

Dyslexia
Dysorthography
Dyscalculia

Review of the scientific data

Group of experts and authors

The following presented a communication

The following compiled a memorandum

Acknowledgments

Inserm and the expert group would like to express their gratitude to Stanislas DEHAENE (Neuroimagerie cognitive, Inserm U 562, Service Hospitalier Frédéric Joliot, CEA, Orsay) and José MORAIS (Faculté des sciences psychologiques et de l'Éducation, Free University of Brussels) for rereading the work and for their advice.

Scientific, editorial and logistic coordination

Preface

Professor Christian Bréchet
Director General of Inserm

Contents

Foreword 7
Synthesis..... 10
Principal findings 55
Recommendations 59
Meeting-debate held on January 16, 2007 69
Inserm collective expert review 79

Foreword

-
-
-
-

-

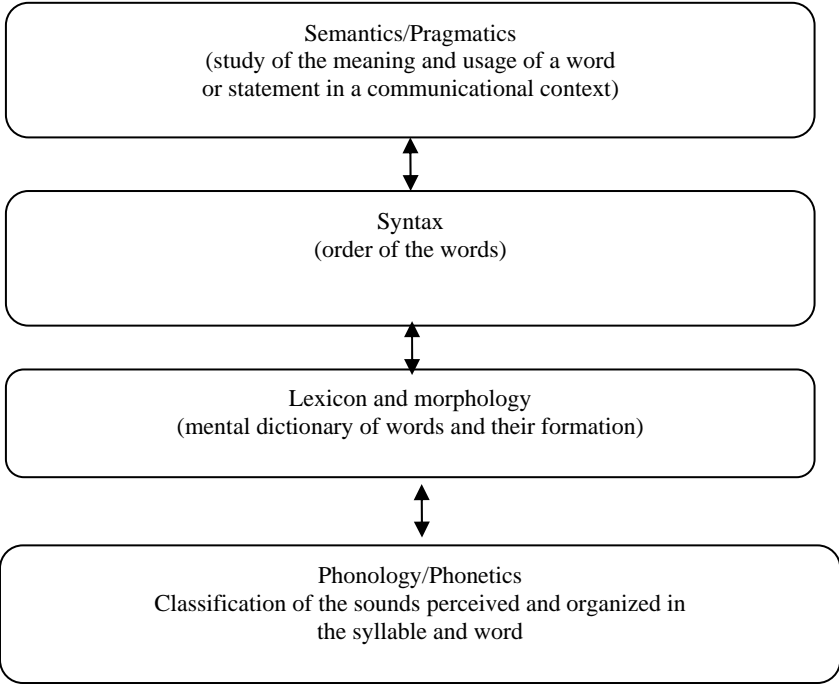
-

-

Synthesis

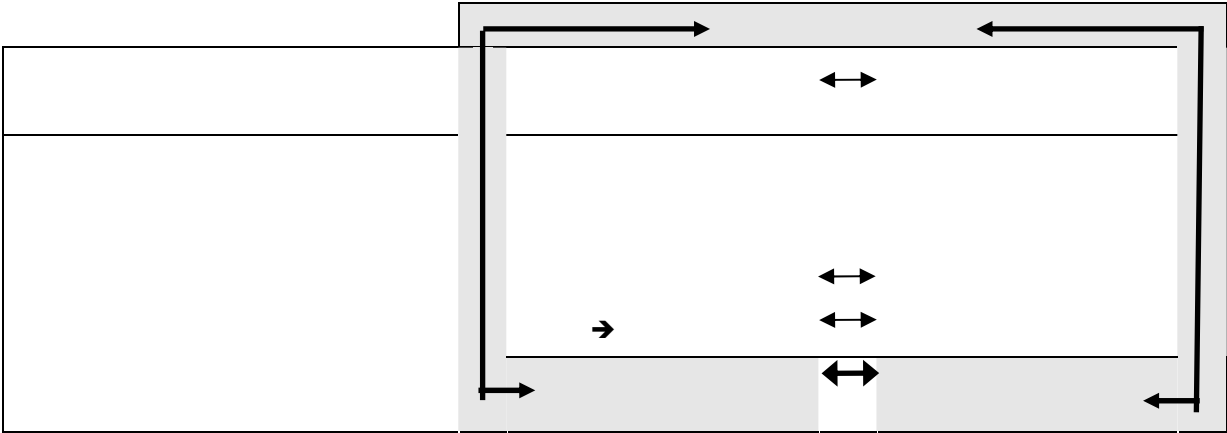


Spoken language acquisition: chronological benchmarks



Language components

Learning to read



Operations involved in written word identification in syllabic writing and alphabetical writing

'sept'

Learning to write and orthography

-
-
-

'thym'

'éléphanteau' 'lionceau'

'accords'

'il les timbres

'eau'

'chiot'

Learning arithmetic

-
-

→

soixante-quinze

Definitions and classifications of specific learning disabilities

-

-

-

ICD-10 common diagnostic criteria for specific developmental disorders of scholastic skills

-

-

-

-

-

ICD-10 diagnostic criteria for specific reading disorder

IDF-10 diagnostic criteria for specific disorder of arithmetical skills

- -
 -
-

ICD-10 diagnostic criteria for specific spelling disorder

-

-

±

-

Prevalence data on specific scholastic learning disabilities

Dyslexia: studies of groups and multiple cases

Dyslexia subtypes: single-case studies

Disorders of learning to write

Dyscalculia

Associated acquisition disorders

Inventory of the diagnoses formulated for 209 successive cases attending a reference center for learning disabilities (CHU de Marseille, after Habib, 2003*)

Associated behavioral or emotional disorders

Theories explaining dyslexia: phonological theory

'pero'

'perro'

The visual dimensions of dyslexia

Cerebellar hypothesis

post mortem

The temporal processing hypothesis

The contribution of brain imaging

Genetic factors

de novo

DYX1C1, ROBO1

KIAA0319 DCDC2

ROBO1

ROBO1

Critical analysis of the various theories of dyslexia

-
-
-

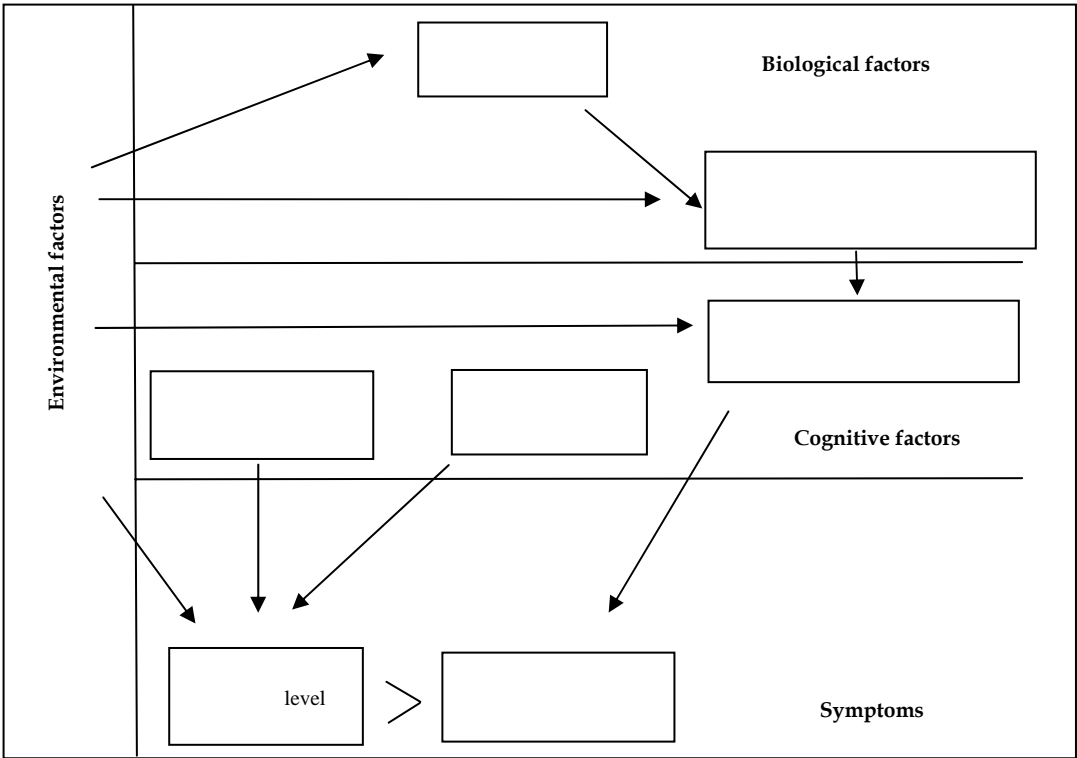
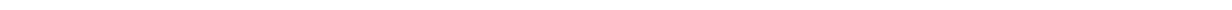


Diagram of the various factors involved in dyslexia

Detection, screening and diagnosis

•

•



-

-

-

Prevention in the school environment

-
-
-

Assessment of rehabilitation methods

Individual management in clinical practice

→

Principal findings

-

-

-

-

-

-

-

•

•

•

•

•

•

•

•

•

•

•

•

•

•

•

•

•

•

Recommendations

Enhancing detection, screening and prevention

INFORMING THE PROFESSIONALS AND PUBLIC ABOUT SPECIFIC LEARNING DISABILITIES AND THEIR MANAGEMENT

**TRAINING TEACHERS TO BETTER UNDERSTAND AND RECOGNIZE SPECIFIC LEARNING
DISABILITIES**

'soixante-quinze'

PROMOTING APPROPRIATE USE OF INSTRUMENTS IN THE CONTEXT OF SCREENING

**DEVELOPING AND EVALUATING PEDAGOGIC TRAINING BY ADAPTING MODELS HAVING
DEMONSTRATED THEIR EFFICACY ABROAD**

**PROMOTING THE PEDAGOGIC ARRANGEMENTS AND ADAPTATIONS NECESSARY FOR
PREVENTING OTHER LEARNING DIFFICULTIES**

'département'

Enhanced management

SETTING UP AND EVALUATING VARIOUS INDIVIDUAL CARE MODALITIES FOR DYSLEXIA

**PROMOTING AND EVALUATING THE VARIOUS MODALITIES FOR INDIVIDUAL MANAGEMENT
FOR LEARNING DISABILITIES OTHER THAN DYSLEXIA**

PROMOTING AND EVALUATING MULTIMODAL MANAGEMENT FOR FREQUENTLY ASSOCIATED DISORDERS

PROMOTING AND EXPERIMENTING WITH SETUP OF COORDINATED DIAGNOSTIC AND CARE NETWORKS

PROPOSING COMMON TRAINING TO ALL RESOURCE PEOPLE IN ADDITION TO SPECIFIC TRAINING BY DISCIPLINE

Widening our knowledge of scholastic learning and learning disabilities

WIDENING OUR UNDERSTANDING OF THE MECHANISMS OF DYSLEXIA

DEVELOPING RESEARCH ON THE MECHANISMS INVOLVED IN LEARNING TO SPELL

'chat'; 'chatte'; 'grand'; 'grande'

DEVELOPING RESEARCH ON THE MECHANISMS INVOLVED IN LEARNING ARITHMETIC

DEVELOPING EPIDEMIOLOGICAL STUDIES IN FRANCE

Meeting-debate held on January 16, 2007 ¹³

Introduction: the Inserm collective expert review approach

Principal findings of the collective expert review

Reading

Writing, arithmetic

Why are disorders so frequently associated?

-
-
-

Biological approaches vs. social approaches

Prevention, screening and management

-
-
-

Debate

Recommendations

Training

département

commune

Preventive strategies

Individual management/coordination and articulation between education and care



Pedagogic arrangements and adaptations

Those attending

Apologies for absences:



APPENDIX

Inserm collective expert review

Methodology

Problem statement

Expert review monitoring committee and assistance unit setup

Literature searching

Constitution of the expert group

Initial expert group meeting

Expert critical analysis of the literature

Synthesis and recommendations

Critical review of the report and synthesis by prominent 'readers'

Presentation of the conclusions of the expert review and debate