Sonic Art – Opportunities for a Level Playing Field for Disabled Composers and Performers
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Abstract: Sonic Art is an umbrella term that encompasses electro-acoustic music and sound design which involves the use of technology in its creation and performance. In this paper I wish to argue that, almost uniquely in the area of music, Sonic Art provides a level playing field for composers and performers with disabilities. This is due to the fact that composition and performance conventions in Sonic Art, which rely heavily on the use of sensor technologies and computer software, free practitioners from the usual musician’s prerequisite of having finely developed motor skills; to be a virtuoso requires only that a creative imagination is at work. I will illustrate my argument with a case study of the Wired Ensemble, a group comprising musicians with varying disabilities who include amongst their achievements three separate invitations to perform at one of the most prestigious contemporary music festivals in the world, Sonorities, based at Queen’s University, Belfast. The violinist Darragh Morgan, who has performed with the London Sinfonietta, Ensemble Modern and Icbreaker, recently commissioned a new work for violin and live electronics that he premiered with the Wired Ensemble in April 2004 to great acclaim. I will argue that the combination of creativity and cutting-edge technology has taken this group out of the normal circuit of disability events into the mainstream where they are accepted and appreciated on their own terms as musicians regardless of their disabilities. I will further argue that these developments should be taken seriously by further and higher education institutions and that pathways in Sonic Art should be made more widely available for musicians with disabilities.

Keywords: Sonic art, Music Technology and Disability

Introduction

A LARGE PERCENTAGE of the scholarly writing which has dealt with the area of music technology and disability has focused on developments in Music Therapy, however, my own interest is concentrated on the small number of papers and articles which discuss the use of adapted hardware and software to compose and perform conventional note-based music.¹ Due to the conditioned nature of the expectations of audiences who are the receivers of this type of music, value judgements made, either consciously or subconsciously, are negatively influenced to such an extent that there can never be a level playing field for disabled musicians who use technology to compose and perform. However, my belief is that a level playing field can be created by exploring a musical environment where composition and performance conventions, and in turn audience expectations, are different; sonic art offers this environment.

Background

From the earliest appearances of adapted, accessible instruments such as Harold Rhodes’ electronic piano, the purpose of the adaptation has been to facilitate the composition and performance of music by those who, through various types of inherited or acquired physical disability, do not possess the necessary motor skills to access the standard equipment used for such activity.² It seemed to the present writer that, for many years, the therapeutic benefits of using such technology clouded judgement of the quality, in purely artistic terms, of the compositions and performances which were the product of disabled musicians’ interaction with the various adapted devices available. More recently, a small number of scholars have begun to engage with the serious issues which surround the aesthetic value of such work. These include Roger Knox and Tim Swingler, who has questioned the extent to which people with disabilities are able to create music which has authenticity and is satisfying and motivating to the player, and the extent to which electronic interfaces allow

¹ ‘Note-based’ is a term I use to describe music which is organised according to the standard Western system which utilises pitches from diatonic and chromatic scales and a rhythmic scheme based on beat subdivision.
individuals with disabilities to create music of a comparable standard to their non-disabled peers. 3

The Playing Field – Note-based Music
In my experience, judgements made regarding the quality of composition and performance of note-based music by disabled musicians using technology are negatively influenced by a combination of factors which can be outlined as follows:

- Musical conditioning of the audience. The expectations of audiences are inevitably conditioned by what they have seen and heard in mainstream concert venues delivered by non-disabled musicians playing conventional instruments. For most it is difficult to make the connection between the physical interaction of the performers with the technology and the notes and rhythms produced. The presence of a multitude of switches, cables and computer screens in the performance environment can be disconcerting to some audience members.

- Physical difficulties. Most styles of note-based music rely heavily on pulse and require precise rhythmic timing, which, even with the assistance of technology, often provides difficulties for those who don’t possess the necessary motor skills. The structure of the majority of note-based pieces implies that they will sound more or less the same each time they are played, over-emphasising the motor skills required to realise this in performance at the expense of imagination.

- Quality of sound. In most note-based compositions that I have heard by disabled musicians there is some attempt to replicate the sounds of standard acoustic and electric instruments. The problem here is that the sound quality of even the most advanced hardware and software synthesisers and samplers still falls short of that produced by these instruments.

I believe the factors outlined above have made it difficult for disabled composers and performers who use technology to break out of the ‘disability circuit’ of care centres, fund raising events and specially-invited audiences into the mainstream where audience members attend because they are genuinely interested in the artistic value of the compositions and performances.

The Playing Field – Sonic Art
My interpretation of the term sonic art embraces all of the genres and subgenres which combine the exploration of sound with the use of technology, including, amongst others, musique concrète, electroacoustic music, acousmatic music and electronica. 4 Composition and performance practice conventions in sonic art and those in note-based music differ in a number of ways which impact on the playing field for disabled artists. 5 To facilitate comparison, I have outlined these below under the same headings used in the discussion of the playing field in relation to note-based music:

- Musical conditioning of the audience. The expectations of audiences for sonic art are not coloured by comparisons with the physical movements associated with the playing of standard acoustic and electric instruments. The physical movements and gestures used by a disabled musician operating a fader on a Control Freak MIDI controller, for example, are essentially the same as those of a non-disabled musician. 6 The presence of large numbers of cables and devices is an accepted part of the sonic artist’s environment and, as such, is not likely to make audiences feel uncomfortable.

- Physical difficulties. There is often an emphasis on eradicating any feeling of pulse, creating more freedom for rhythmic interpretation and reducing the requirement for precisely timed execution and, in turn, finely-tuned motor skills. Works of sonic art which are performed live in real time imply an element of improvisation and freedom of structure, placing more emphasis on the imagination of the performer at the expense of motor skills.

- Quality of sound. The emphasis in works of sonic art is on the creation of mostly abstract original sound as opposed to any attempt at replication.

The different composition and performance practice conventions associated with sonic art do not, in my opinion, suggest any reduction in the capacity for the creation of quality work, rather, they alter the requirements regarding the type of skills needed to achieve this.

My personal interest in sonic art began in the mid-1990’s and focused on the work of composers such
as Michael Alcorn, Francis Dhomont, Jonty Harrison, Robert Normandeau and Denis Smalley, all of whom followed the practice of recording sound samples, transforming the sound of these samples using computer software such as C-sound, then constructing a montage from the transformations which would be played back from a storage medium such as CD or DAT tape in a concert space using a multi-channel speaker system. At this time, transformation procedures such as pitch change, phase-vocoding and granulation, were carried out within the software by typing the relevant lines of code then rendering a new sound file to create the transformed sound. With the subsequent advances in the processing power of computers and developments in software it became possible to execute these transformations in real time by manipulating certain chosen parameters using MIDI control messages generated by hardware controllers. By the end of the 1990’s I began to see how techniques that I was researching in my own work as a composer, for example, transforming audio samples in real time by using MIDI controllers to manipulate parameters in software such as C-sound and Max/MSP, could open up new vistas for disabled musicians, as the accessible hardware they used, such as Soundbeam and MIDICreator, generate the same MIDI control messages. With the combination of these MIDI controllers and assistive devices, such as trackball mice and keyboard overlays, which facilitate access to computer software, the tools and techniques used by both disabled and non-disabled musicians in the composition and performance of sonic art are essentially the same; this fact, when allied to the audience profile and performance environment associated with sonic art, represent potential for a level playing field.

The relevance of the ‘sonic art playing field’ to disabled musicians will now be examined in a case study which focuses on the Wired Ensemble.

Case Study – The Wired Ensemble

The Wired Ensemble is a group of disabled and non-disabled musicians who were brought together in Belfast in 1999 by the present writer as a specialist group dedicated to researching the most up-to-date equipment and methodology in the area of facilitating composition and performance using technology for people with disabilities. All of the members of the ensemble, numbering at various times between eight and ten musicians, were either tutors or students in workshops organised by the Drake Music Project in Ireland, and initially they followed approaches developed and practised in these workshops to create note-based compositions in a variety of styles including pop and rock.

The process of composition was undertaken using accessible MIDI controllers such as Soundbeam and MIDICreator which were utilised to interface with specialist software such as E-Scape and Midigrid to create sequences of notes which triggered instrumental sounds on synthesisers and samplers. In performance, similar equipment was used, with switches and MIDICreator being used to trigger playback of sections of songs in Midigrid and Soundbeam being used to generate single note scale sequences which triggered sounds on a synthesiser for solos.

Despite a huge amount of effort from everyone in composing, rehearsing and performing these pieces, the cold, hard fact was that, satisfying and motivating though the music was to the members of the ensemble, the compositions and performances were not of a standard comparable to the music of their non-disabled peers who in many cases they were attempting to emulate. I also felt that the audiences that the ensemble performed for, though demonstrably appreciative of the effort required to put together the show they were witnessing, were somewhat suspicious of the technology involved and of ‘how much it was doing for them’. The conditioned audience expectation in these ‘conventional’ concert environments also triggered some concern at the sight of so many cables, switches and computer

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9 Harrison, J., (1996) Articles Indéfinis IMED 9627
10 Normandeau, R., (2001) Claire de terre IMED 0157
12 For an explanation of these and other transformation techniques see www.trevorwishart.co.uk/transformation.html
13 MIDI is an acronym for Musical Instrument Digital Interface, a protocol which defines the standard that allows musical instruments, computer hardware and software to communicate musical information with each other. For more information on MIDI visit www.sonic-spot.com/guide/midi.html
14 www.csounds.com
15 www.cycling74.com/products/maxmsp
16 www.soundbeam.co.uk
17 www.midicreator.com
screens and more than one spectator commented on the macabre ‘science lab’ look of the performance set-up.

Around the same time I was attending mainstream concerts of electro-acoustic music and electronica which featured use of live electronics where this ‘science lab’ look was the norm rather than the exception. This fact, together with the realisation that the areas I was investigating as a composer were an untapped resource for disabled musicians, prompted me to explore how the Wired Ensemble might enter a musical environment, that of sonic art, in which their look, their equipment, and their compositional and performance practices would be accepted, by fellow musicians and audience alike, without prejudice.

The first step was to find out if the members of the ensemble were happy to explore new territory as musicians and I decided that the best way to find out was to listen together to some seminal pieces of sonic art by the composers mentioned above. The initial confrontation with these new sounds and concepts are invariably challenging for musicians from a conventional musical background and it was no different for the members of the Wired Ensemble. However, the positive response was unanimous and over the next few months the content of Drake Music Project workshops became focused on sonic art, in terms of listening to important pieces and analysing them, and of training tutors and students in the use of hardware and software in composition and performance situations featuring live electronics. During 2001, members of the ensemble worked with their tutors on composition of new pieces and the weekly Wired Ensemble rehearsals were geared towards realising these in live performance.

The director of Sonorities Festival of Contemporary Music, Professor Michael Alcorn, invited the ensemble to give a concert in the 2001 festival and their appearance was, as far as I am aware, the first time such an ensemble, comprising disabled and non-disabled musicians performing experimental electronic music, had participated in such a high profile, internationally recognised mainstream event. Critical response to the concert from composers and researchers of international stature, such as Professor Alcorn and Professor Piers Hellawell, was overwhelmingly positive and led to further appearances at the 2003 and 2004 Sonorities Festivals.

The concert in the 2004 festival was of particular significance for several reasons: first, the invitation to perform was linked to the opening, by one of the most important figures in the development of electronic music, Karlheinz Stockhausen, of one of the most technically advanced research facilities for sonic art anywhere in the world, the Sonic Arts Research Centre at Queens University Belfast; second, the concert took place in front of a large public audience in the same venue and using the same equipment as had been used by Stockhausen in a concert on the previous day; third, the internationally acclaimed violinist, Darragh Morgan, premiered a new piece, *Rush*, with the ensemble, which he had felt moved to commission from the present writer after attending a Wired Ensemble concert. In addition to *Rush*, the ensemble gave world premieres of two other experimental electronic pieces in this concert by members of the ensemble; *Traffic*, by Philip Calvert and *Faulty Leads Only* by Irene Kelly. All of the works in the programme were cutting-edge in terms of the hardware and software used and in the techniques required of the performers. The complex set-up comprised eight performers using an array of ultra-sonic sensors and switches to drive two Soundbeam 2 units, two Kenton Control Freak MIDI controllers, and three MIDICreators, all of which were used to manipulate parameters on CsoundAV, Max/MSP and Ableton Live software, running on three separate computer workstations.

13 www.qub.ac.uk/sonorities/old/2001/programme.pdf
14 www.qub.ac.uk/sonorities/old/2003
www.qub.ac.uk/sonorities/old/2004
The mainstream international recognition of the artistic achievements of the Wired Ensemble is not due to their suddenly becoming more creative overnight; they, like so many other disabled composers and performers are bursting with talent and success followed when their creative energies were channelled in a direction which gave them a chance to compete artistically on a level playing field.

**Sonic Art Pathways in Further and Higher Education**

The disabled members of the Wired Ensemble depend on tutors who are specially trained by the Drake Music Project for their learning. For most of these disabled musicians, progression into further and higher education is not an option due to the legacy of a system in the UK and Ireland which did not afford them the opportunity to achieve the necessary qualifications for entry. With the combination of the explosion of specialised music technology courses in further education colleges and universities and legislation in the form of SENDA (Special Educational Needs and Disability Act 2001) and SENDO (Special Educational Needs and Disability Order 2005) it is reasonable to assume that more disabled musicians would avail of these training opportunities. However, there is no evidence to suggest that this is happening at present. This could be for a number of reasons, including the prohibitive costs of adaptive technology and a lack of communication regarding the opportunities which do exist. I feel that there is a dual responsibility here; disabled musicians must proactively engage with existing opportunities facilitating access to further and higher education and colleges and universities must ensure that suitable pathways, such as those in sonic art, are in place and that these are communicated more efficiently to interested parties.

**Conclusion**

This paper proposes an avenue of exploration for those musicians with disabilities using technology who take their art seriously and who strive to be valued as composers and performers in the mainstream. I have argued that the sonic art environment provides the opportunity for disabled musicians to compete with their non-disabled counterparts on a more equal footing than at any time in the history of

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[www.deni.gov.uk/index/7-special_educational_needs_pg/special_needs-legislation_pg/special_educational_needs_-_legislation_sendo_pg.htm](http://www.deni.gov.uk/index/7-special_educational_needs_pg/special_needs-legislation_pg/special_educational_needs_-_legislation_sendo_pg.htm)
music; the type of mainstream success achieved by the Wired Ensemble can become the norm rather than the exception if increasing numbers of disabled musicians grasp the possibilities offered by sonic art and become proactive in engaging with expanding educational opportunities.

**About the Author**

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Dr. Frank Lyons is Lecturer in Music Technology, Composition and Popular Music at the University of Ulster. His research interests include music technology and disability, electro-acoustic composition and improvisation using live electronics. He directs the Wired Ensemble, a new music group which combines disabled and non-disabled musicians, using cutting-edge sensor technology and software to compose and perform original works. As a composer, his work has been performed in the UK and Ireland, Europe, Australia and the United States and has been broadcast by the BBC and RTE. He is a Music Technology Consultant for arts and disability groups Share Music Sweden, Share Music UK and the Drake Music Project.
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