Defining Dyslexia

Dyslexia is called "the language disorder that makes reading and writing a struggle" by Laura Helmuth in her News of the Week article "Dyslexia: same brains, different languages," (16 Mar., p. 2064). Although she is in the good company of many cognitive neuroscientists and educational psychologists, her terminology is in error. Evolution prepared us for language, but not for reading or writing. Indeed, Western cultures have demanded that all their normal children acquire script only within about the past 100 years. It is surprising and satisfying that most children do develop a reasonable reading skill—but many children don’t. Most of them would never have become diagnosed as "language disordered" in an oral culture; they have speech and language skills that are entirely in the normal range. Calling dyslexics "language disordered" shows a lack of evolutionary and historical awareness and it risks being considered discriminatory.

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Still, in the Paulesu et al. report, developmental dyslexia is called a “disorder of genetic origin,” and the authors discuss “brain abnormalities” that are apparently discriminatory.

The question is whether this “abnormality” is still within the normal evolutionary range.

In other words, would our ancestors with such brains have become normally speaking and normally functioning hunter-gatherers? If so, it is a misnomer to denote dyslexics as neurologically abnormal. It

References and Notes


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S C I E N C E ' S  C O M P A S S

WILLEM J. M. LEVELT
Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands. E-mail: pim@mpi.nl

Response

Since reading represents highly artificial behavior, and is of historically recent origin, Levelt concludes that a dyslexic would be well off in a nonreading world, and he therefore assumes that the dyslexic's altered pattern of brain response does not represent an underlying neurological abnormality.

However, reading difficulties can no longer be considered a necessary or a sufficient sign of dyslexia (1). The primary and enduring cognitive consequences of dyslexia are subtle deficits in speech/language processing. Affected individuals, from early childhood onwards, have problems in tasks that tap phonological skills (e.g., word repetition, verbal short-term memory) and tasks that require the rapid retrieval of words (e.g., object naming, digit naming). Phonological competence is part of linguistic competence and has a basis in the brain (2), plausibly with a heritable component (3).

Why is reading affected at all in these people? In adult normal readers, the neural systems for reading largely overlap with those for object naming (6, table 2e); learning to read may imply a systematic moulding of that part of the neural system that allows the brain to name objects. We propose that dyslexic brains are not able to mould connections between the sight, sound, and meaning of a word as efficiently as other brains (7). In a preliterate world, this disorder would not lead to the same kind of social exclusion, but it could have subtle consequences for an individual's status in societies that value verbal ability.

E. PAULESU, 1, 2* J.-F. DEMONET, 3 F. FAZIO, 4 S. F. CAPPA, 5 G. COSSU, 6 C. D. FRITH, 7 U. FRITH 8
1 Psychology Department, University of Milan Bicocca, Milan, Italy; 2 INB-CNRS, Scientific Institute H San Raffaele, Milan, Italy; 3 INSERM U455, Hopital Purpan, Toulouse, France; 4 Neuroscience and Biomedical Technologies Department, University of Milan Bicocca, Milan, Italy; 5 Psychology Department, University Vita e Salute H San Raffaele, Milan, Italy; 6 Institute of Human Physiology, University of Parma, Parma, Italy; 7 Wellcome Department of Cognitive Neurology, Institute of Neuropsychology, London, UK; 8 Institute of Cognitive Neuroscience, University College London, London, UK
*To whom correspondence should be addressed. E-mail: eraldo.paulesu@unimib.it

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