

Educational Research Studies (A brief summary)

The research literature shows a core of well-conducted training (teaching intervention) studies that are generally accepted to have shown a **causal link** between phonological processing skills and reading. So in 1985 the researcher Peter Bryant made this point: "Training studies in which alternative explanatory factors are equated across experimental and control groups, and only the experimental group receives the phonological skills training are the only way to prove causation" (Bryant, 1985). *(Many other studies were also conducted that showed strong correlations between phonological skills deficits and reading difficulties.)* Early training (intervention) studies that are credited with such experimental designs are usually listed as Ball & Blachman (1991); Bradley & Bryant (1983); Byrne & Fielding-Bamsley (1989, 1990, 1991, 1993, 1995); Cunningham (1990); Fox & Routh (1976, 1984); Hatcher, Hulme & Ellis (1994)); Lundberg, Frost & Petersen (1988); Torgesen, Wagner & Rashotte (1994). Some descriptions follow:

Bryant & Bradley (1983) conducted a study that was longitudinal and provided training. They found 'at risk' children of four to five years of age (65 out of 400 screened originally) and trained two groups, twice a week for two years in rhyming and alliteration, and rhyming and alliteration plus letter sound

correspondences. These two groups showed very significant gains over two control groups, who received an alternative intervention (vocabulary expansion by sorting pictures into categories), or no intervention. The gains were still evident in the experimental groups who received rhyme and analogy training only (1), and rhyme and analogy training plus direct instruction in letter sound correspondences (2) at later follow-up when the children were twelve. These children received extra training/teaching outside their classrooms and not from their own teachers. The regular teaching of reading started of course for all the children during the training period of two years. The results of this study were so strong and startling at the time that this study is still regarded as a very important milestone. It was also important to see what could be done in the classroom. Benita Blachman later demonstrated that teachers (not just research staff) could get very successful results within classrooms (Blachman, Ball, Black & Tangel, 1994) when they were given training and materials, and had time to work with children in a similar way to Bryant and Bradley. When children are in grade 1, phonological awareness (and possible phonological memory and rate of retrieval) improves as letter sounds and names are taught in the beginning reading curriculum. However, if earlier (kindergarten) phonological skills have been taught, there is a more powerful, positive effect on reading and spelling levels for reading “at risk” children.

A 1988 study that involved phonological skills instruction only, with no phonics teaching took place before the formal teaching of reading in a Danish Kindergarten setting. Lundberg, Frost & Petersen (1988) used their particular situation in Denmark (where children are not formally taught reading until the age of seven) to conduct auditory phonological skills instruction only (without "linkage" to phonics), completely before the formal teaching of reading with 235 children in 12 kindergarten classes. The children had daily sessions of 15 to 20 minutes, over an eight to nine month period, and their progress was monitored from Kindergarten to Grade 2. The program was implemented by the class teachers (who had received training), and it was carefully sequenced from easy listening games to awareness of sentences and words, to syllables and then to phonemes. There was a comparison group of 155 children. No later significant effects were found on "functional linguistic skills" such as vocabulary or comprehension of oral instructions. However, significant effects were found for meta-linguistic skills. For example, the experimental group's ability to segment words into phonemes (phonemic awareness) had increased dramatically, with a strong group by test interaction effect by the end of the training. More importantly evidence of permanence of the training effects was found. In Grade 1 only 6% of the experimental group children still had very low scores on phonemic

segmentation, whereas 37% of the comparison group had low scores. In Grade 2, there were significant differences between experimental group and comparison group children, on tests of reading and spelling. A significant group by grade interaction effect was obtained, suggesting that the impact of training was stronger by Grade 2 than it had been in Grade 1. Hatcher, Hulme & Ellis (1994) suggested the term "linkage" to explain that direct and explicit letter-sound instruction was important as a bridge to phonics after highly sequenced, auditory, phonological skills teaching. They were working with children who were already at least seven years old, and were confirmed as poor readers, rather than younger children "at risk" for reading difficulties. Even in this situation auditory phonological skills training worked very well, making a "foundation" for letter sound knowledge and phonics skills (to enable reading fluency and comprehension to improve). By 2000 a meta-analysis of the National Reading Panel (2000) concluded that early phonemic awareness teaching is very effective for children at-risk for reading difficulties and very beneficial for all children. No studies involving parents teaching phonemic awareness to their own children were found by the National Reading Panel and it was suggested that such work might be useful. A large longitudinal study directed by Dr. Linda Siegel began in the North Vancouver school district in 1997 and went on for 10

years. It involved a group of children across the district being tested every year on their reading and reading-related skills. In response to the testing, a range of interventions was used in kindergarten to grade 3 as indicated by the test results. The results indicated that most children originally at-risk for reading difficulties could be given effective instruction so as not to become reading disabled during the next two years (Lesaux & Siegel, 2001; Lesaux, 2003). In this longitudinal study, 928 kindergarten children were tested and 23.8% of English speaking children, and 37.2% of ESL speakers were identified as at-risk for reading failure. The schools were given the results, and then implemented phonological and phonics skills teaching programs during the next two years. In grade 2, it was found that 4.2% of English speakers, and 3.72% of ESL speakers were reading disabled and by grade 6, only 1.9% of English speakers and 2.3% ESL. More recently several large scale studies have shown that daily one on one teaching is the key to maintaining nearly all children at-risk for reading difficulties at grade level by the end of grade 2 (e.g., Foorman, Fletcher, Francis, Schatschneider & Mehta, 1998; Torgesen, Wagner, Rashotte, Lindamood, Rose, Conway & Garvan, 1999; Vellutino, Scanlon, Sipay, Small, Chen, Pratt & Denckla, 1996).

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