MUSIC AND DISABILITY
St Cecilia's Hall, University of Edinburgh, 22nd October 2006
PROGRAMME

10.15 Registration and Coffee

11.00 Welcome
Murray Campbell and Katie Overy

11.10 Music Therapy and Complex Medical Conditions
Wendy L. Magee

Advances in medicine and technology have resulted in people surviving for longer and with more complex problems following illness or trauma. For the families and professionals caring for such individuals, this presents many challenges. Enabling a severely disabled individual to access and participate in meaningful activity tests even the most experienced carer. Health professionals also need to deliver interventions which are appropriate, evidence-based and measurable.

This paper will present how music is being used with people with profound and complex medical conditions such as head injury, stroke and degenerative conditions to improve health and well-being. Video and audio extracts from a range of clinical case vignettes will illustrate the therapeutic application of music to address communication, movement, behavioural, cognitive and emotional needs of the human condition. The issues covered will include how to enable access to music in the face of profound physical disability; planning how to use music effectively to gain optimum results; the role of music in interdisciplinary care; and the emerging role of electronic music technologies in clinical music therapy.

11.40 From Singing to Speaking: Music-facilitated Language Recovery
Andrea Norton

Aphasia is a common and devastating complication of stroke or other brain injury, causing severe communication difficulties for the more than one million patients in the US who chronically suffer from this condition, yet surprisingly, there are few effective treatment options with the capacity for facilitating gains in speech output beyond patients' natural recovery. Assuming that potential tissue targets for recovering language may be either undamaged portions of the left-hemisphere language network, language-capable homologous brain regions in the right hemisphere, or both, we used an intensive course of Melodic Intonation Therapy (MIT) to test our hypothesis that music not only engages these brain regions more effectively, but also facilitates network reorganization, and thus, has the ability to change the course of natural recovery for severely aphasic patients.

Inspired by the common clinical observation that non-fluent aphasic patients can actually sing the lyrics of a song better than they can speak the same words, MIT is designed to take advantage of the musical elements naturally present in speech (melodic contour and rhythm) and utilize them to facilitate recovery by engaging the preserved language networks. To examine the efficacy of this treatment and investigate the neural bases for language recovery, we treated a group of severely

aphasic patients with an intensive course of MIT, and measured the effects of that treatment using a battery of behavioral tests as well as structural and functional MRI pre- and post-MIT intervention. Preliminary results will be presented.

12.10 Second Order Amplitude Modulation Analysis in Autism Spectrum Disorder
Tim Griffiths, Lauren Stewart, Uta Frith

The concept of weak central coherence was initially developed after consideration of the analysis of local and global structure in visual stimuli by subjects with autistic spectrum disorder (ASD). We have previously examined whether subjects with ASD process the local and global structure of melody in an abnormal way (Foxton et al Brain 2003). In this study we have examined the ability of subjects to extract a second-order pattern in another auditory stimulus. The first order pattern was produced by amplitude modulation of a tone (like vibrato at low rates) whilst the second-order pattern was produced by variation of the modulation rate. In essence the work assesses whether subjects can see the auditory 'wood' (second-order pattern) for the 'trees' (the first order pattern). A preliminary analysis of a group of more than ten subjects with ASD will be presented.

12.40 Discussion and Lunch

1.40 Head=Space 2002: A Virtual Instrument for a Tetraplegic Musician
Rolf Gelhaar

HEAD=SPACE is a screen-based virtual musical "instrument" constructed in the object oriented musical programming environment MAX MSP. This instrument is designed to be played by a tetraplegic musician wearing the *HEADMASTER 2000*, a head pointing system that takes the place of a mouse. Movement of the head moves the mouse cursor on the screen; puffing on a blow-switch makes selections. Cursor control is fast, smooth and accurate.
In fact, HEAD=SPACE consists of a large library of different versions of the same instrument, each with the same 'front end'. Each version, with its own specific sound set, is further programmable to generate, process and manipulate sounds in different ways. The player is able to manipulate the instrument in completely accurate and predictable ways, employing both the visual and aural skills that any musician has acquired.

2.10 Performing with "Headspace"
Clarence Adoo

Clarence Adoo, a musician with severe disabilities, will demonstrate the amazing new Headspace instrument.

2.40 The "Joy of Sound" project
William Langdon

A brief history of the project from instigation in 2000 to present 2006; photographic reference to several of the customized instruments and owners; reference to ongoing

group work rational and voluntary input; conclusion - insights gained - projected developments - any questions.

3.00 Therapy Using Music in a High-Tech Way
Gordon Dalgarno

Music Therapy is well established. The type which is listening to recorded music is not very popular with professional Music Therapist in this country though it is in other countries, eg the USA. However it by far and away the most common way of using music therapeutically in any country. Our objective in the charitable organisation "Enabling Through Sound and Music" is to make this kind of therapy with music more effective through technological means. We do this in two ways. (1) By playing the music through the whole body, not just though the ears. We have designed vibroacoustic couplings which provide efficient coupling combined with a sensation which is more like music rather than a mechanical vibration. These couplings can be built into a reclining chair or a treatment couch. (2) From appropriate pieces of music, choosing one which is in a particular own key (or transposing or pitch shifting by semitones) and then adjusting the pitch finely to match. We believe everyone has their own key (though few know it) and also their own fine pitch adjustment (though even fewer know what their pitch is).
We also choose the key and the pitch for therapy by carrying out an analysis of the client's voice to find pitches which are over and under represented in the voice. We then chose music which is, as close as we can to a mirror image of this. We are also experimenting with compensating pitches for the pitches which are over represented.
We are puzzled as to why the tuning needs to be precise to a small fraction of a semitone for at least some people. We are very much feeling our way in the above and welcome comments and help from others.

3.20 Tea

3.40 The Digital Orchestra: Making Live Music with Bespoke Systems
Stephen Deazley and Martin Parker

This project explores the creation of bespoke computer-generated sound systems and sensor technologies developed for five young adults from Braidburn Special School, and the capacity for these systems to provide a meaningful route to live music performance alongside professional musicians. Composer Stephen Deazley and Sound Designer Dr. Martin Parker discuss work in progress and issues involved in developing bespoke musical material, software, hardware and rehearsal techniques.

4.00 Accessibility Research at Queen's University Belfast
Graham McAllister

The Sonic Arts Research Centre at Queen's University Belfast is currently involved in three projects in the area of accessibility and multimodal feedback. The projects are in the areas of (1) Internet access, (2) access to networked information and (3) accessibility of public artwork information. This talk will present an overview of the ongoing research in each area.

4.20 Exploring Music Access for the Severely Disabled

Jon Hall and Jim Woodhouse

This talk will describe results from an undergraduate project, undertaken in collaboration with Simon Gunton of Escape Artists, to explore the possibilities of some kind of access to music performance for severely disabled patients at the Sue Ryder Centre in Ely. An early decision was taken to restrict attention to music production using a computer. After a survey of available technology, a number of tests were carried out with three selected patients, to establish what interface devices worked best for them and to quantify the level of input they could manage (in terms of speed and precision). A range of possible music interfaces were developed in Max/MSP, and refined in collaboration with the musicians.

4.40 Developing a New Musical Instrument for Children with Disabilities
Nigel Osborne

The University of Edinburgh, in collaboration with Learning Tapestry and Fife, North Lanarkshire and North and East Ayrshire, has been funded by the National Endowment for Science, Technology and the Arts (NESTA) to develop a new musical instrument for young people with both learning and physical difficulties. This paper examines the background considerations in terms of mobility, expressivity, emotion and cognition that may inform the design of the instrument.

5.00 Discussion

5.30 Close