SMT

Simultaneous Multisensory Teaching

The SMT Method

A Multisensory Teaching Method for Students with Dyslexia

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THE SMT METHOD

CANADIAN DYSLEXIA CENTRE (CDC) INC

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TABLE OF CONTENTS

ABOUT DYSLEXIA

DID YOU KNOW THAT

- Dyslexia is not limited to the inversion of letters or numbers?
- Dyslexia is not related to a person's intelligence?
- An estimated one in six Canadians has dyslexia?
- Undiagnosed dyslexia is the major cause of illiteracy?

1. DEFINITION

In the larger sense of the word, dyslexia signifies a problem with respect to words: written or spoken words, words of speech, words that are recalled on command, the organization and memorization of words, and words that conform to complex rules which originate from foreign languages (Thomas G. West)[i].

This problem occurs despite an adequate or above-average intelligence, conventional instruction, and socio-cultural opportunity.

2. CAUSES

Dyslexia is genetically inherited, and its cause is biological. According to Albert M. Galaburda[ii], Associate Professor of Neurology at the Harvard Medical School, sufficient scientific evidence accumulated in the last decade confirms that dyslexia stems from neurological causes. Proof has been obtained from both anatomical observations of autopsy specimens and imaging studies in living subjects.

As Galaburda notes, "Anatomical evidence suggests there are differences in the symmetry of brains of dyslexics, in the specific areas dealing with language. This form of symmetry indicates that the language areas of dyslexics are organized differently and that they probably process linguistic information differently as well. [iii]"

It is important to open our minds to this difference to better understand dyslexia, especially since, as remarks Norman Gerschwind, "It has become increasingly evident in recent years that dyslexics are prodigiously talented in a variety of areas."

3. CHARACTERISTICS

Symptoms of dyslexia vary greatly from one individual to another. The dyslexic person can experience difficulties in many areas, including:

- formation of letters;
- correctly writing letters of the alphabet in the proper sequence;
- naming the letters;
- associating sound (phonetics) with the symbol (grapheme);
- appropriate sequence if individual letters, and a series of letters which make up a word, in the reading or writing process (e.g. b-d, was-saw, quiet-quite);
- reading, spelling, writing;
- finding a word in the dictionary;
- expressing ideas in writing;
- finding the right word when talking;
- expressing clear ideas verbally;
- distinguishing left from right, east from west;
- telling time, days of the week, months of the year;
- confusion with math symbols;
- memorizing multiplication tables (sequential memory);
- difficulty memorizing non-phonetic words.

AS WELL, OTHER SYMPTOMS OF DYSLEXIA INCLUDE:

- inordinate amount of time spent on homework;
- inconsistent performance and grades from day-to-day;
- high stress resulting from having to perform on the spot;
- lack of organization and study habits that are not in keeping with the person's level of intelligence.

4. THREE FUNDAMENTAL TYPES OF DYSLEXIA[iv]

DYSNEMKINESIA (MOTOR)

A deficit in the ability to develop motor gestalts (engrams) for written symbols.

E.g.: The student writes **b** instead of **d.**

The student has difficulty expressing thoughts in writing.

DYSPHONESIA (AUDITORY)

A deficit in the integration of sound and symbol (grapheme-phoneme) and in the ability to develop skills of analysis and synthesis (the ability to syllabicate, to pronounce and to differentiate sounds of unfamiliar words).

E.g.: The student reads **house** instead of **home**.

The student writes **aminal** instead of **animal**.

DYSEIDESIA (visual)

A deficit in the ability to perceive whole words (total configuration) such as visual forms and to make the connection between these and the corresponding auditory forms.

E.g.: The student reads **ball** instead of **bell**.
The student writes **enuf** instead of **enough**.

N.B.: There are also two or three combinations of these three basic types of dyslexia.

5. MYTHS OF DYSLEXIA

- Dyslexia is rare.
- It is difficult to diagnose.
- It disappears with age.
- Repeating a school grade can eliminate dyslexia.
- Dyslexia is limited to those who inverse letters or numbers.
- It is caused by parents not reading to their children.
- It cannot be diagnosed until a child is in third grade.
- Dyslexia results from lack of willingness.
- It is a manifestation of moral weakness or laziness.
- It stems from a lack of maturity ("He's still young, give him time!").
- It is found in over-protected or spoiled children.

6. THE CREATIVE LEGACY OF FAMOUS PEOPLE WITH DYSLEXIA

Albert Einstein	Renowned scientist and discoverer of the theory of relativity, who profoundly influenced the course of modern science.
John Lennon	A member of the famous Beatles, who wrote unforgettable love songs.
Rodin	Considered one of the greatest sculptors of all time, his magnificent sculptures remain our legacy.
Walt Disney	A pioneer of film animation whose numerous works have provided many hours of entertainment and delight for the whole family.
Thomas Edison	Inventor of the telegraph, the phonograph and the microtelephone.
Alexander Graham Bell	Inventor of the telephone, an indispensable communications tool in the modern world.
Steven Spielberg	Filmmaker, director and producer who has mesmerized audiences with spectacular futuristic films and poignant dramas.
Hans Christian Anderson	Author of classic fairy tales, he travelled several times around the world.
Leonardo da Vinci	World-renowned painter who gave us the famous and inscrutable smile of the Mona Lisa.
George Washington	One of the great politicians of history.
Whoopie Golberg	A highly talented contemporary actor and comedian.

WHY A SPECIAL TEACHING METHODOLOGY FOR PERSONS WITH DYSLEXIA?

Talking, listening, reading and writing are all activities related to language. The first two appear to be innate in humans. Even very young children pick up on the sounds of speech, acquire spoken language and unconsciously master its structure, whether or not they receive explicit instruction. This is not the case for written language.

Opposing views have long since existed; some favour a universal teaching method for reading, based on a visual recognition of words within a contextual search for their meaning, while others propose an analytical method in which the structure of written language is learned on the basis of phonetics.

For the first group, the visual recognition and decoding of words come naturally by reading. This excludes the need to systematically teach the relationship between letters and their sounds. For the second group, on the contrary, learning to read is a gradual process that requires a systematic teaching methodology.

What matters is not to debate the best method for teaching literacy, but to increase the effectiveness of teachers, professionals, parents and others to help children, adolescents and adults to be able to read and write to better live in our complex world.

Research by Sally Shaywitz[v], co-director of the Yale Center, for the Study of Learning and Attention, has shown that to learn to read, all children must develop a phonemic awareness, in other words, they need to discover that words in spoken language can be broken down into very small units of sound called phonemes, and that the words of written language are composed of letters which correspond to these sounds. In dyslexic persons, the part of the brain that processes this function is affected; this impacts on the subsequent steps, even if the other parts of the brain from which they emanate are intact.

In other words, to use the analogy of a computer, how can we hope to process the information, if the circuit that processes the entry of the data works differently, or not at all?

Some dyslexics can excel in a number of areas. This makes their learning difficulties with reading even more frustrating, and can result in discouragement, delinquency or simply giving up. Dyslexic children need access to a specialized education to learn to read and write. It is therefore crucial to offer teaching methods that will give students a valuable and effective way to overcome these difficulties. Alternative teaching methods have helped to alleviate this frustration and have met with excellent results for many people with dyslexia.

One of the major problems for a child with reading difficulties is that he has not yet achieved sufficient phonemic awareness. The standard universal method of reading instruction is not effective for dyslexic children. To learn to read, these children require a systematic, explicit and sequential teaching method. They need to learn why words are spelled or pronounced in a certain way, and to learn their meaning. In fact, this is beneficial for all children.

Based on the foregoing, it is now recognized that:

1. Kindergarten and first grade students who lag behind in the development of a phonemic awareness are at risk of experiencing reading problems later on.

2. Older children and adults with reading difficulties exhibit a deficit in phonemic awareness.

3. Re-education techniques using phonemic awareness can help to alleviate reading difficulties.

1. RECOMMENDED CONTENT AND PRINCIPLES

The International Dyslexia Association, formerly known as the Orton Dyslexia Society, recommends that re-education programs for dyslexic persons teach the following:

PHONOLOGICAL/PHONEME AWARENESS

This awareness is the appreciation of larger chunks of sound, such as rhyme (e.g. hand, band, and sand share a final sound unit "and"). Phoneme awareness is the understanding that words are made up of individual speech elements. Students must learn to separate spoken words into their component sounds. An understanding of the phonemes in the language is vital to teaching spelling to dyslexic students.

SOUND-SYMBOL ASSOCIATION

This is the ability to pair a phoneme with its corresponding written letter(s). This association must go in both directions: from symbol to sound and from sound to symbol.

SYLLABLE INSTRUCTION

Syllables are units of words that contain a single vowel sound. Students must learn to divide both spoken and written words into syllables and recognize the six types of English syllables.

MORPHOLOGY

A morpheme is the smallest meaningful unit of language. The study of morphology allows students to understand how complex words are constructed from root words, suffixes and prefixes.

SYNTAX

The set of rules that governs the meaning of sentences according to the sequence and function of words.

SEMANTICS

Semantics is that part of language that has meaning. From the beginning of reading instruction, an emphasis must be placed on reading comprehension.

2. RECOMMENDED TEACHING METHODOLOGY

SIMULTANEOUS, MULTISENSORY

The student learns using the visual, auditory, kinesthetic and tactile senses simultaneously.

SYSTEMATIC AND CUMULATIVE

Each lesson is based on concepts taught in previous lessons. Lessons begin with the most basic concepts of language and progress to the most complex in a logical order.

DIRECT INSTRUCTION

Each concept is explicitly stated. Students are not expected to infer or intuit concepts as part of the learning process, and teachers do not assume that students possess knowledge that has not been clearly stated in a previous lesson.

DIAGNOSTIC TEACHING

The teacher must continuously adjust the pace and style of instruction to suit the changing needs and abilities of each student.

SYNTHETIC AND ANALYTIC INSTRUCTION

Synthetic instruction introduces the component parts of a concept, then describes how the component parts fit together. Analytic instruction presents the concept, and then describes how it may be broken down into its component parts.

In the document entitled: *Informed Instruction for Reading Success: Foundations for Teacher Preparation*[vi], the International Dyslexia Association recommends that this type of instruction be used in all schools in order to prevent reading failure and to reduce the need for remedial help in the future.

These perspectives are recommended for the following reasons:

- Decoding difficulties in the early grades are often synonymous with deficits in comprehension and decoding abilities.
- Children generally find it easier and faster to learn to read, write and spell when receiving systematic teaching instruction.

This instructional method requires comprehensive training for teachers. Although the skills required for reading are well-documented and effective teaching methods currently exist, most teachers do not have the necessary training to provide a multisensory teaching method appropriate for people with reading difficulties.

The **Canadian Dyslexia Association** (CDA) strongly believes that an effective instructional method and well-trained teachers would significantly increase the literacy level of the population. The CDA proposes that the government ask universities to offer specialized training so that future teachers may help the greatest possible number of students.

The teacher's training must therefore include an understanding of dyslexia and appropriate methodologies and activities to enable teachers to provide remedial help at the earliest stages of reading difficulty.

The training should allow the teacher to make informed decisions on the appropriate way of working with each individual, and to determine the source of the difficulty, whether it be, for example, a spelling error indicating a deficit in phonemic awareness, or the absence of a verb in a phrase, demonstrating a problem with

syntax. Thus trained, the teacher could explain what is being taught, and how and why it is being taught.

The CDA recommends that stakeholders — parents, teachers, diagnosticians and other professionals — make concerted efforts to become educated about the process of learning to read and write, as well as the learning difficulties involved, in a concerted effort to maximize benefits for the students, and to ensure adequate follow-up.

S.M.T. METHOD

The *Simultaneous Multisensory Teaching* method (S.M.T.), based on the Orton system, is a language re-education method developed to meet the needs of students of all ages, who need a more thorough knowledge of the structure of written language, and a solid understanding of the association of sounds and symbols, before learning how to apply the concepts and rules of written language.

The objective of the S.M.T. method is to teach reading, writing and spelling, with an emphasis on reading accuracy in the early stages, followed by thorough comprehension of written language and its structures. The material is presented in short sequential steps to help students develop self-confidence. Students progress at their own pace.

To be of practical use by most teachers and parents, this method entails detailed lesson plans that outline the pedagogical objectives and expected outcomes for each step. The manual includes explanatory notes on the causes and effects of dyslexia to give teachers insight into the dyslexic person's perspective.

S.M.T. differs from other multisensory teaching approaches. It incorporates the development of phonologic and phonemic awareness in the following learning techniques and strategies:

- visual and auditory discrimination;
- bimanual reading in Braille dots to develop a "tactile vision";
- direct teaching of non-image words;
- an emphasis on diction;
- the etymology of English words.

1. ADVANTAGES OF S.M.T.

- It can be taught to students of all ages and all grade levels.

- It allows much earlier intervention for dyslexic children, even if they have not been formally diagnosed, because it can be taught as early as grade 1.

- Although developed specifically for dyslexic students, this method can be used for all grade 1 children to prevent reading failure and to reduce the need for remedial help later on.

- Teaching the S.M.T. to the entire class can reduce the cost of specialized teaching for a limited number of students at one time.

- Each lesson is detailed and meticulously prepared, and could be used immediately by most elementary school teachers.

2. DAILY LESSON PLAN[vii]

Every good teacher recognizes the importance of a written daily plan as outlined in the *Teachers' Guide*. Even though the plan is already printed, the teacher must write daily comments, indicative of the progress by individual pupils.

The lesson plans are based on the Orton-Gillingham-Child's concepts. They follow in part the ones suggested in *Foundations for Literacy*[viii] by Aylett R. Cox, in *Literacy Program*[ix] by Joan Keagy and Ann Sanders, in *Dyslexia Training Program*[x] and *Literacy Program*[xi] by Texas Scottish Rite Hospital and in *Sounds In Syllables*[xii] by Sandra Dillon.

The following activities have been adapted from the French version of this program, *E.M.S.*[xiii] authored by Louise Brazeau:

- Kinesthetic and tactile review;
- Auditory discrimination;
- Visual discrimination;
- Laterality and directionality exercises;
- Health break;
- Non-image words;
- Red words;
- Nonsense words;
- Copying/dictation;
- Phonological/phoneme awareness;
- Tongue twisters.

EACH LESSON INCLUDES THE FOLLOWING 20 STEPS:

I. ALPHABET

Purpose

- To develop alphabetizing skills.
- To develop the ability to quickly find a word in a dictionary.

II. GRAPHEME AND KEYWORD REVIEW

Purpose

- To develop the ability to recognize letters.
- To associate each letter with its corresponding sound.
- To develop the memory of movement required to write the letters.

III. PHONEME REVIEW

Purpose

- To develop the ability to translate a phoneme into its corresponding grapheme.
- To learn the most frequent spelling of the speech sounds (e.g. / k / = k, c, //ck, ck).

IV. KINESTHETIC AND TACTILE REVIEW

Purpose

- To develop the ability to automatically remember the movements required to write all the letters of the alphabet.

V. CONCEPT REVIEW

Purpose

- To help the student memorize the concepts, grammar, and spelling rules taught.

The concept cards are used to facilitate the learning of grammar rules. Certain concepts might be too advanced for some students. Therefore, their use is at the discretion of the teacher.

VI. AUDITORY DISCRIMINATION

Purpose

- To develop the ability to distinguish differences between sounds.
- To develop the auditory sequential memory.

VII. VISUAL DISCRIMINATION

Purpose

- To develop the ability to distinguish the visual differences between letters.

VIII. LATERALITY AND DIRECTIONALITY EXERCISES

Purpose

- To develop an awareness of one's own left and right.
- To develop good directionality skills.

IX. INTRODUCTION OF A NEW LETTER (8 LINKAGES)

DISCOVERING THE NEW SOUND

Purpose

- To link all properties of a letter (name, sound, graphic representation and "feel" when pronounced or written) through every pathway (visual, auditory, kinesthetic, tactile).

N.B. : The writing frame[xiv] is used to develop the memory of movement for writing letters. It is not used for handwriting.

1st LINKAGE

Purpose

- Association of a letter's name with its graphic representation, keyword and sound.

2nd LINKAGE

Purpose

- Association of the cursive form of the letter with its name.

3rd LINKAGE

Purpose

- Association of the graphic representation of the letter with its name, and its cursive form.

4th LINKAGE 

Purpose

- Association of the letter's name with its cursive form.

5th LINKAGE

Purpose

- Association of the letter's keyword and its sound, and the memory of movement required to write its cursive form.

6th LINKAGE

Purpose

- Association of the graphic representation of the letter with its name, its sound, and keyword.

7th LINKAGE

Purpose

- Association of the name of the letter with its sound.

8th LINKAGE 

Purpose

- Association of the letter's name and cursive form with its speech sound.

X. HANDWRITING 

Purpose

- To develop and enjoy the art of penmanship.

N.B.: The handwriting program used in this program was created by the Ministry of Education of Quebec[xv]. Certain clinical studies seem to show that dysgraphic students who have used this program show beautiful penmanship during handwriting exercises.

XI. HEALTH BREAK (ONE MINUTE)

Purpose

- To increase the level of energy and concentration.

XII. NON-IMAGE WORDS

Purpose

- Students with dyslexia usually have problems with non-image words, such as prepositions, since they cannot easily create a visual image of their meaning. Therefore the dyslexic student either guesses or skips those words. The student must develop the ability to create a visual image of non-image words.

XIII. RED WORDS

Purpose

- To learn how to spell irregular words.
- Students with dyseidesia see visual image of the meaning of words "in their heads," but have great difficulty in seeing the graphic representation of words "in their heads."
- Although they can apply phonetic spelling rules to regular words, they have difficulty memorizing the spelling of non-phonetic words. It is easier for a person with dyseidesia to learn these words the same way a blind person learns, through the tactile sense.
- In the English language only 13% of the words are phonetically irregular.

XIV. READING

Purpose (nonsense words)

- To prevent guessing behaviour.

Purpose (words and sentences)

- To practice decoding skills and syllable division.
- To be aware that accuracy in decoding skills precedes comprehension and speed.
- To practice hearing ones own voice[xvi].

XV. COPYING/DICTATION 

COPY

Purpose

- To develop the ability to copy text from near-and far point.

DICTATION

Purpose

- To increase the student's auditory sequential memory.

XVI. PHONOLOGICAL/PHONEME AWARENESS

Purpose

- To develop the ability to identify the sounds in words.
- To develop the awareness of the individual speech sounds in words.

XVII. SPELLING 

Purpose

- To learn a series of sequential steps for spelling phonetically regular words by applying spelling rules.
- To learn to spell irregular words.

XVIII. TONGUE TWISTERS

Purpose

- To develop the ability to articulate clearly.

XIX. ORAL/WRITTEN EXPRESSION 

Purpose

- To develop the ability to communicate in well-formulated sentences.
- To develop the ability to express ideas in writing, in an organized manner, using punctuation marks, etc.
- To help the student verbalize what is read.

XX. LISTENING COMPREHENSION

Purpose

- To develop comprehension skills.
- To develop the joy of reading good literature.

S.M.T.

AS A RE-EDUCATION PROGRAM FOR SECOND-LANGUAGE LEARNING

This programme is directed more particularly to the many anglophone civil servants who, after several attempts, do not always succeed in mastering French as a second language, and to those whose prognosis in second-language learning is poor.

The French language is generally recognized as one the most difficult languages to master, especially with regards to grammar. In French, grammar does not always correspond to the sound, and the absence of a particular accentuation on each word in a phrase or expression makes comprehension even more challenging. Because of this particularity, it can be impossible to recognize by sound, the break between one word and the next, when outside a specific context.

This is not the case in English, in which each word is accentuated. It is therefore possible for the ear to perceive the words as separate units. In short, French is essentially a visual language (80 per cent visual), whereas English is highly phonetic (83 per cent).

Persons with visual dyslexia (dyseidetic) are especially handicapped in learning the French language. This problem could explain the insurmountable difficulty of certain people who, having mastered their mother tongue, cannot meet the institutional requirements of bilingualism. However, persons with an auditory type of dyslexia will have more difficulty learning the English language.

The *Simultaneous Multisensory Teaching* method (S.M.T.) has already helped many to surmount this difficulty, which too often is mistakenly associated with a lack of will, intellectual laziness, or a lack of aptitude for learning.

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