Critical Notice

J. Whyte (Ed.)
Dyslexia: Current Research Issues.

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Dyslexia, or specific reading disability, is a problem that essentially came to light in the 20th century, with the increasing demands that modern life has placed on literacy. By the same token, it is largely a problem of the developed countries, and of the increasingly dominant middle class. Estimates of the proportion of otherwise normal individuals who suffer from literary inadequacy vary with the criteria used to define it, but if we accept the UNESCO definition of functional literacy as a reading age of 13 years, then some 20 percent of the adult population are affected. There is, however, a curiously self-defeating aspect to such a definition, since the proportion of those below the acceptable level is likely to remain constant regardless of the overall standard of literacy! Even so, the problem cannot be denied, and our schools and even our universities contain many individuals who are scarcely able to cope with the literary demands placed on them.

The history of research on dyslexia, though not wanting in effort, is in many respects a dismal one. Dyslexia has been blamed on a wide variety of factors, including diet, television, genetic endowment, left-handedness, testosterone, educational policy, and emotional deprivation. As an area of research it is claimed by neurology, psychology, education, and optometry, and parallel literatures have emerged, with little cross-referencing. The dominant axis is the neurology-education one, and this has caused special difficulties.

The neurological tradition dates back to observations in the late 19th century of "word-blindness," or *alexia*, following localized brain damage. Observations of otherwise normal individuals who seemed to have the same symptoms led to the coining of the term "dyslexia" to describe their condition, with the implication that it may reflect some brain malfunction. A more functional, psychological tradition emerged after the second World War with the rise of learning theory, and has been adopted by educationalists anxious to avoid the suggestion that disabled readers have neurological damage. To many working in this tradition the very term "dyslexia" is anathema, and reading disability is often taken to be part of a more general problem of "specific learning disability" (SLD).

Prior to World War II the dominant figure in research and theory on dyslexia was the American psychiatrist and paediatrician Samuel Torrey Orton, who argued that dyslexia was a consequence of poorly established cerebral dominance (see Orton, 1937). Orton's ideas were extremely influential at the time, and are still widely known in the community, even if his name is not. For example, Orton focused on left-right confusion as a key aspect of dyslexia, and I am often surprised at how many lay-people still regard dyslexia as virtually synonymous with "seeing things backwards." Orton also emphasized problems of sequencing. This was nicely captured by participants at a recent conference on dyslexia in Italy who rearranged the letters of the word dyslexia on the conference noticeboard to read "daily sex". Attendance, it was said, picked up after that.

In academic circles, Orton's quasi-neurological notions were swept away with the rise of learning theory after the war, and attention focused on remedial techniques and different ways of teaching reading to normal children. But although this general approach seems to have remained prominent in education, learning theory ceased to be dominant in academic psychology from about the 1970s. With the so-called "cognitive revolution," information-process models of reading emerged, and began to influence the way reading disability was viewed. Cognitive psychology has merged

increasingly with neuropsychology, especially in Britain, to form the discipline now known as "cognitive neuropsychology". A good deal of research effort within this new field has been concerned with the information-processing analysis of alexia, or *acquired dyslexia* as it is now called, and more recently attention has turned to dyslexia as more traditionally defined — or what is now termed *developmental dyslexia.*

The collection in the volume under review consists largely of papers in this recent tradition. Five of them (Olson, Wise, & Rack; Ellis; Supple; Lundberg & Hoien; Wright, Fields, Keating, & Newman) focus on the finding that many dyslexic children have phonological difficulties. An example, given by Olson et al., is their poor performance in the "pig-latin" test, which will be familiar to some as a childhood game: You take the first phoneme in each word, place it at the end of the word, and add the sound "-ay", so that the word "pig", for example, becomes "igpay." Failure to do this demonstrates a lack of *phonemic awareness*, which is also necessary in learning the phoneme-to-grapheme mapping required in reading alphabetic scripts.

I recently attended a one-day symposium at a conference in Cambridge, England, on the nature and importance of phonological deficits in dyslexia, and was roundly attacked when I meekly suggested that, in the opinion of some, people read with their eyes rather than their ears. Nevertheless this heretical view has received some support from work initiated by William Lovegrove, now at the University of Wollongong in Australia. A contribution to the present volume by Lovegrove and Slaghuis confirms their earlier claims that dyslexic children suffer from excessive visible persistence in a certain spatial-frequency range. Breitmeyer adds supporting evidence that this might reflect a deficit of the so-called transient channel in vision, resulting in poor saccadic suppression. (He also notes, incidentally, that this theory is inconsistent with the recent fad for treating dyslexia with coloured lenses, as developed by Helen Irlen.) The upshot is that dyslexics may have difficulty separating out the images received from successive visual fixations, and this would be particularly damaging to an intricate task like reading.

One might be tempted to try to reconcile this work with that on phonological deficits by appealing to evidence that there are different types of dyslexia. Boder (1973), for example, has distinguished between *dysphonetic* dyslexics, whose difficulties are primarily phonological, and *dyseidetic* dyslexics, who suffer visuospatial deficits. She also adds a *mixed* category. The difficulty is that according to the Boder test the great majority of dyslexics are dysphonetic, whereas Lovegrove and Slaghuis claim that 75 percent of dyslexics suffer from the specific *visual* deficit described above. As Lovegrove and Slaghuis remark, "it is now important to know how these visual measures relate to other problems experienced by most [dyslexics] such as phonological awareness" [p. 548]. One possibility, perhaps, is that many dyslexics have a deficit in fine temporal analysis that is manifest both in poor phonemic awareness and in distinguishing successive visual fixations.

Behind all of this lurks the spectre of Orton, although his name only crops up twice, once with an erroneous interpretation of his ideas. Notions of deficits in phonological processing or temporal analysis suggest some impairment in left-hemispheric function. Several authors refer to the claims of Galaburda and his colleagues that dyslexics show anatomical anomalies and retarded growth of the left hemisphere. This is related in turn to the controversial theory, proposed by the late Norman Geschwind, that left-handedness is due to the prenatal effect of testosterone (or some closely related substance) in retarding the growth of parts of the left hemisphere. This supposedly explains why both left-handedness and specific learning disabilities are more prevalent in boys than in girls, and also why left-handedness is often associated with autoimmune disorders (see Geschwind & Galaburda, 1987).

This is not the place for a detailed review of this theory, except to say that the evidence for it is decidedly mixed. Nevertheless it may well be the case that dyslexia is primarily a left-hemispheric disorder. Gordon presents evidence that dyslexics are indeed low on a left-hemispheric, "verbosequential" profile, but compensate by being if anything superior on a right-hemispheric, "visuospatial" profile. Contrary to this, however, Stein asserts that dyslexics have poor visuomotor and visuospatial skills, consistent with a disorder of the right posterior parietal lobe! Stein's article is simply a review of his and others' work and gives no indication of how his

samples were selected, and my guess is that he is describing problems suffered by a minority of dyslexics.

Two papers deal with reading in children with cerebral palsy. Smith reports on ten children with palsy severe enough to deprive them of speech, yet all managed some degree of proficiency in reading, with one child achieving in the normal range. Rowan and Monaghan tested ten children with less severe palsy, and all but one were able to read at a level appropriate to their mental ages. These children demonstrate what might be termed the complement of reading disability, since all were of below-average intelligence and the majority also had deficits in visual perception, speech, and language. Studies like these remind us of the specificity (or *modularity*, to use a more voguish term) of reading, and raise questions as to just how far one can link it to phonological and perceptual abilities.

In her editorial introduction, Whyte remarks that "The non-success of remediation has been a fairly well-kept secret in many educational and clinical settings" [p.473]. This may be a weakness of contemporary models, which lend themselves more readily to diagnosis than to treatment, whereas the earlier learning-theory approach bore more directly on remediation. Nowhere in the volume is there mention of the highly regarded Reading Recovery Programme, developed by Professor Marie Clay at the University of Auckland, and now adopted in some parts of the United States as well as in our own schools.

Nevertheless there are two papers on remediation techniques. In one, McAnaney and Sayles report some success with a compensatory programme designed to capitalize on the strengths displayed by individual dyslexics, but relatively little success with a "holistic" programme that de-emphasizes diagnostics and normative assessments. In the other, Olson et al. describe computer-based techniques using synthesized speech feedback, and it is noteworthy that the attempt to teach correspondences between phonemes and graphemes was judged a failure. The children had much more success in learning words when they were broken down into syllables, especially when these corresponded to morphemes (BOSS units). The use of computers with speech synthesis surely offers great promise, since they can be programmed to focus in on specific difficulties, and so offer the one-on-one therapy that seems to be so important in remedial work. Computers are cheaper than human therapists, and most children seem to enjoy working with them.

Studies of reading problems in twins by Olson et al. and by Wadsworth, Gillis, DeFries, and Fulker attest to the importance of genetic factors in dyslexia. This raises rather a depressing thought. The demand for universal literacy is much too recent a phenomenon to have had any significant effect on the gene pool, and we may simply be stuck with a proportion of individuals who may never learn to read properly. However it should not be thought that such people are generally inferior, and they may well possess special talents that are adaptive in their own right; their genes are worth keeping. Elsewhere, Thompson (1971) has documented evidence for reading and language disabilities in men of eminence, and the American novelist and critic Eileen Simpson (1980) gives a moving account of her struggle with dyslexia in her book *Reversals*, which incidentally reads as a testimonial to the views of that forgotten man, Samuel Torrey Orton.

In sum, the present volume with 18 invited contributions offers a reasonable selection of contemporary research and ideas on developmental dyslexia. The individual papers are all remarkably short, probably at the insistence of the editor. On the whole this is a welcome feature, although details of selection and testing are sometimes frustratingly absent. At the price, however, the collection is probably a bargain.

References

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