

## AUDITORY EVOKED POTENTIALS AND DIGIT SPAN IN CHILDREN

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Recent studies have shown a relationship between visual evoked potentials and intelligence (1,2). It is of interest to determine if auditory evoked potentials can also be used in assessing aspects of intelligence. Correlations between auditory digit span and various components of the auditory evoked potential were examined as digit span has been shown to be an important component of level of intelligence (3) and other communication skills (4). Eleven normal children (7 boys and 4 girls), between the ages of 9 and 12 years, volunteered for this study. Digit spans were obtained on a separate testing occasion from the evoked potentials. The measure of digit span was that developed for the Illinois Test of Psycholinguistic Abilities (4) and represents a more reliable measure than others commonly used.

Auditory evoked potentials were recorded between the vertex and the right mastoid process following binaural stimulation with tone bursts with a frequency of 1.0 kHz, a rise-fall time of 1.0 ms, and an intensity level of 70 db above threshold. The stimulating and recording set-up was similar to that described previously (5). The only constant wave in the auditory evoked potential was the NI wave and its latency, amplitude and height/width (Q value) were measured. The area of the NI wave was determined by a computer subroutine which calculated the standard error of the mean for the EEG activity before the onset of the stimulus, performed a centre-clipping operation on the auditory evoked potential at a level below two standard errors of the mean, and measured the resultant area.

In the normal children there was a significant correlation ( $r = -0.73, P < 0.01$ ) between digit span and latency of the NI wave. There were significant correlations between the latency and Q values of the NI wave ( $r = -0.69, P < 0.02$ ), the latency and area of the NI wave, ( $r = 0.63, P < 0.05$ ) and the amplitude of NI wave and area of the NI wave ( $r = 0.79, P < 0.01$ ).

The present results indicate that the latency of the NI wave of the auditory evoked potential correlates with digit span in normal children. Although the underlying neural mechanisms involved in this correlation in normals are not known, the finding could be of importance in assessing digit span. Given that visual evoked potentials are related to measures of intelligence, it would appear fruitful to explore further the possibility of relationships between auditory evoked potentials and other components of intelligence.

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