METHODS TO ESTABLISH SUBTYPES OF DEVELOPMENTAL DYSLLEXIA

Do the developmental dyslexics form a homogeneous population, with a unique underlying impairment, or do they form distinct subgroups, thus opening up the possibility for different sources of impairment? In this chapter we compare different methods to subgroup dyslexic children and discuss the methodological implications.

Numerous studies carried out suggest the existence of two distinct profiles of developmental dyslexia (Boder, 1973; Mitterer, 1982). Phonological dyslexics have difficulty in reading PWs (PWs) in the absence of a regularity effect while surface dyslexics are indexed by the presence of many regularization errors in their reading of irregular words (IW). However, more recent studies examining large samples of dyslexic children show that most of them are impaired on both PW and IW reading (Castles & Coltheart, 1993; Manis, Seidenberg, Doi, McBride-Chang, & Petersen, 1996; Murphy & Pollatsek, 1994). Given these findings, some authors talk about a continuous distribution of dyslexic children who differ primarily in the severity of their reading deficits (Ellis, 1985; Murphy & Pollatsek, 1994; Wilding, 1989). From the extreme ends of this continuum, however, the two distinct dyslexic patterns may be isolated, even if many dyslexics are found somewhere between (Ellis, 1993; Murphy & Pollatsek, 1994; Seymour, 1986; Wilding, 1989, 1990).

A first commonly used method to identify subtypes of dyslexic children is to compare them with normal chronological age matched children (CA group) on independent measures of their ability to read PWs and IWs as indexes of the phonological and the lexical procedures, respectively (Castles & Coltheart, 1993; Manis et al., 1996). A cutoff criterion computed on the CA group performances for each reading task (e.g., one SD below means or a specified confidence limit below the regression lines) is chosen in order to evaluate the dyslexic children's performances. Castles and Coltheart (1993), for example, examined 53 reading disabled children and regressed separately each reading task on age. Using 90% confidence intervals as a cutoff criterion, they found 10 cases of surface dyslexia for whom IW reading was low while PW reading was within the normal age range, and 8 cases of phonological dyslexia who showed the opposite pattern. The majority of cases exhibited a mixed pattern with low scores on both IWs and PWs. Relatively similar proportions were observed by Manis et al. (1996).
Although this method allows one to identify quite simply the rather "pure" cases of each distinct profile, it does not take into account the relationship between the two reading skills in order to isolate children who are more impaired in one task relative to the other. For this purpose, Castles and Coltheart (1993) proposed an alternative procedure, also based on the regression technique. They first regressed PW reading on IW reading for their CA comparison group and found a significant linear relationship between the two reading skills. When the 90% confidence intervals established for the CA group were used, 29 out of their 53 dyslexics fell below the confidence interval for PW reading, given their level of IW reading (thus fitting the phonological profile), whereas only 16 dyslexics fell below the confidence interval for IW reading, given their level of PW reading (thus fitting the surface profile). Castles and Coltheart concluded that the phonological and surface dyslexic profiles were quite common in the developmental dyslexic population (85% of their sample). Very similar results have been reported by Manis et al. (1996) who used the same method with a 95% confidence interval criterion.

This method does not avoid the arbitrary character of the placement of the cutoff limits along the children's distribution. Therefore, we compared the effects of three cutoff criterion's on the relative proportions of dyslexics fitting either the surface or the phonological profile. In addition to a CA comparison group, we included a reading-level matched group (RL group). One rationale for using such a group is that the comparison may be informative regarding the delay or deviance status of dyslexics' word recognition abilities. Manis et al. (1996) found that the surface dyslexics (but not the phonological ones) showed similar performance patterns to younger normally achieving readers, suggesting that surface dyslexics are delayed and not deviant. Moreover, the reading-match design may be adopted in another perspective. By definition, dyslexics must be less efficient readers than CA controls. Thus, it is impossible to know whether their word recognition deficits constitute a determinant or a consequence of reading efficiency. To resolve this problem, one strategy is to compare dyslexics with younger normal readers of the same reading level. If a difference persists, then one may conclude that it is not consequential to reading efficiency.

However, the RL-match design has its own weaknesses. Dyslexics may differ from younger normals in many respects, due to longer linguistic experience, educational courses, or general cognitive maturation. The fact that dyslexics are equated to younger normals on reading efficiency does not imply that the two groups use identical word identification processes and comparable procedures to reach a given proficiency level. For instance, poor readers tend to compensate