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## Visual and Auditory Processing Disorders

By: National Center for Learning Disabilities (NCLD) (1999)

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### Introduction

Visual and auditory processing are the processes of recognizing and interpreting information taken in through the senses of sight and sound. The terms, "visual and auditory processing" and "visual and auditory perception", are often used interchangeably. Although there are many types of perception, the two most common areas of difficulty involved with a learning disability are visual and auditory perception. Since so much information in the classroom and at home is presented visually and/or verbally, the child with an auditory or visual perceptual disorder can be at a disadvantage in certain situations. The following information describes these two types of disorders, their educational implications, some basic interventions and what to do if there is a suspected problem.

For the sake of consistency, the terms used in this packet are visual processing disorder and auditory processing disorder. Other terms which refer to the same set of disorders include visual or auditory perceptual disorders, visual or auditory processing deficits, central auditory processing disorders, and other similar combinations of these terms.

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### Visual processing disorder

#### What is it?

A visual processing, or perceptual, disorder refers to a hindered ability to make sense of information taken in through the eyes. This is different from problems involving sight or sharpness of vision. Difficulties with visual processing affect how visual information is interpreted, or processed by the brain.

#### Common areas of difficulty and some educational implications: Spatial relation

This refers to the position of objects in space. It also refers to the ability to accurately perceive objects in space with reference to other objects.

Reading and math are two subjects where accurate perception and understanding of spatial relationships are very important. Both of these subjects rely heavily on the use of symbols (letters, numbers, punctuation, math signs). Examples of how difficulty may interfere with learning are in being able to perceive words and numbers as separate units, directionality problems in reading and math, confusion of similarly shaped letters, such as b/d/p/q. The importance of being able to perceive objects in relation to other objects is often seen in math problems. To be successful, the person must be able to associate that certain digits go together to make a single number (ie, 14), that others are single digit numbers, that the operational signs (+,,x,=) are distinct from the numbers, but demonstrate a relationship between them. The only cues to such math problems are the spacing and order between the symbols. These activities presuppose an ability and understanding of spatial relationships.

## **Visual discrimination**

This is the ability to differentiate objects based on their individual characteristics. Visual discrimination is vital in the recognition of common objects and symbols. Attributes which children use to identify different objects include: color, form, shape, pattern, size, and position. Visual discrimination also refers to the ability to recognize an object as distinct from its surrounding environment.

In terms of reading and mathematics, visual discrimination difficulties can interfere with the ability to accurately identify symbols, gain information from pictures, charts, or graphs, or be able to use visually presented material in a productive way. One example is being able to distinguish between an /nl and an Imp, where the only distinguishing feature is the number of humps in the letter. The ability to recognize distinct shapes from their background, such as objects in a picture, or letters on a chalkboard, is largely a function of visual discrimination.

## **Visual closure**

Visual closure is often considered to be a function of visual discrimination. This is the ability to identify or recognize a symbol or object when the entire object is not visible.

Difficulties in visual closure can be seen in such school activities as when the young child is asked to identify, or complete a drawing of, a human face. This difficulty can be so extreme that even a single missing facial feature (a nose, eye, mouth) could render the face unrecognizable by the child.

## **Object recognition (Visual Agnosia)**

Many children are unable to visually recognize objects which are familiar to them, or even objects which they can recognize through their other senses, such as touch or smell. One school of thought about this difficulty is that it is based upon an inability to integrate or synthesize visual stimuli into a recognizable whole. Another school of thought attributes this difficulty to a visual memory problem, whereby the person can not retrieve the mental representation of the object being viewed or make the connection between the mental representation and the object itself.

Educationally, this can interfere with the child's ability to consistently recognize letters, numbers, symbols, words, or pictures. This can obviously frustrate the learning process as what is learned on one day may not be there, or not be available to the child, the next. In cases of partial agnosia, what is learned on day one, "forgotten" on day two, may be remembered.

## **Whole/part relationships**

Some children have a difficulty perceiving or integrating the relationship between an object or symbol in its entirety and the component parts which make it up. Some children may only perceive the pieces, while others are only able to see the whole. The common analogy is not being able to see the forest for the trees and conversely, being able to recognize a forest but not the individual trees which make it up.

In school, children are required to continuously transition from the whole to the parts and back again. A "whole perceiver", for example, might be very adept at recognizing complicated words, but would have difficulty naming the letters within it. On the other hand, "part perceivers" might be able to name the letters, or some of the letters within a word, but have great difficulty integrating them to make up a whole, intact word. In creating artwork or looking at pictures, the "part perceivers" often pay great attention to details, but lack the ability to see the relationship between the details. "Whole perceivers", on the other hand, might only be able to describe a piece of artwork in very general terms, or lack the ability to assimilate the pieces to make any sense of it at all. As with all abilities and disabilities, there is a wide range in the functioning of different children.

## **Interaction with other areas of development**

A common area of difficulty is visual motor integration. This is the ability to use visual cues (sight) to guide the child's movements. This refers to both gross motor and fine motor tasks. Often children with difficulty in this area have a tough time orienting themselves in space, especially in relation to other people and

objects. These are the children who are often called "clumsy" because they bump into things, place things on the edges of tables or counters where they fall off, "miss" their seats when they sit down, etc. This can interfere with virtually all areas of the child's life: social, academic, athletic, pragmatic. Difficulty with fine motor integration affects a child's writing, organization on paper, and ability to transition between a worksheet or keyboard and other necessary information which is in a book, on a number line, graph, chart, or computer screen.

## **Interventions**

First, a few words about interventions in general. Interventions need to be aimed at the specific needs of the child. No two children share the same set of strengths or areas of weaknesses. An effective intervention is one that utilizes a child's strengths in order to build on the specific areas in need of development. As such, interventions need to be viewed as a dynamic and ever changing process. Although this may sound overwhelming initially, it is important to remember that the process of finding successful interventions becomes easier with time and as the child's learning approach, style, and abilities become more easily seen. The following examples provide some ideas regarding a specific disability. It is only a beginning which is meant to encourage further thinking and development of specific interventions and intervention strategies.

The following represent a number of common interventions and accommodations used with children in their regular classroom:

- **For readings**

Enlarged print for books, papers, worksheets or other materials which the child is expected to use can often make tasks much more manageable. Some books and other materials are commercially available; other materials will need to be enlarged using a photocopier or computer, when possible.

There are a number of ways to help a child keep focused and not become overwhelmed when using printed information. For many children, a "window" made from cutting a rectangle in an index card helps keep the relevant numbers, words, sentences, etc. in clear focus while blocking out much of the peripheral material which can become distracting. As the child's tracking improves, the prompt can be reduced. For example, after a period of time, one might replace the "window" with a ruler or other straightedge, thus increasing the task demands while still providing additional structure. This can then be reduced to, perhaps, having the child point to the word s/he is reading with only a finger.

- **For writing**

Adding more structure to the paper a child is using can often help him/her use the paper more effectively. This can be done in a number of ways. For example, lines can be made darker and more distinct. Paper with raised lines to provide kinesthetic feedback is available. Worksheets can be simplified in their structure and the amount of material which is contained per worksheet can be controlled. Using paper which is divided into large and distinct sections can often help with math problems.

- **Teaching Style**

Being aware and monitoring progress of the child's skills and abilities will help dictate what accommodations in classroom structure and/or materials are appropriate and feasible. In addition, the teacher can help by ensuring the child is never relying solely on an area of weakness, unless that is the specific purpose of the activity. For example, if the teacher is referring to writing on a chalkboard or chart paper, s/he can read aloud what is being read or written, providing an additional means for obtaining the information.

# **Auditory processing disorder**

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## **What is it?**

An auditory processing disorder interferes with an individual's ability to analyze or make sense of information taken in through the ears. This is different from problems involving hearing per se, such as deafness or being hard of hearing. Difficulties with auditory processing do not affect what is heard by the ear, but do affect how this information is interpreted, or processed by the brain.

An auditory processing deficit can interfere directly with speech and language, but can affect all areas of learning, especially reading and spelling. When instruction in school relies primarily on spoken language, the individual with an auditory processing disorder may have serious difficulty understanding the lesson or the directions.

## **Common areas of difficulty and some educational implications:**

### Phonological awareness

Phonological awareness is the understanding that language is made up of individual sounds (phonemes) which are put together to form the words we write and speak. This is a fundamental precursor to reading. Children who have difficulty with phonological awareness will often be unable to recognize or isolate the individual sounds in a word, recognize similarities between words (as in rhyming words), or be able to identify the number of sounds in a word. These deficits can affect all areas of language including reading, writing, and understanding of spoken language.

Though phonological awareness develops naturally in most children, the necessary knowledge and skills can be taught through direct instruction for those who have difficulty in this area.

### Auditory discrimination

Auditory discrimination is the ability to recognize differences in phonemes (sounds). This includes the ability to identify words and sounds that are similar and those which are different.

### Auditory memory

Auditory memory is the ability to store and recall information which was given verbally. An individual with difficulties in this area may not be able to follow instructions given verbally or may have trouble recalling information from a story read aloud.

### Auditory sequencing

Auditory sequencing is the ability to remember or reconstruct the order of items in a list or the order of sounds in a word or syllable. One example is saying or writing "ephelant" for "elephant."

### Auditory blending

Auditory blending is the process of putting together phonemes to form words. For example, the individual phonemes "c", "a", and "t" are blended to form the word, "cat".

## **Interventions:**

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The following represent a number of common interventions and accommodations used with children in their regular classroom:

Do not rely solely on an area of weakness.

If instructions are given orally, try to supplement this with written or other visual cues. While it is important to address the area of need directly and try to build up areas of weakness, it is also necessary that the student be able to function successfully in the classroom. A simple accommodation like backing up verbal directions with visual or written cues is one way to facilitate this.

Keep the area of difficulty in mind.

Simplifying verbal directions, slowing the rate of speech, and minimalizing distractions can make a big difference to a person with auditory processing difficulties.

Plan specific activities for the areas of difficulty.

There are many activities that can help build auditory processing skills, whether it be in the area of phonological awareness, auditory discrimination, or any of the other areas in this realm. Rhyming games, for example, can help build phonological awareness as well as discriminating between similar and different sounds. Sorting games can help build auditory memory, as the number of variables and steps involved in the sorting can be easily controlled to adjust the level of difficulty.

## **What to do if you suspect a problem?**

The following suggestions are presented in a sequence which should help ensure that your concerns do not go ignored. Of equal importance, this sequence should help avoid setting off any premature alarms, which may not be in the child's best interests.

Write down the reasons you suspect a problem might be present or developing, carefully documenting examples in which the concerning behavior is taking place.

This will help in two ways. First, it will help confirm or alleviate your concerns. If there is cause for concern, it will help you get a more focused idea of where the difficulty lies. This list will also be helpful if further action or meetings with other professionals are necessary.

Contact the school.

Speak to the child's teacher and other professionals who interact with your child to see if they see similar behaviors or have similar concerns. If the child is already working with specialists or

receiving special education services, a consultation with these people can be helpful in identifying the problem and working out solutions.

If concerns remain, an evaluation by a specialist familiar with these issues could help isolate the problem.

Evaluations can be done through the public schools or through private practitioners. Please refer to NCLD's legal rights packet for a full explanation of your rights, the process, and the school's responsibilities to you. In addition, the evaluation should help identify strengths and weaknesses in general and the therapist should be able to recommend accommodations and strategies to best facilitate your child's learning.

If it is felt that special services or accommodations are warranted, arrange a meeting with the school professionals involved in your child's education to make plans for meeting the specific needs of your child.

In some cases, children meet the requirements to be legally entitled to special services. In other cases, children do not meet the criteria for legal entitlement. In either case, it is the school which will have to arrange and implement these decisions. Legally bound or not, some people and school systems are more responsive to people's needs than others. For this reason, it is important to try to establish and maintain a useful rapport with the people to whom you entrust your child's education. Often there are local resources available to help meet and support the variety of needs which accompany any person and his/her family when a disability is discovered. These organizations often prove tremendously valuable in providing additional resources and strategies which can make the difference between your child receiving the help s/he needs or not.

This information is representative of the materials available from the National Center for Learning Disabilities Information and Referral System

**Related resource from our partner:** 

- **Understanding Visual Processing Issues**

## References

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