

Andrea facoetti

01 Ottobre 2015

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SEDE DEL CORSO

**CTS.CENTRODARI**

PRESSO LA SCUOLA MEDIA STATALE "PACINOTTI"

via C. De Cristoforis, 2

VII Istituto Comprensivo – PADOVA

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**I MECCANISMI ATTENZIONALI NEI DSA:  
DALLE NEUROSCIENZE ALLA SCUOLA**

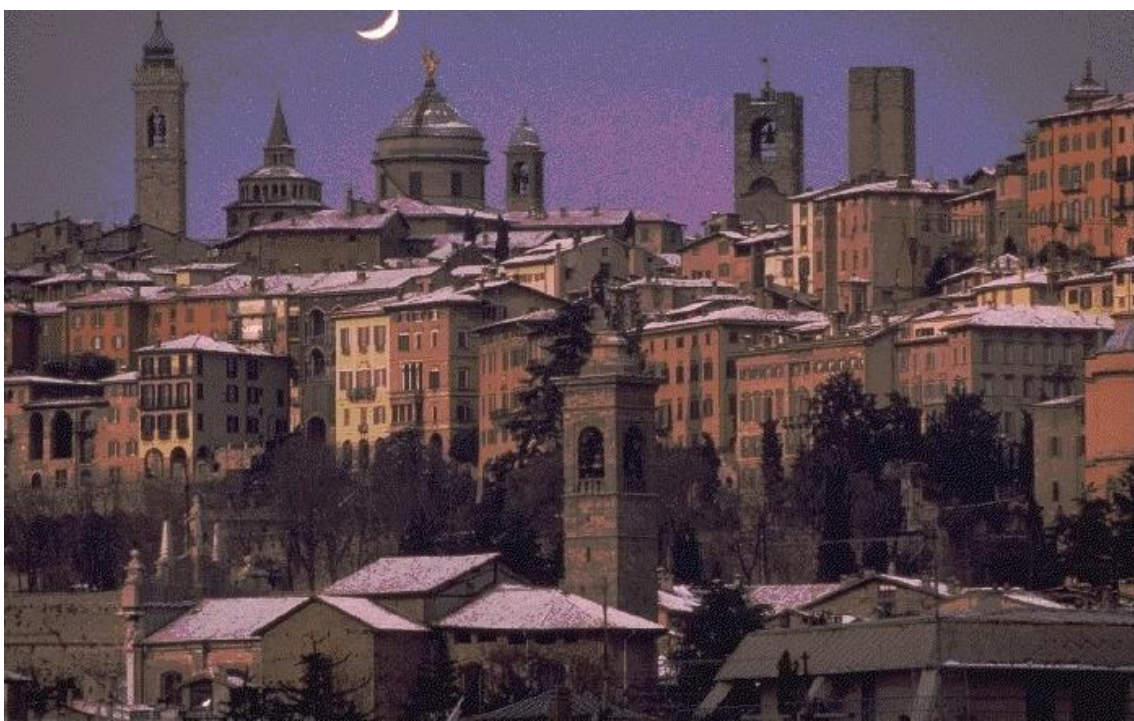


Andrea Facoetti Ph.D



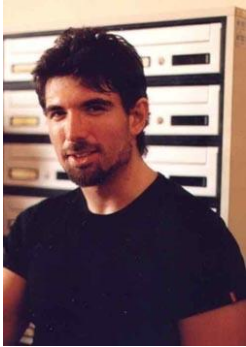
*General Psychology Department, University of Padua, ITALY*

*Child Psychopathology Unit, Scientific Institute "E. Medea"  
Bosisio Parini, (LC), ITALY*





# Ecco la nostra splendida squadra:



Simone Gori



Sandro Franceschini



Milena Ruffino



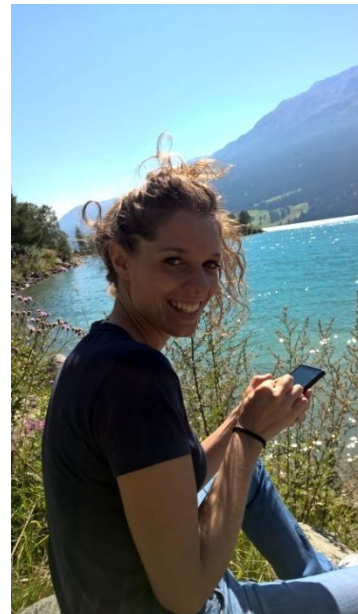
Luca Ronconi



Katia Pedrolli



Maria Enrica Sali



Sara Bertoni



Monja Tait

# Extra-large letter spacing improves reading in dyslexia

Marco Zorzi<sup>a,1,2</sup>, Chiara Barbiero<sup>b,1</sup>, Andrea Facoetti<sup>a,c,1</sup>, Isabella Lonciari<sup>b</sup>, Marco Carrozzi<sup>b</sup>, Marcella Montico<sup>d</sup>, Laura Bravar<sup>b</sup>, Florence George<sup>e</sup>, Catherine Pech-Georgel<sup>e</sup>, and Johannes C. Ziegler<sup>f</sup>

<sup>a</sup>Department of General Psychology and Center for Cognitive Science, University of Padova, 35131 Padua, Italy; <sup>b</sup>Child Neurology and Psychiatry Ward, Department of Pediatrics, Institute for Maternal and Child Health "Burlo Garofolo", 34137 Trieste, Italy; <sup>c</sup>Developmental Neuropsychological Unit, "E. Medea" Scientific Institute, 32842 Bosisio Parini (LC), Italy; <sup>d</sup>Epidemiology and Biostatistics Units, Institute for Maternal and Child Health "Burlo Garofolo", 34137 Trieste, Italy; <sup>e</sup>Centre de Références des Troubles d'apprentissages, Centre Hospitalier Universitaire Timone, 13385 Marseille, France; and <sup>f</sup>Laboratoire de Psychologie Cognitive, Aix-Marseille University and Centre National de la Recherche Scientifique, Fédération de Recherche 3C, Brain and Language Research Institute, 13331 Marseille, France

Edited by Michael Posner, University of Oregon, Eugene, OR, and approved April 23, 2012 (received for review April 4, 2012)

**Come dimezzare  
“al volo” gli errori  
nella lettura nei  
dislessici?!**

**Spatial attention deficits  
in dyslexic children  
might impair their ability  
to focus on each  
successive letter in a  
visual word.**

**Aumentando  
anche la velocità  
di lettura!**

## Helping dyslexic children attend to letters within visual word forms

Bruce D. McCandliss<sup>1</sup>

*Department of Psychology and Human Development, Vanderbilt University, Nashville, TN 37203*

**L**earning to read visual words aloud requires a novel integration of two distinct neurocognitive systems: a visual system that allows one to

metry may soon be changing. The study by Zorzi et al. (7) in PNAS provides a clear demonstration of an easily measured vi-

The letter-spacing effect in dyslexia apparently transcends geographical and linguistic boundaries, which is further evidenced by a study by Perea et al. (8)

Report

# Action Video Games Make Dyslexic Children Read Better

**“Video-giochi  
d’azione”: un  
trattamento per  
la dislessia?!**

Sandro Franceschini,<sup>1,3</sup> Simone Gori,<sup>1,2,3</sup> Milena Ruffino,<sup>2</sup>  
Simona Viola,<sup>1</sup> Massimo Molteni,<sup>2</sup> and Andrea Facoetti<sup>1,2,3,\*</sup>

<sup>1</sup>Developmental and Cognitive Neuroscience Lab,  
Department of General Psychology, University of Padua,  
Padua 35131, Italy

<sup>2</sup>Developmental Neuropsychology Unit, Scientific Institute  
E. Medea, Bosisio Parini, Lecco 23842, Italy

Current Biology 22, 1–6, May 8, 2012 ©2012 Elsevier Ltd All rights reserved DOI 10.1016/j.cub.2012.03.013

Report

# A Causal Link between Visual Spatial Attention and Reading Acquisition

Sandro Franceschini,<sup>1,3</sup> Simone Gori,<sup>1,2</sup> Milena Ruffino,<sup>2</sup>  
Katia Pedrolli,<sup>1</sup> and Andrea Facoetti<sup>1,2,3,\*</sup>

<sup>1</sup>Developmental and Cognitive Neuroscience Lab,  
Department of General Psychology, University of Padua,  
Padova 35131, Italy

<sup>2</sup>Developmental Neuropsychology Unit,  
Scientific Institute “E. Medea,” Bosisio Parini,  
Lecco 23842, Italy

**Prevedere la  
dislessia?!**





**La lettura è cruciale  
per vivere nella  
società moderna**



**Per circa il 5% dei  
bambini imparare  
a leggere è  
estremamente  
difficile**



**Questi bambini  
sono affetti da  
dislessia che è  
un complesso  
disordine  
neuroevolutivo**

**La più popolare spiegazione della dislessia individua nel disturbo  
linguistico-fonologico l'unica causa,  
MA  
In realtà, la dislessia è causata da una combinazione di cause.**

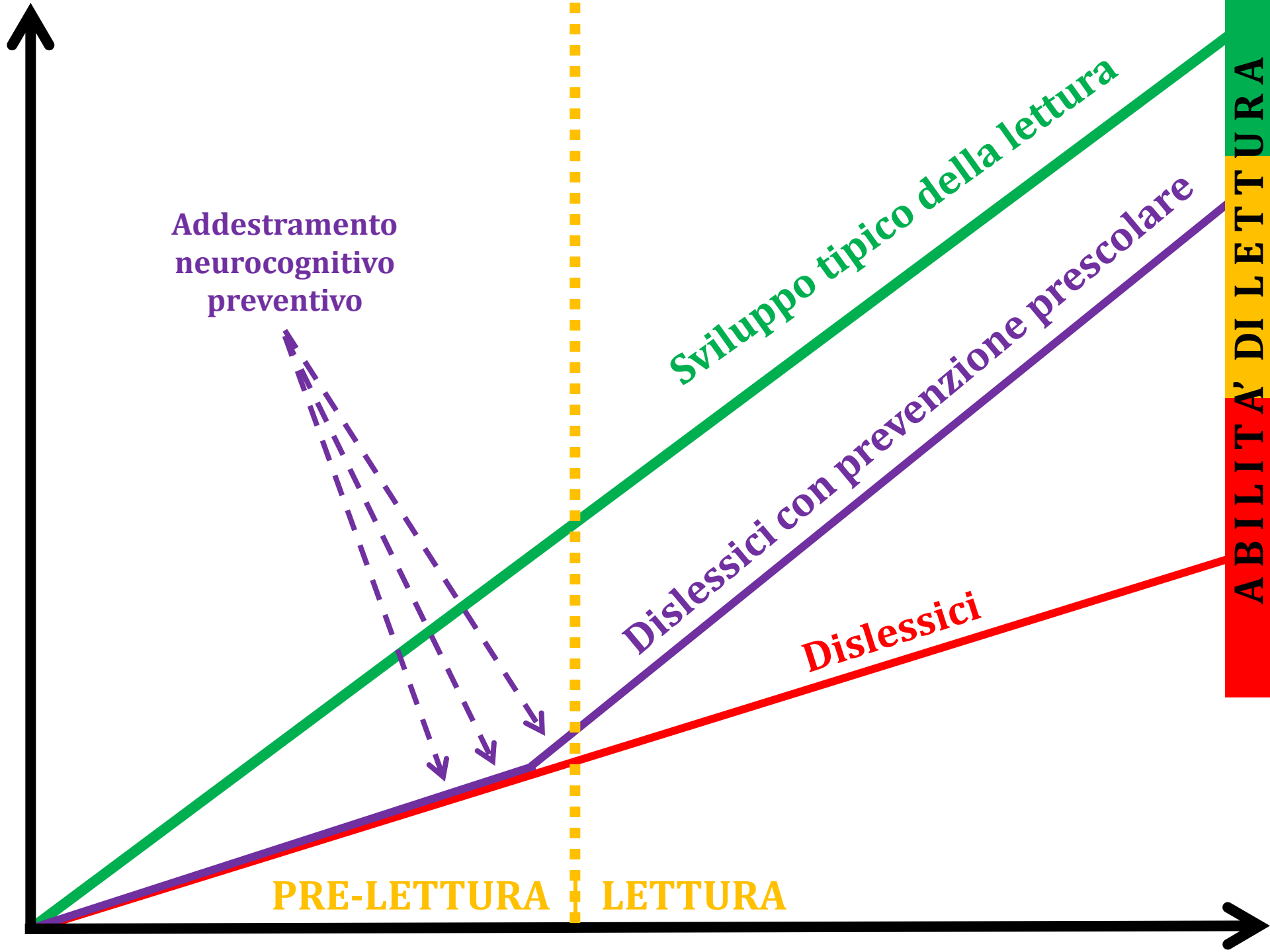
**I tradizionali trattamenti della dislessia sono spesso lenti, lunghi, cari e frustranti per i children (e i loro genitori) e spesso neppure troppo efficienti.**



**Il nostro approccio mira alla prevenzione, piuttosto che al trattamento della dislessia mediante un trattamento preventivo prescolare mediante video giochi**







# MA... NON SOLO!!!

**Prevenire la dislessia???**

<http://decone.psy.unipd.it>

## Can Action Video Game Training Prevent Future Reading Disabilities?

Simone Gori,<sup>1,2</sup> Milena Ruffino,<sup>2</sup> Maria Enrica Sali,<sup>2</sup> Massimo Molteni,<sup>2</sup> & Andrea Facoetti<sup>1,2</sup>

1. Department of General Psychology, University of Padua & 2. Scientific Institute E. Medea, Bosio Parini (LC) Italy

Learning to read is extremely difficult for about 10% of children across cultures; they are affected by a neurodevelopmental disorder called dyslexia. The neurocognitive causes of dyslexia are still hotly debated (Gabrieli, 2009; Peterson & Pennington, 2012). To date, dyslexia prevention is only a dream far from being achieved.

Pre-reading children (n=86):

-ADCL= No risk (n=41);

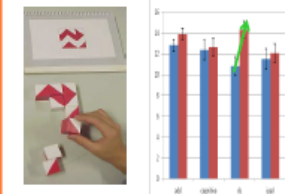
-Cognitive = At risk no training (n=15);

-ds = At risk "Action" training (n=16);

-Ipad = At risk "Serious" training (n=14).

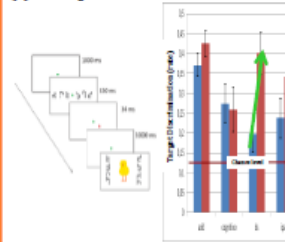


### Visuo-spatial Improvement: Block Design

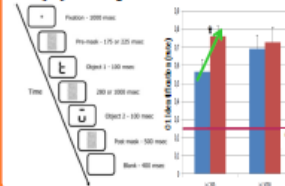


### Visual Attention Improvements:

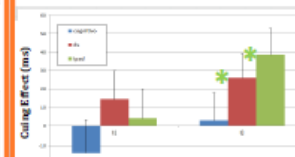
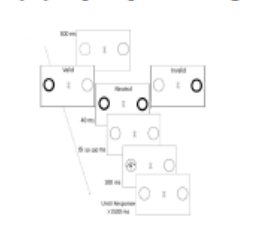
#### (i) Peripheral Discrimination;



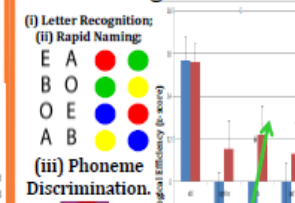
#### (ii) Temporal Attention;



#### (iii) Rapid spatial cuing.



### Early Language Predictors of Future Reading Abilities



It has been demonstrated that action video games efficiently improve attention (Green & Bavelier, 2003, 2012) and reading abilities in children with dyslexia (Franceschini et al., 2013); our results showed, for the first time, that these attentional improvements can directly translate into better language and reading-related abilities, providing a new, fast and fun potential prevention training for dyslexia that has theoretical relevance in unveiling the causal role of attention in reading acquisition.

## DISLESSIA, DISORTOGRAFIA, DISCALCULIA

- Definizione e criteri diagnostici

Relatore: **Andrea Facoetti**

*Assistant Professor - Department of General Psychology - University of Padova*

**1 Ottobre 2015**  
ore 16:30 – 19:30

### L'ATTENZIONE NEI DSA

- Che cos'è l'attenzione e i suoi disturbi nei DSA

Relatore: **Andrea Facoetti**

**19 Novembre 2015**  
ore 16:30 – 19:30

### STUDI LONGITUDINALI

- Alla ricerca delle cause dei DSA 1

Relatore: **Andrea Facoetti**

**26 Novembre 2015**  
ore 16:30 – 19:30

### STUDI RIABILITATIVI

- Alla ricerca delle cause dei DSA 2

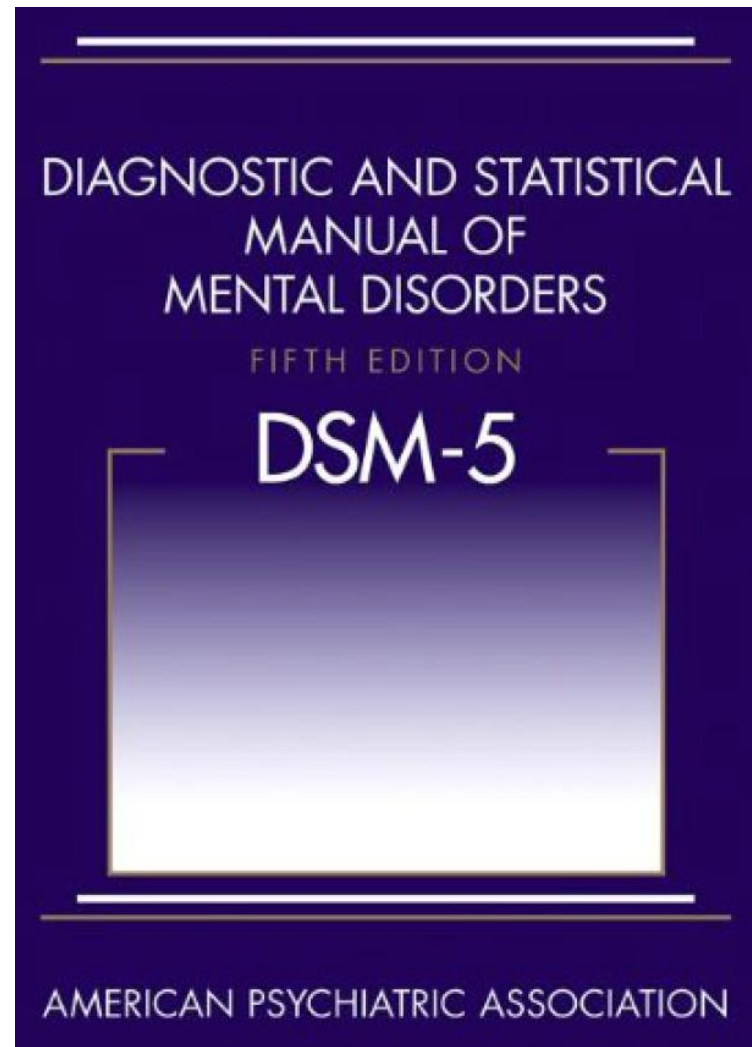
Relatore: **Andrea Facoetti**

**3 Dicembre 2015**  
ore 16:30 – 19:30

### DALLE NEUROSCIENZE DEI DSA ALLA SCUOLA

Relatore: **Andrea Facoetti**

**10 Dicembre 2015**  
ore 16:30 – 19:30





# Neurodevelopmental Disorders

The neurodevelopmental disorders are a group of conditions with onset in the developmental period. The disorders typically manifest early in development, often before the child enters grade school, and are characterized by developmental deficits that produce impairments of personal, social, academic, or occupational functioning. The range of developmental deficits varies from very specific limitations of learning or control of executive functions to global impairments of social skills or intelligence. The neurodevelopmental disorders frequently co-occur; for example, individuals with autism spectrum disorder often have intellectual disability (intellectual developmental disorder), and many children with attention-deficit/hyperactivity disorder (ADHD) also have a specific learning disorder. For some disorders, the clinical presentation includes symptoms of excess as well as deficits and delays in achieving expected milestones. For example, autism spectrum disorder is diagnosed only when the characteristic deficits of social communication are accompanied by excessively repetitive behaviors, restricted interests, and insistence on sameness.

# I 5 livelli di Analisi dei disturbi neuroevolutivi

- Livello I genetico-molecolare (ricorda  
Interazione gene-ambiente = epigenetica e soprattutto l'effetto  
dell'ambiente = riabilitazione)
- Livello II Neurobiologico
  - Livello III Cognitivo
- Livello IV Comportamentale
  - Livello V Il Fenotipo  
(manifestazione clinica)

# Disturbi neuroevolutivi:

## Quale direzione???

### GOTTLIEB'S (1992) DIFFERENT VIEWS OF DEVELOPMENT

Predetermined development:

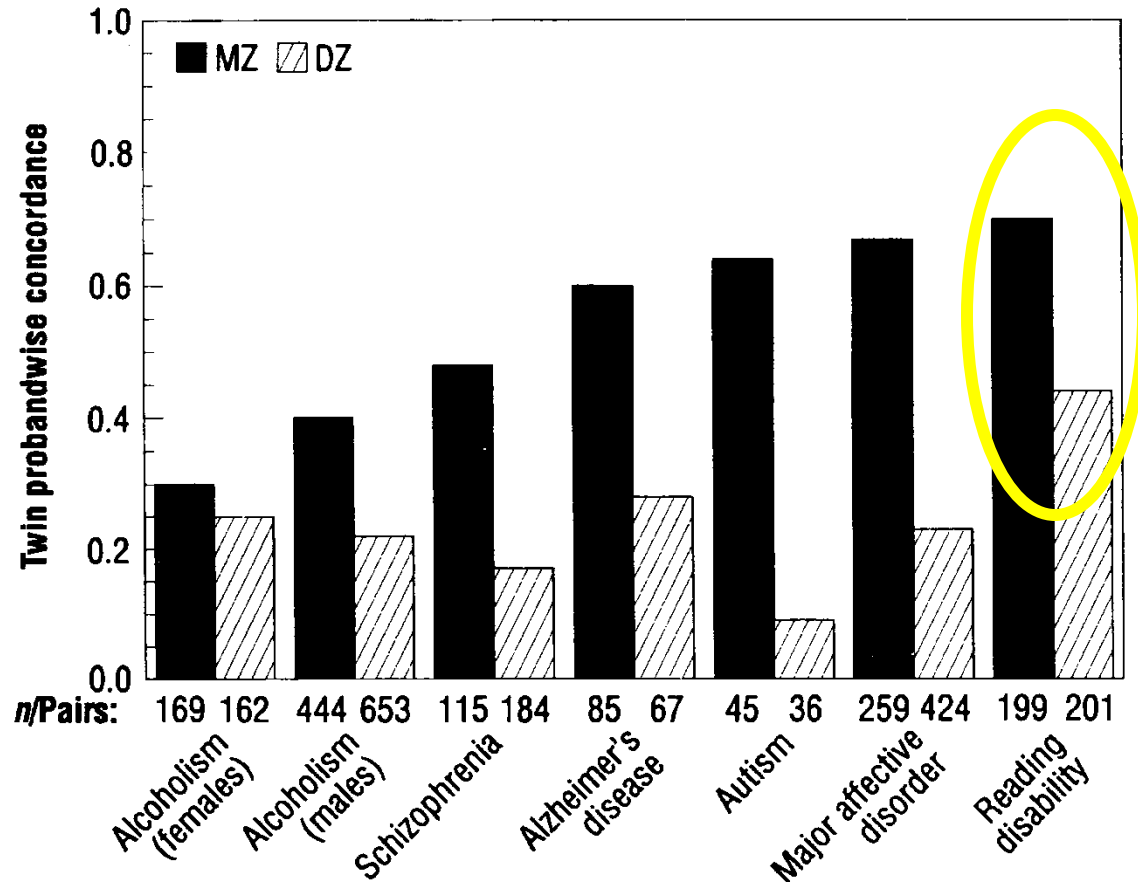
Genes → Brain structure → Brain function → Experience

Probabilistic development:

Genes ↔ Brain structure ↔ Brain function ↔ Experience



# Twin concordance rates



(From: Plomin et al. 1994, Science 264: 1733-9)

Specific learning disorder, as the name implies, is diagnosed when there are specific deficits in an individual's ability to perceive or process information efficiently and accurately. This neurodevelopmental disorder first manifests during the years of formal schooling and is characterized by persistent and impairing difficulties with learning foundational academic skills in reading, writing, and/or math. The individual's performance of the affected academic skills is well below average for age, or acceptable performance levels are achieved only with extraordinary effort. Specific learning disorder may occur in individuals identified as intellectually gifted and manifest only when the learning demands or assessment procedures (e.g., timed tests) pose barriers that cannot be overcome by their innate intelligence and compensatory strategies. For all individuals, specific learning disorder can produce lifelong impairments in activities dependent on the skills, including occupational performance.

The use of specifiers for the neurodevelopmental disorder diagnoses enriches the clinical description of the individual's clinical course and current symptomatology. In addition to specifiers that describe the clinical presentation, such as age at onset or severity ratings, the neurodevelopmental disorders may include the specifier "associated with a known medical or genetic condition or environmental factor." This specifier gives clini-

cians an opportunity to document factors that may have played a role in the etiology of the disorder, as well as those that might affect the clinical course. Examples include genetic disorders, such as fragile X syndrome, tuberous sclerosis, and Rett syndrome; medical conditions such as epilepsy; and environmental factors, including very low birth weight and fetal alcohol exposure (even in the absence of stigmata of fetal alcohol syndrome).

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# Specific Learning Disorder

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## Specific Learning Disorder

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### Diagnostic Criteria

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- A. Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties:
1. Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, has difficulty sounding out words).
  2. Difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).
  3. Difficulties with spelling (e.g., may add, omit, or substitute vowels or consonants).
  4. Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity).
  5. Difficulties mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures).
  6. Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).



- B. The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.
- C. The learning difficulties begin during school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities (e.g., as in timed tests, reading or writing lengthy complex reports for a tight deadline, excessively heavy academic loads).
- D. The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.

**Note:** The four diagnostic criteria are to be met based on a clinical synthesis of the individual's history (developmental, medical, family, educational), school reports, and psycho-educational assessment.