

<b>Institution: BRUNEL UNIVERSITY (H0113)</b>
<b>Unit of Assessment: 35 – Music, Drama, Dance and Performing Arts</b>
<b>Title of case study: Auditory streaming and the intelligibility of sung texts in music for vocal ensemble</b>
<p><b>1. Summary of the impact</b> (indicative maximum 100 words)</p> <p>Since 2006 Professor Christopher Fox has been engaged in a series of linked projects which explore ways in which the engagement of performers and listeners in texted music for vocal ensemble can be enhanced. The research was initially based on received understandings of the perceptible relationship between music and text but, as the project and its impact have developed, the research has extended into a collaborative scientific study of this relationship, funded by two successive awards from the Wellcome Trust. Each stage of the research has been extensively disseminated through public performance, broadcast, recording, print and on-line media and the impact of the research now reaches into a wide range of communities of interest and the general public.</p>
<p><b>2. Underpinning research</b> (indicative maximum 500 words)</p> <p>The research has been undertaken by Professor Christopher Fox and is a developing project in four main phases, investigating the relationship between text and music in new composition for vocal ensemble. This relationship is the subject of a number of longstanding assumptions held by musicians particularly about the extent to which sung texts are intelligible.</p> <p>Fox's initial study, <i>20 Ways To Improve Your Life</i>, focused on predominantly syllabic settings of short contemporary texts whose banality (they were drawn from small ads in free-sheet newspapers) might be expected to make them readily intelligible. As these settings could also be heard as a 21st century version of 'City Cries', a genre of the 15th and 16th centuries (cf. Jannequin, Gibbons, Weelkes, etc), the work was taken up by The Clerks (director, Edward Wickham), a group which specialises in Renaissance vocal music.</p> <p>A second pilot study, <i>Sing a new song</i>, juxtaposed different elements of a text, using the classically-trained voices of The Clerks as counterpoints to a unison line sung by children. This phase of the project was funded by Faber Music as part of their work for <i>Sing Up</i>, the government initiative to encourage singing in schools. Government-funding for <i>Sing Up</i> was withdrawn in 2011 but its on-line resources remain available and <i>Sing a new song</i> continues to be used in schools.</p> <p>A third, more substantial phase grew out of the evaluation of these initial studies. It was realised that a more systematic investigation was needed into the degree of intelligibility achieved by each musical setting. Edward Wickham proposed the Brungart test, an auditory streaming test devised by the US Air Force to train air-traffic controllers, as a model and a new work was devised in which voices within a Brungart test gradually turn into characters in a domestic drama scripted by Wickham. A successful grant application was made to the Wellcome Trust's 'Public Engagement' funding stream and three scientific advisers – experts in linguistics and acoustics – were added to the project team. The resultant work, <i>Roger go to yellow three</i>, is a 25 minute-long performance within which a number of tests are embedded for listeners to complete as it progresses.</p> <p>The data from performances of <i>Roger go to yellow three</i> yielded a range of new findings about the effects of masking between auditory streams, summarised in a conference poster by Heinrich, Cross and Hawkins – 'Stream segregation of speech in live concert-hall performances of a 6-voice choir' – and a second, more substantial funding application was made to the Wellcome Trust for the creation of a work within which further tests are embedded to investigate these masking phenomena and the role of harmonic and melodic dissonance in determining listeners' focus. The application was approved in summer 2012 and the new work, <i>Tales from Babel</i>, again with a libretto by Wickham, was premiered at the Cheltenham Festival in July 2013 and toured in the UK in autumn 2013.</p> <p>The composition of new music is a key element underpinning the research produced by the Centre for Contemporary Music Practice (CCMP), the Music Research Centre at Brunel University, and Fox's work is complemented by similar work being undertaken on new techniques for vocal music by other members of the CCMP, particularly Harald Muenz and Jennifer Walshe. Fox's former PhD</p>

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student, Dr Simon Katan, is also involved in related research and during the latter stages of the project he built the web-site which enables on-line participation in the project (see section 5 for URL). Specific support for this project was provided when The Clerks were invited to perform an early version of *Roger go to yellow three* at the School of Arts' 'Researching the Arts' conference in May 2011 so that the data collection method used in gathering listener feedback could be tested. Further support was provided through a period of study leave (academic year 2012-13) for Fox to enable him to compose the music for *Tales from Babel*.

**3. References to the research** (indicative maximum of six references)

Christopher Fox

*20 Ways To Improve Your Life*

2007

Composition. Parts of the work were broadcast on The Verb, BBC Radio 3, 19 October 2007.

The complete work was premiered at the Spitalfields Festival, 14 June 2008.

Christopher Fox

*Don't talk, just listen*

2009

CD. Signum Records SIGCD174 (also includes Fox's *A Spousal Verse* and other works by Jackson, Pitts and Saxton)

Christopher Fox

*Sing a new song*

Composition. Commissioned by Faber Music for *Sing Up* (£2000)

Christopher Fox and Edward Wickham

*Roger go to yellow three*

2011

Composition. Funded by a Wellcome Trust Small Arts Award (£16,005) to The Clerks.

Christopher Fox and Edward Wickham

*Tales from Babel*

2013

Composition. Funded by a Wellcome Trust Large Arts Award (£60,000) to The Clerks.

**4. Details of the impact** (indicative maximum 750 words)

The impact of this project lies not only in the musical works which have been produced during the research but also in the new understandings which have been developed as the project has progressed about the ways in which listeners respond to and understand multiple streams of auditory information in these musical works and, by extension, in texted vocal music in general. Performance of the musical works has generated new hypotheses about auditory streaming and in the latter phases of the project the testing of these hypotheses has embraced both compositional practice and scientific investigation, a process enabled by substantial support from the Wellcome Trust.

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Although the impact of the latter phases of this project are potentially the most wide-reaching and influential, there has nevertheless been considerable impact at every phase. The initial output, *20 Ways To Improve Your Life*, generated extensive interest through its musical, textual and social significance. The work was presented and discussed on BBC Radio 3's *The Verb* while it was still a work-in-progress; it received concert and street performances at the Spitalfields Festival and was recorded by Signum Records for a CD which on release was in *Gramophone* magazine's Top Ten for January 2010. It was also heard on the soundtrack of Channel 4's *Dispatches* documentary, 'The trouble with Boris', and a new version for mass participation was commissioned by the Greater London Authority and performed outside the Tower of London.

*Sing a new song* has been published by Faber Music and is also available as a download from the *Sing Up* website. It has been adopted by a number of schools, particularly in east London and in Cambridgeshire and was broadcast in BBC Radio 3's *The Choir*.

The impact of the initial stages of this research were recognised by the Wellcome Trust when they chose to support the application made by The Clerks to develop the project further with a grant from the Trust's Small Arts Award scheme. The impact was also demonstrated by the willingness of three scientists, Professors Ian Cross and Sarah Hawkins of Cambridge University and Dr Antje Heinrich of Leicester University, to join the project team for the development of *Roger go to yellow three*. They were involved in presentations of the research at the 2011 Cambridge Festival of Ideas and further interest in the project was reflected in its discussion on BBC Radio 3's *Music Matters* programme and public performances in Cambridge and Huddersfield. The performances of *Roger go to yellow three* drew a further positive response from the Wellcome Trust, who were impressed not only by the work's impact in developing public understanding of the phenomenon of auditory streaming but also by the way that the auditory tests embedded in the work enabled the project's scientific advisers to undertake new scientific research. The data collected in the *Roger go to yellow three* performances was extensively analysed and yielded findings which offer new insights into the phenomenon of masking. Dr Antje Heinrich presented an initial survey of these findings, under the title 'Stream segregation of speech in live concert-hall performances of a 6-voice choir', at the British Society of Audiology's 2012 conference.

The success of *Roger go to yellow three*, as a project which not only encouraged public engagement in science but also enabled scientists to gather new experimental data, led to the Wellcome Trust inviting The Clerks to submit an application for a Large Arts Award to develop further the work begun in *Roger go to yellow three*. Confirmation of the impact of the research and the Wellcome Trust's commitment to the project came in summer 2012 when this application was approved and the impact of the project was further demonstrated by the widespread interest of festivals and concert promoters in presenting the new work, *Tales from Babel*. A fourth scientist, Dr Sarah Knight, joined the team to oversee data collection and public presentations of the scientific aspects of the project. Scenes from *Tales from Babel* were presented on 5<sup>th</sup> April 2013 during the Second International Conference of the AHRC Research Centre for Musical Performance as Creative Practice, at the British Neuroscience Association's biennial meeting at the Barbican, London on 8 April 2013 and at Addenbroke's Hospital; the premiere of the complete work was given as part of the Cheltenham Festival of Music on 7 July 2013, the first date in a concert tour which extended into the autumn of 2013. In the wake of the Cheltenham Festival there has been extensive media coverage including BBC Radios 3 (*In Tune* and *The Choir*) and 5 Live, and articles in the *Independent*, *NME*, *Times*, *London Evening Standard* and *Guardian*.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

Norman Lebrecht, 'Fun use of a free newspaper', 29 October 2009, [http://www.artsjournal.com/slippedisc/2009/10/fun\\_use\\_of\\_a\\_free\\_newspaper.html](http://www.artsjournal.com/slippedisc/2009/10/fun_use_of_a_free_newspaper.html)

Carla Rees, 'The Clerks: Don't Talk – Just Listen!', Musicweb International, [http://www.musicweb-international.com/classrev/2010/Jan10/Dont\\_Talk\\_sigcd174.htm](http://www.musicweb-international.com/classrev/2010/Jan10/Dont_Talk_sigcd174.htm)

*The Gramophone*, January 2010: 'Don't Talk - Just Listen!' CD, selected as one of the Top Ten

## Impact case study (REF3b)

discs of the month

*Sing a new song*, downloads from Sing Up website, <http://www.singup.org/songbank/songbank/song-detail/view/427-sing-a-new-song/>

*Sing a new song*, broadcast on *The Choir*, BBC Radio 3, 24 April 2011  
<http://www.bbc.co.uk/programmes/b010qlpb>

Wellcome Trust press release, 'Roger go to yellow three: choral composition to explore the cocktail party effect, 24 October 2011, <http://www.wellcome.ac.uk/news/media-office/press-releases/2011/wtvm053233.htm>

*Music Matters*, 'Roger go to yellow three', BBC Radio 3, 4 February 2012  
<http://www.bbc.co.uk/programmes/b01blz5>

A. Heinrich\*, I. Cross§ and S. Hawkins§. (\*MRC Institute of Hearing Research, Nottingham, UK; §University of Cambridge, Cambridge, UK), 'Stream segregation of speech in live concert-hall performances of a 6-voice choir', British Society of Audiology conference (5-7 September 2012, Nottingham) [http://www.talesfrombabel.co.uk/wp-content/uploads/2013/02/Heinrich\\_etal\\_BSA.pdf](http://www.talesfrombabel.co.uk/wp-content/uploads/2013/02/Heinrich_etal_BSA.pdf)

*Roger go to yellow three* and *Tales from Babel*, recordings and other resources, The Clerks' website [http://www.theclerks.co.uk/programmes\\_Roger.html](http://www.theclerks.co.uk/programmes_Roger.html) and <http://www.talesfrombabel.co.uk/>

The Guardian, 'Rivers of babble on: how word became the servant to music', 28 June 2013  
<http://www.theguardian.com/music/2013/jun/28/tales-from-babel-word-servant-music>

On-line tests demonstrating auditory streaming <http://sample-talesfrombabel.eu01.aws.af.cm/#>

'Listening in the presence of competing sound is a major challenge for hearing impaired people [...] this was an example of clinical skills, auditory science and art coming together to glean new insights.' David Baguley PhD MBA, Consultant Clinical Scientist, Head of Audiology, Cambridge University Foundation Hospitals Trust.