Temporal auditory processing in dyslexia: Cause or co-occurrence?

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We studied 16 dyslexic and 16 control adults matched in age and IQ on a large variety of phonological and auditory tasks. The auditory tasks included syllable discrimination and categorisation, single formant discrimination, backward and simultaneous masking, temporal order judgement of short and long sounds, and detection of frequency modulations at 2 Hz and 240 Hz. Overall, we find that very few of the dyslexic individuals tested present any sign of auditory dysfunction on those tasks, in contradiction with auditory theories of dyslexia. One might argue that auditory defects were present in all subjects during childhood, and subsequently recovered. However, there is no evidence whatsoever that this can happen, at least in the absence of specific intervention. Phonological processing, on the other hand, was significantly affected in almost all subjects, in spite of the phonological training undergone by most of them as part of remediation programs.

These results are consistent with a growing number of studies reporting that the incidence of auditory deficits in the dyslexic population is hardly above one third, while the rest perform normally. Other studies fail to find any relationship between auditory and phonological abilities. Overall this suggests that auditory dysfunction does not play a causal role in the aetiology of phonological and reading impairments. Yet, it seems to be a reliable finding that auditory problems occur more often in the dyslexic than in the normal population. Why is that so? Bringing together data from studies of auditory, visual and motor deficits in dyslexia, as well as from research on brain anatomy and development, we will propose a theory of the genesis of developmental disorders, with or without co-occurring sensori-motor impairments. [Study funded by a Marie Curie Fellowship from the European Commission and the Medical Research Council.]