sempre:

Society for Education, Music and Psychology Research

Empirical Musicology

Senate House, University of London

2-3 April 2008

Institute of Musical Research

UNIVERSITY OF LONDON · SCHOOL OF ADVANCED STUDY

Programme

Wednesday 2 April

10.00 - 11.00 **Registration and Coffee** (Room NG14)

11.00 - 1.00

Performance (Room N336) Chair: Lawrence Zbikowski	**Memory and Learning** (Room NG16) Chair: Adam Ockelford
Martin Clayton (Open University), Entrainment, Empirical Methods and Musical Performance Taina Riikonen (Sibelius Academy, Finland), Multimaterial Research Data in the Study of Musical Performance Terence Curran (University of Oxford), The Psychology of Recording: A Qualitative Study of Musicians' Attitudes and Approaches to Recording Werner Goebl and Caroline Palmer (McGill University, Montreal), Do Movement Strategies Change Across Tempo in Piano Playing?	Jane Ginsborg and Jenny Pitkin (Royal Northern College of Music), Long-Term Memory for Simple and Complex Music: The Effects of Practice Time and Expertise Alicja Knast, Simon Durrant, Eduardo Miranda and Susan Denham (University of Plymouth), Enculturation Limits. The Statistical Learning of Musical Stimuli. Saffran et al. 1999 Revisited Graham Welch (Institute of Education, University of London) and Adam Ockelford (Roehampton University), Analysing the Structure of the Patterns of Sound Produced by Children and Young People with Learning Difficulties to Gauge their Levels of Musical Development: A Model and Examples Ioulia Papageorgi (Institute of Education, University of London) and Elizabeth Haddon (University of York), Culture and Context: The Influence of Institutional Culture on Undergraduate Musicians' Attitudes to Learning and Performance

13.00 - 14.00 **Lunch** (Room NG14)

14.00 - 16.00

Composition and Improvisation (Room N336) Chair: Eric Clarke	**Symposium** (Room NG16) Chair: Raymond MacDonald
Mark Doffman (Open University), Time on their Hands: An Analysis of Groove and How Jazz Musicians Feel It Atte Tenkanen and Erkki Huovinen (University of Turku, Finland), Towards an Empirical Analysis of Free Improvisation Adam Ockelford (Roehampton University), Measuring the Musical Impact of one Performer on Another in Improvisation: A Method, an Example, and Potential Future Developments Ulla Pohjannoro (Sibelius Academy, Finland), Composer's Composing Process: a Case Study of Creating One Piece of Music	Karen Burland (University of Leeds) and Melissa Dobson, Stephanie Pitts and Christopher Spencer (University of Sheffield), Beyond Market Research: Empirical Investigations of Audience Experience • Introduction • Case study 1: Longitudinal Research at the Music in the Round Chamber Music Festival • Case study 2: Edinburgh Jazz and Blues Festival • Case study 3: Audience Research with Non-Attenders • Closing Themes

16.00 – 16.30 **Tea** (Room NG14)

16.30 – 17.00 **Aubrey Hickman Award Paper** (Room N336)
Helen Daynes (University of Hull), Listeners' Perceptual and Emotional Responses to Tonal and Atonal Music
Chair/Award presentation: Graham Welch

17.00 – 18.00 **Keynote Address** (Room N336)
Nicholas Cook (Royal Holloway, University of London)
Bridging the Unbridgeable? Empirical Musicology and Interdisciplinary Performance Studies
Chair: Eric Clarke

18.00 – 18.30 **Wine Reception** (Room N336)

19.30 **Optional Conference Dinner at the Paradiso Restaurant, 35 Store Street, WC1E 7BS**

Thursday 3 April

09.00 – 09.30 **Late Registration** (Room NG14)

09.30 – 10.30

Emotion and Meaning in Music (Room N336) Chair: Ian Cross	**Performance and Perception** (Room NG16) Chair: Jane Ginsborg
Kyriaki Zacharopoulou (Aristotle University of Thessaloniki), The Perception of Emotion in Familiar and Unfamiliar Music: A Cross-Cultural Study of Emotional Intelligence Gunter Kreutz (Royal Northern College of Music) and Mark Levy and Mark Sandler (Queen Mary, University of London), Emotion Words for Music by Internet Users	Alicja Knast (University of Plymouth), Reconstructing Nineteenth-Century Conducting Gestures Ju-Lee Hong (Goldsmiths, University of London), Cello Portamenti: An Empirical Analysis of Legendary Cellists on Record

10.30 – 11.00 **Coffee** (Room NG14)

11.00 – 12.30

Limitations and Possibilities in Empirical Musicology (Room N336) Chair: Nicholas Cook	**Multimodal Approaches** (Room NG16) Chair: Stephanie Pitts
Lawrence Zbikowski (University of Chicago), The Limits of Empirical Musicology Jonathan Owen Clark (Brunel University), Empirical Musicology and Psychoanalysis Richard Lewis (University of East Anglia), Growth by Query: Enabling Critical Reflexivity in Digital Corpuses	Peter Atkins (University of New South Wales), Spirituality and Musical Meaning Ailbhe Kenny (St Patrick's College, Dublin), Picturing Music: Investigating Children's Visual Representations of Music in the Primary School George Papageorgiou (Royal Holloway, University of London), Decoding Musical Expression: The Performance Cube Matrix I

12.30 – 13.30 **Lunch** (Room NG14)
SEMPRE AGM (Room N336)

13.30 – 14.30 **Special Address by Desmond Sergeant** (Room N336)
Cognition and Atonality
Chair/Award presentation: Graham Welch

14.30 – 15.30

Music in Everyday Life (Room N336) Chair: Katharine Ellis	**Computation and Analysis** (Room NG16) Chair: Geraint Wiggins
Anneli Beronius Haake (University of York), Empirical Approaches to Examine the Use of Music Listening in Offices Alisun Russell Pawley (University of York), Singalongability in Popular Music: Reports from the Field	Craig Graci (State University of New York at Oswego), A Quantitative Measure of Melodic Structure: Computational Infrastructure and Cognitive Implications Alan Marsden (Lancaster Institute for the Contemporary Arts), Systematic Exploration of Schenkerian Reduction

15.30 – 16.00 **Tea** (Room NG14)

16.00 – 17.00 **Keynote Address by Eric Clarke (University of Oxford)**
(Room N336)
Empirical, Critical – Dialectical?
Chair: Nicholas Cook

Discussion

17.00 **Close**

Poster Presentations (Room NG15)

The poster presenters will be available during the lunch and tea breaks on Wednesday and the coffee and tea breaks on Thursday to discuss their presentations.

Poster Abstracts

Jillian Bracken (Florida State University), The Effect of Individual Musical Genre Preference on Customers' Overall Experience in a Restaurant as Measured by Customer Satisfaction Surveys

This study explores the connection between music preference and customer ratings of a dining experience in a restaurant. Questionnaires were administered to 80 pizza restaurant customers, each of whom was present for one of four different musical conditions. Listening conditions were determined using the genre-grouping classifications established by Rentfrow and Gosling (2007): 1) Reflective and Complex Genres; 2) Intense and Rebellious Genres; 3) Upbeat and Conventional Genres: and 4) Energetic and Rhythmic Genres. Participants gave feedback on specific aspects of their dining experience, and provided overall ratings of the restaurant. Following this, participants ranked their music preferences from a combined list of all the genres included in the study. Results showed that customers rated their overall experience in the restaurant as more enjoyable when at least one of their top three musical genres was represented in their listening condition.

Carlo Bosi (City University), Emergence of Modal Categories in Late-Medieval Polyphony: An Empirical Approach

Analytical approaches to late medieval/early Renaissance polyphony are by and large still in their earliest developments but their sheer variety and richness is still testified by relatively few publications. Many analysts tackling 14th/16th-century polyphony have often taken very strong theoretical stances as preconditions for work, ranging from Christian Berger's systematic superposition of the hexachords system onto contemporary theories of modality to Harry Powers' rejection of modality as a viable analytical tool for polyphony. An alternative approach would be one that does not lose touch with contemporary modal theories and at the same time strives to attain a satisfactory understanding of the working of late medieval/early Renaissance polyphony based on the works themselves: a practical application is to systematically search for an important mode-defining concept, such as fourth and fifth species, and how these shape and characterise the melodic articulation of polyphony.

Feyzan Goher (University of Nigde, Turkey), Examination of the Melodic Intervals in Western and Turkish Children's Songs from the Angle of Pitch Proximity: Research on 1000 Western and 1000 Turkish Children's Songs

Pitch proximity is a significant indicator of the melodic structure. This research examines melodic intervals in Western and Turkish children's songs from the angle of proximity, and evaluates the results comparatively. 1000 Western and 1000 Turkish children's songs have been analysed respectively. As a result of the research, it has been determined that small pitch intervals have been used in Turkish Children's songs in comparison with Western Children's songs, based on the digital data. The general structures of harmonious Turkish and Western Music coincide with the findings of the research.

Eva Georgii-Hemming and Maria Westvall (Őrebro University, Sweden), Musicology – Research Focusing on the Relationship Between Music and Human Beings

The relationship between Music and Human beings is a major research focus within Musicology at the School of Music at Örebro University in Sweden. With this twofold orientation, the University particularly attempts to elucidate people's relation to art and to science. The encounter between Music and Human beings covers not only how people relate to music, but also the artistic, educational and social aspects of music. This indicates that an important question is not only what people do with music, but in addition what music does to people. This poster presents models of empirical musicology including examples from ongoing projects within the School of Music. The theme 'A Researching Department' illustrates how teachers, students, musicians and researchers together generate new, fruitful and productive knowledge.

Kristen Link, Craig Graci and Janelle Hutchinson (State University of New York at Oswego), The Effect of Computer Modeling on Melodic Memory

To explore the idea that the computational modeling of melody may enhance melodic memory, a participant in a single subject experiment completed sixteen study sessions, each devoted to studying one melody. Eight pairs of melodies were selected, and, for each pair, a different study method was assigned for each melody: computational modeling or instrumental practice. Each session consisted of the presentation of the score of a melody, a study period, a rest period, and an assessment period, which included a note-sequence recognition test, a note-sequence recall task, and a transcription task. The modeling language used is a simple symbolic language well-suited to modeling melodic structure. The participant became competent with the language after roughly six hours of training. The instrument used was the piano. The participant could read and write music from previous piano training. We present results that compare the effectiveness of the two methods.

Paper Abstracts

Peter Atkins (University of New South Wales), Spirituality and Musical Meaning

Most of us have had a powerful experience of music. Some of us might even call that experience spiritual. But what does that mean? This talk presents some exploratory research into this issue, taken from a focus on musical meaning. If music can mean a variety of things which type of meaning best explains the phenomenon of spirituality? Results from a questionnaire are discussed. They indicate some involvement of all types of meaning in this phenomenon, and yet some level of disjunction at each point of contact. Absolute expressionist meaning (the emotional content arising from the musical forms) demonstrated the most support for spirituality, suggesting that spirituality is experienced in a similar way to emotions. A variety of implications are discussed, including the suggestion that the current scientific focus on emotion has passed over an arguably even more fundamental element to the human-music nexus: spirituality.

Anneli Beronius Haake (University of Sheffield), Empirical Approaches to Examine the Use of Music Listening in Offices

Increased availability of mobile and computer-based listening devices means that private listening to recorded music is a ubiquitous presence in British offices. Three empirical studies have been carried out to further the understanding of the role of music listening in offices: a survey, an interview study and a field experiment. In these empirical studies, a multi-disciplinary approach was taken to the collection of data. Disciplines included music psychology, work psychology, musicology, sociology and architecture. Instead of using a theoretical model for constructing hypotheses, the process involved an exploratory approach and the use of many different theories from the various disciplines above. This paper will present the design of three empirical studies on this topic, and the rationale for each empirical approach. It will examine advantages and disavdantages of each approach, and also discuss some of the particular issues surrounding the study of music in the 'real world'.

Karen Burland (University of Leeds), Melissa Dobson (University of Sheffield), Stephanie Pitts (University of Sheffield) and Christopher Spencer (University of Sheffield), Beyond Market Research: Empirical Investigations of Audience Experience

Introduction
This themed session will consider the purposes and practicalities of empirical research with concert audiences, drawing on recent and ongoing case studies carried out by the presenters. We will address in this session the practical challenges of

conducting audience research, evaluating some of the methods we have used and proposing strategies for stimulating audience interest and participation, and for securing the trust and support of arts organisations. Our aims have consistently been to go beyond the familiar collection of demographic information in order to gain qualitative understanding of the audience experience. Empirical investigation with audiences has much to contribute to psychological and musicological research: offering new insight on the behaviour of large groups, considering the effects of venue and ethos on expectations and experience, and providing evidence to inform current debates about declining audiences for live concerts, particularly classical music.

Case study 1: Longitudinal Research at the Music in the Round Chamber Music Festival [Stephanie Pitts & Christopher Spencer]
The Music in the Round chamber music festival has run annually in Sheffield for over twenty years, and in recent years has seen the appointment of a new resident ensemble. A case study carried out in 2003 investigated audience sense of belonging to the festival, and a follow-up in 2006 revealed a process of evaluation and self-reflection amongst the audience, as they confronted their own aging and changing priorities in the wake of the founding string quartet's retirement. This festival therefore offers particular insight on audience development over time and on the relationship between long-term audience members and familiar and not-so-familiar performers. Through its unusual 'studio' setting, the audience experiences also shed light on the effects of venue, illustrating the concept of 'place attachment' through the audience's willingness to overlook the shortcomings of the venue in light of their favourable memories of listening in that context.

Case study 2: Edinburgh Jazz and Blues Festival [Karen Burland & Stephanie Pitts]
The Edinburgh Jazz and Blues Festival is one of the biggest jazz festivals in the UK and has been established for thirty years. The festival includes New Orleans, Rhythm and Blues, Swing and Free jazz, all performed in a variety of contrasting venues. A large-scale case study carried out in 2007 examined the different perspectives of jazz audiences, who are typically characterised as being younger than that for classical music, and possibly more open to new musical experiences. Data were collected through 40 interviews, 700 questionnaires and observations to form a rich qualitative picture of the musical behaviour and attitudes connected with the Festival. The research enables comparisons with classical music audiences, where current concern about aging and declining audience profiles prompts us to ask whether the different settings and ethos of jazz events can inform an understanding of audience recruitment and retention for other genres.

Case study 3: Audience Research with Non-Attenders [Melissa Dobson]
Fresh insight on audience behaviour can be gained from exploring the assumptions and experiences of those who do not typically attend classical music concerts. This paper outlines the methods chosen for an in-progress study using first-time attenders, and presents some preliminary findings. The study explores the effect of venue on audience experience by providing tickets for concerts at three different venues to eight culturally-aware participants for whom classical concert attendance is not a usual occurrence. Group interviews enabled participants to discuss their

experiences of each event, and to compare one venue with another. In addition, prior to attendance, half of the participants were provided with recordings of the pieces to be heard in performance, as a means of gaining exploratory qualitative data on the effects of repertoire familiarity on audience experience. Lastly, individual interviews provided an opportunity for more detailed exploration of the participants' experiences of classical concert attendance.

Closing themes
The session will close with an evaluation of methods, including strategies for gaining meaningful qualitative data through large-scale surveys. We will draw conclusions about the function and experience of concert attendance for audience members in the three case studies, investigating the role of live and recorded music in contemporary listening practices. The purpose of audience research will be considered for its contribution to various strands of psychology and musicology, and for its practical value for arts organisations seeking to retain and recruit their audiences.

Jonathan Owen Clark (Brunel University), Empirical Musicology and Psychoanalysis

This paper will explore the 'limits' of empirical musicology from the perspective of certain ideas from cultural theory and psychoanalysis. Eric Clarke's recent work posits a decentred 'subject-position' for the listener/perceiver, based on a contingent environmental and ecological mutualism, but with certain acoustic 'invariants' playing key roles. This work can be seen as a challenge to the predominant 'cognitivism' of much recent research in empirical musicology, but here we suggest another sort of challenge from psychoanalysis. What is the role of what psychoanalysis calls jouissance in the construction of such a subject-position? and in particular, how does it apply to the experience of listening? Can access to such 'listening-pleasure' be 'categorised', much as Lacan did in the famous mathemes for sexuation, and in doing so can we posit the subject of 'listening-pleasure' as an always dual entity, a subject that, at least partly, 'listens beyond signification'?

Eric Clarke (University of Oxford), Empirical, Critical – Dialectical?

The case for empirical musicology focuses around a recognition that larger bodies of empirical information allow different kinds of questions to be addressed, or allow old questions to be addressed in new ways. But it brings with it the risk of a positivistic empiricism (of an attitude that clings to 'evidence' in a naïve, dogmatic or unquestioning manner), and suggests a fruitful engagement with another relatively recent turn in musicology – critical musicology – however distant from one another these 'brands' appear to be. In this paper, I explore the potential for such an engagement, argue against the 'brand' perspective on both of these terms, and illustrate some of the ways in which a productive dialectic between the empirical and

the critical might be achieved, using examples from existing empirical and critical writing and research.

Martin Clayton (Open University), Entrainment, Empirical Methods and Musical Performance

Entrainment theory describes interactions between rhythmic (oscillatory) systems: it is an important factor underlying musical metre, amongst many other phenomena, both mechanical and biological. A question arising with entrainment, as with other aspects of dynamical systems theory, is: To what extent can groups of musicking humans be regarded as 'dynamical systems'?
In order to unpick the relationship between musical behaviour as the emergent self-organisation of a complex system, and musical behaviour as the intentional and meaningful action of individuals, two types of empirical study are essential: (1) study of timing in music in order to establish the extent to which the relationships between human rhythmical processes can be modelled using entrainment theory, and (2) ethnographic research aimed at establishing the relevance people ascribe to these same phenomena.
I will illustrate data-gathering and analysis techniques using examples from studies on groups performing Indian raga and Afro-Brazilian Congado ritual.

Nicholas Cook (Royal Holloway, University of London), Bridging the Unbridgeable? Empirical Musicology and Interdisciplinary Performance Studies

How does empirical musicology relate to cultural musicology, or are they quite different enterprises? I address this question in terms of the study of performance, contrasting the kind of knowledge that can be gained from empirical analysis of recorded performances on the one hand with the approach of interdisciplinary performance studies on the other. Philip Auslander sees performance in terms of the construction of the fictive identities he terms performers' 'personae', arguing that 'to think of music as performance is to foreground performers and their concrete relationships to audiences, rather than the question of the relationship between musical works and performances': I argue that both approaches are essential to an adequate understanding of the multidimensional phenomenon of musical performance (it is not a matter of 'rather than' but 'as well as'), and that the important distinction is not between works and personae, but between performance understood as reproduction and as the generation of emergent meaning in real time.

Terence Curran (University of Oxford), The Psychology of Recording: a Qualitative Study of Musicians' Attitudes and Approaches to Recording

Recordings have been in existence for over a century and for many musicians are an accepted part of professional life, yet there is virtually no research available on the psychology of recording and the ways in which musicians respond to the medium.
A qualitative study was conducted, based on interviews with musicians and record producers, to explore attitudes and approaches to recording.
Analysis of the data, using a grounded theory approach, confirmed that although, at a superficial level, there are similarities between recording and concert performance, there are also significant differences: recording makes particular demands of musicians, with interruption and repetition creating extreme conditions for memory, concentration, and stamina.
A key finding of this study was that recording disrupts musicians' sense of control over their performance and that this, linked with tendencies towards perfectionism, was a source of anxiety likely to have a negative impact on performance.

Helen Daynes (University of Hull), Listeners' Perceptual and Emotional Responses to Tonal and Atonal Music

Research in music and emotion has largely focused on responses to tonal music on isolated occasions. This paper presents a novel approach to the study of music and emotion that aims to investigate the effects of familiarity on listeners' responses to tonal and atonal music. A mixed-methods longitudinal design was adopted to enable access to the familiarisation process. 19 participants (10 musicians; 9 non-musicians) embarked on the study. Participants used a range of quantitative and qualitative self-report mechanisms to record their emotional responses to music by Clementi, Schoenberg and Berio over a two-week familiarisation period. Results suggested that with increased familiarity, participants showed greater understanding of the musical structure and increased awareness of details in the music, which impacted on the emotional triggers they identified. There was evidence for increasing anticipation of emotional events with familiarity. The musical language also showed profound effects: participants found it more difficult to identify the musical structure of the atonal pieces than the tonal pieces; emotional responses to the atonal pieces were lower than those for the tonal pieces, and this effect was greatest for non-music students. The implications of these results are discussed.

Mark Doffman (Open University), Time on Their Hands: an Analysis of Groove Within Three Jazz Trios

Jazz musicians will often cite groove as the key component in a successful performance yet it remains elusive as a musical phenomenon. The literature around groove tends to highlight either its structural or processual qualities. This paper

attempts to reconcile the notions of groove as structure and groove as process for a more complete understanding.
Incorporating ideas from ethnomusicological studies of jazz interaction, work on cultural models from cognitive anthropology and entrainment theory, the approach here involves detailed analysis of players' timing patterns within a trio setting. Using Praat software, it is possible to gain insight into the expressive and dynamic nature of groove. In tandem with this quantitative approach, the paper presents qualitative data from interviews with the performers which contextualise the timing data. An ethnography of musical feeling is presented which relates entrained musical behaviours to the shared temporal models of the musicians.

Jane Ginsborg and Jenny Pitkin (Royal Northern College of Music), Long-term Memory for Simple and Complex Music: the Effects of Practice Time and Expertise

Compositional characteristics influence the time it takes to learn and memorise music. This study investigated the effects of expertise and practice time on music performance students' accuracy of recall, over time, for newly-memorised simple and complex pieces. Participants memorised one of two pieces, which they then performed from memory six times over a four-week period. Accuracy of recall was calculated for each performance. While expertise or type of piece had no effect on practice time, there were significant effects on accuracy of recall: more advanced students had better recall and the simple piece was recalled more accurately than the complex piece in the fourth, fifth and sixth performances. Data from practice diaries suggest that rather than the amount of practice undertaken, it is the quality of practice that determines accuracy of recall.

Werner Goebl and Caroline Palmer (McGill University, Montreal), Do Movement Strategies Change Across Tempo in Piano Playing?

Piano educators disagree as to how performers should develop the ability to perform scale passages evenly and dexterously at very fast rates. One side points out the importance of practicing these fast sequences at very slow speeds, while others insist on practicing at the intended fast tempo, easing the task by chopping up the passage into smaller segments. The main argument of the latter is that movement strategies change across different tempi – as human gait changes from walking to running – and wrong movements would be learned if fast passages were practiced slowly. In this paper, we investigate the kinematic properties of finger and hand movements of 12 skilled pianists playing simple isochronous melodies at different tempi ranging from medium (500 ms inter-onset interval, IOI) to very fast (75 ms IOI and shorter). A 3-dimensional motion capture system tracked the movements of small reflective markers glued on pianists' finger joints, hand and wrist. Kinematic features, such as finger-key landmarks, key-bottom landmarks, finger peak height, or wrist rotation were computed from the motion trajectories. All measures changed

considerably with increasing performance rate suggesting that indeed pianists adapt their movements to the required tempo.
We will discuss the results in the light of the above mentioned controversy.

Craig Graci (State University of New York at Oswego), A Quantitative Measure of Melodic Structure: Computational Infrastructure and Cognitive Implications

The problem of modelling melodic structure in tonal music has relevance to the study of listening, performance, and composition. This paper introduces a metric for assessing the degree to which structural representations of melody are plausible with respect to tonal theory. The metric is informed by such factors as hierarchical organization and relational recognition. It is defined in terms of computational representations of melody which are realized in a simple symbolic programming language. I present elements of this computational formalism that are used for melodic representation and metric evaluation. I discuss two empirical studies relating to the metric. The first is a correlational study in which evaluations of melodic grouping structures made by the metric are compared with those made by musicians. The second is a small exploratory study which investigates the role of the metric as a cognitive artifact for enhancing ability to analyze melodic structure.

Ju-Lee Hong (Goldsmiths, University of London), Cello Portamenti: An Empirical Analysis of Legendary Cellists on Record

Portamenti and timing fluctuation were empirically investigated in six legendary cellists' recordings of two contrasting repertoires, the Sarabande in J. S. Bach's G major solo cello suite BWV 1007 and the Adagio affettuoso in Brahms' F major sonata for cello and piano Op. 99. Glide (portamenti) duration and rhythmic patterns were measured at inter-onset-intervals (IOIs), using the computer system BeatRoot. Similarities between performances were analysed using Pearson's r. Investigated areas include (1) portamento occurrences, (2) glide length and pitch leap, and (3) slide speed and the following performed score duration. In the Brahms case study, consequent ensemble synchronisation error deriving from portamento occurrences was also considered. To conclude, a correlation rate of cello portamenti on record was observed in relation to recording date, the age of artists at the time of recordings, pedagogical lineages between artists and the style of the specific piece being performed.

Ailbhe Kenny (St Patrick's College, Dublin), Picturing Music: Investigating Children's Visual Representations of Music in the Primary School

The research investigated the ways primary school children represent music visually. The main aim was to reveal how these visual representations present a window into musical understanding and development. The research design included a whole-class music-task and individual interviews with all class levels (aged four to thirteen) of a Dublin city primary school in Ireland. The main issues that arose from the findings were the intentions children had in their representations, the means children used to demonstrate the music heard and the subject matter of the representations. A model of representational development is proposed based on the research findings. In recent times there have been various streams of thought into how children represent music. Many music educationalists (Barrett, Shiobara, Swanwick) argue that there is a need for a repertoire of musical experiences to draw from in the course of musical development. This building up of a repertoire of symbolisation strategies was a core element of this research study where it became evident that children build upon these experiences as they get older. This is outlined clearly in the model of representational development put forward in this research.

Alicja Knast, Simon Durrant, Eduardo Miranda and Susan Denham (University of Plymouth), Enculturation Limits. The Statistical Learning of Musical Stimuli. Saffran et al. 1999 Revisited

While many individuals benefit from some explicit acquisition of musical knowledge, for most of the population it remains primarily a case of implicit learning. As such, understanding the mechanisms of this implicit knowledge acquisition is crucial. Central to current discussions about the mechanisms of implicit knowledge acquisition in various modalities are two questions: 1) is implicit knowledge acquired on the basis of rules or statistics?; 2) Do we learn statistical regularities of adjacent or non-adjacent distributions?

In this paper we seek to shed light on this situation for musical tone sequences by presenting the results of a set of experiments using the statistical learning paradigm developed for language by Saffran et al, and subsequently applied to tone sequences, in which transition probabilities are the only cue for learning. This paradigm has been widely adopted and applied in other domains following Saffran's initial work, but our results suggest that caution should be exercised when taking this approach. In particular, the role of enculturation forming prior preferences which bias subsequent post-exposure results, which was largely ignored by Saffran, is found to be a crucial determining factor in these results, with culturally familiar intervals such as seconds proving more resistant to learning than the less frequently encountered tritone, for example. Experiments which ignore the effect of previous long-term exposure do so at their peril.

Alicja Knast (University of Plymouth), Reconstructing Nineteenth-Century Conducting Gestures

Research on the history of conducting, interwoven so tightly with the development of the orchestra, has recently been a well presented topic in historical musicology research. More practical issues can be found in handbooks for conductors, especially those from the first part of the 20th century.
Some insights towards understanding 19th-century conductors' gestures have been gathered during research on a unique collection of seventy batons in a private collection in Warsaw. The basis of the gestures‘ reconstruction are observations of length, shape, weight and cross-references with iconography and first-hand witnesses' recollections. The following hypotheses can be drawn:

1) initially around 1830-50 baton gestures were executed in a parallel to the body manner, where both tips of a baton were equally important in showing cues to an ensemble
2) gradually the angle between baton and body increased, which is reflected in a grip change, moving towards the bottom end of a baton; it can also be observed in changes of a handle's ergonomy (a narrowing 1/3rd from the bottom)
3) the space used for performing gestures evolved from 2- to 3-dimensional; these limitations were set by the shape of a baton in conjuction with possible movements
4) modern conducting, in which efficiency and expressiveness are emphasised, represents a final stage of that process, where the tip of a baton is extensively used in most minute gestures

Gunter Kreutz (Royal Northern College of Music), Mark Levy and Mark Sandler (Queen Mary, University of London), Emotion Words in Social Tags for Popular Music

We explore the use of data mining techniques to identify underlying dimensions and hierarchical relationships of emotion words as applied to music by millions of users of social music websites. The purpose of this paper is to highlight the methodological implications of data mining, in general, and the analysis of “social tags” (listener-supplied annotations), in particular, as a complementary approach to traditional laboratory-based experimental studies. We studied emotion words from some 330,000 individual tags applied to a dataset of over 8,000 tracks, covering all the well-known popular genres, as well as a few pieces by 18th- and 19th-century composers. We applied multidimensional scaling (MDS) and factor analysis (FA) to analyse these word-track associations. Results reveal similarities and differences from the classic circumplex model of affect. These results suggest that data mining as a powerful means to explore verbal responses to music in the open field.

Richard Lewis (University of East Anglia), Growth by Query: Enabling Critical Reflexivity in Digital Corpuses

Much work in empirical musicology, whether quantitative or qualitative, relies on evidence bases from which to draw observations. Here I problematise the often restrictive specificity of digitally delivered bases. I demonstrate some problems evident in corpuses as a result of poorly conceived use-cases. I discuss some reasons why use-case definitions can be problematic. I then propose a solution to some of these problems based on integrating researchers' queries ('attempted uses') into data-sets to make them more critically reflexive. I argue that such a technique could facilitate the proposing of evidence-based use-cases and I explore some potential implementations of this idea. Finally, I address potential problems and criticisms such as: can implementations become culturally credible, or is this a mere technological proposal? Would query data in a corpus be a help or a hindrance to researchers and could it ever achieve necessary critical mass?

Alan Marsden (Lancaster Institute for the Contemporary Arts), Systematic Exploration of Schenkerian Reduction

A computational approach has been taken to discovering principles which govern the derivation of a Schenkerian analysis from a score. Computer software has been written which generates a matrix from which reductions of a fragment of music may be derived. The reductions are restricted to those allowed by harmonic-contrapuntal rules (as currently embodied in the software), but the number of possible reductions for even a few bars of music is nevertheless very large. The software is able to sample this population and take arbitrary measurements (e.g., the number of notes) of each sample. The objective is to find measurements in which the values found for actual analyses made by musicians are consistently distinctive in the distribution of values found in the population of possible reductions from the same fragment. These measurements are good candidates to form the basis of principles for making a Schenkerian analysis.

Adam Ockelford (Roehampton University), Measuring the Musical Impact of one Performer on Another in Improvisation: A Method, an Example, and Potential Future Developments

This paper sets out a method through which the influence of one performer on another during improvisation can be measured in purely musical terms, using the 'zygonic' theory of music-structural cognition developed by Ockelford (2005). A short improvised song by a congenitally blind four-and-a-half-year-old girl and her teacher (accompanying on the piano) is analysed by assessing the strength of derivation of each part from the other as the piece unfolds (Ockelford, 2006, 2007). The result is a note-by-note mapping of the musical impact of the pupil on her teacher and vice versa – with powerful though sobering results for the latter who

had imagined that he was adopting a child-centred approach during the session! The potential development of the zygonic technique of gauging musical impact in real time using computer-based analysis is considered, and its utilisation in other contexts – for example, music therapy and jazz – is explored.

Ioulia Papageorgi (Institute of Education, University of London), Elizabeth Haddon (University of York), John Potter (University of York), Celia Duffy (Royal Scottish Academy of Music and Drama), Tony Whyton (University of Salford), Andrea Creech (Institute of Education, University of London), Frances Morton (Royal Scottish Academy of Music and Drama), Christophe de Bézenac (Leeds College of Music), Evangelos Himonides (Institute of Education, University of London) and Graham Welch (Institute of Education, University of London), Culture and Context: the Influence of Institutional Culture on Undergraduate Musicians' Attitudes to Learning and Performance

This paper derives from the 'Investigating Musical Performance' research project (ESRC/TLRP) and discusses differences and similarities in undergraduate musicians' attitudes to learning and performance. Data was obtained from a questionnaire investigating undergraduate musicians' (N=170) backgrounds, attitudes and approaches to advanced performance learning.
Analysis of variance revealed that student musicians across three HEIs rated their musical skills differently and had different perceptions regarding the amount of control they had over them. Differences were also observed in the perceived relevance and pleasure gained from musical activities, musical self-efficacy beliefs and solo performance anxiety. Students shared similarities in the time and effort they devoted to musical activities, use of self-regulation skills, general self-esteem, general life anxiety and group performance anxiety.
Case study interview and focus group data elucidated some of these results. Findings highlight the potential influence of the institutional context and culture in shaping musicians' approaches and attitudes to learning and performance.

George Papageorgiou (Royal Holloway, University of London), Decoding Musical Expression: The Performance Cube Matrix I

In this paper, I will propose a systematic language for the description of musical expression that can be used for the analysis of performance interpretation. It comes to fill a gap in the study of performance where there is still a problem in how to relate empirical data to analytical concepts. A theoretical model makes possible the evaluation of both the expressive potential inherent in the music as notated and its realisation in performance. The basic analytical units used are organised by the 'Performance Cube Matrix' according to various expressive parameters. The dynamic quality of musical flow is described by four different musical motion phases that can be arranged in various ways to shape motion cycles at different hierarchical

levels. The specific expressive character of these motion phases is specified by pairs of 'dynamic-tempo' patterns whose values are taken from the tempo and dynamic fluctuation graphs extracted from specific recordings.

Alisun Russell Pawley (University of York), Singalongability in Popular Music: Reports from the Field

In pubs and clubs today, one often finds a picture akin to that of the traditional Free-and-Easy held in Victorian taverns where the frequenters habitually joined in with the songs being performed. What compels these frequenters to sing along? This paper presents field research investigating how individuals sing along to live and recorded music in pubs and clubs across Northern England. The social, psychological, and cultural aspects of this tradition will be explored, including how singing along can play a role in the social politics of the pub and in facilitating individual and group identity construction. The research aims to ascertain what musical characteristics, if any, endow a song with a definable 'singalongability'. Preliminary results suggest that such a 'singalongability' exists, though the act of singing along is ultimately dependent on the context in which the song is received.

Ulla Pohjannoro (Sibelius Academy, Finland), Composer's Composing Process: a Case Study of Creating One Piece of Music

My presentation describes aspects of the composing process of one piece of music by an eminent Finnish contemporary art music composer. The focus is on the composer's conscious thinking and acting in actual composing situations. The approach thus takes an epistemological stance to reach the composer's thinking in naturalistic settings as compared to socially constructed statements such as 'how I composed this piece of music'.
The data consists of stimulated recall interviews, manuscripts and the final score of the respective composition. In the presentation I will discuss the function of original ideas, and the transformation process of the ideas into the musical structures, as well as the creation and exploration of the musical material. Furthermore I will demonstrate one sequence of the compositional process exemplifying a complex chain of accumulating problems, leading up to a series of problem-solving moves. Resourceful problem-solving procedures will be detected, as the solution to one problem leads the way to the solution of another problem, and so on.

Taina Riikonen (Sibelius Academy, Helsinki), Multimaterial Research Data in the Study of Musical Performance

In the versatile field of analysis and performance studies (or, 'performance studies') there has been a crucial elaboration of the approaches that study the interactional processes of musical performance through the use of extensive ethnographic and

empirical data (e.g. Clarke et al. 2005). However, the potentially huge amount of data that may be the result of only a single day's fieldwork forces the researcher to carefully consider the relation between the data and the aims of the analysis, and the questions around analytical language and epistemological embedding.
In this paper these issues are discussed from a musician-centred perspective through combining the investigation of a multimaterial research data (collected around the Summer Sounds festival 2006 rehearsals of Lichtbogen, composed by Kaija Saariaho) with the sociological concept of mediation (Hennion & Grenier 2000). The aim of this exploration is to problematise the arbitrary split between the embodied sound-making and the abstracted meaning of music by focusing on the socio-material interaction during the performance process. The main question is: How are the relations between the flautist, the conductor and the script (Cook 2003) negotiated around the first rehearsal of Lichtbogen? The research data consists of the script of the flautist, the dvd-recording of the first rehearsal, and the interview and other discussions with the flautist.

Desmond Sergeant, Cognition and Atonality

Dictionary definitions of atonality all refer to its negative polarity – i.e. what it isn't, rather than what it is? But what are the defining qualities of atonality? And why does atonal music generally enjoy less popularity than tonal music? Are different cognitive processes involved that make it more 'difficult'?
A series of experiments, using practising musicians with wide experience of performance of contemporary music as listeners, will be described. These examine relevant aspects of cognitive processing. The evidence of these will be discussed in the light of Ockelford's *Zygonic* theory.

Atte Tenkanen and Erkki Huovinen (University of Turku, Finland), Towards an Empirical Analysis of Free Improvisation

Within western art music, there is a long-standing tradition of solo keyboard improvisation that has various manifestations in organ music, virtuoso pianism and in the work of improvising composers. However, because of the lack of appropriate research methods and material, no extensive studies have been made concerning the improvisational processes of these musicians. In this paper, we will explore some possibilities that are opened in this field by computer technology. The focus of our study is a corpus of 750 MIDI-recorded free improvisations by a professional keyboard improviser. Our analytical methods aim at producing intuitively obvious graphical descriptions of large-scale musical trends that may reveal something about the underlying psychological processes of the improviser. For example, there is a recurring tendency of the pitch material to develop towards something like an 'average' style of the player within the first two minutes of an improvisation. Interpreting such findings could serve as a starting point for a new type of empirical improvisation research.

Graham Welch (Institute of Education, University of London) and Adam Ockelford (University of Roehampton), Analysing the Structure of the Patterns of Sound Produced by Children and Young People with Learning Difficulties to Gauge their Levels of Musical Development: A Model and Examples

The 'Sounds of Intent' project (Ockelford, et al, 2005; Welch et al, 2007) seeks to map and model the musical development of children and young people with severe, or profound and multiple learning difficulties (SLD or PMLD), with a view to enabling teachers to assess their evolving musicality accurately and therefore permit them to scaffold pupils' further progress most effectively. The latest iteration of the Sounds of Intent model (Ockelford, 2008) integrates three sources of evidence: the musical behaviours of the children and young people themselves, drawn from extensive observation in a range of settings (Welch et al, ms in preparation); the growing literature on the types and levels of musical engagement and ability of young children who are considered to be developing 'typically' (McPherson, 2006; Welch, 2006); and Ockelford's 'zygonic' theory of music-structural understanding (Ockelford, 2005). The result is a framework with six levels in each of three domains of musical activity: 'reactive', 'proactive' and 'interactive'. Through giving teachers the wherewithal to undertake systematic musicological analysis of children's outputs in sound, this framework enables the musical development of pupils with learning difficulties to be mapped with some precision.

Kyriaki Zacharopoulou (Aristotle University of Thessaloniki), The Perception of Emotion in Familiar and Unfamiliar Music: a Cross-cultural Study of Emotional Intelligence

This study explores cultural influences on the perception of emotion in Byzantine music as an indicator of emotional intelligence. British, Italian and Greek adults listened to Greek traditional music based on Byzantine music theory. Subjects rated the degree to which they believed that certain basic and secondary emotions were conveyed by the music. Moreover, structural features of the listening examples were analysed in order to understand the relationship between the structural components of Byzantine music and their impact on perception of emotions. Results demonstrated that basic emotions were accurately recognised (except for fear). However cultural effects were also noticed, displaying both a universal and a culture-specific way of perceiving emotions in unfamiliar music. Finally, the results of an emotional intelligence test revealed a significant correlation between emotional intelligence and successful recognition of emotion in familiar and unfamiliar music, thus suggesting a universal decoding behaviour concerning certain features of musical structure.

Lawrence Zbikowski (University of Chicago), The Limits of Empirical Musicology

In this paper I argue that musical practice, by its very nature, places significant limits on the method of investigation that is basic to empirical musicology. I illustrate my argument with a review of recent research on music and emotion. Although this research has accumulated and analysed a considerable body of data, it has not yielded a model of the relation between music and emotion that offers anything of substance to musicology. I propose that the way forward is not simply through engaging with more data, but through developing better theoretical models - for both human emotions and musical structure - that can both guide and delimit the discovery process.