, numbers, words, and even sentences when he/she is reading, copying, or writing ("E" is seen as "3"; "w" as "m"; "dog" as "god"; "+" sign as a times sign);
- 2.** Or the child may have difficulty with **figure-ground** (*focusing on a significant figure instead of the rest of the background*) causing him/her to be unable to track left to right, line to line, or to skip words, read the same line twice, see two words as one, one word as two, or skip lines. When doing a math sheet, the child might put the answer under the wrong problem or add part of another problem to the one he/she is doing.
- 3.** Children with visual perceptual disabilities also may **misjudge distance, depth or position in space**, bumping into things, falling off their chairs, or knocking things over when reaching for them. These children are often labeled "clumsy" or uncoordinated when the real problem is one of visual perception.

## **Ways to Help Children with Visual Perceptual Disabilities**

- Encourage the child to use a bookstand to hold books and papers upright to reduce glare on the page when reading and copying.
- Give children extra time to complete visual-perceptual activities. They need time to figure out and understand what they are seeing.
- Seat the child in the front row near the center of the chalkboard.
- When writing on the chalkboard, help the child keep place by writing each line in a different color of chalk.
- Avoid tasks involving copying from the blackboard or from books.
- When the class is taking notes from the board or during class, have a classmate who has neat handwriting put a piece of carbon paper under his sheet to make a copy for the child with LD. Or, give a copy of your notes to him/her.
- If homework assignments are written on the chalkboard for the class to copy, check to make sure that the child with LD has copied them accurately. Read aloud what you have written.
- Reduce home / classwork requirements by allowing the child to do only the even or odd problems rather than the whole page.
- Allow the child to tape record class lectures.
- Photocopy pages of nonconsumable books so the child doesn't have to copy writing or math problems.
- Use large print books and workbooks, or enlarge on a copier.
- Teach the child to highlight important information in books.
- Allow the child to use a notecard, ruler, or his finger under lines of print when reading or copying. Use a notecard to block out the rest of the page.
- On worksheets, put a heavy line around the pertinent items to help them attend to one item at a time.
- Allow the child to point to or touch the first letter of every word. This will eliminate reversal tendencies.
- For new words, use color cues like green letters at the beginning and red ones at the end.
- Present reading materials that are clear, legible, and on uncrowded pages. Blurred dittoes are very hard for the child to read.
- Provide kinesthetic exercises such as writing on the chalkboard, walking exercises, fingerpainting, and body in space.
- Provide tactile experiences such as sandpaper letters, form letters from play dough or pipe cleaners, or outline letters or words with glue, let dry, and then 'feel' the letter.
- Mark paper to show the child where to start and stop.
- Mark the child's desk with "left" and "right" markers.
- These children will remember more of what they HEAR than what they see. Present new material and give directions orally.
- Mouthing the words or quietly whispering will make a visual task an auditory one as well.
- When the student is writing something new, encourage him/her to verbalize what is being written.
- Use tape recorders, language master, and record player activities for the child with poor reading skills.

In the United States, children with learning disabilities are eligible for services for people with impaired vision including books on tape. Register the child at the local public library to receive large print books and "talking books." The library will lend you the special recorder needed to play the tapes. Children benefit from reading along with the tapes. The tapes also enable them to enjoy higher level books that they otherwise couldn't read by themselves.

In addition, children with learning disabilities in the US who are at least in fifth grade are eligible to receive services from the Recording House for the Blind & Dyslexic. There is a one

time fee of \$50 for these services plus an annual \$25 membership. They will provide tapes of any textbooks you are using. For an application write to: Recording House for the Blind & Dyslexic, 20 Roszel Road, Princeton, NJ 08540.

Or call: (800)221-4792. These tapes are used on the special recorder mentioned above.

## **AUDITORY PERCEPTUAL DISABILITIES**

**Auditory Perceptual Disabilities** are those where the child has:

1. **Difficulty distinguishing the subtle differences in sounds**, confusing words that sound alike. The child might answer your question about how he or she is by giving you his/her age.
2. Or, these children have **trouble picking out sounds from the rest of the background** (*auditory figure ground*). Understanding and following directions, particularly those with several steps, is a strenuous task for children with auditory perceptual difficulties. They are often thought to not be paying attention or listening. Actually, they are paying attention to TOO much!
3. Children who ask you to repeat questions or directions over and over again **may not be able to process the information as fast** as most people can (*auditory tag*). They "stall" for more time to think about and respond to what they are being asked. Or, they may be only hearing part of what is said.

### **Ways to Help Children with Auditory Perceptual Disabilities**

- Give the child extra time to think about a problem or answer a question before requiring a verbal response from him/her.
- SHOW the child how to do something rather than just telling him/her.
- If visual skills are strong, use sight word, "look-say" and similar techniques to teach reading. Approaches that rely entirely on phonics are confusing.
- Do not give directions while the child is in the midst of performing a task. Wait until you have his/her full attention.
- Have the child repeat directions given orally AND have him demonstrate that he knows what to do. He may not have understood or may have misinterpreted what he is to do.
- Provide Lots of visual reinforcements (pictures, maps, charts, graphs). They help keep the child's attention.
- When teaching a new concept illustrate the concept when giving a verbal explanation.
- When a child seems confused, have him/her verbalize what he/she heard or have the child "talk through" a task to find out what he/she misheard or misunderstood.
- Provide written outlines for older children to follow along during oral presentations.
- Directions need to be visual— written on the chalkboard or on paper.
- Encourage students to visualize or "make pictures in their head" of what they hear.
- When giving homework assignments orally, check to make sure the child has written them correctly. It is helpful to write them on the chalkboard for the child to copy as well as hear.

## **SOCIAL PERCEPTUAL DISABILITIES**

Children with a perceptual disability may also misperceive social cues and body language. They may misinterpret gestures, facial expressions, and tone of voice.

Or they may not notice them at all. These are the children who go too far and don't know when to stop at home and in the classroom because they do not pick up that someone is annoyed or frustrated with them. Children with social perceptual disabilities are often shunned by their classmates because of their inappropriate behavior. They have trouble making and keeping friends, although they desperately want and need others to like and accept them. Without friends, a child feels isolated and many times withdraws from social situations, including school. Social perceptual disabilities are the most devastating type of

learning disability a child can have. Many children with LD say, "it is bad enough having to have a learning disability, but the worst thing in the world is not having friends."

### **Ways to Help the Child With Social Perceptual Disabilities**

- Rather than assume a child will just "pick up" appropriate social behaviors, teach them to the child.
- Demonstrate rather than just talk about appropriate ways to act.
- Role-play different social situations in which a child might find him/herself and discuss possible consequences.
- Teach children "teacher pleasing behavior."
- Teach children to recognize facial expressions, body language, and moods.
- Analyze the source of social problems by observing the child in various situations to see where he/she is having difficulty and why.
- Teach children how to play games so when they are with their peers they'll know how to play them.
- Find an activity that promotes social confidence, such as drama, reading to younger children, or having the child teach a skill he/ she excels in.

### **DISABILITIES AT THE INTEGRATION STAGE**

The next step in the learning process is to put together or process the information that has come in through the senses, i.e. **Integration**. The information that has been taken in has to be understood before it can be remembered and be useful to the child. There are at least three parts in this step:

**Sequencing**—organizing information into an order that makes sense;

**Abstraction**—inferring meaning from the words or symbols;

**Organization**—information must be integrated with new incoming information, and it must also be related to previously learned information.

A child with a **sequencing disability** might have trouble retelling a story in order, or spell words with all the correct letters, but in the wrong order. He or she may be able to memorize the days of the week or numbers in correct order, but be unable to tell you what comes after Tuesday, or 19, without starting from the beginning. These children also have a poor concept of time.

When a child is unable to understand jokes and humor based on a play of words, he/she is exhibiting an **abstraction disability**. In a way, the child is thought to be somewhat narrow minded with his/ her understanding of words, particularly those with more than one meaning, as well as concepts.

Many (I'm tempted to say most) children with learning disabilities have **organizational disabilities**.

These children are able to take in information, such as a series of facts, but are unable to answer questions using the facts. They are unable to pull all the newly learned information and previous information together to make a whole concept. The signs of an organizational disability are clearly evident when one observes the child. His/her desk, notebook, reports, bedroom, etc. are in disarray. These children leave their homework at home or work needed at home at school. Time management is a major issue with these children.

### **Ways to Help the Child with Integration Disabilities**

- Help the child organize his desk, belongings, and materials by providing "a place for everything".
- Provide the child with an assignment book and calendar to keep track of homework and special projects. A teacher's plan book, available at office supply or stationery stores, is good to use because it has large spaces for both the child and teacher in which to write.
- Have a classmate help the child see that all homework assignments are recorded.
- At the end of the school day, help the child check that he/she has everything needed for homework. The same can be done at home when getting ready for school. Checklists of materials needed are great for the child to use.
- Make sure the child understands what he/she is to do on homework or schoolwork assignments. Have the child demonstrate what to do.
- Teach the child to be responsible for keeping his/her notebook organized, assignments recorded, and homework turned in by graphing, charting, or rewarding when he/she is successful.
- A binder with dividers and pockets for each class will help keep the child organized. Keep loose sheets in the pockets.
- Provide the child with a three-hole punch that fits in his/her notebook. Teach the child to punch holes in loose sheets immediately and put them in the proper place in his/her notebook.
- Help the child get started doing tasks by talking through the first step with him/her.
- When assigning long term independent tasks such as book reports or term papers, provide a sequential list of tasks for the child to follow. Help the child outline the steps needed to complete the task. This will also help the child learn to plan and manage time.
- Check periodically on the status of long-term reports and other assignments to see that the child is following his plan.
- Keep an extra folder of handouts, so a child can easily replace lost ones.
- Daily schedules for the child to follow at home and at school are extremely useful.
- Use concrete and manipulative materials to demonstrate concepts. Allow the child to use fingers and other aids that are useful.
- Keep him/her focused on tasks by actively involving the child.
- Explain words and phrases that have multiple or subtle meanings, such as idioms.
- Be sure that presentations are organized in sequential order.
- Give instructions in small segments and reward the child for completing each step. Gradually increase the length and complexity.
- Hands-on activities will benefit this child.
- Speak clearly, distinctly, and try to keep the vocabulary simple.
- Speak slower and in shorter sentences to give the child time to process the information and formulate ideas.
- Try to keep eye contact with the student.
- If the children have trouble understanding information, show them how to draw pictures or diagrams to help them visualize it. This also gives the information order.
- Teach the child strategies to organize information according to relationships.
- Record class lectures for the child to hear several times.
- In problem solving situations, teach the child to talk through steps. It will help him/her to think clearly.
- A confused child often doesn't know what part of a task is confusing. Help him/her learn how to determine those parts and be able to be specific when asking for help. It may be just one word or phrase that is confusing him/her and not the whole task.

## **MEMORY DISABILITIES**

The next step in the Learning process is to take the information that has been received and integrated and store it for later use—in other words; we must remember what we have learned. There are two types of memory—**short-term** memory and **long-term** memory.

Short-term memory has been defined as anywhere from a few minutes to 24 hours and involves retaining information for a short time while attending to and concentrating on it. Long-term memory can be anywhere from a few minutes to over 24 hours.

Children with learning disabilities usually don't have much difficulty with long-term memory. If they have learned something well, they most likely retain it, particularly if the information is interesting and meaningful. Children with learning disabilities have excellent memories when it comes to remembering their past failures!

Most likely a memory disability is a short-term one. Children with a short-term memory disability may need 10-15 repetitions to retain what the average child retains after just a few repetitions.

Short-term memory disabilities can occur with information received both visually and/or aurally. A child may understand his/her homework until it's time to do it at home. Then he/she can't remember how to do it. These children practice and practice for a spelling test at home, and get them all right, only to flunk the test the next day at school

Timed tests, particularly those involving math facts such as multiplication tables, are sheer torture for children with memory problems. It is unreasonable and unfair to put these children under the pressure of having to retrieve information and respond under time constraints.

Children with memory problems are often frustrated and tempted to give up. We would be too! Trying to retrieve information you know can be energy and time consuming.

### **Ways to Help the Child with Memory Disabilities**

- You may need to repeat directions, step by step, and then have the child repeat them AND demonstrate he/she knows what to do.
- Do not give directions while the child is doing something else. Wait until you have the child's full attention.
- Review materials previously learned as often as possible until responses become automatic. If classes are tape recorded, the child can listen to them several times.
- The child will need to overlearn material to remember it. Provide many opportunities for practice.
- Don't assume a child will know tomorrow what he/she knows today. Inconsistency is a trait of children with memory problems.
- Don't assume because a child has trouble learning something today that he/she will be unable to learn it tomorrow.
- Teach the child memory strategies, like mnemonics or acronyms to remember information.
- Teach the child how to use visualization and imaging techniques to recall information.
- Provide charts showing math facts or a calculator, which the child can use when teaching a new math process to avoid interfering with new learning.
- Teach the child how to make notes and lists for himself to help him remember information.
- Avoid rote memory instruction in any content area.

### **DISABILITIES AT THE OUTPUT STAGE**

This final step in the learning process is the proof that we have learned something—**output**. It involves being able to express in some way what has been learned. Information is

expressed either through **language**—by means of words; or through writing, drawing, gesturing—**motor** output.

## LANGUAGE DISABILITIES

There are three forms of **language** output:

**Spontaneous**—where one **initiates** whatever is said and has the opportunity to select the subject, organize his/her thoughts, and choose the correct words before saying them.

**Demand**—a language situation where the child is asked to respond to a question or is *required* to communicate. It is necessary to simultaneously organize, find the right words, and answer appropriately in a brief amount of time. For children with a language disability, it is like being in a pressure cooker.

**Social**—social language skills are needed when carrying on a conversation with peers and others, or when asking for help or getting his/her needs met.

Language is perhaps the most complex and difficult of all learning tasks. Language disabilities put a child at risk for failure in school, work and social situations. Most children with learning disabilities have problems with "demand language." These are the children who can talk on and on with a great deal of intelligence and expression about a wide range of topics, and then freeze when asked a question. The difference is remarkable. Children with a "demand language" disability will often mumble, ask you to repeat questions to gain time, or not answer at all. If forced to answer, the response may be so confusing and jumbled that you are not able to understand it. It's hard to believe that this is the same child who was speaking so fluently a moment ago.

### Ways to Help Children with Language Disabilities

- Role-play situations involving social conversation and demand language.
- Give the child extra time to respond to questions, particularly during tests.
- Increase the child's self-confidence by calling on him/her when you know he/she knows an answer. Ask non-threatening questions which require only a short answer or opinion.
- Have the child repeat questions to him/herself before responding.
- Seat the child at the front of the room to reduce embarrassment when he/she speaks.
- Prepare the student by saying his/her name before asking questions.
- If a child stammers or pauses, assist him/her with clues.
- Reduce the child's anxiety by providing opportunities for small group discussion and participation.
- Give the child time to rehearse oral presentations.

## MOTOR DISABILITIES

**Motor Disabilities** are those involving coordination of the large muscles (gross motor) and small muscles (fine motor). The child with **gross motor** difficulties may appear to be clumsy, falls, bumps into things, and has trouble with gym activities.

Usually more complex (and more frustrating) are fine motor disabilities. These show up when the child begins to write and has to get the muscles in the dominant hand to work together in a cooperative and coordinated way. Children with a written language disability have slow and poor handwriting. The writing task also requires a tremendous amount of energy and stamina. These are the children with the awkward pencil grip and white knuckles.

Quite often the child with visual perceptual problems has motor problems as well—referred to as a visual motor disability. If the brain receives information that has been misperceived visually, then incorrectly processes and records it, it may misinform the muscles that require eye-hand coordination.

Written Language tasks are made even more difficult because they require using correct grammar, punctuation, spelling, and vocabulary at the same time. Children with learning disabilities who can tell creative, involved, and detailed stories are often unable to get any of their thoughts onto paper. The words are often in the wrong order, usually are misspelled or unintelligible or completely omitted. And they can usually manage to write only a few words or sentences. Writing definitely stifles these creative children. Free them of the burden of writing by allowing them to dictate, tape record or use a word processor to get their thoughts down. They'll be forever grateful!

### **Ways to Help the Child with Fine Motor and Writing Difficulties**

- Avoid assigning long copying or writing assignments. Allow the child to dictate longer reports or writing tasks to someone who can do the writing, or let the child tape record them.
- Use manipulative activities to increase fine motor control.
- Chalkboard practice should precede paper and pencil writing.
- Experiment with different writing tools to find the one that makes writing easiest for the child. Let the child choose which he/she likes best.
- Pencil grips are helpful for many children.
- Proper posture is important for good writing. Make sure the height of the child's chair and table is appropriate for him/her.
- A piece of tape can be placed on the desk to help position paper for cursive writing.
- Try cursive writing if the child has trouble printing.
- If printing is preferred, teach the methods that do not require the child to lift his/her pencil off the paper while forming the letters.
- Avoid the use of paper with faint lines. White paper with dark blue or black lines is the best. Paper with raised lines might also be helpful.
- Have the child write on every other line. It's easier for him to read and make corrections.
- Be aware that children sometimes write illegibly purposely because they cannot spell the words.
- Children who use capital letters in the middle of a word often can't remember what direction the Lowercase letter goes (i.e.: r, n, p, b, d). It's usually easier to remember how to make capital letters.
  
- Sometimes it's easier for the child to write on paper with narrower lines rather than wide-lined paper. Experiment.
- Crossword puzzles will develop language and spelling skills as well as provide an opportunity to practice writing in small places.
- Provide children with alphabet and number charts to help them remember how to form the symbols when they are writing.
- Allow the child to trace if he/she has trouble drawing.
- Provide well-spaced and uncluttered worksheets.
- Teach the child to use a word-processor or typewriter. The computer is a godsend for children with LD when doing written tasks that require several revisions and a lot of writing.
- Disregard misspellings when grading, unless it is a spelling task.
- Provide spelling aids for the child to use.
- Encourage the child to keep a file of frequently misspelled words for reference when writing.
- Underline all misspelled words and give the child a chance to correct them before grading.

- Encourage children to proofread written work by reading it aloud. They often pick up their own mistakes that way.
- Provide a checklist to use with written assignments reminding the child to use punctuation, capital letters, check spellings, etc.
- Accept correct answers on tests or worksheets in any written form such as lists or phrases.
- Provide an opportunity for the child to take oral tests or quizzes, or provide a reader for the child. Allow the child to dictate answers to a writer. You'll be amazed at how much the child really knows, but was unable to get down on paper!
- For math work, have the child use graph paper to work problems, or turn lined paper to the side.
- Remind the child that math problems are worked right to left, unlike reading, which is left to right.

### **BEHAVIORAL CHARACTERISTICS OF CHILDREN WITH LEARNING DISABILITIES**

Learning is a complex process. A learning disability can occur at any or several of the steps. If what you are seeing or hearing is confusing or distorted, and you cannot trust your brain to understand or store the information you need and then be able to express it, then it's little wonder that you might begin to doubt yourself, or become frustrated! Many of the behavioral characteristics exhibited by children with learning disabilities that interfere with their ability to learn are the result of the confusion and insecurity they feel because of their difficulties.

#### **Some of these behavioral characteristics include:**

**Impulsivity**—the difficulty of controlling impulses. Children with learning disabilities, when faced with uncertain situations, tend to respond quickly without evaluating alternative solutions.

**Inattention or Short Attention Span**—the inability to focus on one activity for reasonable lengths of time.

**Distractibility**—where attention is disturbed by noise, movement, visual stimuli, or one's thoughts.

**Perseveration**—inability to shift easily from one activity to another.

**Social Misperception**—immature or inappropriate responses in social encounters.

**Inflexibility**—overly excited or unsettled by changes in routine.

**Hyperactivity**—unusually high rate of purposeless motor activity.

Several of the behaviors—hyperactivity, distractibility, and impulsivity—are also characteristic behaviors of children with **Attention Deficit Disorder** or **ADD**, with or without hyperactivity. Until October 1991, children with ADD/ADHD were classified under the label "learning disabilities." Now ADD/ADHD are recognized as being separate and distinct disorders—related to LD but different. Many children with LD also have attention deficit disorder. An even larger number of youngsters with ADD have learning disabilities.

It is important to note that not all kids who exhibit hyperactivity, distractibility, and/or impulsivity have ADD. It is important to rule out other conditions that could cause these behaviors, such as stress, anxiety, depression, and learning disabilities, because the treatment for each is very different.

#### **Ways to Help the Child with Behavioral Disabilities**

- Perhaps the most important way to eliminate behavior caused by learning disabilities is to help the child develop confidence. Insure success by focusing on the child's strengths rather than weaknesses. Praise good behavior and try to overlook bad.

- Peer approval is extremely vital. Provide lots of opportunity for success when the child is performing before his peers.
- Include the child in all activities and projects. Modify when needed.
- Try to provide immediate reinforcement and feedback for small accomplishments.
- Be consistent with directions, rules, discipline, and organization.
- Provide the child with a schedule of the classroom routine and prepare him/her ahead of time for changes.
- Dispense encouragement and praise freely but fairly. Help the child correct errors and then reward him/her.
- Discover the child's strengths and areas of special interests, such as hobbies, and capitalize on them. Children with LD are usually highly creative. They HAVE to be to get around their disabilities!
- Include the child in all discussions about him/her and allow the child to give input and be part of decisions that are made about him/her at home and at school.
- Use a timer to help the child structure his/her time.
- Position the child's desk where there is a minimum of distraction.
- Help the child organize his work area so that it is not distracting.
- Keep child actively involved to keep his attention.
- Perseveration is controlled by setting limits for the child. Tell him/her specifically what you want.
- Computers and other teaching machines help keep the child's attention.
- When giving directions, keep them clear and simple, and make sure you have the child's attention and eye contact.
- Often a child doesn't realize she is being hyperactive. Talk to him/her about it. He/she may be able to verbalize causes for it.
- Encourage the child to verbalize problems and frustrations he/she is feeling. This may help to settle him/her.
- Allow appropriate ways and times for the child to expend extra energy.
- Use relaxation techniques to help relieve tensions; the child's AND yours!
- The more a child is able to understand and recognize his/her strengths and weaknesses, the better you'll be able to help him/ her. In later years, the child will need to be his/her own advocate. Begin now to help him/her develop the survival skills needed in college, in the workplace, and for adulthood.

## **Learning Disabilities Children and Adolescents with Neurofibromatosis 1 (NF1)**

### **INTRODUCTION**

Progress in medical and genetic research of NF1 has been impressive. In contrast, we're still in the stage of describing learning and development of persons with NF1. Early questions by researchers involved whether or not learning disabilities (LD) are found in NF1. More recent questions have included what type of LD is found in NF1. This section will explain what we currently understand about LD in children and adolescents with NF1 and give some suggestions to foster healthy development.

### **VARIATION IN DEVELOPMENT**

First, it may be helpful to talk about LD in general. These ideas are taken from Dr. Melvin Levine, a pediatrician who studies learning and development. Some brain functions required for learning include attention, language and memory. These brain functions normally vary, or are different, from person to person. Each of us has patterns of individual strengths and

weaknesses. This *developmental variation* becomes significant when it limits skill development. When brain functions are delayed and skill development is weak, there is developmental *dysfunction*. When one or more dysfunctions, such as dysfunction in development of motor skills, result in a child's poor performance on a particular type of task, a *disability* (for example, writing) is described for those particular tasks. A child with disabilities is handicapped when those tasks are critical and the child has no strategies to compensate for the disability.

### **SPECIAL EDUCATION**

In the school system, LD are indicated when a child's academic achievement is significantly below what is expected for his or her intellectual, or cognitive, ability.

Other factors, such as many absences in school or need for glasses, must be ruled out as the reason for low achievement. LD is also a legal classification for special education services from the 1990 Individual with Disabilities Education Act (Public Law 101-476). Although your child may have dysfunction in developmental skills that affect learning, he or she may not meet the specific criteria for special education classification of LD in the school system. However, if special education is needed, your child may receive specially designed services through the classification of "Other Health Impairment" because of having NF1.

### **CHARACTERISTICS OF CHILDREN AND ADOLESCENTS WITH NF1**

The following is a description of a profile of characteristics we identified in children and adolescents with NF1. Our findings will need to be confirmed by future research.

#### **General cognitive (IQ)**

Average skills are most common. Above average skills do occur.

#### **Language**

Language dysfunction is common but may not be identified.

#### **Memory**

Memory for stories is stronger than memory for pictures, shapes and other visual forms.

#### **Attention**

Further research on attentional skills in NF1 is needed.

#### **Visual-perception**

Average skills for simple visual discrimination and visual perception of figure-ground relationships.

#### **Visual-spatial**

Dysfunction occurs in complex, problem solving for visual-spatial information.

#### **Motor**

Dysfunction is common and may affect development of motor based skills (such as daily living, work or recreational skills) expected for one's age.

#### **Visual-motor integration**

Dysfunction is common and may affect fluency and efficiency of writing, copying and drawing skills.

#### **Reading**

Average skills are common.

#### **Math**

LD are likely to occur.

#### **Written expression**

LD are common but may not be identified.

#### **Learning disabilities**

LD or low academic achievement are more likely found in those students with more than one area of dysfunction in development.

#### **Problem behavior**

Behaviors associated with being anxious or depressed are common in children and adolescents with NF1.

## **Adaptive behavior**

Average social skills are common.

## **Psychosocial**

Within a family, the child with NF1 is likely to be less competent in many skills than a brother or sister who does not have NF1. Social problems are common. Children and adolescents with NF1 often have difficulty being accepted by other children at school and in the community.

## **LEARNING DISABILITIES**

Developmental dysfunctions and LD occur more frequently in children and adolescents with NF1 than in the general population. Developmental dysfunctions and LD also occur more frequently in children and adolescents with NF1 than in their sisters or brothers who do not have NF1. Our research suggested that more than 50% of children and adolescents with NF1 need special education services.

Early research described nonverbal LD as the typical LD of NF1. Current studies suggest the NF1 gene produces broader effects on development. Disabilities are not limited to nonverbal skills. In NF1, dysfunction also occurs in the development of language. Language dysfunction can affect many different skills and lead to language-related learning problems. Here are some of the problems a child with language dysfunction might experience.

## **DYSFUNCTION/DESCRIPTION**

### **Weak attention to verbal information**

Poor listening skills and distractibility in situations such as school or in groups where much talking occurs. Difficulty listening for a long period of time.

### **Weak verbal memory**

Poor memory for rules of language or sequences of words.

### **Weak understanding of word meanings**

Limited vocabulary, poor reading comprehension, trouble with word problems in math.

### **Weak interpretation of language**

Difficulty with multiple meanings of words such as in ambiguity, irony, and metaphor.

### **Weak verbal reasoning**

Poor verbal problem-solving skills.

### **Poor understanding of language in social situations**

Trouble with interpreting a person's meaning or intentions in social situations. Trouble using language appropriate to a social situation (verbal social skills).

### **Difficulty distinguishing sounds**

Problems with sound-symbol association in reading and phonics.

### **Weak word finding**

Limited vocabulary. Slow word retrieval.

### **Disorganization in communication**

Problems starting and organizing spoken or written language for describing events or telling stories. Limited speaking or making statements that don't make sense.

## **What about nonverbal LD?**

Developmental dysfunctions in NF1 may contribute to language based LD, a cluster of nonverbal problems that are part of nonverbal LD, or both. What are nonverbal LD?

Although there is no common definition of nonverbal LD, these involve brain functions such as motor, attention and perception that are not language based. Nonverbal skills include what is known as simultaneous processing; that is, the perception of an entire array of visual-spatial information together, at the same time, rather than in a step-by-step manner. Nonverbal LD are not a recognized disability for classification in special education. If your child has characteristics of nonverbal LD, he or she would have to meet other criteria, such as "Other Health Impairment" due to NF1, to gain specially designed services. Our study

suggested that children and adolescents with NF1 have some aspects of nonverbal LD but not the full profile of nonverbal LD.

A cluster of nonverbal dysfunctions in NF1 was identified. Learning disabilities in math and written language may result from the effects of both nonverbal and verbal dysfunctions. Here are some of the problems a child with NF1 might experience.

### **DYSFUNCTION/DESCRIPTION**

Weak visual-spatial skills

Difficulty with skills of interpreting position or direction and orienting oneself to the surroundings.

**Weak simultaneous processing of visual-spatial information Difficulty** interpreting, organizing or working precisely with spatial information such as of maps, diagrams graphs, and complex charts, music and mathematics. Poor spatial planning and visual organization for writing and drawing and organizing material spatially on a page.

### **Weak visual-motor integration**

Slow, uncoordinated and imprecise copying, writing numbers and words or drawing. Poor mechanical and construction skills for arts and crafts or for building or fixing things. Poor athletic skills for catching, hitting or kicking a ball.

### **WHAT ABOUT ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD)?**

To date, firm conclusions about ADHD in NF1 cannot be made. No study has emphasized the comprehensive evaluation of ADHD in children and adolescents with NF1. Future studies will need to consider attentional problems as possibly secondary; that is, problems due to other developmental causes. Although, our study suggested that symptoms of ADHD are found more often in children and adolescents with NF1 than in the general population, future research specific to ADHD is needed.

### **INTERVENTIONS**

The same recommendations that are made for children and adolescents with the types of developmental dysfunctions and LD described previously should also be made for children and adolescents with NF1. An excellent resource has been written for parents, teachers and others with specific interventions for developmental and learning disorders entitled "Developmental Variation and Learning Disorders."<sup>1</sup> More information can be found on page 28.

What is different about children or adolescents with NF1 is that they may have BOTH learning and developmental problems PLUS the many physical signs and medical complications of NF1. It is these multiple problems that contribute to the "burden" of NF1 and may lead to anxiety or depression. Because of multiple problems, the child and adolescent with NF1 may be more vulnerable to feeling discouraged.

Perhaps the most basic intervention we can offer to each and every child with NF1 is the suggestion that parents, teachers and others develop a hopeful attitude of acceptance and respect for the developing child. Our goal is to promote the child's successes, to foster his or her talents, and to prevent an ongoing sense of inadequacy. Specifically, as child advocates, we want to avoid feeling disappointed by the child's struggles. Most of all, we want to prevent children with NF1 from feeling that they are disappointing their families, teachers or themselves. Here are some specific recommendations for children and adolescents with NF1.

### **1. Assessment of Skills**

The first step in solving problems is to accurately describe the problem. What are your child's problems and weaknesses? What are your child's talents and strengths? A formal assessment of skills can give you this description. Talk to your child's teacher or the school psychologist about psychoeducational assessment in the schools or talk to your child's physician about a developmental evaluation and other available options for this in your community. For children with NF1 we recommend a neurodevelopmental evaluation in the first year of life to allow for early intervention.

### **2. "Demystification"**

This is a helpful process of describing your child's strengths and weaknesses clearly, honestly with as little mystery or fantasy as possible. Students with LD frequently do not understand what is wrong with them. A child should know that he or she has a real problem that is specific and can be described. A child needs to know that he or she is not "dumb." Based on an assessment of your child's skills, your observations and knowledge of your child, learn to talk openly to your child about strengths and weaknesses, without labels or technical jargon, for teachers, family members or other important people in your child's life. Discussions should begin and end positively with frequent references to your child's strengths. An excellent resource for the process of demystification is a readable child's guide describing a variety of learning problems in words that make sense to children is entitled, "All Kinds of Minds: A Young Students Book About Learning Abilities and Learning Disorders."<sup>2</sup> More information can be found on page 28.

### **3. "Bypass Strategies."**

Teach your child ways to bypass, or get around learning problems. Develop methods in home and school to bypass areas of difficulty for the child. Specific strategies can be included in an intervention plan or an individualized educational plan (IEP) and may involve modifications of expectations, curriculum or procedures. For example, to bypass language dysfunctions, the child can sit close to the teacher in the classroom and directions can be repeated multiple times throughout the day. Visual aids can be provided. In group discussions, the child with language dysfunction can be prompted in advance to allow time for preparation before being called upon; questions can also be asked that only require a yes or no answer.

### **4. Actively teach problem solving skills.**

Children and adolescents with NF1 need skills to solve problems. The following set of questions can be used to teach your child a practical approach to solving simple problems of daily living as well as complex life challenges. The best way to teach a new skill is by your own example.

### **STOP-THINK**

1. What is the problem?
2. What are ALL the things I could do?
3. What might happen if I do this? What might happen if I do that?
4. Choose the best thing to do and try it.

### **5. Promote Individual Success.**

Children need to experience personal accomplishment in at least one area of their own specialty; that is, some special skill that the child practices overtime and in which the child develops proficiency. To learn to strive for excellence, success must be experienced firsthand. Children with LD or developmental dysfunctions may need special attention to ensure that they experience success. Support your child in finding interests for personal accomplishment that he or she will stay with overtime. It is through such practiced accomplishments that respect can be gained from peers, siblings and adults. The child,

through direct experience of personal mastery, can develop confidence to meet other life goals.

### **CONCLUSION**

Our research at the University of Utah supports Dr. Vincent Riccardi's<sup>3</sup> description of NF1 as affecting the "whole child"; that is, NF1 affects physical, social-emotional, and cognitive development including verbal and nonverbal functions. With this knowledge, both home and school intervention planning should be made with the whole child in mind. For the child or adolescent with NF1, any plan should begin with *active prevention* of the possible complications of developmental dysfunction as the very first step.

### **ADDITIONAL INFORMATION**

The Children's Tumor Foundation can be a source of educational materials and support. They can be reached at:

The Children's Tumor Foundation  
95 Pine Street, 16th Floor  
New York, NY 10005  
212-344-6633 or 1-800-323-7938  
Email: [Info@ctf.org](mailto:Info@ctf.org)  
Internet: [www.ctf.org](http://www.ctf.org)