

## A Phonological and Auditory Processing Approach to Reading: Effects on Normally Developing and Clinical Children

Dyslexia is characterized by difficulties in word recognition, spelling and decoding (*International Dyslexia Association, 2007*) and is typically caused by deficits in phonological and auditory processing (*Ramus, et al., 2003*). Unfortunately, traditional remedial programs for dyslexics are not effective for 15-25% of these individuals (*Habib, et al., 2002*). The dEcode remedial program may be more effective because it focuses on both phonological and auditory processing skills, to address both types of skill deficits. Although the program was designed to address the needs of individuals with severe reading difficulties, this specialized reading program may help children of all reading levels develop their phonological and auditory processing skills and prevent future difficulties with reading. The study evaluated the effectiveness of the dEcode program on the reading development of dyslexic and normally developing children. In addition, the study sought to determine whether post-treatment improvements in participants' word reading were predicted by improvements in auditory processing.

The study involved 61 participants (42 experimental, 19 control), ranging in age from 6 to 16 years ( $M = 9.73$ ). Of the 61 participants, 19 had been referred to a clinic for severe and persistent reading difficulties and had been diagnosed with dyslexia. The other 42 participants were elementary students from a local school board, who had never been diagnosed with a reading disability. All individuals participated in the pre- and post-testing, which involved standardized tests of word reading and auditory processing. Clinical and school participants in the experimental group received the intervention (dEcode reading program) between pre- and post-testing. Testing and intervention sessions took place at the clinic (clinical sample) and the school (school sample). During remedial sessions of dEcode, experimental participants were

taught how to accurately identify and produce individual graphemes and phonemes. Participants were presented with additional phonemes, and did not proceed until they demonstrated 100% accuracy and speed in identification and production. Through this process, individuals worked on strengthening both their phonological and auditory processing skills.

In order to determine whether the dEcode program was successful in improving word reading and auditory processing, a series of ANOVA's were conducted with data from the clinical and school samples. As shown in Figures 1 and 2, clinical participants in the experimental group made significantly larger gains in word reading,  $F(1,18) = 16.55, p < .01$ , and in auditory processing  $F(1,18) = 14.05, p < .01$ , than clinical participants in the control group. Among the school sample, participants in the experimental group made significantly larger gains in word reading  $F(1,41) = 9.48, p < .01$ , but not in auditory processing  $F(1,39) = .05, ns$ , than participants in the control group. Furthermore, regression analyses indicated that among clinical participants, changes in word reading were predicted by changes in auditory processing,  $F(1,17) = 8.09, p < .05$ . Alternatively, changes in auditory processing did not predict changes in word reading for school participants,  $F(1,38) = .49, ns$ .

Results from this study suggest that the dEcode program is effective in improving reading among individuals with and without dyslexia. Although both groups showed improvements in decoding, only the clinical sample exhibited gains in auditory processing, which were associated with gains in reading. The findings support the use of a remediation program for children with dyslexia that includes training in both phonological and auditory processing skills.

Figure 1. Word Reading Change Scores for Experimental and Control Groups

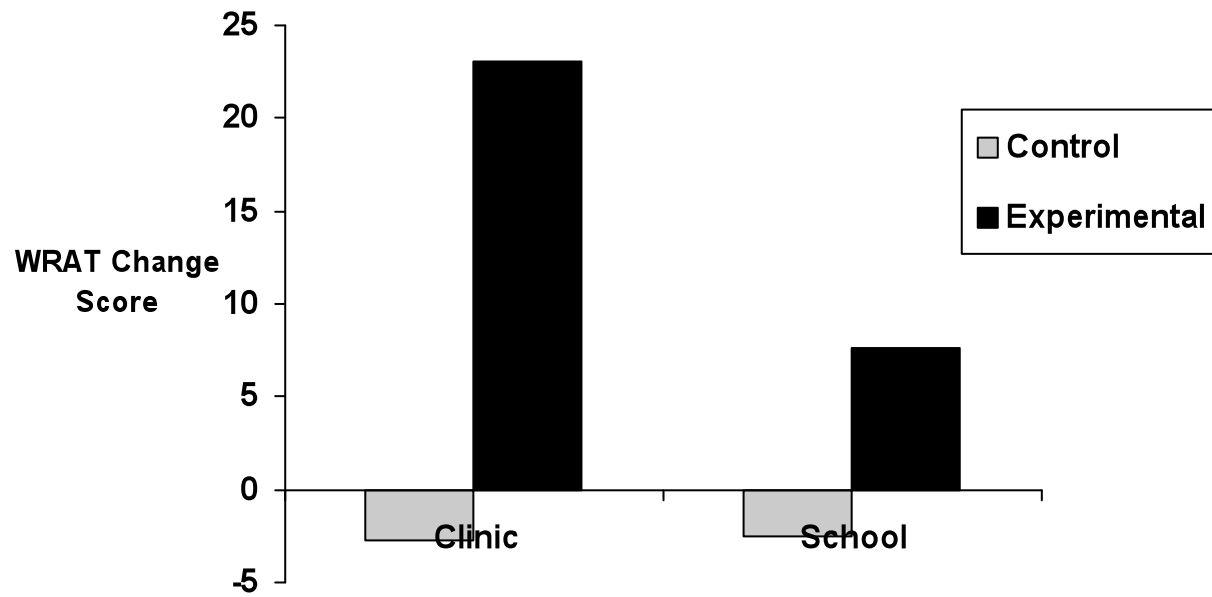
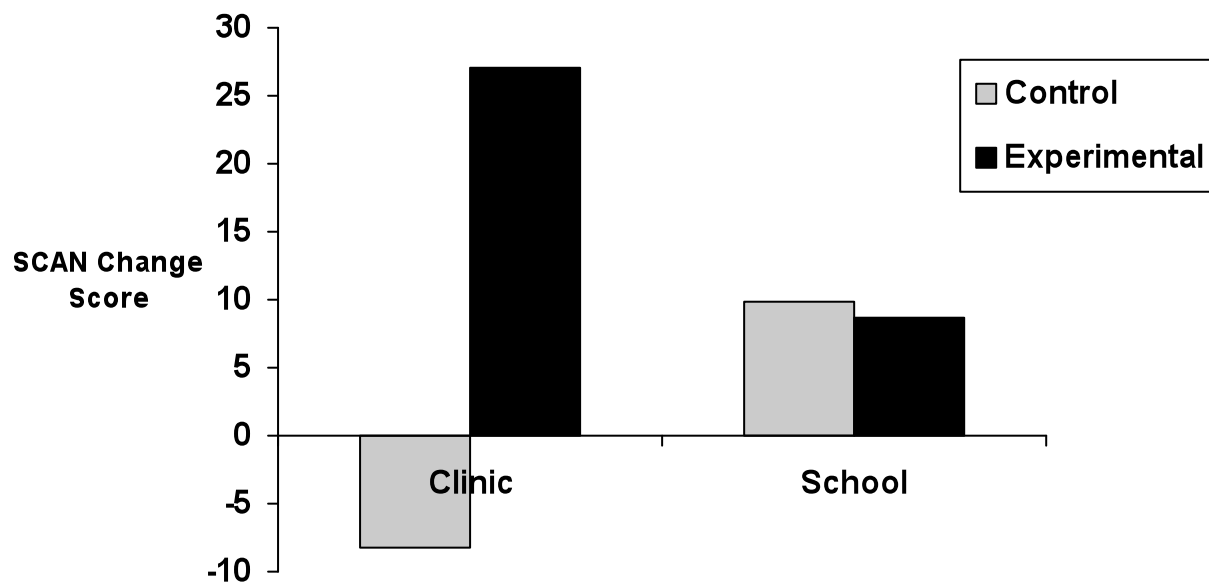


Figure 2. Auditory Processing Change Scores for Experimental and Control Groups



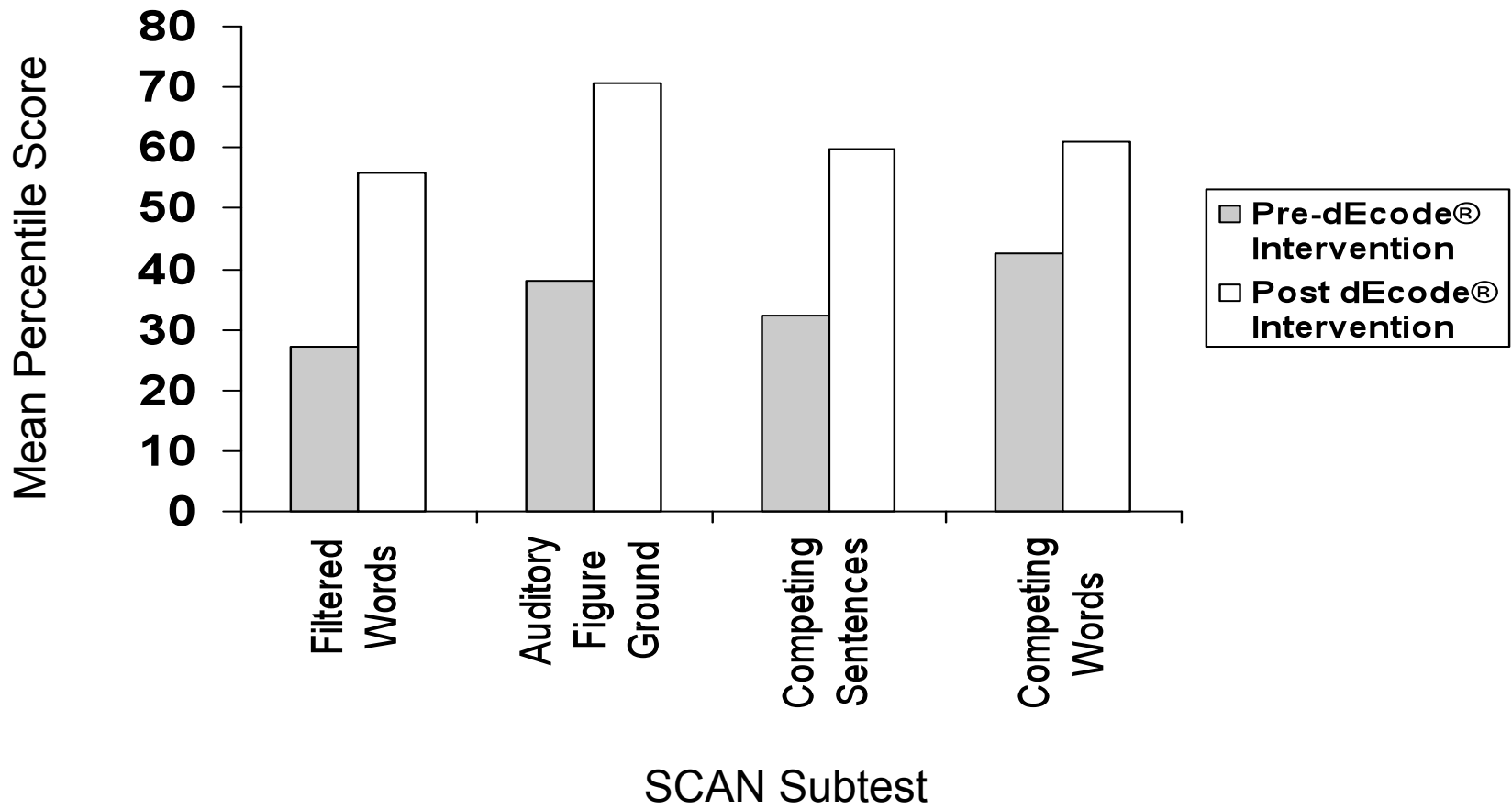


Figure 1. Pre-Post means across all SCAN subtests.