

## ■ Low-level Defective Processing of Non-verbal Sounds in Dyslexic Children

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We compared processing of non-verbal auditory stimuli by dyslexic and non-dyslexic children using electrophysiological methods. The study included 39 children (17 with dyslexia plus 22 controls) assessed via frontal, central, parietal, and temporal electrodes. As an extension of previous P300 event-related potential studies, we analysed variations in the power values of 40-Hz oscillations (gamma-band oscillations involved in cognitive processing) during a specific time window in response to the auditory 'oddball' paradigm that entail target (random 2 kHz) and standard (frequent 1 kHz) stimuli. Dyslexic children differed significantly from controls ( $P < 0.001$ ) in the mean power of the wavelet-transformed 40-Hz oscillation in a time interval starting at 25 ms after stimulus onset up to 50 ms. This means defective processing of sounds. Within groups, standard and target tones elicited significantly different power values ( $P < 0.001$ ). Correlations of values between standard and target responses at each electrode position were not significant within either group, although dyslexics showed a lower correlation than controls. Significant differences in the mean power of these oscillations detected at very early stages of auditory processing in dyslexic children and the wide range of mean values reveal impairment in processing non-verbal sounds in dyslexia. Our results also support recent findings using behavioural and electrophysiological methods suggesting that dyslexia is a general auditory deficit instead of a speech-specific deficit. Copyright © 2008 John Wiley & Sons, Ltd.

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