

---

# Response to Historical Perspective: A Developmental Language Perspective

Alan G. Kamhi

*The strength of Richardson's historical perspective of dyslexia is that it illuminates some historical antecedents of dyslexia that may be unfamiliar to readers. Its weakness is that it fails to address the definitional issues associated with dyslexia. These issues are addressed in the present article. A definition of dyslexia is offered that considers the nature of the processing limitation that underlies the disorder as well as the developmental changes that occur in the manifestation of the disorder.*

---

In a recent review of two books on historical perspectives in psychology, Bolles (1990) suggested that there are two aspects to the history of psychology. One aspect tells the story of discovery and advance—the story of how new movements and theories came about. The other aspect is the story of decline and dismissal, of passing over and forgetting. In his review of the same books, Kendler (1990) began by noting that we are constantly reminded of the importance of history by oft-quoted maxims such as “Those who cannot remember the past are condemned to repeat it” and “You can’t know where you are going unless you know where you’ve been.” He points out, however, that agreement about the importance of the past fails to yield any agreement about the proper method to evaluate historical interpretations. I think these considerations are important in thinking about historical perspectives of dyslexia.

It should be clear from reading Richardson’s article that we are not the first to recognize that some individuals have difficulty learning to read. Barring a major neurochemical advance (pink pill), we will also surely not be the last. Richardson traces the roots of dyslexia back to the medical literature of 100 years ago, wherein dyslexia was first viewed as a type of aphasia. She briefly reviews the history of aphasia, highlighting the work of Broca, Wernicke,

and Jackson. Serious study of dyslexia is traced back to 1872, when Broadbent described patients who were unable to read. The next big landmark is the work of Hinshelwood, in the early part of this century. His major contribution was to differentiate children with a pure type of congenital word blindness from those who were “mentally defective.” Orton’s significant contributions are discussed next. Richardson uses more recent studies by Geschwind and Galaburda to substantiate some of Orton’s claims. The history of dyslexia essentially ends with that discussion, however. The reader is left to assume that nothing substantial occurred between Orton’s work in the 1930s and the studies by Geschwind and Galaburda in the 1970s.

The remainder of Richardson’s paper covers a range of topics, including right-hemisphere language, genetic transmission, psycholinguistic models, and remediation. In the remediation section, Richardson describes four basic approaches to teaching reading. She reminds us that good teaching practices have been described in the literature for at least two centuries, and bemoans the fact that many special education graduates are usually unaware of this literature. She questions why these graduates may know only one approach to teaching children to read—and may not know even one method of remediation. She doubts

that many graduates can recognize the names cited in her article and finds this state of affairs appalling.

Unfortunately, simply knowing history does not ensure that past mistakes will not be repeated or that correct decisions will be made. If this were the case, war would be obsolete, there would be no more polluting of our air and lakes, and so forth. As Kendler (1990) has noted, a fundamental shortcoming of oft-quoted maxims (e.g., “Those who cannot remember the past are condemned to repeat it”) is that they ignore the interpretive aspect of history. That is, what one historian views as a past mistake another may view as a past success. Historical interpretation is rarely black and white. (Consider, for example, the “revisionist” views of the Nixon era, appearing now, 15 years after he left office.) A good example in the area of reading is the relationship between visual processing abilities and reading performance: Despite the large body of literature that minimizes the importance of visual processing skills in reading, many teachers still think reading problems stem from visual processing deficiencies.

Another problem with historical reviews is that they usually reflect the theoretical biases of the reviewer. This would not be a problem if it were widely recognized that presenting an unbiased historical review is impossible. One’s biases influence the emphasis particular bodies of literature receive; some will be covered in depth, while others will be treated cursorily or omitted entirely. Such biases, of course, also influence one’s interpretation of a particular body of literature. It should come as no surprise that

Richardson's medical orientation and background are clearly reflected in her paper. Although Richardson did not attempt to disguise her biases, it is fair to ask whether her historical review achieved the stated goal of helping readers gain a better understanding of the nature of dyslexia.

Richardson's review may have illuminated some historical antecedents of dyslexia that were unfamiliar to many readers. It seems unlikely, however, that the review led to a better understanding of the nature of dyslexia. Achieving this goal seems difficult without considering the definitional issues that have plagued the study of dyslexia. In order to begin to understand the nature of dyslexia, one must first define what it is and identify individuals who suffer from the disorder. Richardson never addresses these issues in her review. Unfortunately, the definitional issues surrounding dyslexia are not simple or easy to resolve. In the remainder of the paper, I humbly offer my own contribution to the definitional muddle.

## Defining Dyslexia

How dyslexia is defined has both theoretical and educational implications. The validity of research on children with dyslexia, and reading disabilities in general, depends in large part on the criteria used to identify subjects for study. Part of the confusion in the literature is the result of the different criteria used to identify children with reading problems. The principal educational implications of defining dyslexia revolve around service delivery issues, such as which children are eligible for remedial services.

The fundamental assumption underlying much of the theoretical and remedial work on individuals with dyslexia is that their reading difficulties stem from problems different from those that characterize the "garden-variety" poor readers (Gough & Tunmer, 1986). If no differences are found between

individuals with dyslexia and garden-variety poor readers, one must question whether it is worth it to study dyslexia (Ellis, 1985). Seidenberg, Bruck, Fornarolo, and Backman (1985) have suggested that if individuals with dyslexia differ from garden-variety poor readers along the same dimensions that differentiate the poor readers, they should be called something other than dyslexic or reading disabled, which carry other connotations. They suggest the label "very poor readers."

The way children with dyslexia have traditionally been identified is through the use of exclusionary criteria. The definitions proposed by the World Federation of Neurology (1968; cited in Thompson, 1984) and Perfetti (1985), respectively, are typical of exclusionary definitions:

Specific developmental dyslexia is a disorder manifested by difficulty learning to read, despite conventional instruction, adequate intelligence, and sociocultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional origin. (p. 10)

A dyslexic is a child who is normal or above at least in nonverbal IQ, two years behind in reading achievement, and with a reading disability that is not explainable primarily by social, economic, motivation, or emotional factors. (p. 180)

Despite the widespread use and general acceptance of exclusionary definitions, there are serious limitations associated with them. The most serious problem is that exclusionary definitions provide a very limited description of the characteristics of the disorder (Catts, 1989a; Kamhi & Catts, 1989; Thomson, 1984). Such definitions tell us more about what the disorder *is not*, rather than what it *is*. Because the only defining characteristic of the disorder is a difficulty learning to read, children must experience some academic failure before they can be identified as dyslexic. Exclusionary definitions thus do not encourage early identification of the problem.

Another problem with exclusionary definitions is that they often define the disorder in terms of a discrepancy between reading achievement and chronological age, mental age, or grade level. The most commonly used discrepancy formulas involve distinctions between IQ and reading achievement. A serious problem with these formulas is that they fail to consider the overlap between some of the IQ subtests and reading tests. As Catts (1989a) points out, "in order to assure the necessary discrepancy between IQ and reading performance, the cognitive processing limitations that underlie dyslexia must be assumed to be specific in nature and have little influence on general intellectual ability" (p. 52). Because most IQ tests tap a wide range of intellectual abilities, there will usually be some relationship between IQ and whatever processing deficit is proposed to underlie the reading problem. Furthermore, IQ will also be influenced by poor reading skills and negative experiences/attributions that may result from the reading problem. In a recent article, Stanovich (1991) suggested that listening comprehension ability would provide a better aptitude benchmark than IQ for measuring aptitude/achievement discrepancies.

Other problems with exclusionary definitions and discrepancy criteria are described in detail elsewhere (e.g., Catts, 1989a; Kamhi & Catts, 1989; Thomson, 1984). Rather than belabor these problems, I would like to discuss the alternative to exclusionary definitions, namely, *inclusionary* definitions. Inclusionary definitions delimit the specific abilities and disabilities that characterize individuals with dyslexia. Inclusionary definitions attempt to identify what have been referred to as "marker variables" (Keogh, 1987). Specifying the marker variables of dyslexia is easier said than done. Early inclusionary definitions focused on the general language deficits and informational processing deficiencies that characterized individuals with dyslexia. For example, Wheeler and

Wheeler (1979, cited in Thomson, 1984) defined dyslexia as follows:

Dyslexia is experienced by children of adequate intelligence, as a general language deficit which is a specific manifestation of a wider limitation in processing all forms of information in short-term memory, be they visually or auditorally presented. This wide limitation exhibits itself in tasks requiring the heaviest use and access to short-term memory, such as reading, but particularly spelling. (p. 12)

More recent inclusionary definitions have attempted to further specify the nature of the language and processing impairment. A large body of research conducted within the last 10 to 15 years has converged in finding that individuals with dyslexia often have difficulty performing tasks that require the processing of phonological information. This research (reviewed in Catts, 1989b; see, also, Jorm & Share, 1983; Stanovich, 1985) has shown that the ability to access the lexicon accurately and rapidly using a phonologic code is strongly related to reading skill, and negatively associated with reading disability. Specific deficits have been found in (a) the encoding of speech-sound information in long-term memory, (b) the use of phonological codes in working memory, (c) the retrieval of phonological information from long-term memory, (d) the production of complex phonological sequences, and (e) the awareness of phonological structures.

Another important finding from recent studies involves the changes that occur in the manifestation of dyslexia through development. During the preschool years, the impairment often causes some delays in acquiring spoken language (Scarborough & Dobrich, 1990). Preschool children who are later identified as dyslexic also have been shown to demonstrate word-finding and naming problems (Wolf, 1991; Wolf, Bally, & Morris, 1986), poor verbal short-term memory (e.g., Cohen & Netley, 1981), and limited phonological awareness skills

(Bradley & Bryant, 1983; Mann & Liberman, 1984).

During the school years, children with dyslexia experience significant difficulty acquiring word recognition and spelling skills. These children also demonstrate significant phonological processing difficulties (see Catts, 1989b). In most cases, children with dyslexia will also exhibit spoken language deficiencies, particularly in comprehending complex sentences and relating events and stories (Mann, Shankweiler, & Smith, 1984; Roth & Spekman, 1986).

During the later school years, children with dyslexia continue to have reading problems, as well as continued problems in writing, spelling, and oral reading. These children continue to experience difficulties in age-appropriate phonological processing tasks. For example, phonemic segmentation skills may be adequate, but rapid naming and speech production difficulties will still be found (e.g., Catts, 1989c). As adults, individuals with dyslexia will continue to experience problems in spoken and written language and show selected phonological processing difficulties. Catts, for example, has found that adults with dyslexia have difficulty repeating phonologically complex words and phrases.

The view of dyslexia that Hugh Catts and I have advocated in our recent work combines what has been learned about the phonological processing abilities of individuals with dyslexia with what has been learned about the developmental changes that occur in the manifestation of the disorder. Dyslexia, we feel, is best viewed as a developmental language disorder. The definition below is a slight modification of the one that appeared in Catts (1989a):

Dyslexia is a developmental language disorder whose defining characteristic is a life-long difficulty processing phonological information. This difficulty involves encoding, retrieving, and using phonological codes in memory as well as deficits in phonological awareness and speech

production. The disorder, which is often genetically transmitted, is generally present at birth and persists throughout the lifespan. A prominent characteristic of the disorder is spoken and written language deficiencies.

Although we are not alone in acknowledging the language bases of dyslexia (see, for example, Chasty, 1985), our definition is unique in several ways. First, it defines the disorder according to the specific processing limitations that characterize it (e.g., encoding and retrieving phonologically coded information) rather than simply as a reading disability. Placing the emphasis on specific processing limitations allows us to focus attention on the different developmental manifestations of the disorder. Definitions of dyslexia that emphasize the reading disability do not accurately describe the many adolescents and adults with dyslexia who develop proficient reading skills. Although individuals with dyslexia may learn to read fairly well, the phonological processing deficit that underlies the disorder never goes away.

Second, by specifying the nature of the processing disorder, the definition excludes individuals who might have reading problems that derive from other sources, such as a general cognitive delay, visual processing deficiencies, higher level language deficits, and attention deficits. The exclusion of these individuals clearly reduces the size of the dyslexic population. This is our attempt to make the concept of dyslexia a meaningful one. As noted earlier, if nothing can be found to differentiate individuals with dyslexia from the garden-variety poor reader, we should stop using the term.

Third, our definition of dyslexia maintains the fundamental assumption of specificity that has historically characterized dyslexia. The notion here is that the deficits displayed by individuals with dyslexia should not extend too far into other domains of cognitive functioning. As Stanovich (1988) noted, if they did, measures of intelli-

gence would be reduced, which in turn would reduce the reading-IQ discrepancy, and the child would no longer be dyslexic. Such a child would become a garden-variety poor reader. The key deficit, thus, must lie in a domain-specific process (i.e., vertical faculty), rather than in a process that operates across a wide variety of domains (i.e., horizontal faculty) (Fodor, 1983; Stanovich, 1988). For this reason, the search for the basic processing limitation must be limited to the word recognition "module" rather than general comprehension processes, because the latter draw from a large number of horizontal faculties and knowledge domains.

In a recent review of causal correlates of reading disabilities, I suggested that the most likely candidates for the basic processing limitation were (a) difficulty forming accurate representations of phonological information and maintaining them in long-term memory, and (b) slow rate of access to phonological information stored in long-term memory (Kamhi, 1989). Wolf (1991) recently suggested that the cause of processing limitations such as these is a failure in an underlying temporal processing mechanism that is responsible for rapid rates of activating and integrating relevant subprocesses for various tasks. As Wolf duly noted, "the ever-expanding list of deficits associated with dyslexia hardly needs additions" (p. 135). Moreover, attributing language disorders to temporal processing deficiencies is hardly a novel idea (see Stark & Tallal, 1988). Yet, Wolf has dressed up her temporal processing claim to look different enough from previous ones that it warrants serious consideration. Although most "unifying" explanations eventually come up short, they often provide important insights about the nature of dyslexia.

### ***Educational and Remedial Implications***

In her review, Richardson discussed several multisensory remediation

approaches (e.g., Orton-Gillingham, V-A-K-T, Slingerland) that have been used successfully with children with dyslexia. These approaches focus on improving word recognition skills by emphasizing the direct, structured instruction of decoding. Focusing remediation efforts on word recognition/decoding processes is consistent with the view of dyslexia espoused in this paper. A key aspect of this view is that the deficits displayed by individuals with dyslexia do not extend too far into general domains of cognitive functioning, such as reasoning, problem solving, and comprehension. This does not mean that these higher level processes/skills are not important aspects of reading; the teaching of these skills, however, involves objectives and procedures different from those associated with teaching word recognition skills. Rawson (1988, cited in Richardson, 1989) suggested that the teaching of skills such as comprehension (or "apprehension of meaning") is the business for all education. The implication of this statement is that those who profess to teach reading should focus on word recognition skills. Yet, with the exception of practitioners who specialize in treating dyslexia, I think most teachers and special educators should be in the education business rather than in the reading business.

There are several reasons why it is advantageous to be in the education business rather than in the reading business (defined as word recognition/decoding). First, there are many more garden-variety poor readers than poor readers with dyslexia. The learning problems in most poor readers seen by teachers extend beyond phonological processing deficiencies and word recognition problems to other areas of thinking and problem solving.

Second, the distinction between garden-variety poor readers and children with dyslexia is often not clear-cut. As Stanovich (1988) has noted, there is a continuous gradation between these two groups of children. At a given level of reading ability,

the distribution of IQ is continuous, with an "unbroken gradation of intermediate cases" between the "pure" dyslexic (with relatively high IQ for that level of reading) and the "pure" garden-variety (with a lower and more typical IQ). The closer one gets to the fuzzy and arbitrary boundary between the two groups, the more similar the processing abilities of the two groups will be. (pp. 601-602)

What all this means is that it may often be too difficult to differentiate garden-variety poor readers from poor readers with dyslexia. All children will probably be better served if the teacher assumes that the learning problem is not specific to reading (i.e., word recognition). Even the "pure" dyslexic might derive some benefit from remediation directed toward general reasoning and problem-solving skills.

Third, most teachers have more experience and training as general educators than as reading teachers. As general educators, teachers know much more about comprehension skills and problem-solving strategies than they do about word recognition processes. Given their educational training, it should come as no surprise that most reading teachers have little familiarity with the reading approaches discussed by Richardson. Unless there are major changes in educational and special educational curricula, teachers will continue to have little knowledge about the cognitive processes involved in word recognition and the various approaches that are effective in improving word recognition skills.

The situation is not as bleak as it may appear, however. In my own field of speech-language pathology, a large number of clinicians are actively involved in the identification, assessment, and remediation of children with reading problems. Whereas it was once common to discontinue treatment when a child with spoken language deficiencies had progressed sufficiently, an increasing number of speech-language pathologists now recognize that many children with

spoken language deficits go on to have reading problems. Recognition of the developmental nature of language disorders has led to remediation efforts that target emergent literacy skills (e.g., phonological awareness) in language-disordered children before they experience difficulty learning to read in school (e.g., Catts, in press).

Another note of optimism is the increasing interdisciplinary cooperation that is occurring in school systems and clinical settings around the country. Classroom teachers are now working more closely with special educators and speech-language pathologists to better serve children with language and reading deficiencies. Speech-language pathologists are moving away from the traditional pull-out model to provide classroom-based intervention (see Miller, 1989). At the same time, special educators and classroom teachers are becoming more adept in adapting remediation programs and approaches to fit children's individual learning needs (Taylor, Harris, & Pearson, 1988).

Richardson (1989) concluded a recent article with the following comment and appeal: "Literacy gives us the keys to knowledge and wisdom—the keys to the Kingdom. Isn't it time now for us all to put our heads together, to work together to see to it that those keys are given to every child?" (p. 20). Although we may have many differences in how we view dyslexia and its treatment, I think we would all agree with Richardson that, yes, it is time.

#### ABOUT THE AUTHOR

Alan G. Kamhi, PhD, is an associate professor in the Department of Audiology and Speech Pathology at Memphis State University. His research focuses on normal language development and spoken and written language disorders. His recent book, coedited with Hugh Catts, views reading disabilities from a developmental language perspective. Address: Alan G. Kamhi, Memphis Speech and Hearing Center, 807 Jefferson Ave., Memphis, TN 38105.

#### REFERENCES

- Bolles, R. (1990). Where did everybody go? *Psychological Science*, 1, 107-113.
- Bradley, L., & Bryant, P. (1983). Categorizing sounds and learning to read: A causal connection. *Nature*, 301, 419-421.
- Catts, H. (1989a). Defining dyslexia as a developmental language disorder. *Annals of Dyslexia*, 39, 50-67.
- Catts, H. (1989b). Phonological processing deficits and reading disabilities. In A. Kamhi & H. Catts (Eds.), *Reading disabilities: A developmental language perspective* (pp. 101-133). Austin, TX: PRO-ED.
- Catts, H. (1989c). Speech production deficits in developmental dyslexia. *Journal of Speech and Hearing Disorders*, 54, 422-428.
- Catts, H. (in press). Facilitating phonological awareness: Role of speech-language pathologists. *Language, Speech, and Hearing Services in Schools*.
- Chasty, H. (1985). What is dyslexia? A developmental language perspective. In M. Snowling (Ed.), *Children's written language difficulties: Assessment and management* (pp. 11-28). Windsor, Berkshire: NFER-Nelson.
- Cohen, R., & Netley, C. (1981) Short-term memory deficits in reading disabled children, in the absence of opportunity for rehearsal strategies. *Intelligence*, 5, 69-76.
- Ellis, A. (1985). The cognitive neuropsychology of developmental (and acquired) dyslexia: A critical survey. *Cognitive Neuropsychology*, 2, 169-205.
- Fodor, J. (1983). *The modularity of mind: An essay on faculty psychology*. Cambridge, MA: MIT Press.
- Gough, P., & Tunmer, W. (1986) Decoding, reading, and reading disability. *Remedial and Special Education*, 7(1), 6-10.
- Jorm, A., & Share, D. (1983). Phonological recoding and reading acquisition. *Applied Psycholinguistics*, 4, 103-147.
- Kamhi, A., & Catts, H. (1989). Reading disabilities: Terminology, definitions and subtyping issues. In A. Kamhi & H. Catts (Eds.), *Reading disabilities: A developmental language perspective* (pp. 35-67). Austin, TX: PRO-ED.
- Kendler, H. (1990). Looking backward to see ahead. *Psychological Science*, 1, 107-113.
- Keogh, B. (1987). A shared attribute model of learning disabilities. In S. Vaughn & C. Bos (Eds.), *Research in learning disabilities: Issues and future directions* (pp. 3-19). Boston: Little, Brown.
- Mann, V., & Liberman, I. (1984). Phonological awareness and verbal short-term memory. *Journal of Learning Disabilities*, 17, 592-599.
- Mann, V., Shankweiler, D., & Smith, S. (1984). The association between comprehension of spoken sentences: The role of phonetic representation. *Journal of Child Language*, 11, 627-643.
- Miller, L. (1989). Classroom-based language intervention. *Language, Speech, and Hearing Services in Schools*, 20, 153-170.
- Perfetti, F. (1985). *Reading ability*. New York: Oxford University Press.
- Richardson, S. (1989). Specific developmental dyslexia: Retrospective and prospective views. *Annals of Dyslexia*, 39, 3-24.
- Roth, F., & Spekman, N. (1986). Narrative discourse: Spontaneously generated stories of learning disabled and normally achieving students. *Journal of Speech and Hearing Disorders*, 51, 8-23.
- Scarborough, H., & Dobrich, W. (1990). Development of children with early language delay. *Journal of Speech and Hearing Research*, 33, 70-84.
- Seidenberg, M., Bruck, M., Fornarolo, G., & Backman, J. (1985). Word recognition processes of poor and disabled readers: Do they necessarily differ? *Applied Psycholinguistics*, 6, 161-180.
- Stanovich, K. (1985). Explaining the variance in reading ability in terms of psychological processes: What have we learned? *Annals of Dyslexia*, 35, 67-96.
- Stanovich, K. (1988). Explaining the differences between the dyslexic and the garden-variety poor reader: The phonological-core variable-difference model. *Journal of Learning Disabilities*, 32, 590-604.
- Stanovich, K. (1991). Discrepancy definitions of reading disability: Has intelligence led us astray? *Reading Research Quarterly*, 26, 7-30.
- Stark, B., & Tallal, P. (1988). *Language, speech, and reading disorders in children: Neuropsychological studies*. San Diego: Singular Press.
- Taylor, B., Harris, L., & Pearson, P. (1988). *Reading difficulties: Instruction and assessment*. New York: Random House.
- Thomson, M. (1984). *Developmental dyslexia: Its nature, assessment and remediation*. London: Arnold Press.
- Wolf, M. (1991). Naming speed and reading: The contribution of the cognitive neurosciences. *Reading Research Quarterly*, 26, 123-142.
- Wolf, M., Bally, H., & Morris, R. (1986). Automaticity, retrieval processes and reading: A longitudinal study in average and impaired readers. *Child Development*, 57, 988-1000.