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# Identifying reading disabilities secondary to attention deficit disorder

KENNETH MOSELLE & JESSICA BALL

Many pupils in regular primary school classrooms have specific difficulties with reading, while aspects of their learning and performance that do not depend upon reading skills are within the normal range according to their age and level in school. Many of these children can be helped through special remediation efforts, if the teacher recognizes the problem early, and if the teacher or learning resource specialist accurately identifies the nature of the problem.

In the assessment and remediation of reading disabilities, it is essential to recognize the underlying cognitive processes that are producing a reading disability. The effectiveness of remedial work with a pupil depends, in part, on whether an accurate diagnosis has been made about which of the cognitive processes that a reader uses to decode and comprehend text are deficient (Moselle, 1991).

Until now, models of reading disabilities and their remediation have focused too narrowly on the pupil's deficits in sensory reception, analysis, and storage of information about text. There are two principle types of reading disabilities that are due to shortcomings in the way the pupil processes information about text. The most common reading disability results from deficits in auditory information processing (Pennington, 1991; Wagner & Torgesen, 1987). A less common kind of reading disability results from deficits in visual-spatial information processing (Boder, 1973; Vellutino, 1978).

This report describes a third kind of reading disability that has been neglected; namely, reading disabilities in which the principle cause is an attention **deficit**. The role of attention has not been emphasized in models of reading disabilities that guide prevailing

assessment and remediation practices. However, among children who are known to have an attention deficit disorder, anywhere from 50 to 70 percent also suffer from some significant learning disability (Accardo & Whitman, 1991; Barkley, 1981). The following report describes indicators that a teacher can use to recognize reading difficulties that are being produced by primary attention deficits, especially among children who are just beginning to learn to read.

## **Identifying A Primary Attention Deficit Disorder**

In order to differentiate between a reading disability that is due to a sensory information processing deficit versus one produced by an underlying attention deficit, we must first determine whether the pupil shows the kinds of behaviours that are indicative of an attention deficit disorder. Two approaches to diagnosing an attention deficit disorder are presented below.

### ***I. Parent and teacher reports of the pupil's behaviours***

Parents and teachers typically report that the pupil is easily distractible, impulsive, and easily frustrated. The Conners Teacher Rating Scales (Conners, 1973) is an instrument that has often been used to identify an attention deficit disorder. A sample of items is presented below.

1. Distractibility or short attention span
2. Restless in the "squirmy" sense.
3. Easily frustrated in efforts.
4. Excitable, impulsive.
5. Daydreams (more than most same aged children).
6. Mood changes quickly and drastically.

### ***II. Qualitative analysis of behaviour on non-reading tasks***

Most children with an attention deficit disorder show disorganized, apparently random, or trial-and-error approaches to all kinds of tasks involving cognitive effort. For example, on tasks involving manipulation of materials to form a prescribed pattern or to create a prescribed structure, they typically

manipulate the materials in what appears to be an unplanned, unstructured manner. Their work with the materials does not progress in any sequential way toward the prescribed outcome. Lack of structure may also be evident in performance of written calculations on maths problems, for example.

## **Determining That A Reading Disability Is Due To A Primary Attention Deficit**

It is always possible that a pupil has **both** an attention deficit disorder **and** a sensory information processing deficit. Both of these kinds of deficits can produce reading problems, although of different kinds. In order to determine that a pupil's reading disorder is **secondary** to, or a result of, an underlying attention deficit disorder, there are several kinds of evidence that we can use. Three-kinds of evidence are presented here, describing the performance characteristics of a typical pupil whose reading disability is caused by a primary attention deficit disorder.

### ***I. Indications of sensory and attentional processes on cognitive tasks***

- (1) *Performance on tasks emphasizing auditory information processing.* Observations of the pupil's receptive and expressive language indicates that he or she has no difficulties in phonemic reception and analysis. For example, the pupil is able to follow verbal instructions, shows no unusual difficulty comprehending verbal passages, and can discriminate precisely between similar sounding words. He or she shows no peculiarities in the selection of words to express him/herself, or in pronouncing words.
- (2) *Performance on tasks emphasizing visual-spatial information processing.* Observations of the pupil's approach to reading letters and words indicates that his or her visual-spatial analytic abilities are fully up to the task of recognizing and discriminating written characters. For example, he or she shows no higher incidence of spelling

errors or letter reversals than expected for pupils that age. Spelling difficulties are commensurate with the pupils' decoding skills.

- (3) *Attention and concentration.* The pupil has significantly more difficulty on tasks where successful performance depends upon sustaining focused attention than on tasks that depend more on the pupil's native intelligence. For example, the pupil makes many careless errors on rote mathematical computations emphasizing accuracy more than understanding. In comparison, the pupil performs well on mathematical problem solving tasks (e.g., word problems) emphasizing understanding of the operations involved. On writing assignments, the pupil may block completely because of an inability to organize his or her thoughts sequentially.

## **II. Qualitative analyses of performance on decoding tasks**

- (1) *Learning history.* When a reading disability is a manifestation of an underlying attention deficit disorder, it is typical for the pupil to be able to learn the letter-sound associations without undue difficulty. This shows that the pupil **can** form cross-modal associations between visual and auditory information processing systems. This capability is one kind of evidence against an interpretation of the pupil's reading problems as being due to a primary sensory information processing deficit. If the child **does** experience difficulty in mastering letter-sound associations, this suggests that the reading difficulty is a direct consequence of a deficit in auditory information processing – specifically in phonological encoding.
- (2) *Word attack strategy.* When the pupil encounters the challenge of having to blend more than one sound, we see the clearest evidence that a pupil's reading disability may be due to a primary attention deficit, rather than due to a primary sensory information processing deficit. Pupils with a primary attention deficit disorder show dramatic deteriorations in performance when asked to read words of more than 2-3 letters.

A close examination of how the pupil is approaching the task typically shows an unstructured decoding process, with a tendency to guess rather wildly at what the word is on the basis of a very fragmentary analysis of the phonemic composition of the word. It may seem to an observer that the pupil is simply not holding him/herself to the task of producing a real word. He or she may seem content just to guess at words to conjure up nonsense words.

The characteristic response pattern described here is illustrated in the following list of miscalls generated by a pupil when asked to read a list of words. This boy, whose mother tongue is English, was 8 yrs 5 mth when he was assessed by the first author. He had a reading disability secondary to an attention deficit disorder.

Written Word	Pupil's Miscall
deep	drip
sorry	story
knife	cafe
twenty	twins
special	speller, spelling
straight	steadily
couple	complete
honest	holdist
doubt	droped
warrior	wierd
atmosphere	escapore
corporal	kempor
progressive	profris

An examination of this pupil's miscalls shows that he decodes the initial portion of the word, sometimes decodes a fragment of the latter part of the word, and then makes up a word out of the sounds he has extracted. It is as if he is unconcerned about whether the word he calls is a real English word, despite the fact that he knows he is reading real English words.

This tendency towards premature closure (i.e., decoding only a fragment of a word and then calling it) may represent the kind of impulsiveness commonly found among pupils with an attention deficit disorder. Alternatively, it may be that pupils with primary attention deficits are unable to hold in working memory information about what letters are in a word long enough to blend them together.

### ***III. Response to remediation***

Another "sign", but one that we can detect and apply only in retrospect, is the distinctive response to reading remediation that is often found among pupils with a reading disability secondary to an attention deficit disorder. Once the pupil gets started on treatment for the attention deficit disorder and a well-targetted remedial programme, the pupil often shows rapid improvement in decoding skills. This improvement often occurs at a rate that far exceeds the rate that one would expect from a pupil whose dyslexia stems from primary sensory information processing deficits, particularly from phonological processing deficits.

## **Conclusion**

The purpose of the foregoing discussion has been to encourage an expanded view of the cognitive deficits that may cause reading disabilities. Teachers and learning resource specialists involved in assessing and designing remedial programmes for reading disabilities must incorporate a consideration of the possible causal role of attention deficits, rather than focusing exclusively on sensory information processing deficits. By paying more attention to the role of attention in the reading process, we stand a better chance of accurately identifying and helping a sizable sub-group of pupils whose reading difficulties are a secondary 'symptom' or product of a primary attention deficit disorder.

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