Thursday 14\textsuperscript{th} September

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-10:00</td>
<td>Registration and Coffee</td>
</tr>
<tr>
<td>09:45-10:00</td>
<td>Welcome</td>
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<tr>
<td>10:00-10:15</td>
<td>Reflections of a deaf church organist</td>
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<td>\textit{Brian Henderson}</td>
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<tr>
<td>10:15-10:45</td>
<td>AHRC-funded Hearing Aids for Music project</td>
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<td>\textit{Alinka Greasley}</td>
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<td>This talk will give an overview of the aims, methods, findings and key outputs of the Hearing Aids for Music project.</td>
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<td>10:45-11:15</td>
<td>Effects of hearing aids on music perception</td>
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<td>\textit{Sara M. K. Madsen and Brian C. J. Moore}</td>
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<td>Hearing aids and fitting methods for hearing aids are mainly designed to optimize speech intelligibility. Perhaps this is the reason why many hearing-aid users are not satisfied with their hearing aids when listening to music. Reports of such dissatisfaction inspired the internet-based survey presented here. The survey was designed to identify the nature and prevalence of problems associated with listening to live and reproduced music with hearing aids. Responses from 523 hearing-aid users to 21 multiple-choice questions and one open question are presented and the relationships between responses to questions regarding music and questions concerned with information about the respondents, their hearing aids and their hearing loss are described. Large proportions of the respondents reported that they found their hearing aids to be helpful for listening to both live and reproduced music, although less so for the former. The survey also identified problems such as distortion, acoustic feedback, insufficient or excessive gain, unbalanced frequency response and reduced tone quality. The results indicate that the enjoyment of listening to music via hearing aids could be improved by an increase of the dynamic range, extension of the low-frequency response, and improvement of feedback cancellation and automatic gain control systems.</td>
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<td>11:15-11:45</td>
<td>Coffee</td>
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### 11:45-12:30

| **Consideration of physical and perceptual factors in aided music listening** |
| **Maja Serman and Mirko Arnold** |
| Sivantos GmbH, Erlangen, Germany |

Music listening can be examined from two perspectives. From the physical perspective, music, as any other sound, is defined as propagation of pressure disturbance through a medium. From the perceptual perspective, these pressure disturbances are coded and represented throughout various stages of the auditory system, resulting in a multitude of experiences which we think of as sound.

With regard to the physical realm, hearing aid processing must create a faithful rendition of a wide range of signals that comprise musical sounds, with as high spectral resolution and as little delay and distortion as possible. In the perceptual realm, the properties of the auditory system and the broader cognitive characteristics of hearing impaired listeners influence their listening experiences (e.g. short term tonal and verbal memory, musical background etc.).

In our talk, we will present ongoing research and development in the Sivantos R&D team, where we explore music listening with hearing aids from both of these perspectives. The audible characteristics of music depend heavily on the way it is performed, recorded and reproduced. We will discuss three different music programs, which have been developed to cover a wide spectrum of current music listening situations. We shall also discuss recent study results exploring the influence of tonal working memory and musical background on speech performance in hearing impaired listeners.

### 12:30-13:00

| **Beyond the audiogram: A consideration of the practical, emotional and psychological factors which may impact music engagement following hearing loss** |
| **Lena Batra** |

Hearing loss and remedial technology play a significant part in an individual's auditory perception of music following hearing loss.

However, on the basis of my clinical observations of music lovers and musicians attending the audiology setting, the extent to which music engagement is perceived to become, and remain, a problem for an individual wearing hearing aids does not consistently correlate with the severity of hearing loss.

This talk discusses other factors which can play an important role in the willingness and ability of the client to engage with music using listening technology, while also providing an overview of the practical rehabilitation measures which can materially enhance the appreciation of music for hearing aid users.

### 13:00-14:00

**Lunch and Exhibition**

### 14:00-15:00

**Workshops (x4)**
<table>
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<th>Time</th>
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| 15:00-15:30 | **Musicians and the prevention of hearing loss**<br>
*Marshall Chasin,*<br>
*AuD, Musicians’ Clinics of Canada*<br>
Music exposure can pose a problem, especially with the advent of “portable” music. Despite the complexity of the human auditory system, it does not know the difference between industrial noise and music. Indeed, many of the factors can equally affect music exposure as well as industrial exposure. This talk is an overview of those factors affecting hearing for musicians as well as environmental strategies and hearing protection to minimize the potential damaging effects of music. |
| 15:30-16:00 | Coffee                                                                |
| 16:00-16:15 | **Reflections from a deaf music therapist**<br>
*Cathy Bowker* |
| 16:15-17:00 | **Training deaf musicians**<br>
*Chris Rocca* |
| 17:00-18:00 | Exhibition, Networking and Wine Reception                              |
| 18:00-19:00 | **Concert “4orte”**                                                  |
**Friday 15th September**

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<th>Time</th>
<th>Speaker</th>
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<tr>
<td>09:00-09:30</td>
<td><strong>Rick Ledbetter</strong></td>
<td><strong>Music in the view of a hearing aid manufacturer</strong></td>
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<td><em>Volker Kühnel, PhD, Sonova AG, Stäfa, Switzerland</em></td>
<td><strong>Traditionally the main functionality of hearing aids is making soft speech sounds audible and intelligible again while keeping the loudness of loud sounds comfortable. Typically different flavours of automatic dynamic gain control (AGC) are applied to achieve this goal. In addition directional microphone technology helps to get speech in noisy situations above the noise to enable communication in adverse listening situations to enhance clarity (improve the SNR). In recent years perception of music with hearing aids is getting in the focus of researchers more and more. Here the listening goal is a natural sound quality. Modern hearing aid technology, when configured correctly, has made some progress over the last years. Factors influencing the perceived sound quality of music are discussed (namely: frequency response, dynamic range, system noise, distortions at high sound pressure levels and the effect of dynamic gain control). A study investigating different aspects of music perception with different hearing aid solutions is presented. An expert panel of hearing impaired expert listener rated different attributes that contribute to the perceived sound quality. These attributes are discussed. Another aspect is the availability of low energy Bluetooth technology which enables direct audio streaming e.g. from a TV set or smartphones to the hearing aids. This allows wireless listening to high quality audio media. Factors affecting sound quality in this application are discussed. Important factors here are the performance of the audio codec applied, and the treatment of direct sound and venting in the hearing aid.</strong></td>
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<td>10:00-10:30</td>
<td><strong>Dr Kei Kobayashi</strong></td>
<td><strong>Improving music preference in hearing loss through fitting psychoacoustic model with their equivalent rectangular bandwidth</strong></td>
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<td><strong>Timbre perception in music almost certainly depends on the frequency selectivity of the ear, and the resulting spectral shape is then represented in the excitation pattern. In an ear with cochlear damage, frequency selectivity and loudness recruitment are usually aggravated which may result in greater difficulty in identifying contrast in the excitation pattern (cf. Moore, 1998). To address these issues, the author investigated individual equivalent rectangular bandwidth (ERB) over five center frequencies (0.25, 0.5, 1, 2, 4kHz), manipulated psychoacoustic model for the individual and developed spectral subtraction to suppress excessive loudness and associated masking which improved spectral contrast of multiple musical components (e.g. musical instrument, formants/consonants in vocals). The processing effect was investigated using a musical preference questionnaire which asked participants to rate the target sound (on loudness, fullness, clearness, naturalness and dynamics) compared to the original sound. A pop track (tempo: 94bpm) composed of male vocal and musical instruments (two guitars, one bass, drums, piano) was used. 34 elderly</strong></td>
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adults participated (mean age = 72.7, SD=6.2; 21 normally hearing and 13 hearing impaired in average absolute threshold). Results of paired t-tests showed that preference ratings were significantly higher in the processed music conditions. In particular, loudness preference was significantly improved ($p<0.01$). This result indicates feasibility of a front-end spectral enhancement technique to manage a sound optimization by manipulating psychoacoustic model.

**10:30-11:00**

**Hearing aids and music: An analysis of the factors influencing user satisfaction**

Rémi Marchand $^{a,b,c}$ Jörg Buchholz $^{a,b,c}$ Harvey Dillon $^{a,b,c}$ Valerie Looi $^{d,a}$

*a National Acoustic Laboratories, b The HEARing Cooperative Research Centre, c Macquarie University, Department of Linguistics, d Sydney Cochlear Implant Centre*

Most hearing aid research has focused on optimizing speech perception in noise, and little attention has been given to listening to music. In this study, a survey was conducted with the aim to better understand the musical listening habits of hearing aid users, whether or not they use their hearing aids to listen to music, and to identify the main issues they experience while listening to music. The survey consisted of 42 multiple choice and open ended questions. Respondents were recruited from two large databases available at the National Acoustic Laboratories, providing detailed information about the respondents such as their age, gender, type and degree of hearing loss, and information about their hearing aids. Preliminary results from 41 respondents show that hearing aid users are mainly listening to recorded music at home. The majority of them responded that they did not know if their hearing aids included a music program and most of them do not change the settings of their hearing aids when listening to music. The survey identified that the most prevalent problems are difficulties to understand the lyrics, the soft passages of music being too soft, the music being too loud, melody perception issues, and lack of clarity of the music. Respondents reported being generally satisfied by the performance of their hearing aids for listening to music, although they were generally less satisfied with live music than recorded music. Hence, hearing aids need to be modified to improve the enjoyment of music depending on the listening conditions.

**11:00-11:30**

**Coffee**

**11:30-12:00**

**Music Appreciation and Participation in Children with Hearing Loss**

Erik Jorgensen and Elizabeth Walker, PhD, CCCA, CCCSLP

University of Iowa

**Rationale:** The purpose of this study is to examine outcomes of music appreciation and participation in two cohorts of five grade children with and without hearing aids. While much research has been conducted on music outcomes in children who are cochlear implant users, little research has been conducted on these same outcomes in children who wear hearing aids.

**Methods:** A survey was developed and face validity was evaluated by
experts in the field, parents of children with hearing loss, and a statistician. The survey consists of three sections: engagement with recorded music, engagement with live music, and participation in musical training. The survey includes questions regarding frequency, importance, musical genres, and hearing aid use. In the first round, 58 surveys were returned (15 normal hearing, 43 hearing loss). A second cohort will be surveyed in May 2017. Participants were identified through their participation in the OCHL study (for more information, visit www.ochlstudy.org).

**Results/Discussion:** Preliminary results suggest that children with hearing aids engage with music, particularly recorded music and musical training, at equal or greater rates than normal hearing children. This finding may suggest that parents with children who have hearing loss may be inclined to encourage them to pursue auditory based activities. It might also suggest that children with hearing loss are more likely to seek out musical experiences due to a lifelong focus on audition. Interpretations should be tempered by demographics of survey participants, lack of perceptual data, and general issues with parent report. Data collection and analysis are ongoing.

**12:00-12:30**

**Bimodal research**

*Chris Rocca*

**12:30-13:00**

**Music perception of adult cochlear implant and hearing aid users**

*Valerie Looi*

*Senior Research Manager, Sydney Cochlear Implant Centre*

In many areas of research and technology, the hearing aid (HA) literature is far more advanced than the cochlear implant (CI) literature. For example, automatic scene selection and automatic background noise reduction are comparatively new features in CI processors. However on the topic of music perception, the research from the CI field is significantly more advanced than the HA literature. It is well accepted that adult CI recipients score significantly lower on music perception tests, and rate music to sound poorer than normally hearing (NH) listeners. In more recent times, it has also been shown that although CI users perform worse than HA users with significant hearing loss at some music tasks, HA users do not perform equivalently to NH listeners, and on some tasks, score similarly to CI recipients. This presentation will start by summarising the current state of knowledge on music perception and appreciation of adult CI recipients, and then compare these findings to outcome from adult HA users with significant sensorineural hearing losses. Although HA users with moderately-severe to profound hearing losses are better than CI recipients at pitch and melody perception tasks, they perform similarly on timbre perception tasks, and seem to rate music to sound less pleasant than CI recipients. These findings suggest that a significant sensorineural hearing loss impacts on music perception, regardless of whether acoustic or electric hearing is used. However, music training programs have been shown to be beneficial for CI recipients, and to a lesser extent, HA users. Implications and findings from the CI literature that should be considered in music training programs for adult HA users will also be discussed.

**13:00-14:00**

**Lunch and Exhibition**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
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<tbody>
<tr>
<td>14:00-15:00</td>
<td>Workshops</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>Sam Lanes</td>
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<tr>
<td>15:15-16:00</td>
<td>Plenary and Future Directions</td>
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<td><em>Marshall Chasin and Alinka Greasley</em></td>
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<tr>
<td>16:00-16:30</td>
<td>Coffee and close</td>
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### WORKSHOP 1
**Cognition, hearing aids and music**  
*Thomas Behrens* (Oticon)

New research is adding to our understanding of how hearing loss affects cognitive processing. A central aspect of cognitive processing is selective attention, as it is helping us suppress competing sounds in a busy and constantly changing world. In two recent studies, different techniques were used to look at general cognitive load and selective attention. The studies provide evidence that attention is a fragile concept that is jeopardized by the added cognitive load of hearing loss. This workshop will review and discuss these studies to provide a framework for how hearing loss affects detailed auditory perception, as needed for music appreciation. It will further review and discuss how modern hearing aids can be programmed to reduce different kinds of noises, amplify and compress to improve perception. Finally, it will discuss how reduction in cognitive load (as evidenced by recent studies) imposed by hearing loss can be reduced, freeing up capacity for improved auditory perception. With more cognitive capacity available, the latest evidence suggests music appreciation is improved and people can better remember their musical experiences. The outcome of these discussions can inform future research and clinical work related to how hearing aids can be further improved to make music appreciation even better for people with hearing impairment.

### WORKSHOP 2
**Optimising hearing technology for music: It’s not all down to software.**  
*Gary Holland* – AudioLogical Limited

Hearing instrument technology has advanced at a rapid rate since the introduction of DSP technology in 1996. However the main focus of technology has been on optimising speech for the user and, in particular, speech in noise. Whilst there are some similarities between speech and music signals, there are also some huge differences. The whole patient journey starting with the hearing assessment followed by hearing instrument selection, fitting, programming, verification and validation need to be considered differently where listening to music is important. Simply relying on a ‘Music’ programme from the manufacturer is unlikely to produce the best results, especially if the basic acoustics have not been properly considered. It’s also possible that the patient/client’s satisfaction with the hearing technology could be negatively impacted if it does perform as expected with music signals. In this workshop we will review some of the practical factors that can have a major impact on the success (or failure) of using hearing technology for music listening. Using real examples and we will consider some of the tips and tricks that can optimise hearing instrument performance for the user, and also review some limitations that may be difficult to address. Whilst the workshop will be of particular interest to Audiologists and Hearing Care Practitioners, it will also cover some practical solutions that the hearing technology wearer can use to maximise their enjoyment when listening to music.
WORKSHOP 3

Developing self directed music learning activities for adult hearing aid users

Valerie Looi
Senior Research Manager, Sydney Cochlear Implant Centre

The aim of the workshop is to develop collectively a list of different music activities which could be given to adult HA users who want to re-introduce themselves to, and/or improve their music perception. The facilitator published a list of music activities in ‘ENT and Audiology news’ in 2016 that could be provided to adult CI users wanting to work on their music listening skills independently. Examples include listening to the same piece through different playback modes (e.g. stereo, computer, MP3 player) and noting any differences in the sound; listening to contrasting styles within preferred styles (e.g. orchestral vs. chamber) with a focus on instrumentation; and listening with different programs (e.g. everyday vs. music program) to explore similarities and differences in sound quality. In this workshop, participants will look at the activities and discuss their suitability for adult HA users, or how they can be modified to be more applicable for HA users. Further, additional activities that could be included will also be discussed and developed.

The goal is for workshop participants to help in the construction of a list of different music activities which are suitable for HA users with different levels of hearing losses and different musical abilities that practitioners can then suggest to HA users. As part of the workshop, we will discuss how each activity could be ‘introduced’ and explained to HA users, and built upon as their skills progress, as well as any resources that could be recommended. The workshop will draw on the expertise of different participants (HA users, practitioners, manufacturers) to adapt a CI-specific resource to HA users; the list of the CI music activities will be provided to the participants prior to the workshop for them to read and consider.

WORKSHOP 4

Hearing is Believing
Phonak (TBC)

This workshop will use sound samples processed through different hearing instrument music programmes and the output recorded via a Kemar manikin. The recorded samples will be presented via headphones to participants in the form of an ‘a-b-c’ comparison which participants will be asked to perceptually rate in rank order. In this listening task, any perceived differences will be considered to arise from respective algorithms and/or technical limitations.

WORKSHOP 5

Virtual hearing aids, binaural audio, and gamification for better hearing aid adoption
Lorenzo Picinali and Yuli Levtoy  
Imperial College London, Reactify Music

3D Tune-In is an EU-funded project with the primary aim of improving the quality of life of hearing aid users. Musiclarity, one of the applications being developed as part of the project, is dedicated to improving the experience of listening to music for hearing aid users. This talk provides an overview of how Musiclarity uses virtual hearing aid technology and binaural audio to improve the music listening experience, and provides a novel way of improving communication between audiologists and their patients.

After the presentation, there will be the possibility for attendees to try the Musiclarity web application, and to install on their computers the 3D Tune-In Toolkit test application (see http://www.3d-tune-in.eu/toolkit-developers), which allows to perform full binaural audio spatialisation with any chosen audio track(s), including hearing loss and hearing aid simulations.

WORKSHOP 6  
Hearing Rehabilitation  
Harriet Crook and Heather Austin  
Sheffield Teaching Hospitals NHS Foundation Trust

This workshop covers the practicalities of providing a hearing aid equipment and support service within routine audiology services with a focus on how this can support music listening. At Sheffield Teaching Hospitals we have provided a longstanding hearing aid equipment support service. This covers counselling to optimise use of aids, ensures users are empowered to understand their hearing loss, their own aids and are aware of all the listening options available to them - VIA ALD’s, loop phone etc. for a variety of listening settings. It allows trials of equipment and tailored provision of advice in addition to help accessing other support services. We have found many patients struggling with music listening have benefitted from this service and will present some case examples of these. This is informed by the findings of the Hearing aids for Music research project in relation to hearing aid users' expectations and common misunderstandings about hearing loss and hearing aids. We will discuss pathway used, and what to consider in establishing a similar service and resources that can be used for music. In addition this workshop will include an interactive session with participants to gather information on what is currently being provided, resources that are available regionally around the UK and other online resources that are being used for music. Including what is provided by clinics/charities/music venues nationally. The aim of the workshop is to pool data that can be shared via the HAFM website as a resource for clinicians and hearing aid wearers.

WORKSHOP 7  
Wired and unwired for sound – the next stage in the development in technology for listening to music  
Richard Vaughan Connevans ALDs, James Mander The Ewing foundation
Hearing aid users have long been able to maximise the benefits their hearing aids offer them by connecting to other audio devices. Methods such as the telecoil or direct audio input (DAI) shoes with connecting leads remain popular, effective and affordable.

However with the developments of the wireless technology by the manufacturers, a new range of possibilities for listening to music with flexibility and convenience has emerged.

This workshop will examine the developments in assistive listening and wireless connectivity options for hearing instruments and give an overview of the range of accessories currently available. Also we hope to share experiences of users and their ability to listen and enjoy music.

**WORKSHOP 8**

**Starkey hearing technologies workshop**

*Sue Falkingham* and *Paul Lamb*

*Starkey*

Music has a wider bandwidth and greater dynamic range than speech. It enables us to enjoy the soaring high notes of a flute and the deep lows of a bass drum when we can hear the full range of those extremes. For many years, we have compromised on the amplification of music in our wide dynamic range compression instruments. We had good reason to do that as we know WDRC works well for speech understanding and this has taken priority over music amplification. Starkey Hearing Technologies have developed a new way to amplify music within their Muse and Halo 2 Hearing Instruments. With a dedicated second compression system designed to give a wider dynamic range to the musical inputs and a more linear approach to amplification we can allow soft music to be audible whilst loud music retains its punch. We will demonstrate the music amplification of Muse products and explain some of the research behind the dedicated features, formula and fine tuning available in the products. Streaming directly to hearing instruments requires an approach that compensates for acoustic differences between a microphone and a streamed input. As streaming becomes ever more common and useful to the end user of a hearing instrument we will take this opportunity to cover some of these differences and how you might optimally use streamed inputs for music amplification.
Electroacoustic correlates of subjective sound quality for hearing aid processed music

Jonathan Vaisberg\textsuperscript{1,2}, Paula Folkeard\textsuperscript{1}, Ewan Macpherson\textsuperscript{1,3}, Vijay Parsa\textsuperscript{1,3}, and Susan Scollie\textsuperscript{1,3}

\textsuperscript{1} Western University, National Centre for Audiology, London, ON
\textsuperscript{2} Western University, Graduate Program in Health & Rehabilitation Sciences, London, ON
\textsuperscript{3} Western University, School of Communication Sciences & Disorders, London, ON

Objective(s): The purpose of this study is to compare hearing impaired listeners’ subjective sound quality ratings of hearing aid processed music between several premier hearing aids and the hearing aids’ respective universal and music programs. This study also strives to identify electroacoustic characteristics associated with changes in subjective sound quality.

Background: Listening to music is an enjoyable aspect of many people’s lives. However, music enjoyment may become compromised for an individual with hearing loss. Hearing aid amplification is a frequent intervention to overcome inaudibility of sound due to hearing loss. However, hearing aids are often thought of as devices which improve speech perception rather than other complex sounds such as music. Music can be broader and more variable than speech in the intensity and frequency domains. As a result, hearing aids optimized for speech may not amplify music as effectively. Manufacturers often include dedicated music programs in their products. However, a music program’s electroacoustic behaviour is not always transparent, and its efficacy improving music sound quality is often left unmeasured. Sound quality differences between hearing aids and programs, and electroacoustic correlates which drive those differences, are therefore of interest to academics, clinicians, and manufacturers.

Methods: Hearing impaired listeners rated the sound quality of music samples recorded via the universal and music programs of five hearing aids. Recordings were individualized using each hearing aid’s proprietary fitting formula. Recordings were electroacoustically evaluated using measurements of bandwidth and intensity. Bandwidth measures included average spectrum levels, and upper and lower cut-offs of audibility. Intensity measures included dynamic range, compression ratio, and envelope detection index.

Results: Sound quality differences were most apparent between hearing aids. A music program improved ratings for two hearing aids, although the magnitude of improvement was less than the difference between a high- versus low-rated hearing aid. Electroacoustic correlates are currently being analyzed.

Conclusions: Optimal music sound quality appears to be a question of hearing aid selection, rather than music program selection. However, it is possible that measureable parameters in signal processing adjustments may be related to music sound quality, which may inform clinical fine tuning.

Funding: This study was funded with support from Sivantos & Ontario Research Fund. The authors report no conflicts of interest.
### Biographies

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<tr>
<th>Mirko Arnold</th>
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<td>Mirko Arnold graduated in media technology from Ilmenau University of Technology, Germany, with focus on audio signal processing. He received his Ph.D. in computer science from Trinity College Dublin, Ireland, where he investigated topics in computer vision and machine learning in the context of endoscopy. He continued his work afterwards as a post-doctoral researcher in Trinity College before joining Siemens Audiologische Technik (now: Sivantos) in 2014 to work as a research audiologist. His focus is on audiological optimization of hearing aid algorithms and study design. Contact: <a href="mailto:mirko.arnold@sivantos.com">mirko.arnold@sivantos.com</a></td>
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<th>Heather Austin</th>
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<td>Heather worked as a Speech and Language Therapy Assistant in the Audiology Department of Sheffield Teaching Hospitals NHS Trust for 14 years before her retirement in July 2016. She worked along Speech and Language Therapists and Audiological Scientists in delivering a holistic service to people with mild to profound hearing loss including many with cochlear implants. Her main role within the team was to provide emotional and practical support to help people to adjust to their hearing loss, alongside demonstration and explanation of environmental aids. As Heather has had a hearing loss since her early 20s she was able to use her own experience - not only of hearing loss - but also her knowledge around environmental aids which she has found useful in her personal life - to help people to find the most suitable piece of equipment to help them adjust to life with a hearing aid. During both her personal life and working</td>
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Life she has found that hearing music is one of the most difficult to come to terms with after hearing loss so is honoured to be able to share her knowledge and skills with people today.

Lena Batra, B.Sc. DipHE (Hearing Therapy), R.C.C.P.

Lena Batra is a registered Hearing Therapist. She completed her training at Bristol University and the Royal National Throat Nose and Ear Hospital in 2004 and is a member of the Registration Council for Clinical Physiologists.

Lena has held a number of clinical posts. These have included setting up the first Hearing Therapy service in Hertfordshire and working with a complex patient caseload as an Advanced Hearing Therapist for 6 years at the Royal National Throat Nose and Ear Hospital.

Lena's role is to facilitate the holistic rehabilitation of adults with acquired hearing loss. This entails using a wide range of practical and therapeutic interventions to facilitate the change process for the client. Effective clinical work focuses on helping clients navigate and manage the wide-ranging practical and psychosocial challenges they may face in daily living.

As a music lover with hearing difficulties from childhood, Lena’s personal experience has had an important influence on her professional interest in understanding the barriers to music engagement which can exist, and how this can inform the rehabilitation process with the client.
Thomas Behrens

Thomas Behrens is the Head of Audiology and Director at the Centre for Applied Audiology Research at Oticon global headquarters in Denmark. He is responsible for clinical research, professional communication and definition of the audiology in new products for Oticon. Prior to this Thomas was for 10 years a Researcher and Project Manager at the Oticon Research Centre, Eriksholm. Thomas areas of expertise in particular are spatial hearing, signal processing for hearing aids, technical audiology, outcome measures and methods for laboratory as well as field trials. Thomas has a master degree in Applied Signal Processing and a bachelor degree in Business Administration.

Cathy Bowker

Dr Harriet Crook is Lead Clinical Scientist for Complex Hearing Loss at Sheffield Teaching Hospitals NHS Trust. She has worked as a Clinical Scientist in the NHS since 2003 across Adult Rehabilitation, Auditory Processing Disorders and Cochlear Implants. She completed a PhD in Auditory Neuropsychology (Sheffield University), an M.Sc. in Audiological Science (Manchester) and CAC training at Addenbrookes’ NHS Trust, Cambridge. She is also currently Director of Education Accreditation and CPD for the British Academy of Audiology.

Dr Crook is actively engaged in funded research and holds collaborations with the Departments of Music, Computer Science and Human Communication Sciences at the University of Sheffield and with the School of Music at the University of Leeds. Her research explores Auditory streaming, Auditory processing in Cochlear Implant users and Music listening with implants and hearing aids. Dr Crook has a personal interest in music and hearing loss, having a unilateral hearing loss since early
childhood and having undertaken a degree in Music and Philosophy at University of Wales, Cardiff. Her PhD on auditory processing focussed on the effects of brain damage on the perception of music and emotion through hearing.

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<th>Marshall Chasin</th>
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<td>Dr. Marshall Chasin is an audiologist and the Director of Auditory Research at the Musicians' Clinics of Canada, Adjunct Professor at the University of Toronto (in Linguistics), and Associate Professor in the School of Communication Disorders and Sciences at the Western University. He is the author of over 200 articles and 8 books including Musicians and the Prevention of Hearing Loss. He currently writes a monthly column in Hearing Review called Back to Basics and a weekly blog at <a href="http://www.HearingHealthMatters.org/HearTheMusic">www.HearingHealthMatters.org/HearTheMusic</a>. Dr. Chasin has been the recipient of many awards over the years including the 2012 Queen Elizabeth II Silver Jubilee Award for service to Canada. He has developed a new TTS app called Temporary Hearing Loss Test app.</td>
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<th>Sue Falkingham</th>
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<td>Sue Falkingham has been an Audiologist in Training and Education at Starkey Hearing Technologies for 7 years. Her role is to deliver training to all Starkey Customers to make them competent and confident to fit Starkey products. As a qualified, Clinical Audiologist, Hearing Therapist and Registered Hearing Aid Dispenser Sue brings 27 years of varied work experience to the team from both the NHS and Commercial sides of the industry. Currently Vice President of the British Academy of Audiology Sue is passionate about the role of the audiologist in rehabilitation for adults with hearing loss.</td>
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Alinka Greasley

Dr. Alinka Greasley is an Associate Professor of Music Psychology at the School of Music at the University of Leeds. She specialises in social-psychological research into people’s musical preferences and listening behaviour, using both quantitative and qualitative approaches, and is currently Principal Investigator on an AHRC-funded project ‘Hearing Aids for Music’ which is exploring how hearing impairments and the use of hearing aid technology affect music perception and appreciation. She is a Chartered Psychologist with the British Psychological Society, a Fellow of the Higher Education Academy and a member of the Society for Education, Music and Psychology Research. She is also a violinist, pianist and DJ.

Brian Henderson

Born and educated in Liverpool, Brian is a Physics graduate with an interest in music. He taught Physics to A and S level in a variety of schools. He has been an organist in churches for over 50 years with particular involvement in Bromsgrove Methodist Church, Worcestershire, since 1972. Brian is now moderately deaf following sudden hearing loss in his left ear in 2010 and then in his right ear in February 2016. The loss at high frequency had devastating effects on his perception of organ sound. His gradual return to playing using NHS digital aids has been a time of mixed emotions, involving both frustration and satisfaction.

Gary Holland, Independent Audiology Consultant

Gary has been an Audiologist for over 40 years. Initially training as a student Physiological Measurement Technician in Newcastle upon Tyne, he then progressed to being one of the youngest Senior Chief Audiologists in the NHS when he took over the running of the Audiology department in Sunderland in 1979 aged 21. He then worked with PC Werth as a regional manager before setting up a very successful independent
hearing care practice near Newcastle upon Tyne in the early 1990’s. He no longer dispenses himself, but now dedicates his time to keeping up to date with Best Practice in Audiology, and helping other independent business owners ensure that they are able to offer the best possible service for their customers. He has collaborated with Widex UK for more than 6 years now, assisting with development of the Widex Best Practice Programme. He has designed and delivered educational seminars and workshops on topics as diverse as “Setting up a tinnitus service” to “Pricing transparency and unbundling”. He has also helped with practical practice design and is a self-confessed stickler for detail. Many of the customers that he visits say that they find it extremely useful to have an external pair of eyes look at their practice, and then offer not just advice, but also practical assistance in updating clinical and business standards. The provision of hearing aid services has changed dramatically in the last few years, and there will surely be many more changes to come. Gary is committed to providing independent hearing aid audiologists with the knowledge and tools that they will need to flourish in this constantly changing market.

**Erik Jorgensen**

Erik is an AuD/PhD student at the University of Iowa. He is currently a fellow in the Iowa Leadership and Education in Neurodevelopmental and Related Disorders program. His primary research interests are in music perception, auditory ecology, and psychoacoustics. He is also an active composer of new music. He has a BA in philosophy from Columbia University.
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<th>Kei Kobayashi</th>
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<td>Dr. Kei Kobayashi is an Honorary Academic in Faculty of Engineering who received his doctorate (Electronics Engineering) from Sophia University in Japan after working for 10 years in SONY where he had worked on design and management of various consumer products, such as digital hearing aids, infrared headphones, speakers, integrated remotes and computer OS. He has a plenty of engineering experience from software/hardware design to manufacturing. He has moved to NZ and joined in Audiology as research fellow since 2007 where he has contributed to various auditory research and software (see list below). He is currently in Communication acoustics lab in Acoustics centre and working on digital signal processing and acoustics for hearing instruments. He is Deaf (profound hearing loss) and his hearing aid use and engineering expertise allows an appreciation of hearing loss and its challenge to engineering for the community.</td>
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<th>Völker Kühnel</th>
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<td>Volker Kühnel, PhD, received his degree in Physics in 1995. Since 1998 he works with Sonova AG (formerly Phonak) in Switzerland. Currently his role is as principal expert for hearing performance. His work is focused on the audiological quality of Phonak hearing instruments, especially the initial-fit as well as sound quality and user benefit from advanced audio signal processing. Working at the interface between hearing aid algorithms, fitting software and audiological research is motivating him. Volker is married, has two children and besides enjoying time with his family, sailing and music – especially singing in choirs is very much to his heart.</td>
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Paul Lamb has worked with Starkey for 30 years and is Technical Director. Paul is responsible for overseeing the education and training initiatives for the Starkey brand both in the UK and Europe. He joined the company in 1987 and gained invaluable experience working across manufacturing, technical support and training within the organisation. Paul has led the Professional Services group to create and deliver Training for all customer groups and plays a key role in all Starkey UK Event planning and delivery. Externally Paul has lectured on hearing aid technology for numerous U.K. Universities. Paul is registered with the HCPC and a member of BSHAA.
Sam Lanes
Rick Ledbetter

Yuli Levlov
Yuli is co-founder and director of Reactify - a unique music production company focusing on formats of music that go beyond simply listening. Projects include sound installations, VR apps, games and web-based tools, and span the landscape of generative, interactive and reactive music.

Valerie Looi
Valerie is both a clinically-certified audiologist and a registered music therapist. She completed her Masters in Clinical Audiology at the University of Queensland, and her PhD in Audiology from the University of Melbourne. Her PhD research investigated the music perception skills of cochlear implant (CI) recipients compared to hearing aid users. After working at the University of Canterbury in New Zealand, as a Senior Lecturer in Audiology for 5 years, she moved back to Australia and was previously the Senior Research Manager for the Sydney Cochlear Implant Centre (SCIC), the largest cochlear implant clinic in Australia. She currently is the Regional Research Manager covering Asia Pacific for Advanced Bionics. She also holds adjunct positions with both the National University of Singapore and Macquarie University, supervising Audiology Masters and PhD students for these institutions. Her research has focused on the music perception and appreciation of CI recipients, and more recently, on developing music training programs for hearing impaired adults. Her other research interests include lexical tone perception, quality of life, and clinical outcomes for the hearing impaired. She has published over 30 peer-reviewed papers, and made over 35 oral conference presentations, including 10 as an invited speaker, and is very honored to be involved in this unique conference.
Sara Madsen
Sara is a postdoctoral researcher in the Hearing Systems Group at the Technical University of Denmark where she previously studied biomedical engineering (BSc) and Engineering Acoustics (MSc). Sara received her PhD in 2014 from the Department of Psychology at the University of Cambridge, under the supervision of Prof. Brian Moore. Sara has a background in music which has heavily influenced her research. She has previously studied flute performance at North Carolina School of the Arts, USA and the Royal Conservatory of Music in Aarhus, Denmark. Her PhD was concerned with effects of hearing impairment and hearing aids on listening to music. Her postdoctoral work investigates abilities of normal and hearing impaired listeners to use pitch cues for sound segregation. Sara is currently funded by the Carlsberg Foundation.

James Mander
I trained as an Audiolist at The Royal National Throat Nose & Ear Hospital and have experience of working in a number of Audiology departments in London. I then worked at the Manchester Royal Infirmary specialising in cochlear implants. Using this knowledge I moved into the commercial sector by joining the technical team at Advanced Bionics and subsequently worked closely with Phonak Communication on wireless products. I currently work for the Ewing Foundation - a UK based charity supporting deaf children. I bring together experience and technical knowledge from working in the
NHS, the Sovona Hearing Group and from working in partnership with teachers who look after deaf children in the education environment.

**Rémi Marchand**

Rémi Marchand is currently pursuing a PhD on Hearing aids and music at the National Acoustic Laboratories (NAL) in Sydney (Australia) and supported by the HEARing Cooperative Research Centre. In 2015, Rémi concluded a Masters of Research in Acoustics, in Le Mans (France). His Master's thesis took place at the Acoustical and Mechanical Laboratory (LMA) in Marseille (France) working on the Psychoacoustic simulation of Cochlear Implants. Prior to this, in 2014, he concluded a Master’s Degree of Electronics and Signal Processing Engineering, in Toulouse (France) and Hamburg (Germany). Rémi is passionate about music and plays guitar.

![Rémi Marchand](image)

**Lorenzo Picinali**

I am a Senior Lecturer in Audio Experience Design, and the Director of Undergraduate Studies in the Dyson School of Design Engineering at Imperial College London. In the past years I have worked in Italy, France and UK on projects related with 3D binaural sound rendering, spatial hearing, interactive applications for visually impaired individuals, hearing aids technologies, audio and haptic interaction and, more in general, acoustical virtual and augmented reality.

![Lorenzo Picinali](image)

**Christine Rocca**


Maja Serman

Maja Serman holds a diploma in mech. engineering and a M.Sc. in power engineering, from the University of Zagreb, Croatia. She completed a Ph.D. in modelling change detection in melodic processes at the University of Limerick, Ireland and the Embark Initiative Postdoctoral Fellowship in temporal multi-scale modelling of auditory short-term memory. Ms Serman works as a research audiologist in hearing aid industry since 2007. Her activities include the development and optimisation of hearing aid related algorithms, as well as designing and conducting studies with normal hearing and hearing impaired listeners.
Contact: maja.serman@sivantos.com

Jonathan Vaisberg

Richard Vaughan

Richard Vaughan is Customer Support Manager at Connevans Limited. Connevans is an independent family run company established over 55 years ago, specialising in meeting the needs of people who are deaf or hard of hearing. Connevans is proud to have been awarded the Royal Warrant of Appointment to Her Majesty Queen Elizabeth II as Manufacturer and Supplier of Audio Equipment. Richard joined Connevans ten years ago. Prior to this he was Technology Services Manager at the National Deaf Children’s Society, responsible for providing information services to families and professionals and for leading on policy work to improve the provision of technology to deaf children.