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**Temporal resolution and frequency discrimination in people with a specific language impairment:
Behavioural and electrophysiological evidence**

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A controversial hypothesis holds that specific language impairment (SLI) arises from a so-called temporal processing deficit (e.g., Tallal, Sainburg, & Jernigan, 1991). Despite rigorous testing from a number of independent laboratories in recent years (e.g., Bishop, Carlyon, Deeks, & Bishop, 1999; McArthur & Hogben, 2001; Rosen, 1999; Wright *et al.*, 1997) the validity of this hypothesis has yet to be established. In fact, the results of these experiments seem to raise more questions than they have answered. One is whether only a subgroup of people with SLI have impaired temporal resolution. We addressed this in Experiment 1 using a two-interval, two-alternative forced-choice (2AFC) paradigm to measure how well 16 people with SLI and 16 control listeners discriminated between the frequency of tones presented in four auditory backward recognition masking (ABRM) conditions. Another question is what differentiates people with SLI who demonstrate a temporal resolution deficit from those who do not. This was also addressed in Experiment 1 which compared the spoken language and reading abilities of people with SLI who had normal and poor ABRM scores. A third question is whether poor ABRM scores result from a true temporal resolution deficit or an inability to discriminate between sounds irrespective of rate of presentation or brevity (i.e., auditory discrimination). Again, this was addressed in Experiment 1 which examined the relationship between performance in the four ABRM conditions and that in a fifth condition that used the same paradigm except the tones were not followed by a backward mask (i.e., frequency discrimination). A fourth question is whether the poor performance of people with SLI on psychoacoustic tasks actually reflects a low-level auditory deficit. This was investigated in Experiment 2 which measured the electrophysiological brain responses (the mismatch negativity (MMN) event-related potential paradigm) of the same people with and without SLI to the same ABRM and non-masked stimuli. A fifth question is whether the auditory perceptual deficit seen in some people with SLI is related to their perception of speech. This was examined at the behavioural level in Experiment 3 using a three-interval, 2AFC procedure to compare how well 16 people with SLI and 16 control listeners could discriminate between pure tones, complex tones, and synthesised vowels that varied in the frequency of their component sinusoids. It was further examined at the electrophysiological level in Experiment 4 which measured the MMN responses of the same listeners to the same tone, complex tone, and vowel stimuli.