

# "An Overview of Interventions"

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*Living with Dyslexia*

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"Dyslexia is known to be a hereditary, neurological disorder that affects a huge number of people — about 5% of the global population — but its underlying basis is still hotly debated."

-Ramus, 2003

**Cause**



**Symptoms**



**Treatment**

Aetiology

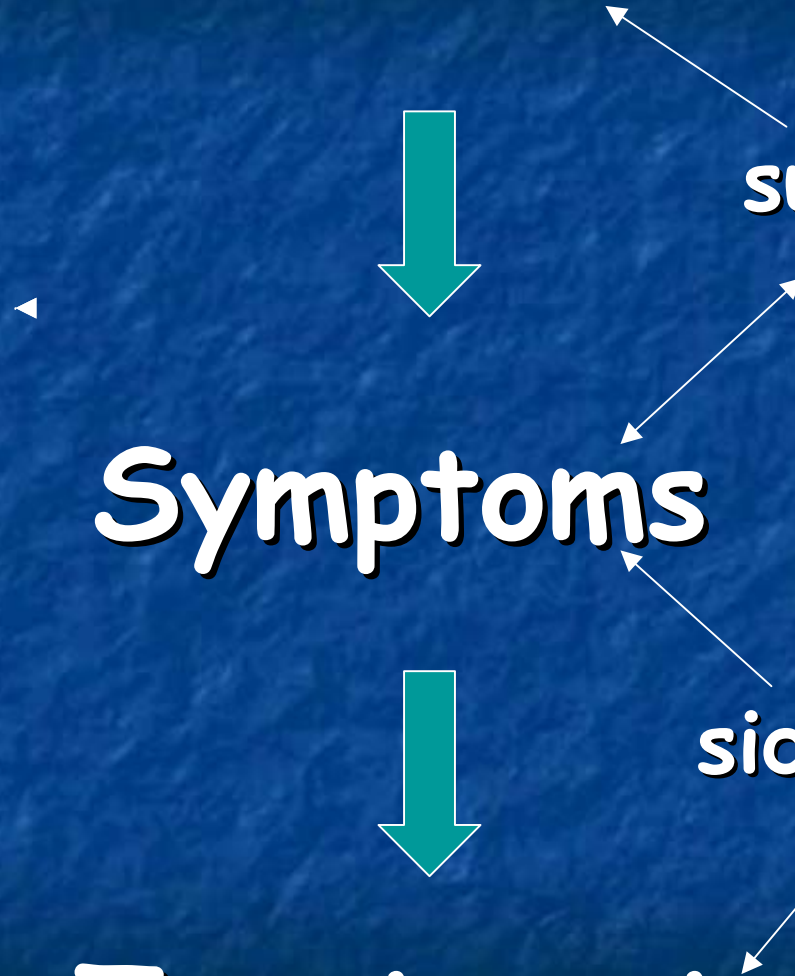
Cause

sub-cause

Symptoms

side-effect

Treatment



## ■ Possible sub-causes

- Poor sensory processing
- Poor eye movement control
- Dietary deficiency
- Lack of opportunity

## ■ Probable side-effects

- Trauma
- Demotivation
- Matthew Effect

- Nicholson, 2001

# Key Questions for Intervention

1. What is the underlying cause of dyslexia?
2. What are the symptoms of dyslexia?
3. What is the best treatment for dyslexia?

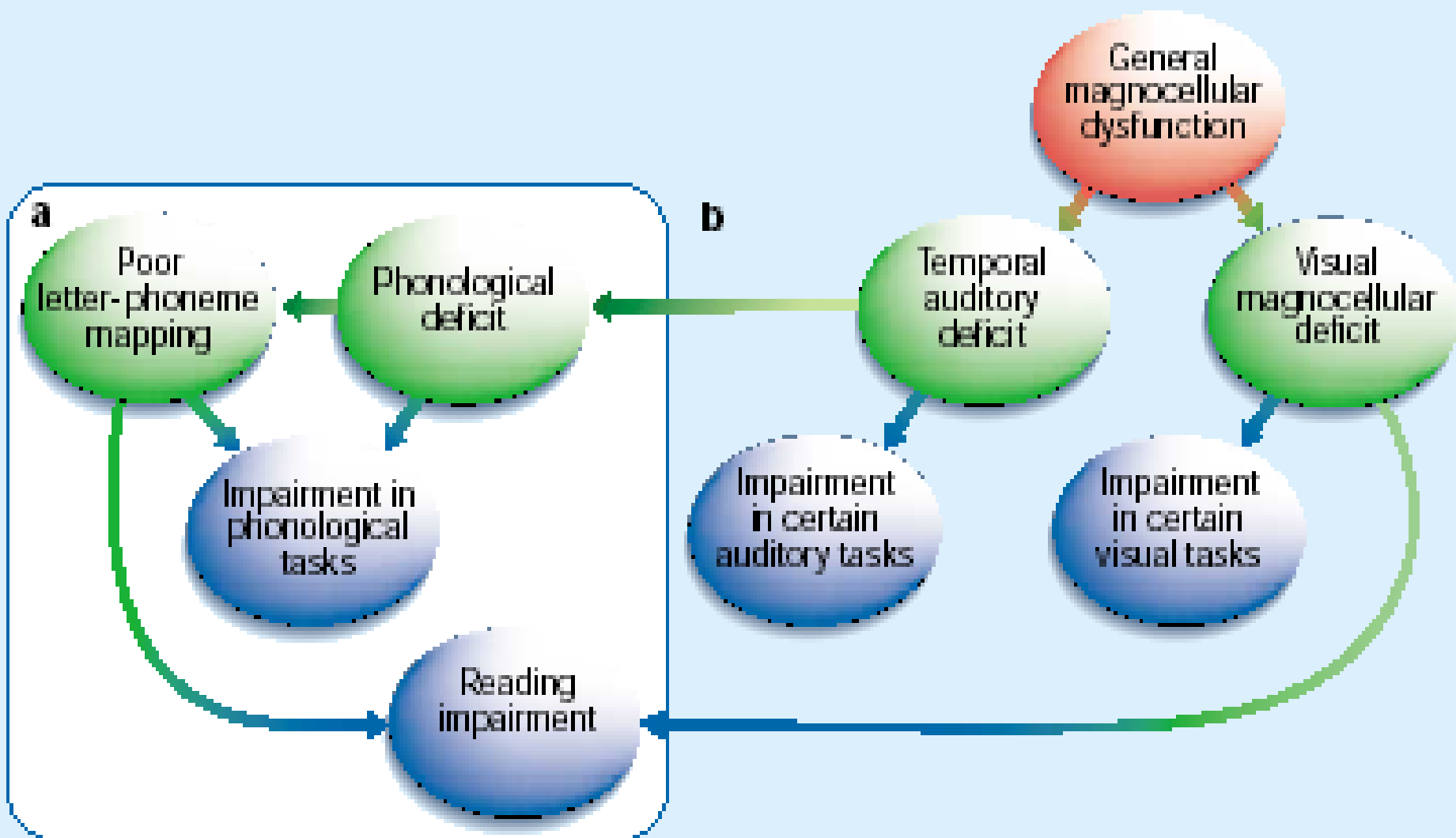
# Possible Causes

- Phonological Deficit Hypothesis
- Magnocellular Deficit Hypothesis
- Temporal Processing Deficit Hypothesis
- Cerebellar Deficit Hypothesis

All theories may be correct  
at different levels of explanation  
(Fawcett, 2002)

- At the behavioural level: e.g. problems in poor reading or rhyming deficits.
- At the cognitive level: e.g. problems in phonological awareness, automatisisation, or slow processing speed.
- At the biological level: e.g. differences in language areas, magnocellular pathways or the cerebellum.

# The phonological and magnocellular explanations for dyslexia (Ramus, 2002)



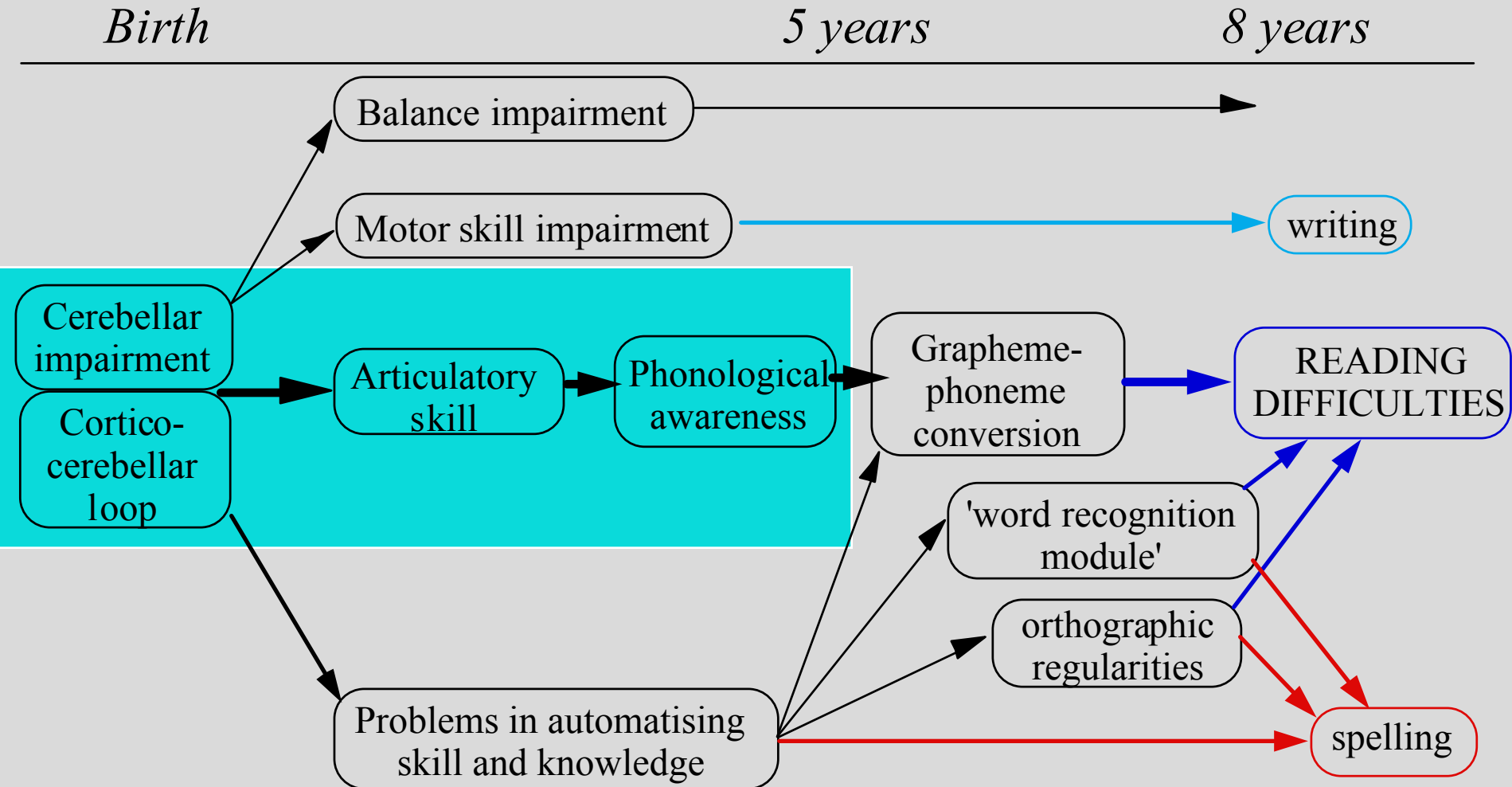
# The Magnocellular Hypotheses

-Stein (2003) [www.physiol.ox.ac.uk/~jfs](http://www.physiol.ox.ac.uk/~jfs)

- Language, reading, spelling, attentional and coordination problems may result from impaired development of magnocellular neurones in the brain. These are specialised for tracking visual and auditory transients.
- Visual magnocellular weakness may cause visual instability, hence letter position confusions → fuzzy orthographic representations, leading to poor orthographic skill
- Auditory magnocellular weakness may impede letter/sound translation → low phonological skill

# Dyslexia: a Causal Chain

-Fawcett & Nicholson, 2004



# Symptoms

- Reading, spelling & writing difficulties
- Problems learning and matching letters and sounds
- Problems with rhyme and alliteration
- Difficulties with other subjects
- Organising and sequencing difficulties
- Poor short term memory
- Slow speed of processing
- Poor information retrieval
- Ability-achievement mismatch

# Treatments

Teaching Interventions

VS

Non-teaching Interventions

# Teaching Interventions

**Cause**



**Symptoms**



**Treatment**



# Non-teaching Interventions

**Cause**



**Symptoms**



**Treatment**



# Cause-Symptoms-Treatment

- Originally, teaching interventions were developed to deal with symptoms irregardless of cause.
- With the development of research-supported, causal theories, teaching interventions have evolved to deal with symptoms in relationship to cause.

- “The scientific evidence has shown us that reading must be taught - directly and systematically- and that the children most at risk require the most systematic instruction with the best-prepared teachers. There remains an unforgiveable gap between what we know about reading development and effective reading instruction and the instruction provided in many of our schools. This must stop.”

- Reid Lyon (NICHD) & Shaywitz (Yale), 2004

- “Teaching reading is rocket science”

- Moats, 2002

What is the best kind of instruction for dyslexia?



"...intensive and one-to-one is best"  
(Torgesen, 2001)

"...the earlier, the better" (Shaywitz, 2003)

"...more intensive, more relentless, more precisely delivered, more highly structured and direct, and more carefully monitored for procedural fidelity and effects" (Kavale, 1996)

"According to a review of the research and clinical consensus, the combination of the following five principles will facilitate the dyslexic learner's ability to learn and recall information."

-McIntyre and Pickering (1995)

# Principles of Effective Multisensory Instruction for Dyslexic Learners

- (1) simultaneous employment of visual, auditory, kinaesthetic and tactile linkages;
- (2) systematic and cumulative organisation of content;
- (3) direct, teacher-led instruction;
- (4) diagnostic teaching to mastery;
- (5) synthetic and analytic presentation.

# What do dyslexic pupils need to learn?

1. Phonological Awareness
2. Phoneme/Grapheme Correspondence Skills
3. Vocabulary, Morphology & Syllable Instruction
4. Reading Fluency Practice
5. Knowledge of Syntax & Language Structures
6. Metacognitive Reading Comprehension Strategies

# Non-teaching interventions attempt to 'treat' the cause and thereby end the symptoms.

- What a non-teaching intervention consists of is dependant on a theory of cause.
- However, many non-teaching interventions are based on unproven causal theories without scientifically based research.
- As there are numerous unproven causal theories, there is a wide variety of non-teaching interventions.

# 1. Neuro-Developmental Delay

- There is a school of thought that claims that that some specific learning difficulties may be due to developmental disorders, sensory motor problems or neurological immaturity.
- NDD is described as the omission or arrest of a stage in early development due to the retention of primary reflexes.

## Current Related NDD Therapies include:

- a. DDAT (Dyslexia, Dyspraxia, Attention Disorder Treatment) - Dore & Rutherford [www.ddat.org.uk](http://www.ddat.org.uk)
- b. Neuro-Development Therapy (Institute for Neuro-Physiological Psychology) - Blythe & Goddard-Blythe [www.inpp.co.uk](http://www.inpp.co.uk)
- c. Primary Movement Therapy - McPhillips (Queen's University, Belfast) [www.primarymovement.org](http://www.primarymovement.org)
- d. Sensory Integration - Ayres [www.sensoryintegration.org.uk](http://www.sensoryintegration.org.uk)

The OECD (2004) has warned,  
"The term neuro-developmental therapy  
may refer to a variety of techniques  
none of which has really been subjected  
to careful scientific scrutiny."

"The evidence of the applicability of  
neuro-developmental therapy to the  
treatment of developmental dyslexia is  
not convincing."

- H. Lyytinen, Professor of Developmental Neuropsychology,  
University of Jyväskylä, Finland, (2004)

"It should be recognized that neuroscience research is in its infancy. The tenuous link between neuroscience and educational applications has not hampered enthusiastic claims for 'brain-based' interventions, many such programs are available commercially. Most of these are built upon superficial understandings of the brain or erroneous or outdated models (i.e. neuromyths)."

- Prof. A. E. Kelly, George Mason University, USA  
(2003)

" While we feel the cost of the Dore treatment is exceptional, considering its questionable validity, we are far more concerned about the human cost. Current research tells us that early and appropriate intervention is our best weapon to ameliorate dyslexia's impact on a person's life. Too often parents will grasp at anything in a desperate effort to help their children. It is IDA's position that any delay in the delivery of effective educational intervention diminishes the potential for successful outcomes. There are too many talented and hard working people with dyslexia in this and other countries to write them off with unsubstantiated programs or teaching methods." -International Dyslexia Association, 2003

# What are persistent primary reflexes?

- **Reflexes:** Involuntary reactions of the body to external stimulation.
- **Primary Reflexes:** Such reactions exhibited during foetal and neonatal life.
- **Persistent Primary Reflexes:** Primary reflexes which do not disappear within the expected time.

# Claims which require substantiation include the following...

- ...that dyslexia is caused by the retention of primary reflexes
- ...that all children with dyslexia present with retained reflexes.
- ...that all children that present with retained reflexes have dyslexia
- ...that the inhibition of primary reflexes will 'cure' dyslexia

# Other Exercise/Movement-based Therapies include:

- e. Brain Gym® (Educational Kinesiology)  
- Dennison. [www.braingymireland.org](http://www.braingymireland.org)
- f. CranioSacral Therapy (Swedish Massage) - Upledger 087-6196340
- g. Developmental Reflexive Rehabilitation (BIRD - Brain Injury Rehabilitation & Development) - McGlowan. [www.b-i-r-d.org.uk](http://www.b-i-r-d.org.uk)

## 2. Vision Therapies

### a. Scotopic Sensitivity Syndrome

- i. Irlen-Meaures tinted lenses [www.irlen.com](http://www.irlen.com)
- ii. Intuitive Colorimeter [www.ceriumvistech.co.uk](http://www.ceriumvistech.co.uk)
- iii. ChromaGen Lenses [www.ultralase.co.uk](http://www.ultralase.co.uk)

- "The significant increase in the reading rate amongst those who reported distortion suggests that by decreasing the distortion to text, a substantial proportion of dyslexic patients--in combination with their normal reading programs--would benefit from this aid." - Harris, Jnl Am Optom Assoc 1999 Oct;70(10):629-40

## 2. Vision Therapies

### b. re: Vision Therapy and Visual Training Treatments

“...the nature of the language deficit found for most dyslexics suggests that they do not have a visual deficit that might benefit from this kind of exercise” -OECD, 2004

## 3. Auditory Therapies

- a. Auditory Stimulation Training (Sound Therapy) (Johansen)  
[www.johansensoundtherapy.com](http://www.johansensoundtherapy.com)
- b. SAMONAS (Spectral Activated Music of Optimal Natural Structure) (Steinbach). [www.samonas.com](http://www.samonas.com)
- c. Tomatis Sound Therapy - (Electronic Ear) (Tomatis) [www.tomatis.com](http://www.tomatis.com)

# 4. Food Supplements

[www.lcpsolution.com/resources.html](http://www.lcpsolution.com/resources.html)

a. eyeq™ - Equazen

Nutraceuticals [www.equazen.com](http://www.equazen.com)

e-mail: [info@nutrifarma.be](mailto:info@nutrifarma.be)

Durham School Trials -  
Richardson & Portwood, 2002



b. Attention Focus - Nature's Way

c. Learning Factors - Natural  
Factors

# What are fatty acids?

- Essential fatty acids (EFA)

2 fatty acids are essential and must be provided by the diet because humans cannot synthesise them

Linoleic acid - (omega 6 series)

Alpha-linolenic acid - (omega 3 series)

- Highly Unsaturated Fatty Acids (HUFA)

are crucial for normal brain function; extra needed during brain development; but can be synthesised from the 'parent' EFAs.

Arachidonic - (omega 6 series)

Eicosapentanoic - (omega 3 series)

Docosahexanoic - (omega 3 series)

# 5. Other Interventions

combining therapy with teaching

- a. **dyslexia@bay™** (NLP, physical & mental exercises) - Martin  
[dyslexia@bay.com](mailto:dyslexia@bay.com)
- b. **Neuro-Linguistic Programming (NLP)**  
- Bandler and Grinder [www.nlpinfo.com](http://www.nlpinfo.com)
- c. **Davis Dyslexia Correction Method**  
[www.daviddyslexia.com](http://www.daviddyslexia.com)
- d. **Speed Reading-** Foyle 01-4975239

- OECD (2004) on NLP,

"...there is no convincing evidence that it is an effective therapy for any particular disorder."

- Shaywitz (2003) on speed reading,

"Avoid speed reading classes. They will not benefit you or any other dyslexic reader. Don't waste your time."

What is needed is scientifically based research that proves the intervention method works.

**Scientifically Based Research** is research that applies rigorous, systematic and objective procedures to obtain valid and relevant knowledge.

When evaluating intervention methods, scientifically based research must take into account:

- Placebo effects
- Hawthorne effects
- Pygmalion / attentional / novelty effects
- Motivational effects

Scientifically Based Research includes research that:

1. Employs systematic, empirical methods that draw on observation or experiment;
2. Involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn;

3. Relies on measurements or observational methods that provide valid data across evaluators and observers and across multiple measurements and observations; and
4. Has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective and scientific review.

"When research data is not available and the approach is based on an individual's belief and writings, information on such treatment approaches are usually found in a popular book, the newspapers, lay magazines, or in discussions on television shows. Often parents hear of such approaches before professionals."

- Silver, 2001

# Differences in Perspective

- **Parents** don't care why it works, as long as it does.
- **Therapists** believe in the causal theory and feel they know why it works.
- **Scientists** want proof that it really works and to understand why.
- **Policy makers** want to know which is the most cost-effective approach.

# On the plus side non-teaching interventions...

- are not physically harmful
- may complement teaching
- are often supported by positive anecdotal evidence
- may eventually find support through research

Some therapies (e.g. Primary Movement, eyeq and DDAT) are currently co-operating in objective, scientifically-based, evaluation studies.

# ...but, "caveat emptor"

- ...if there is a lack of objective, scientific evidence
- ...if the only 'proof' is testimonials
- ...if there is significant financial cost
- ...if it is promoted as an alternative to teaching
- ...if it promises a quick, easy 'cure'
- ...if it sounds too good to be true, it probably is

# Social vs Medical Model

- Do people with dyslexia really want a 'cure' ?
- Dyslexia in Scotland (2002) found that "dyslexic adults do not want a cure they simply want an improvement in their literacy skills and their organisational skills. They do not want to lose their special gifts."

# Mary Hamilton (adult with dyslexia)

"If there was a pill, to say if you take that, you will lose your dyslexia, but you will also lose all of your other... how you see the world and whatever, but I wouldn't change who I am, no I would never change who I am."

source: Understanding Dyslexia:  
Challenges and Opportunities

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