

Les troubles d'apprentissage

Michel HABIB,
neurologue

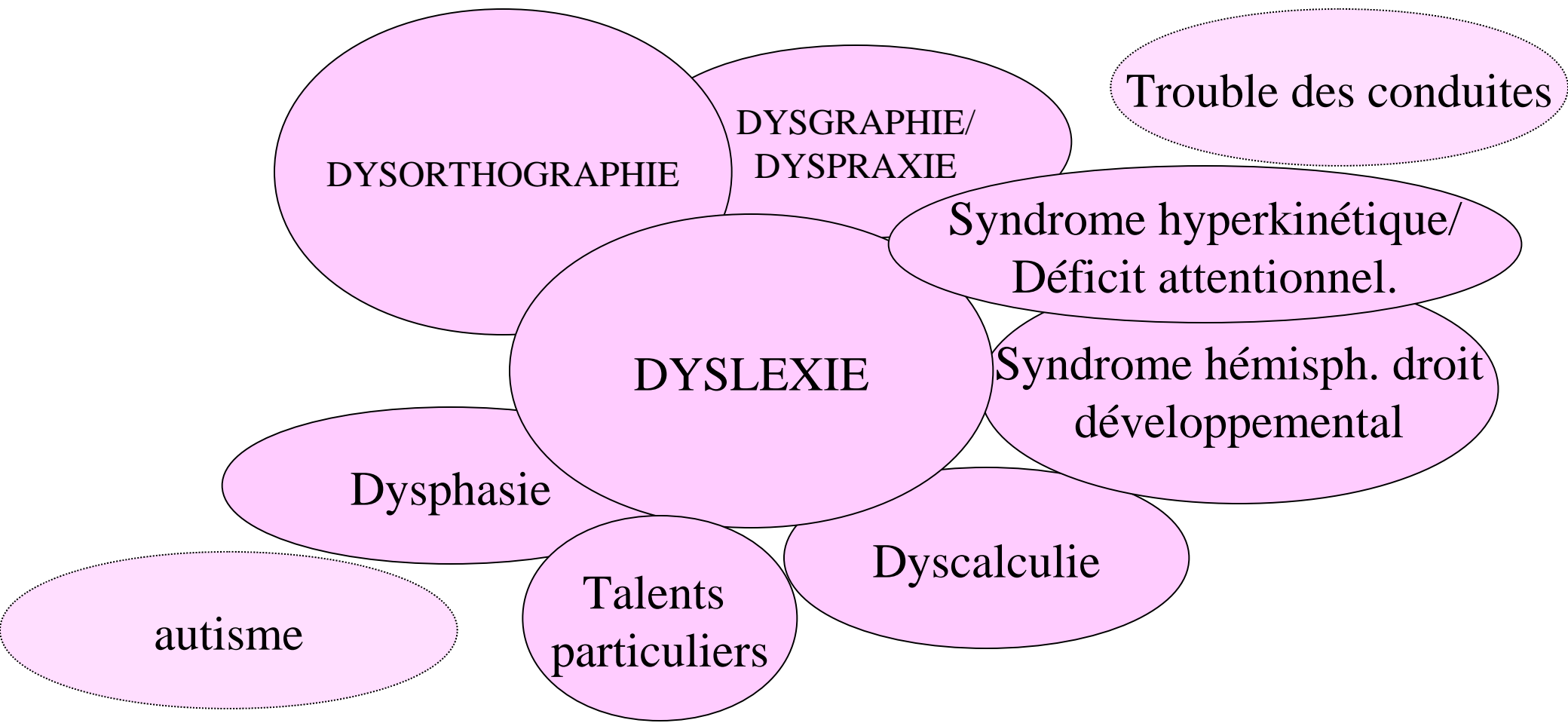
CHU Timone, Résodys

Définitions

Troubles spécifiques des apprentissages :

Ensemble de troubles du développement des fonctions cognitives

- Langage oral : dysphasie
- Langage écrit : dyslexie / dysorthographe
- Compétences logico-mathématiques : dyscalculie
- Programmation de l'action : dyspraxie
- Attention avec ou sans hyperactivité : THADA



DYSORTHOGRAPHIE

DYSGRAPHIE/
DYSPRAXIE

Trouble des conduites

Syndrome hyperkinétique/
Déficit attentionnel.

DYSLEXIE

Syndrome hémisph. droit
développemental

Dysphasie

Dyscalculie

Talents
particuliers

autisme

"CHAPEAU"



ANALYSE VISUELLE
(identité, position, etc...)

"CHAPEAU"



*lecture par
adressage*

chapeau

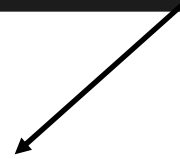


*lecture par
assemblage*

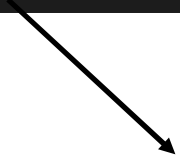
ch a p eau



/ʃa|p|o|/



**production
orale**
/ʃ a p o /



bol

confortablement

tambenefoneclor

"CHAPEAU"



**ANALYSE VISUELLE
(identité, position, etc...)**
"CHAPEAU"



lecture par adressage

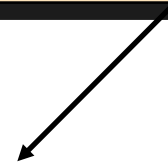
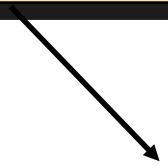
chapeau

lecture par assemblage

ch a p eau

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**production
orale**
/ʃ a p o /

chrysanthème

Trouble des apprentissages

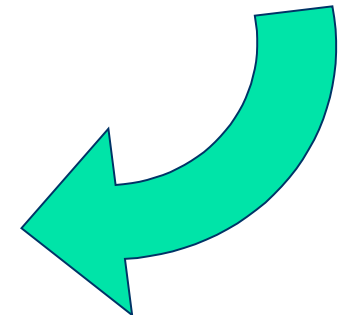
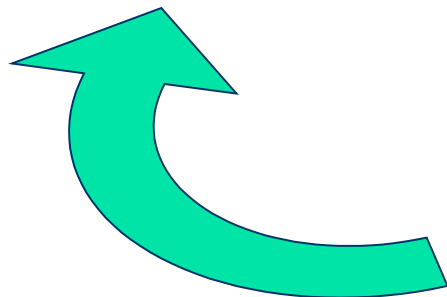
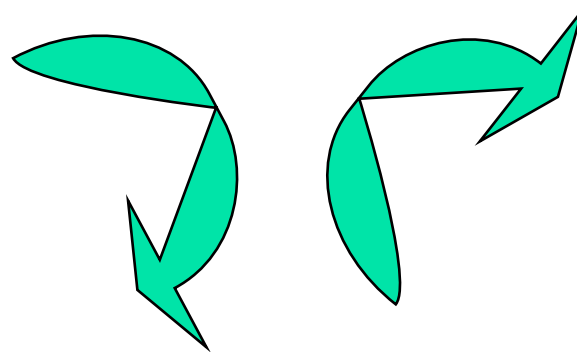
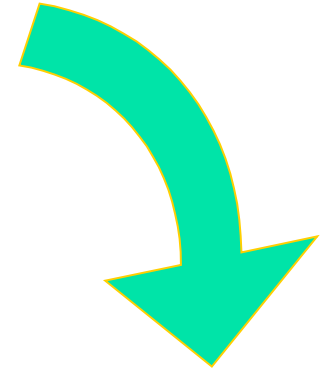
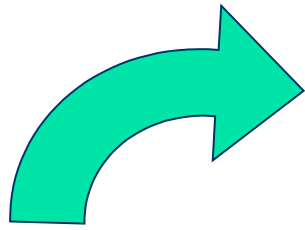
dyslexie, dysphasie, dyspraxie,
déficit d'attention, précocité...

démotivation

échec scolaire

troubles du comportement

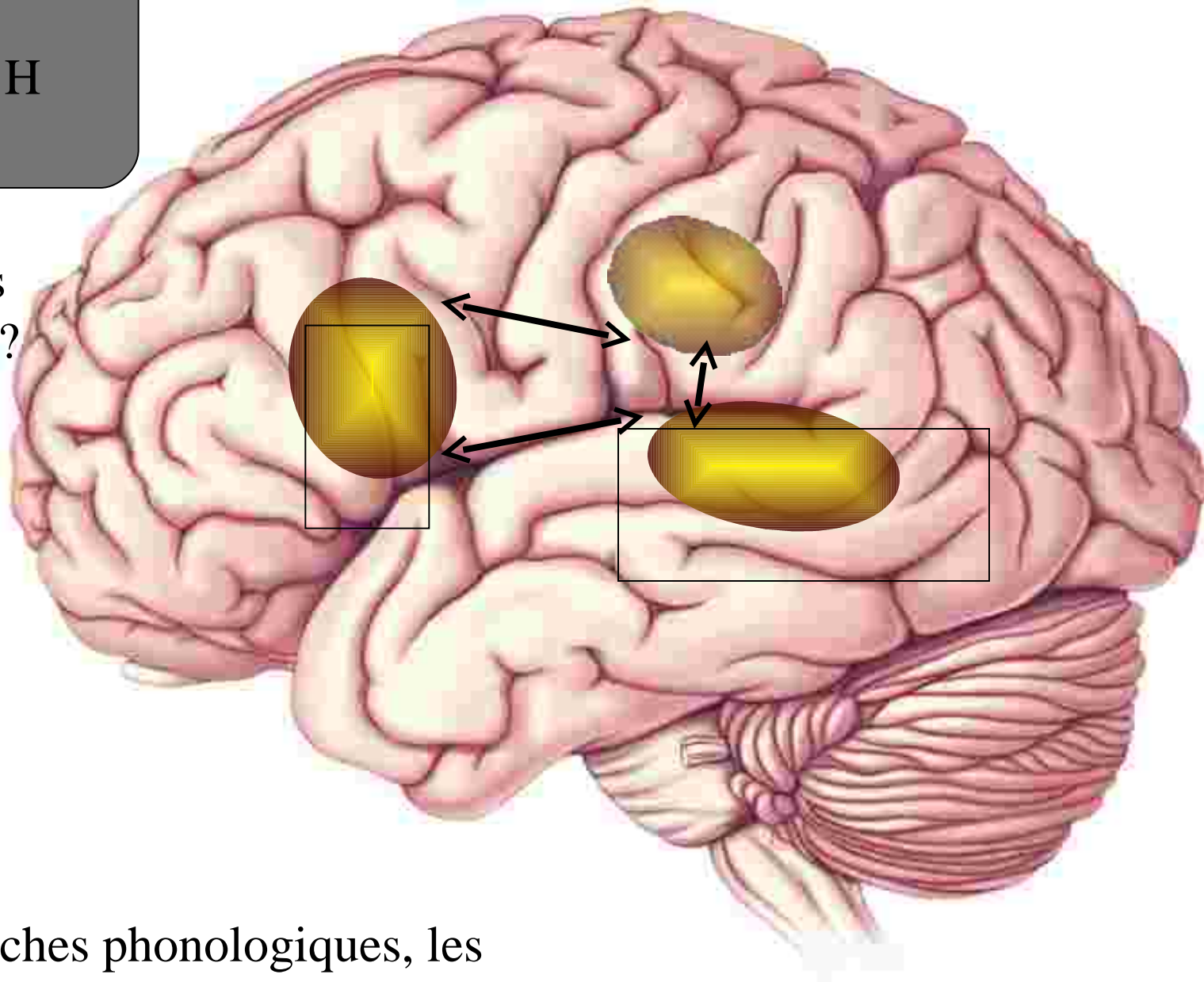
- instabilité
- dépression



Dyslexie : les causes, les mécanismes

G H

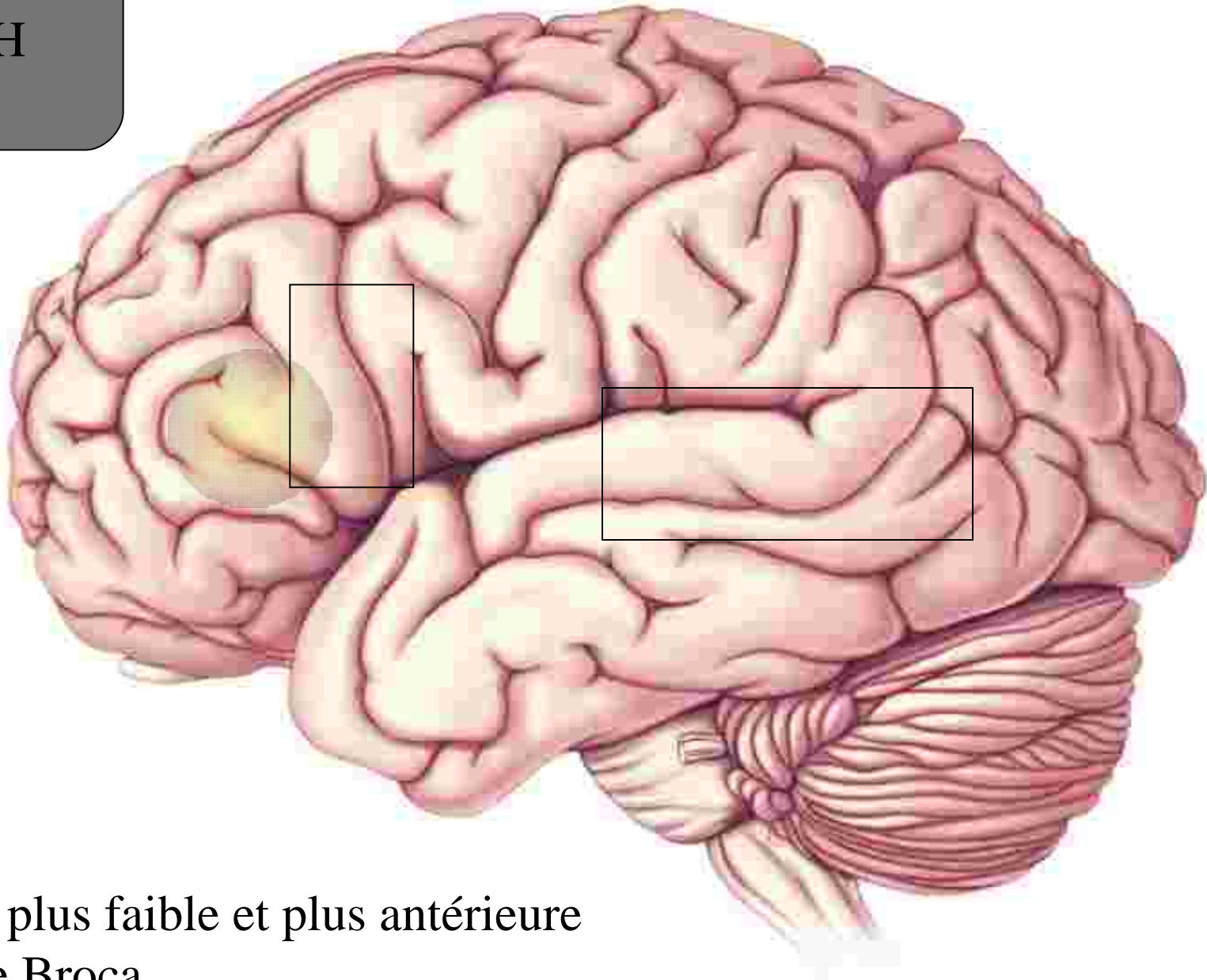
Lettres
riment?



Lors de tâches phonologiques, les
aires du langage ne peuvent
s'activer correctement

Enfant dyslexique

G H

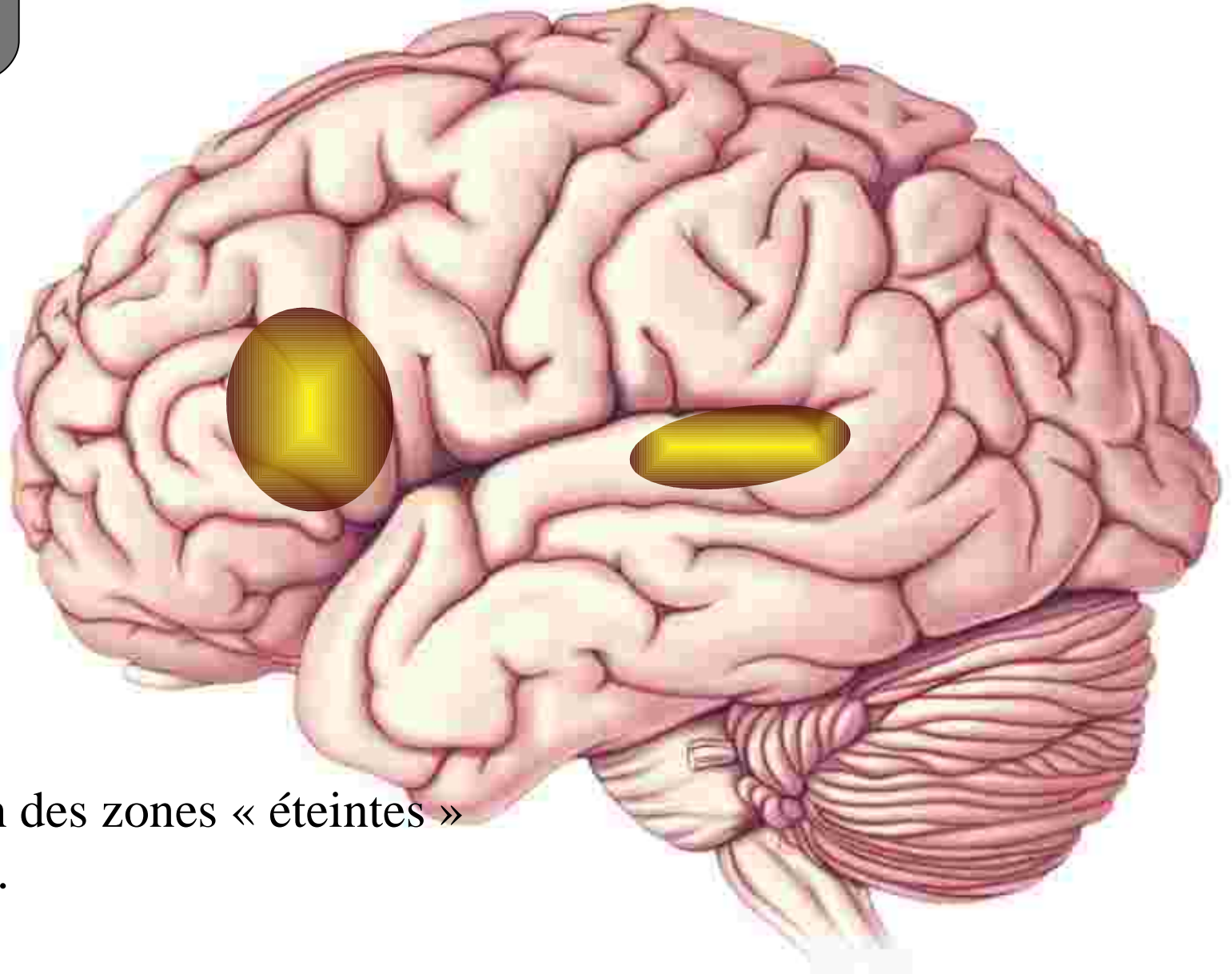


Activation plus faible et plus antérieure
de l'aire de Broca

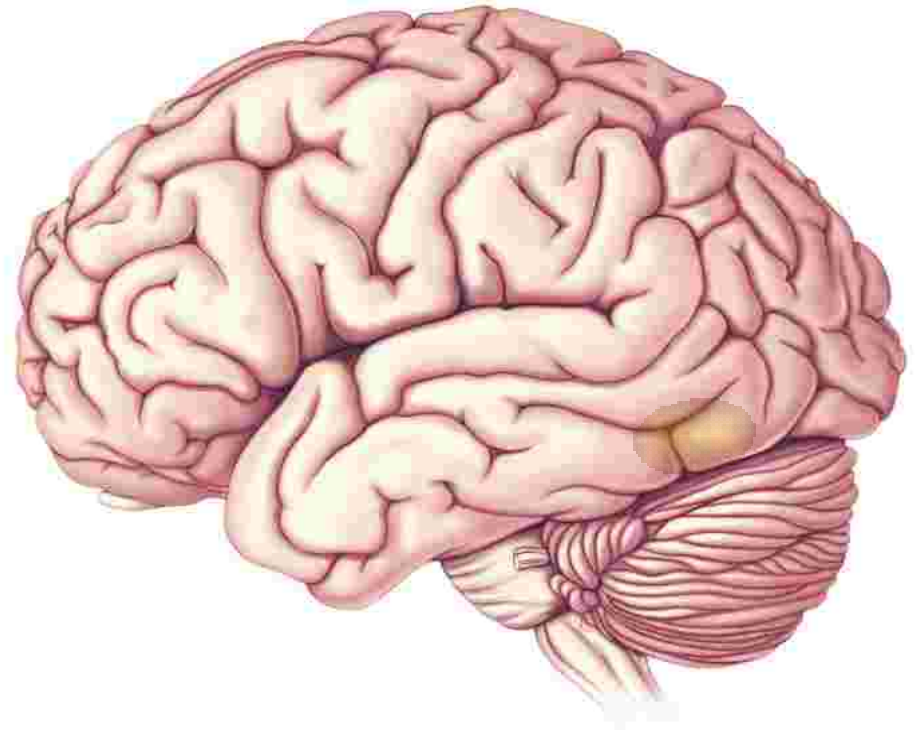
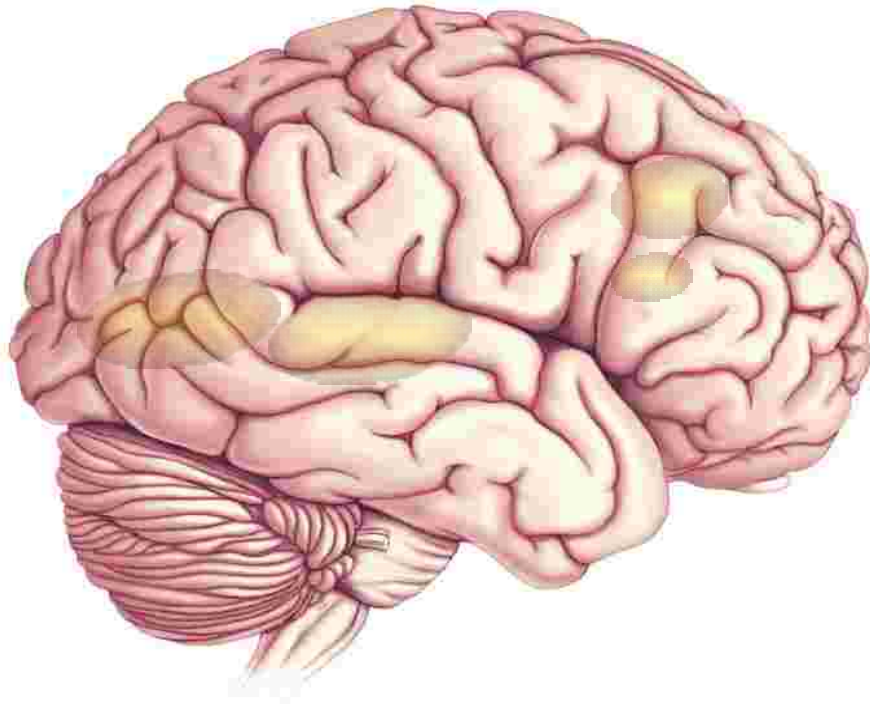
Absence d'activation postérieure

Enfant dyslexique après entraînement (Fastforward®)

G H



Réapparition des zones « éteintes »
Mais aussi...



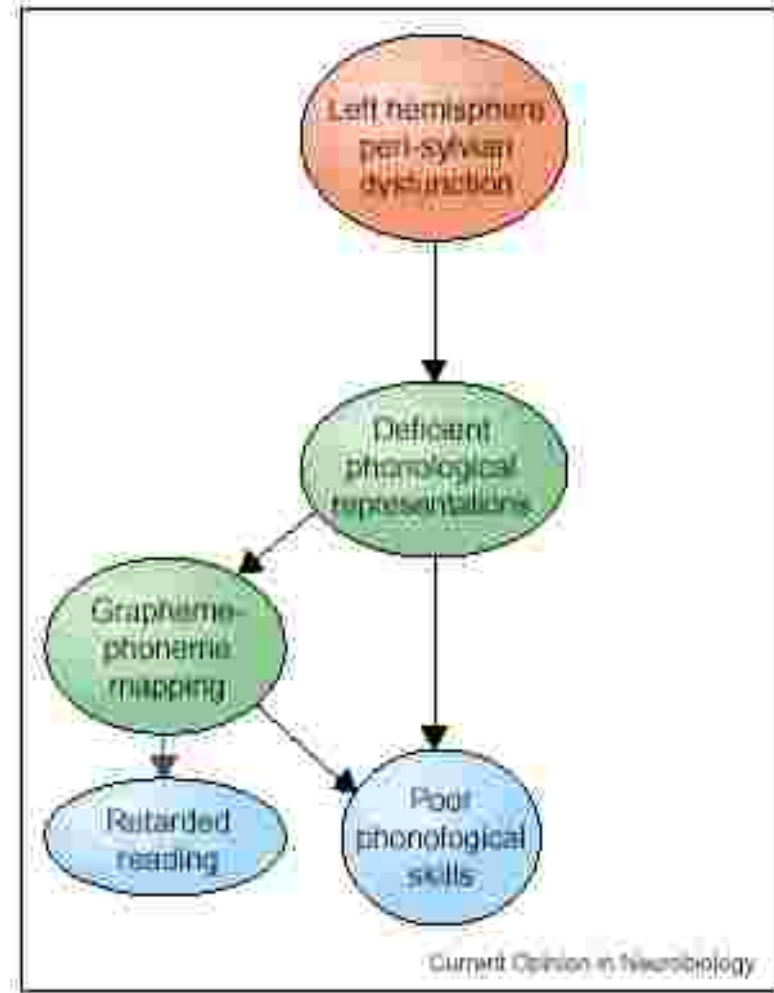
... apparition de zones non activées précédemment (et non activées chez le témoin) : mécanisme de compensation? réorganisation?

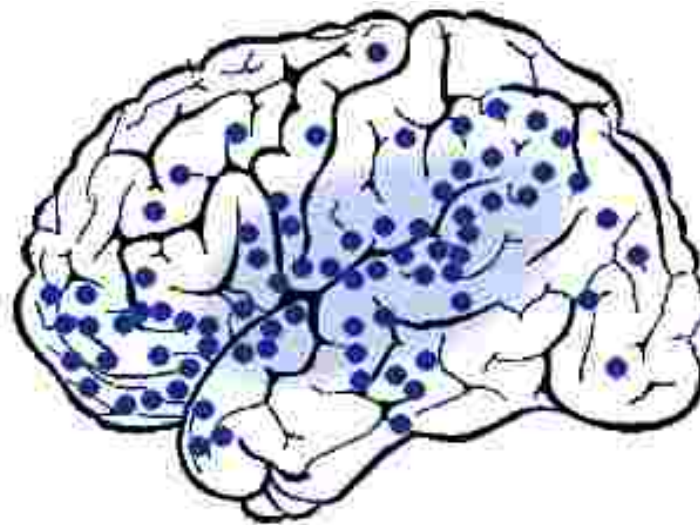
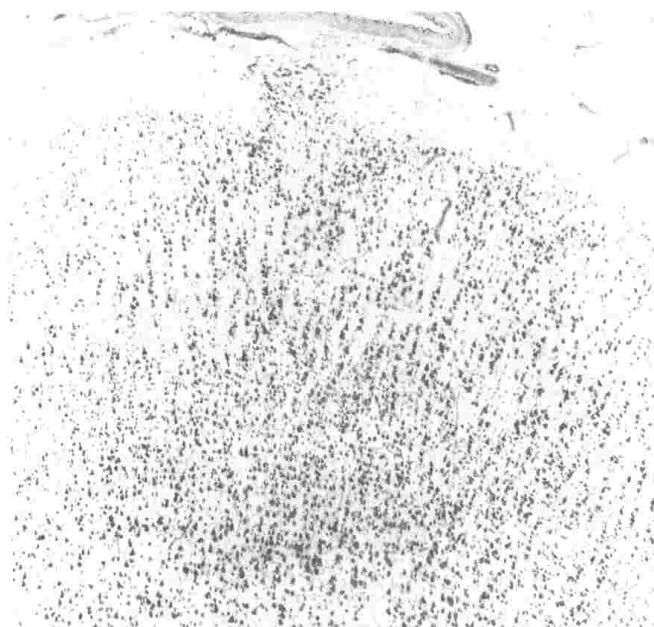
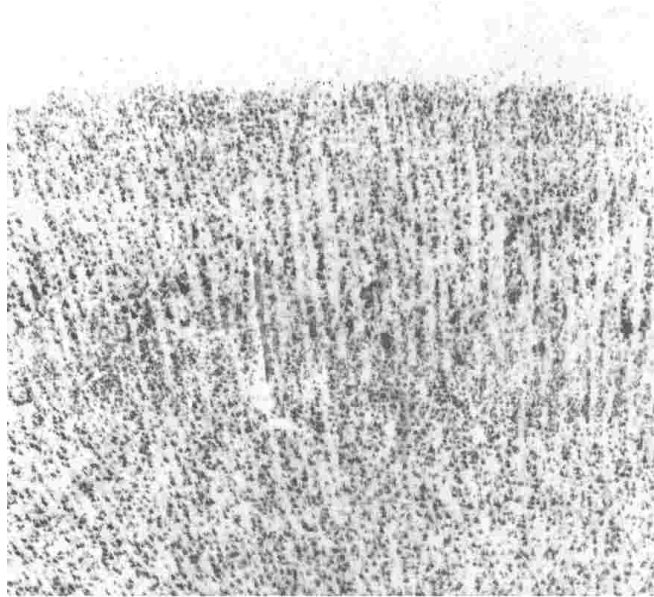
ENVIRONNEMENT

Niveau neurobiologique

Niveau cognitif

Niveau comportemental





**Ectopies sur le cerveau dyslexique
(Galaburda et al., 1979, 1985)**

VWFA : aire de la forme visuelle des mots



Attribue un statut linguistique à une suite de lettres

Génétique des troubles d'apprentissage

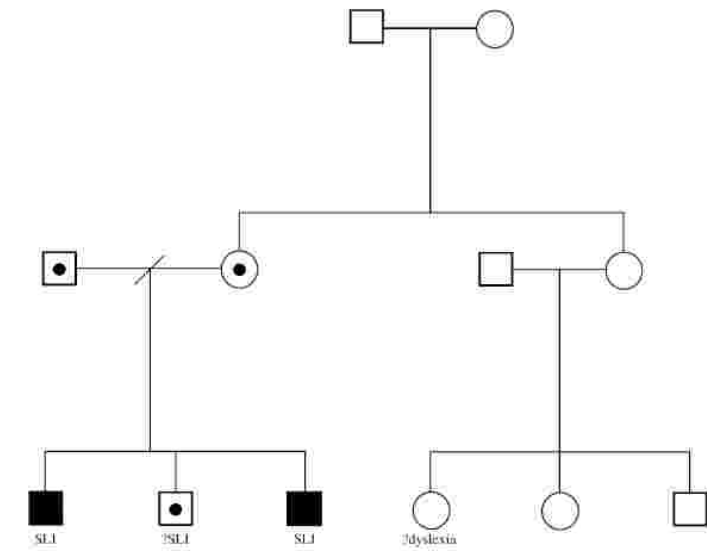
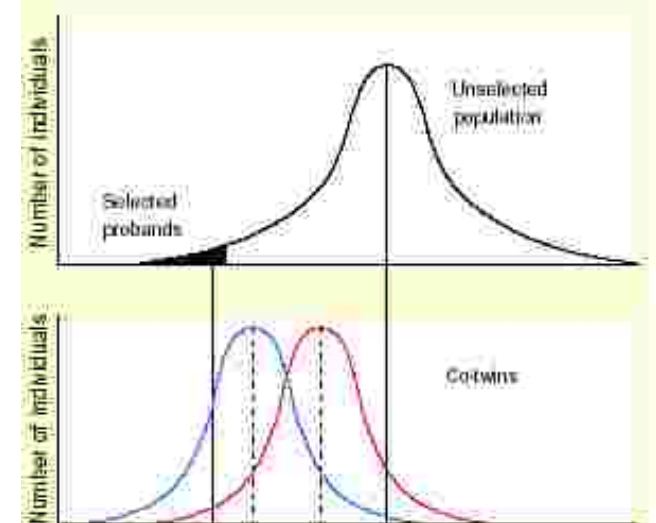
Dyslexie :

- jusqu'à 65% : un des parents est dyslexique
- 40% des premiers degrés sont dyslexiques

Degré de concordance dans paires de jumeaux
68% DZ, 38% MZ (Colorado Twin Study of Reading Disability), Olson et al.

SLI : 90 paires de jumeaux (Bishop, 1995)

- 70% concordance entre MZ, 46% entre DZ
- jusqu'à 100% concordance entre MZ si critères plus larges
- Variance partagée entre déficit oral et lecture

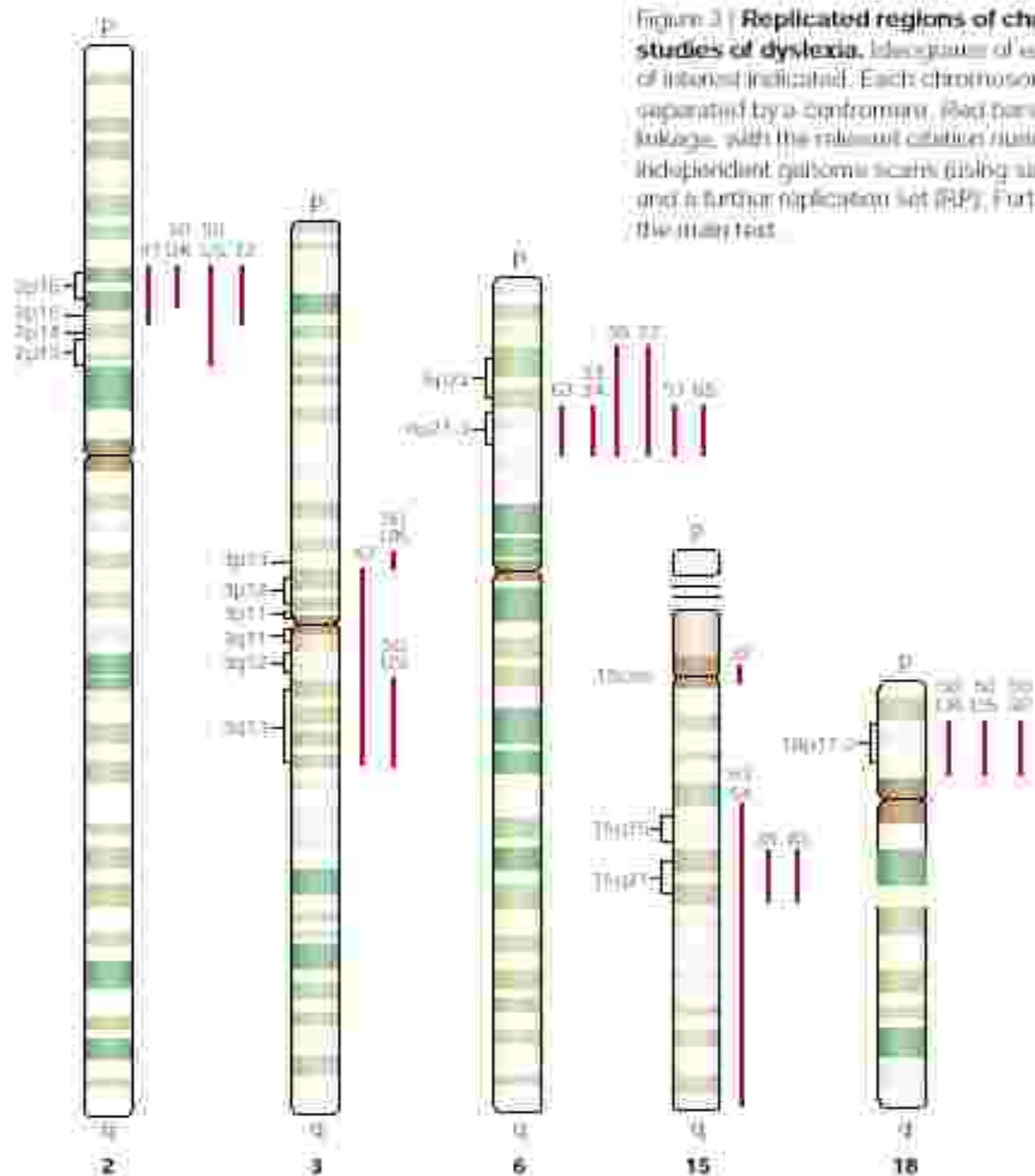


Héritabilité des troubles du langage oral

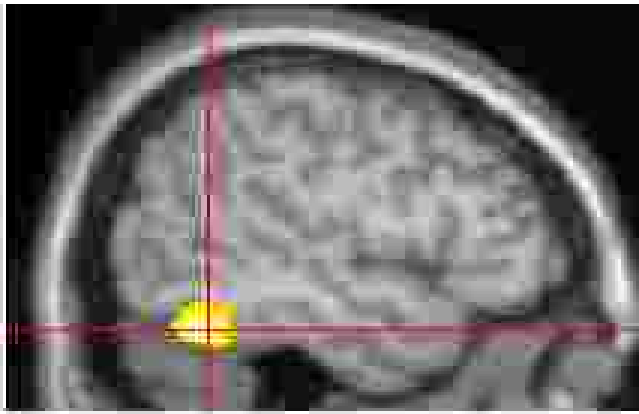
1. Héritabilité (Ostergren, 1994)



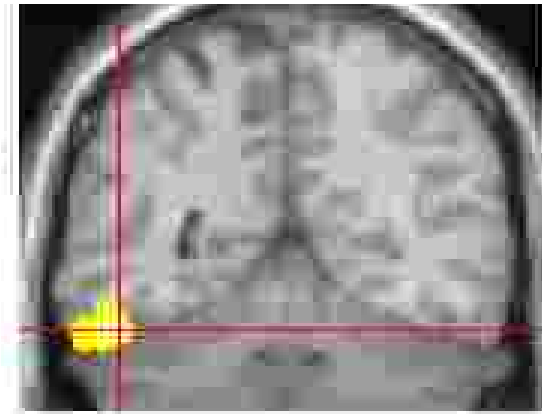
Figure 3 | **Replicated regions of chromosomes 2, 3, 6, 15 and 18 implicated by linkage studies of dyslexia.** Ideograms of each chromosome are shown with the cytogenetic bands of interest indicated. Each chromosome has a short (p) arm and a long (q) arm, which are separated by a centromere. Red bars indicate approximate positions of positive regions of linkage, with the relevant citation number of the study shown above. REF 30 excluded two independent genome scans using samples from the United Kingdom and the United States) and a further replication set (RP). Further details of each study are given in Tables 2–4 and in the study text.



sagittal

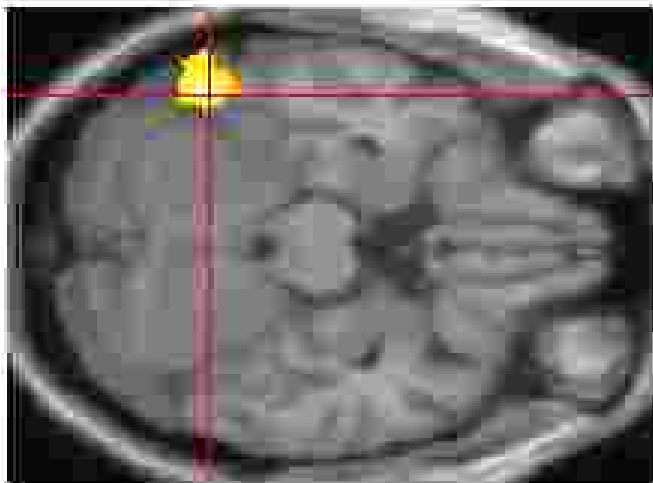


coronal



Reading Words in Controls
compared to Dyslexics

transverse

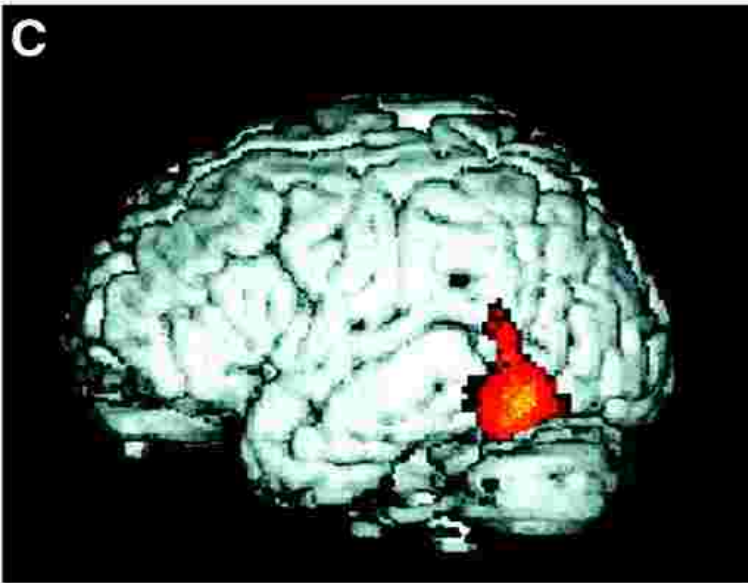


(Chanoine et al., 1998)

Aire 37 : zone de plus forte différence entre dyslexiques et témoins

Dyslexia: Cultural Diversity and Biological Unity

E. Paulesu,^{1,2*} J.-F. Démonet,³ F. Fazio,^{2,4} E. McCrory,⁵
V. Chanoine,³ N. Brunswick,⁶ S. F. Cappa,⁷ G. Cossu,⁸ M. Habib,⁹
C. D. Frith,⁶ U. Frith⁵



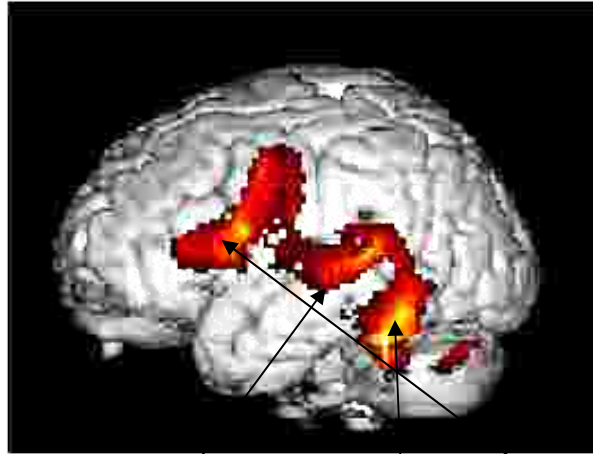
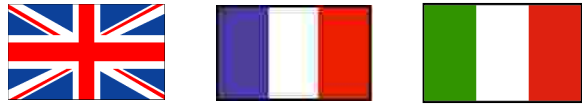
Controls - dyslexics

The recognition of dyslexia as a neurodevelopmental disorder has been hampered by the belief that it is not a specific diagnostic entity because it has variable and culture-specific manifestations. In line with this belief, we found that Italian dyslexics, using a shallow orthography which facilitates reading, performed better on reading tasks than did English and French dyslexics. However, all dyslexics were equally impaired relative to their controls on reading and phonological tasks. Positron emission tomography scans during explicit and implicit reading showed the same reduced activity in a region of the left hemisphere in dyslexics from all three countries, with the maximum peak in the middle temporal gyrus and additional peaks in the inferior and superior temporal gyri and middle occipital gyrus. We conclude that there is a universal neurocognitive basis for dyslexia and that differences in reading performance among dyslexics of different countries are due to different orthographies.

¹Psychology Department, University of Milan Bicocca, Milan, Italy. ²INB-CNR, Scientific Institute H San Raffaele, Milan, Italy. ³INSERM U455, Hôpital Purpan, Toulouse, France. ⁴Neuroscience and Biomedical Technologies Department, University of Milan Bicocca, Milan, Italy. ⁵Institute of Cognitive Neuroscience, University College London, London, UK. ⁶Wellcome Department of Cognitive Neurology, Institute of Neurology, London, UK. ⁷Psychology Department, University "Vita e Salute H San Raffaele", Milan, Italy. ⁸Institute of Human Physiology, University of Parma, Parma, Italy. ⁹Centre de Recherche Institut Universitaire de Gériatrie, Montréal, Québec, Canada.

*To whom correspondence should be addressed at University of Milan Bicocca. E-mail: eraldo.paulesu@unimib.it

A

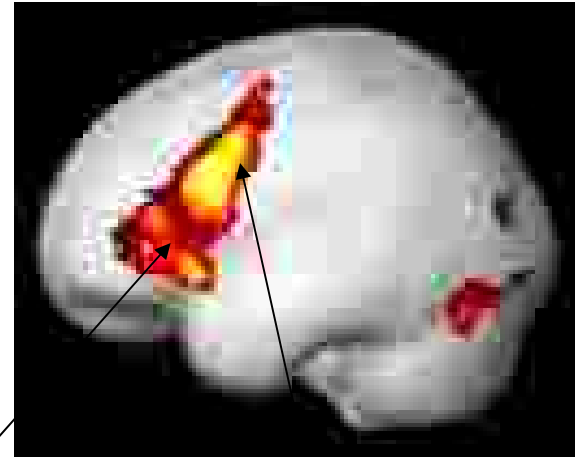
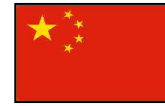


Wernicke's area

Posterior temporal lobe

Broca's area (BA45)

B



电
+
店

Middle frontal gyrus (BA9)

Ziegler & Habib (2005) TICS