THE NORMAL AND ABNORMAL PROCESSING OF PITCH PATTERN

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ABSTRACT

The studies presented in this thesis investigate the importance of pitch-pattern processing for normals and those with developmental disorders. This was achieved by assessing the perception of 'global' contour patterns of rises and falls in pitch and 'local' actual pitches. The first experimental study investigated individual differences in pitch-pattern processing. It was found that pitch contour perception relates to reading skills, which suggests that this aspect of audition may be important for the acquisition of literacy. The second study investigated pitch-pattern perception in 'tone-deaf' individuals. Deficits were found for both pitch contour and actual-pitch perception, which suggests that these auditory features are important for normal music processing. A further study demonstrated that it is possible to improve pitch contour perception with training. This suggests that it may be possible to improve the perception of natural sounds through such training. The final study investigated whether there are abnormalities in pitch pattern processing in individuals with Autism Spectrum Disorder. It was hypothesised that there might be deficits in 'global' aspects of pitch pattern processing, as a result of a cognitive style known as Weak Central Coherence (Frith, 1989). This was not found using the conventional definition, where pitch contour is considered to represent a 'global' level of perception. However when a novel definition was adopted, evidence was obtained for a deficit in 'global' pitch pattern processing in this disorder. In this novel definition, 'global' representations result from the integration of different 'local' features (pitch contour, actual pitches and specific time points) to form a coherent percept. This represents a new approach to studying pitch pattern perception, which could be adopted in future investigations.

Publications Arising from Thesis

Foxton, J.M., Dean, J.L., Gee, R., Peretz, I, & Griffiths, T.D.

Characterisation of deficits in pitch perception underlying ‘tone deafness’.

Brain, 2004, 127, 801-810.

Foxton, J.M., Brown, A.C.B., Chambers, S., & Griffiths, T.D.

Training improves acoustic pattern perception.

Current Biology, 2004, 14, 322-325.

Foxton, J.M., Stewart, M., Barnard, L., Rodgers, J., Young, A.H., O’Brien, G., & Griffiths, T.D.

Absence of auditory ‘global interference’ in autism.

Brain, 2003, 126, 2703-2709.

Foxton, J.M., Talcott, J.B., Witton, C., Brace, H., McIntyre, F., Griffiths, T.D.

Reading skills are related to global, but not local, acoustic pattern perception.

Nature Neuroscience, 2003, 6(4), 343-344.

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