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LANGUAGE AND LEARNING DISORDERS

SYNTHETIC SPEECH USED TO TREAT LANGUAGE DELAY

Deficits in recognition and processing of rapidly successive phonetic elements of speech in language-learning impaired (LLI) children, aged 5 to 10 years, treated at Rutgers University, Newark, NJ, and University of California, San Francisco, were improved by listening to acoustically modified synthetic speech and by daily training with computer "games" designed to modify temporal processing and phoneme perception. A two-stage acoustic speech processing algorithm was developed: 1) prolonging the duration of the speech signal by 50%, and 2) enhancing by 20dB the fast (3-30 Hz) consonant speech elements relative to the slowly modulated vowels. After 1 month of daily training with this acoustically modified speech presented as listening exercises on audiotapes, test scores significantly improved by approximately 2 years, with each of seven LLI children achieving normal levels of speech discrimination and language comprehension. In a second study involving 22 LLI children divided into two matched groups, both groups received the same training exercises used in the initial study but only one group was presented with temporally adaptive computer games and acoustically modified speech exercises. Significantly larger improvements in speech discrimination and language comprehension were achieved by the LLI children receiving the acoustically modified speech training as compared with improvements recorded for subjects receiving natural speech training. (Tallal P, Merzenich MM et al. Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* Jan 5, 1996;271:81-84). (Respond: Dr Paula Tallal, Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ 07102).

COMMENT. Remarkable and significant improvements in receptive speech and language comprehension were demonstrated in language-learning impaired children who received training with acoustically modified speech stimuli. Brief, rapidly changing components of speech were temporally prolonged and emphasized, and coupled with adaptive training exercises.

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LLI children have been found to have a temporal processing deficit, expressed by limited identification of brief phonetic elements of speech and impaired sequencing of short-duration acoustic stimuli presented in rapid succession. When presented in slower forms and rates, the stimuli are correctly perceived and receptive language is improved. Temporal processing deficits of 11 LLI children studied at the Center for Integrative Neurosciences and Coleman Laboratory, University of California, San Francisco, were corrected by adaptive training exercises and computer games designed to modify temporal processing skills. (Merzenich MM, Tallal P et al. Temporal processing deficits of language-learning impaired children ameliorated by training. Science Jan 5, 1996;271:77-81).

COGNITIVE AND SPEECH DEFICITS WITH OPSOCLONUS-MYOCLONUS

Thirteen patients, aged 1.7 to 16 years, with opsoclonus-myoclonus syndrome were evaluated for neuropsychological, psychosocial and adaptive function at the Children's National Medical Center, George Washington University, Washington, DC. IQs of six older children ranged from 50 to 72 on the Wechsler scales. One infant had a Mental Index of 71 on the Bayley, and a 46-month-old child tested at the 20-month level. Severe problems related to motor output, involving ambulation, fine motor coordination and speech, while some age-appropriate cognitive skills were retained. Verbal and visual reasoning approached the borderline to normal range. On the Achenbach Child Behavior Checklist, mild to moderately severe behavioral irritability and emotional lability were reported in 8 of 12 non-medicated children. On Vineland Adaptive Behavior Scales, severe adaptive limitations were noted; self-care was significantly delayed in areas related to feeding, dressing and toileting. Motor problems contributed to low scores in daily living and communication scales. One child, aged 8 years examined while treated with ACTH, tested in the normal range. (Papero PH, Pranzatelli MR et al. Neurobehavioral and psychosocial functioning of children with opsoclonus-myoclonus syndrome. Dev Med Child Neurol 1995;37:915-932). (Respond: Dr Patricia H Papero, Department of Psychiatry, Children's National Medical Center, 111 Michigan Ave NW, Washington DC 20010).

COMMENT. In 27 patients with opsoclonus-myoclonus syndrome reported previously from the same center (Pranzatelli et al. 1995, see Ped Neur Briefs March 1995;9:19), the etiology was paraneoplastic in 46% and infectious in the remainder. Hammer, Larsen, and Stack, at Children's Memorial Hospital, Chicago, have reported on the developmental outcome of 11 children with opsoclonus-myoclonus syndrome, the majority having an associated neuroblastoma. (See Ped Neur Briefs August 1995;9:61). Delayed development with motor incoordination and speech delay occurred in 8 patients and 3 had behavioral problems. Development was normal in 2 of 3 patients without neuroblastoma and in only 1 of 8 whose opsoclonus was associated with neuroblastoma. While the majority of patients in this study had significant developmental delay, others have reported a 50% incidence of intellectual deficit. The poor outcome might possibly be related to etiology, but symptoms of ataxia and opsoclonus were not improved by removal of a neuroblastoma.

CORTICAL MOTOR OUTPUT OF BRAILLE READING HAND

Focal transcranial magnetic stimulation (TMS) was used to map the