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The Early Identification of Learning Difficulties

The value of early screening for learning difficulties combined with intensive individual tutoring is attested frequently in research literature. Despite the difficulties inherent in the construction and validity of infant screening devices, teachers find them useful as they provide help in understanding children's learning. A description of three tests currently available in Ireland opens a discussion on the selection and usefulness of such instruments.

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INTRODUCTION

It is widely believed that learning difficulties could be eliminated or at least alleviated if children who are at risk could be identified early in their schooling and could be given access to intervention programmes at this stage. The need for early identification of children with learning difficulties has been discussed in the *Green Paper on Education* (Ireland, 1992) and in the *Report of the Special Education Review Committee* (SERC Report) (Department of Education, 1993). This report suggests that there may be many children with learning difficulties in regular classrooms in Irish schools who have not been formally identified. This possibility adds impetus to the need to consider the development of more systematic procedures for identifying such children as early as possible. According to Spelman and McHugh (1994), teachers of infants believe that "screening infant pupils would be beneficial to all concerned" (p.10).

The value of early screening for learning difficulties together with procedures for identification, diagnostic assessment and appropriate intervention is supported in several reports from abroad. Intervention programmes such as *Prevention of Learning Disabilities* (Silver, Hagin & Beecher, 1981), *Reading Recovery* (Clay,

1993; Pinell, Lyons, Deford, Bryk & Seltzer, 1994) and *Success for All* (Slavin et al., 1991; Wasik and Slavin, 1993) are recognised as being successful in bringing many at-risk children (ages 5-7) up to the level of their peers in basic literacy skills and maintaining gains over time. The programmes, which are administered to the lowest achieving readers in a school or district, combine the early identification of learning needs with intensive individual tutoring. The evidence is that this kind of intervention procedure reduces referrals to special education (see Clay, 1993; Wasik & Slavin, 1993).

PROBLEMS OF EARLY IDENTIFICATION

In the *Green Paper on Education*, it was proposed to formally assess all children at age 7 in order to "support efforts by teachers to identify those in need of special assistance and the nature and extent of the assistance needed" (p.75). However, since instruction in reading usually begins much earlier in Irish schools, and since the early years are critically important for reading development (Adams, 1990), and since remedial intervention after the early years is rarely successful (Kennedy, Birman & Dermaline, 1986; Juel, 1988), the identification of learning difficulties should take place before age 7. A problem with early identification, however, is that assessment may have to focus on skills and processes that are only indirectly related to reading (e.g. auditory and visual discrimination, motor processes) and that may develop in unpredictable ways in the infant years.

This paper begins with a discussion of several of the issues related to the selection of early screening tests. This is followed by a description of three tests which were developed for the specific purpose of the early identification of learning problems. The paper concludes with a discussion on what the early screening measures of the future might look like.

ISSUES IN SELECTING EARLY SCREENING MEASURES

Only a small number of instruments suitable for the early screening of learning difficulties has been developed in Ireland. These include the Screening Device for Disadvantage (Archer & Edwards, 1982) and the Belfield Infant Assessment Profile (Spelman & McHugh, 1994). In Britain, the publication of the Bullock Report on language (DES, 1975) and the Warnock Report (DES, 1978) on special education, and the passing of the 1981 Education Act led to the development of a range of screening devices by local education authorities (LEAs) and psychologists. These include the *Croydon Checklist* (Wolfendale &

Bryans, 1979), the *Infant Rating Scale* (Lindsay, 1980), the *Bury Infant Check* (Pearson & Quinn, 1986), and the *Early Years Easy Screen* (EYES) (Clerehugh, Hart, Pither, Rider & Turner, 1991). In the United States, the *Boehm Test of Basic Concepts* (Boehm, 1986) and the *Rhode Island Profile of Early Learning Behaviour* (Novack, Bonaventura & Merenda, 1982) are among the many group and individual measures that are available for screening young children for learning difficulties.

Early screening measures are often selected with regard to their predictive validity, their construct validity, their internal consistency and their test-retest reliability.

Leach (1983) has listed three (apparently faulty) assumptions that often underlie early screening:

1. The utility of early screening as a preventive strategy depends on the assumption that screening procedures exist which can accurately detect the truly 'at risk' group of pupils in any population of pupils without identifying high proportions of pupils who are truly ' not at risk', and which have a high probability of being correct in any single instance of positive identification. (p.48)

2. The efficacy of early screening depends on the assumption that critical psychological deficiencies in underlying ability determine an individual's later performance on basic academic tasks, and that these critical deficiencies are known and can be measured reliably with valid instruments. (p.48)

3. The methodology of early screening depends on the assumption that absolute standards or cut-off points can be determined for deciding truly 'at risk' and 'not at risk' pupils, for deciding 'success' and 'failure' on later criteria performance measures, and for determining whether later 'failure' has been prevented. (p.50)

These assumptions together with the criteria listed above, are considered in the discussion that follows.

PREDICTIVE VALIDITY IN EARLY SCREENING TESTS

Predictive validity, which was raised in Leach's first assumption, can be examined by looking at the link between performance on a screening measure and performance on some criterion measure such as a test of reading

achievement administered at 6 or 7 years of age. For example, Potton (1983) administered the *Croydon Check List* to 384 children at age 5, and administered a criterion test of reading achievement, the *Group Reading Test* (Young, 1968) to the same group at age 7. Using cut-off points of 6 or more 'no' ratings on the Croydon Check List, and 'six months or more retardation' on the Group Reading Test, he found that 58 children (40% of the 'retarded' readers) had been correctly identified by the screening test (the correct positives), and that 87 children (60% of the 'retarded' readers) had been (incorrectly) identified as not being at risk (the false positives). Turning to those who did well on the reading test, Potton found that 210 (84% of 'adequate' readers) had been identified as not being at risk (the correct negatives), while 40 children (16% of 'adequate' readers) had been incorrectly identified as being at risk (the false positives). Confident that his cut-off points were reasonable (see Leach's third assumption), Potton questioned the predictive validity of the *Croydon Check List* since it failed to identify 60% of the 'retarded' readers, and incorrectly identified as being at risk 16% of 'adequate' readers. The fact that 26% of the 384 children in the sample (98 children) was initially identified as being at risk is also a cause for concern since the percentage of academically at-risk children in the general population of five-year-olds is probably much lower (see Lindsay & Wedell, 1982).

CONSTRUCT VALIDITY OF EARLY SCREENING TESTS

The value of the information that a screening test can provide is related to the test's construct validity - the extent to which the test demonstrates a relationship between the theoretical base and what the test purports to measure. Leach's second assumption suggests that some of the constructs (e.g. auditory and visual discrimination, laterality, speech processing) which are often assessed by early screening tests may not, in fact, be important for later academic achievement. Stanovich (1986) has pointed out that research has identified a plethora of cognitive differences between reading disabled and non-reading disabled children, but that many of the differences are not specific to the reading disabled population and hence may not be critical for achievement in reading (or in other areas). Within the reading field, there appears to be some consensus that phonological awareness - the ability to segment aurally presented words into their constituent phonemes - is a construct that clearly predicts subsequent reading achievement, and that reading achievement can be improved by teaching phonemic awareness skills (see Bradley & Bryant, 1983; Jorm, Share, Maclean & Matthews, 1986; Stanovich, 1986, 1993-94). Phonemic awareness aside, the evidence that many of the constructs tested by early screening measures are important, is limited.

ISSUES OF RELIABILITY

Reliability is also an important consideration in the selection of early screening tests. Two forms of reliability are generally of interest - internal consistency and test-retest reliability. Measures of internal consistency provide evidence that the items within a particular test or subtest are measuring the same domain. Test-retest reliability coefficients provide evidence that subtest and total test scores are stable, though it is recognised that young children may make considerable progress in some areas in a relatively short time.

AN EXAMINATION OF THREE EARLY SCREENING TESTS

In this section, three currently available screening/diagnostic tests are examined. These are the *Infant Reading Tests* (Brimer & Raban, 1979), the *Aston Index-Revised* (Newton & Thomson, 1982), and the *Belfield Infant Assessment Profile* (Spelman & McHugh, 1994). These instruments, which can be administered by teachers, are discussed because they were specifically designed to identify children with learning difficulties at or near the beginning of formal schooling, and because they exemplify some different approaches to early screening and diagnosis.

THE INFANT READING TESTS (IRT)

The *Infant Reading Tests* (IRT) are designed to provide teachers with a profile of a pupil's strengths and weaknesses in reading. The *Infant Reading Tests* consist of three pre-reading tests and three reading tests. The pre-reading tests, which can be administered to 4 to 5 year-olds, examine temporal-spatial co-ordination (16 items), sound discrimination (37 items), and shape discrimination (32 items). The reading tests, which can be used to screen children in the 5-7 years age range, assess word recognition (24 items), sentence comprehension (25 items), and passage comprehension (22 items). For each subtest, a child's raw score is converted to a 7 point equal interval scale score. A score of 2 or lower indicates that the child has not mastered a particular pre-reading/reading skill, while a score of 5 or higher indicates adequate mastery. Scores are plotted on a single-page profile where information on attention span, speech, hearing and vision can also be recorded. A reading age, which reflects performance on the passage comprehension test, can also be obtained and recorded.

Unfortunately, the manual accompanying the *Infant Reading Tests* provides limited help on how to interpret test profiles. While high internal consistency reliabilities are reported for the subtests, correlations between the subtests are not given so it is difficult to determine whether or not they are measuring the different constructs. Information on predictive validity is also absent from the manual. Nevertheless, the different subtests appear to provide useful information on the performance of children on components of reading. Such information generally cannot be derived from standardised tests of reading designed for the same age group.

ASTON INDEX REVISED TESTS

The major purpose of the *Aston Index* is to assist teachers in the early identification of children who are at risk and to suggest possible barriers to progress, with the expectation that intervention will follow. Level 1 of the Index, which focuses on pre-reading skills, and does not presuppose a knowledge of reading or writing, can be administered to children from 5½ years onwards, who have been at school for at least 6 months. There are five subtests of general ability and attainment in Level 1, and 7 subtests involving performance. Two profiles are constructed on the basis of the results of diagnostic testing. The "General Underlying Ability and Attainment Profile" includes performance on vocabulary and Draw-a-Man subtests as well as measures of mental age and attainment (obtained from tests not included in the *Index*). The "Performance Items Profile" uses subtests of visual and auditory sequential memory, sound blending and sound discrimination. Graph lines indicate profiles for average children at ages 5½ and 7 ½. Test users can use the profiles to determine if there is a discrepancy between ability and achievement, and to determine children's strengths and weaknesses on the specific skills measured by the performance items. Pumfrey (1985), however, has pointed out that the advice on profile interpretation in the handbook makes no mention of the need for a simultaneous consideration of both sub-test reliabilities and inter-correlations. He warns that failure to consider these may lead to over-reliance on the visually presented profile, and to a mis-diagnosis.

Porteous (1991) has pointed to a lack of information in the handbook on the construction, standardisation and validation of the *Index*. In particular, he noted the following omissions: essential data on the standardisation samples including numbers in samples, ages of children, standard deviations of scores, sampling method and information on the background of the sample.

BELFIELD INFANT ASSESSMENT PROFILE (BIAP)

The *Belfield Infant Assessment Profile* (BIAP) is designed to identify children with learning difficulties at an early stage in their formal schooling. Infants (ages 4-6) can be assessed in five developmental areas: perceptual processes, motor development, early learning styles (attentiveness and motivation), language and communication, and social and emotional development. There are five items for each developmental area. Perceptual processes and motor development are assessed by administering individual pupil tests or group paper-and-pencil tests. Teacher ratings are used as indicators of performance on learning styles, language and communication, and social and emotional development. After testing and rating have been completed, a pupil profile is constructed, and performance in each developmental area and overall performance can be interpreted with reference to "critical" or cut-off scores. If a pupil's score falls below the cut-off score for his/her age group, then the pupil is considered to be at risk and may have a learning difficulty. The BIAP was standardised on 5,419 infants enrolled in Dublin-area schools.

A factor analysis using individual scores on the 25 BIAP items provided evidence of construct validity by generally supporting the structure of the test. Items that loaded high on a factor labelled "language and communication" accounted for 40% of the variance in children's total scores. A factor labelled "early learning styles/social and emotional development" accounted for a further 8.1% of the variance, while "motor development" and "perceptual processes" accounted for 6.5% and 4.1% respectively. The structure of the BIAP appears to be quite similar to Lindsay's (1980) *Infant Rating Scale* in which a factor labelled "language" accounted for 50% of the variance.

Alpha reliability coefficients ranging from .60 (perceptual processes) to .94 (language and communication) provide evidence of the BIAP's internal consistency. Six-month test-retest correlations ranging from .65 (perceptual processes) to .75 (motor development) are offered as broad support for the stability of the BIAP.

The absence of data on the predictive validity of the BIAP suggests that a study of that aspect of validity would be worthwhile. It might also be useful to investigate the uses that teachers make of children's results on the BIAP, and what effects the BIAP has on children themselves.

CONCLUSIONS

Early screening measures have come in for some strong criticism. According to Potton (1983), "the construction of a test with items which will contribute to sensible decision-making about long term development of reading failure... makes successful betting on horses seem easy by comparison" (p. 30). He adds that "the identification of predictive antecedents of such disorders, never mind the understanding of their complex inter-relationships, is overwhelmingly complicated" (p. 230). Nevertheless, even those who have criticised early screening measures (e.g. Crossland, 1994) admit that teachers find them useful as they provide help with understanding children's learning.

Given the criticisms of and difficulties with screening devices, it seems important that teachers consider them as one source of information in the ongoing assessment of young children. A promising approach is to combine information gleaned from the application of screening measures with teachers' observations of the performance of children on curricular objectives to determine if and when additional assessment and/or intervention is needed. Potton himself concluded that such teacher vigilance is critically important in identifying at-risk learners, and that screening devices should only be used to confirm what has already been hypothesised.

The general appeal of screening devices in the UK in the past, and here in Ireland at present, may be related to the fact that no alternative approach to the assessment of early learning is in place. This situation is now changing in the UK with the development of systems for profiling pupil achievement that provide for the systematic documentation of performance in relation to curricular objectives and involve the participation of parents and specialist teachers from an early stage. The development of such measures as the *Primary Language Record* (Barrs, Ellis, Hester & Thomas, 1993), the *Primary Record of Achievement* (Powell, 1991) and the *PROCESS Profile* (Stierer, 1990) provides a promising beginning in the quest for the next generation of tests to identify early learning difficulties.

As we await these new developments, it is important that every primary school puts in place a systematic approach to the early identification of learning difficulties using a combination of teacher vigilance and the best available screening tests.

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