SPECIAL SERIES

EDITOR'S COMMENT: *One of the more, if not the most, common ways in which individuals are identified as learning disabled is based on discrepancies between academic attainment and intelligence test scores. However, several professionals have questioned this practice, particularly over the last few years. In this series, Dr. Jack Fletcher, Department of Pediatrics at the University of Texas Medical School, has brought together some of the finest researchers and thinkers in the field regarding discrepancy formulas. Four articles appear in this issue and three in the next. Readers' comments are encouraged.*—**JLW**

The Validity of Distinguishing Children with Language and Learning Disabilities According to Discrepancies with IQ: Introduction to the Special Series

Jack M. Fletcher

The articles in this special series address a common topic: the validity of distinguishing subgroups of children with language and learning disabilities based on discrepancies between academic attainment and intelligence test scores (IQ). The basic issue is whether children who show lower academic attainment relative to their IQ scores (i.e., IQ-based discrepancy definition) are different from children who are discrepant in attainment relative to age but not IQ scores (i.e., low achievement or chronological age definition). Each article addresses this issue using a different sample, including two samples of children with language impairment (Aram, Morris, and Hall), two referred samples of children with learning disabilities (Fletcher, Francis, Rourke, Shaywitz, and Shaywitz; Siegel), a sample of twins (Pennington, Gilger, Olsen, and DeFries), an early-brain-injured sample (Taylor and Schatsneider), and an epidemiologically derived sample (Shaywitz, Fletcher, Holahan, and Shaywitz). The primary comparisons involve children with deficient attainments in reading, spelling, and/or oral language, who meet either IQ-based discrepancy or low achievement definitions, or both. With the exception of the Aram et al. study, children who meet definitional criteria for impaired groups based on the presence or absence of IQ discrepancy and, in some instances, more than one definitional group (Fletcher et al.; Pennington et al.; Shaywitz et al.) are compared on a set of variables not used to form the groups. These variables include a variety of cognitive, linguistic, and neuropsychological variables that vary considerably in terms of the theoretical source and specific measurement characteristics. Some of the articles in the series also compare familial, sociodemographic, and other characteristics of the subjects among definitional groups (Pennington et al.; Shaywitz et al.; Taylor and Schatsneider).

Despite the diversity in samples, measurement characteristics, and statistical approaches, each article finds that differences between children who meet discrepancy or low achievement definitions are either nonexistent or small, and of questionable significance, particularly relative to the variability within groups varying in definition. Consequently, these results question the role of IQ tests for identification of children with LD (Siegel, 1989; Stanovich, 1991) and the validity of the common practice of segregating children with language and academic disabilities according to IQ-based dis-

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crepancy and low achievement definitions. The presence of IQ-based discrepancies is often used to justify provision of services or as proof of the existence of specific syndromes (e.g., developmental dyslexia, specific reading retardation); the papers in this series raise major questions concerning policy and research decisions based on this distinction. Clinicians will find little support herein regarding eligibility for special education only to children with attainments below levels predicted by IQ scores. For researchers, the notion that research requires the use of IQ-based discrepancies (e.g., Torgesen, 1989) must also be questioned.

Using reading disability as an example, the absence of evidence for differences on nondefinitional variables among definitional groups is consistent with epidemiological studies of reading disability subsequent to Rutter and Yule (1975). Rutter and Yule found evidence for a bimodal distribution of reading skills representing children with attainments consistent with IQ (i.e., general reading backwardness [GRB]) and inconsistent with IQ (i.e., specific reading retardation [SRR]). What generally is not emphasized is that Rutter and Yule applied no exclusionary criteria to the sample, so that the GRB group had a higher incidence of acquired neurological disorders, including epilepsy and cerebral palsy. The downward extension of the IQ-reading distribution in Rutter and Yule may reflect, in part, the influence of specific cognitive deficits secondary to brain injury on IQ scores observed by Taylor and Schatsneider (this series). In addition, studies of children with mental retardation also show bimodality when known organic causes are included (Zigler, 1969). It is not surprising that subsequent epidemiological studies (Rodgers, 1983; Share, McGee, McKenzie, Williams, & Silva, 1987; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992) have failed to replicate the bimodal distribution observed by Rutter and Yule. The most recent study on the issue of bimodality (Shaywitz et al., 1992), which received considerable media attention, simply showed that reading disability exists on a continuum with no biologically determined cutting point in the bivariate distribution of reading and IQ.

Rutter (1989) stated that the presence or absence of bimodality was less critical than the discriminative validity of distinctions of GRB and SRR. The papers in this series and other papers, reviewed by Siegel (1989), Fletcher, Francis, Rourke, Shaywitz, and Shaywitz (in press), and by Stanovich (1991), do not support the validity of this distinction. Like the one by Shaywitz et al. (1992), none of the articles in this series refute the notion that language and reading disabilities exist—only that reading disabilities based on discrepancies with IQ are a unique syndrome. Indeed, these articles also show that children with reading disabilities have specific processing deficiencies independent of IQ, with strong effect sizes in comparisons with children with no reading impairment. Similarly, these articles, like Shaywitz et al.'s (1992), do not refute a possible biological basis for reading disability—only the hypothesis that the biological basis is different for children who meet IQ-based discrepancies. This latter point is best demonstrated by Pennington et al. (this issue), who show that components of a reading disability are inherited, but not differentially according to the presence or absence of an IQ-based discrepancy. In general, the papers in this series support the validity of definitions based on either discrepancy or low achievement criteria, with no evidence of differential validity.

The implications of these studies for research and for public policy are significant. For research, studies should carefully specify definitional criteria, as this is a source of variability in the results. If particular types of definitions are used (e.g., decoding relative to IQ), variability estimates may be lower (Siegel, this series). However, researchers may find it instructive to specify the number of children who meet IQ-based or low achievement definitions of reading disability, because such comparisons would add to the body of literature on this important classification issue. For public policy, the inclusion of children without IQ-based discrepancies will increase the number of children eligible for services under the applicable federal legislation. This issue is most clearly illustrated by Aram et al. (this series), who show that children with language disorders can be overidentified or underidentified, depending on definitional criteria and the adequacy of measurement instruments at different ages. In the other studies in this series, significant numbers of non–mentally deficient children with comparable reading impairment would not be identified if only IQ-based discrepancies were used: Fletcher et al., 44%, Shaywitz et al., 54%, Pennington et al., 64%, and Siegel, approximately 50%, depending on criteria. This does not mean that the number of children eligible for services as LD would double, partially because many children with low achievement are served under other provisions of the federal guidelines. In addition, other factors influence eligibility decisions, such as whether the child would benefit from services outside the mainstream. Perhaps most important is the issue of severity. The articles in this series are research oriented and use liberal criteria for determining low achievement, which is reasonable, as the null hypothesis is under scrutiny and liberal cut-points decrease the possibility of observing definitional group differences. For policy, an important issue is the degree of severity indicating eligibility. This is a multidetermined, policy-based issue influenced by funding, classroom performance, and other factors extrinsic to the child and not reflected in actual test scores. The articles in this series suggest a need to focus policy issues on these problems and not to form policy using distinctions based on IQ-based discrepancies that are difficult to empirically support.

When definitions are developed, however, the notion that only a single type of definition will be appropriate

may result in the exclusion of children with need. In this series, both Fletcher et al. and Siegel imply that definitions based solely on low achievement are appropriate. However, as Shaywitz et al. show, such an approach would eliminate approximately 20% of children with reading deficiencies based on regression-based IQ discrepancies. Again, there is no empirical basis for excluding such children, because they may have processing deficiencies consistent with learning difficulty but not measured by most IQ tests (Stanovich, 1991). If IQ-based discrepancies are used, regression adjustments must be made because the effect of unadjusted IQ-based discrepancies will be the inclusion of children with extremely high IQ scores and above-average (but discrepant) reading skills (Francis, Espy, Rourke, & Fletcher, 1991).

The definition of disabilities of language and learning is ultimately a classification issue (Fletcher & Morris, 1986; Morris, 1988). The articles in this series do not show that the variations in definitional criteria produce valid subclassifications of children with language and learning disabilities. They show that children who demonstrate measurable impairments in attainment can be excluded from certain approaches to definition with little empirical support for the distinctions implicit in the definition. These articles are not the final word on this issue. Other criteria for assessing discrepancy have been proposed, such as differences in listening comprehension and reading skills (Stanovich, 1991). In addition, these articles are based on post hoc, a posteriori examinations of this classification issue. More powerful tests of the classification hypothesis could be developed with hypothesis-driven, a priori studies. It is likely that such studies will be forthcoming in the near future.

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